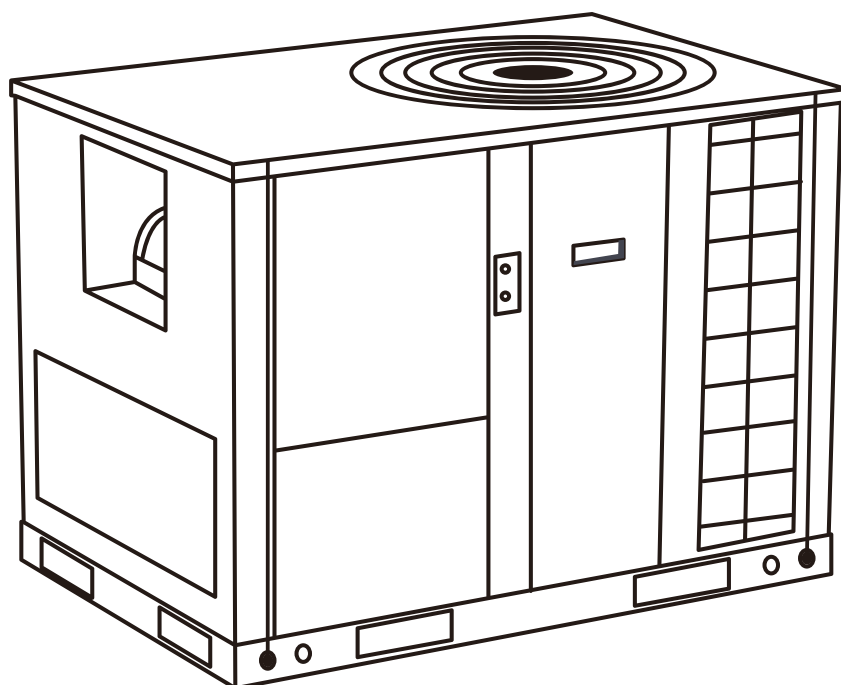




Rooftop Unit

User manual

Please Read the Instruction Carefully before Operating the Unit

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I. To the customers

Thank you for choosing us. Please read the manual carefully before you install and use our products. We preserve the right to change the contents of this manual. We shall not be responsible for the loss and failure caused in the process of installation due to not conforming to this manual.

II. Introduction

Rooftop Unit series include 10 optional models. Everyone has been through wide market research and long time actual operation in system, structure and control, ensuring that every model can be designed on the basis of best price.

The series of units are applied in the industrial and commercial fields such as hotel, supermarkets, authorized dealing shop, office building and factory workshop. They perfectly connect many characteristic of large-sized central a/c, such as convenience, comfort, high-grade and the simplicity and flexibility of split units. The new design makes use of the space module, the features of small-sized commercial modern building space, making the cool and heat air spread into every room averagely to form 0°C temperature difference. Besides, outdoor fresh air can be absorbed. The air path can connect with indoor ornament which is completely hidden and doesn't occupy any space. It has become a new generation of products of central a/c and traditional commercial a/c.

Characteristic and merits

1. Various products and wide application

The series of Rooftop units include many different specifications which can completely meet the demand of home and commercial places' requirement and offer you a comfortable and pleasant environment.

2. Complete air system, simple and hygiene, less components, easy maintenance

The flexible and concise design makes the maintenance very simple. Disassembling several bolts from any side of the unit can repair any part of the unit.

3. Microcomputer intelligent controller can reach four control modes: cooling, dehumidifying, and ventilation. It also has the functions of timing on-off and failure display.

4. Excellent performance

World well-known brand of main parts are used. To guarantee the rational match of the unit, strict performance testing is done. Besides the unit runs steady and the vibration and noise are effectively controlled by the use of multi-vane pitch centrifugal fan, world-known high efficiency compressor and the elaborative-designed controller, motor, etc.

5. Quiet operation and convenient maintenance

Reach the lowest noise of the a/c room. The a/c units are placed far from the a/c area which meets the demand of indoor low noise to the greatest degree. The adoption of high efficiency and low noise centrifugal fan makes the quiet operation come true.

III. Equipment installation

(i) Installation notice

1. Aptitude:

The equipment installation must be completed by professionals. Installation by non-professional staff may lead to improper operation, even failure.

2. Acceptance:

Check the unit carefully when receiving the units to see if any failure occurs in the process of transportation.

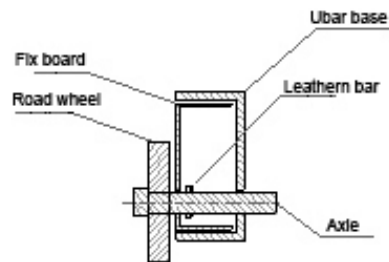
Check the amount of equipment and accessories. Contact the relevant staff if any problem occurs.

3. Move:

Take necessary protection to the unit when moving the units. It is not allowed to make forcible operation to damage the units.

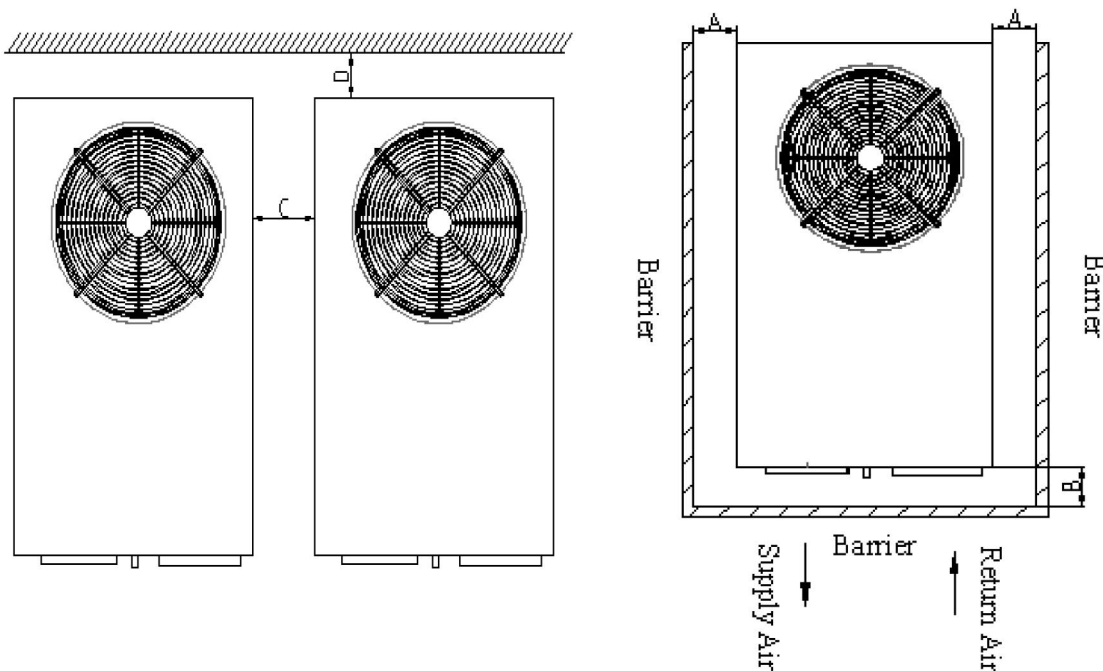
4. Method of dismantle the road wheel:

- 1) Dismantle the leathern bar
- 2) Take out the road wheel



(ii) Unit installation

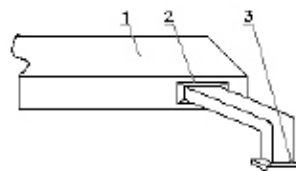
1. The installation location should make the hot air through condenser not to be absorbed back to the unit or absorb hot air which comes from another unit. Besides, enough space should be kept for unit maintenance.
2. Barrier should not exist to block the air discharge and air suction in the passage of air discharge and air suction of the units.
3. There should be good ventilation at the location of unit installation so as to take away the heat air blown from the unit and bring in the air at a lower temperature
4. The unit should be installed on a base which is firm and flat, 50~100mm higher than the plane. Enough strength should be kept to support the weight of the unit and the vibration when running.
5. The unit should be installed horizontally to decrease the vibration, lower the noise and make the condensing water discharge smooth. The condensing water discharge vent of the unit must have water seal whose height should be more than 50mm.
6. Keep the installation away from the dirty or oily place so as not to block the heat exchanger.
7. Following space is suggested during installation.



(iii) Duct installation

1. Usually two air supply ducts: Rectangle air duct and circular one.
2. Rectangle air duct can connect the air supply inlet of the indoor unit by flexible connection.
3. For circular duct, add a transition duct to the air inlet of indoor unit, and be connected separately to air diffuser, (referring to the drawing), the air inlet velocity of air diffuser should be the same to meet the requirement.
4. Suggest using silencer box in the air supply duct of the heavy airflow unit to lower noise.

Model	Name
1	Main pipe
2	Branch pipe
3	Air supply pipe

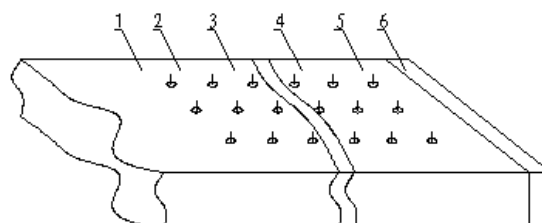


5. If adopting fresh air, the fresh air entrance is better to choose the place where the air is clean and there is no pollution. As for the outdoor air entrance, rain-proof shutter and filter should be installed and at the fresh air section, air flow adjuster should be installed. It is suitable when the fresh air quantity makes up 10% of the total air quantity.

(iv) Air duct heat preservation

Air supply and air return pipes should both have heat preservation. First of all, stick the nail on the air duct and then attach the cotton preservation with tin foil paper. Fasten it with nails and seal the connection with tin foil adhesive tape.

Model	Name
1	Galvanized plate
2	nail
3	Cotton preservation
4	Tin foil
5	Nail cover
6	Adhesive tape



Remarks:

1. Every air supply pipe and return air pipe should have iron bracket fastened on the floor prefabricated board. The air duct connector should be sealed tight by adhesive tape.
2. It is recommended that the air return margin should keep the wall 150mm far

(v) Electric appliance installation

Notice:

1. The power supply capacity must meet the a/c requirement. The voltage at the side of the power supply incoming line inside the a/c unit should remain within +10% rating and the power supply frequency is within 2%.
2. Cut the power supply at electric wire connection. Forbidden to operate with electricity.
3. To protect the staff and avoid the danger of electric shock caused by leakage, the unit body should have good and reliable grounding protection setting to prevent the electric shock accident. It also needs check the grounding line very often to guarantee a good grounding(grounding resistance should not exceed 4 ohm)

4. The layout of power supply routing must conform to the national standard and the unit body must have good grounding to avoid the danger caused by insulation failure. The indoor suspending routing adopts electric specialized PVC conduit tube and PVC connection wire box with cover (not use recycling material connection wire box) Wiring conduit should flat and erect and be fixed. Threading pipe should not use right angle elbow plumbing, but use proper siphon spring bend. The radius of the syphon should be more than four times as long as the diameter of the conduit. Drape should not occur after bending the threading pipe. Lay the connection box properly so as to easy maintenance and wire changeover.
5. The communication wire (Temp. Probe connection wire) and the power supply source should be laid separately to prevent interruption

(vi) Operation and Commissioning

Inspection before operation

1. Read the wiring diagram and make sure that wiring and communication wiring are correct and meet requirements. Make sure that the unit has ground wire protection.

2. First Time Operation

After a complete inspection of the whole system, a trial operation can be conducted.

- A. Connect the power and watch the thermostat. If the wiring controller does not display "search the power", the unit cannot start until wiring controller displays normally.
- B. Listen carefully if there is any strange sound of the unit, or if the compressor or fan operates normally. Disconnect power to check the unit if there is strange sound.
- C. Examine the temperature of each room to see if the temperature changes are normal. Modify the air valves of duct of each room to meet airflow volume requirement of each room. Set the work condition and then examine it to meet the requirement.
- D. Keep trial operating for some time (about three days).

IV. Control operation

1 Parameters and queries

1.1 User parameter settings

The specific user settings are as follows:

name	value	unit	default	significance
cooling setting	-15.0 ~ 32.0	℃	25 .0	【 Mode Selection 】 =When cooling, the temperature control target
heating equipment	10.0 ~ 70.0	℃	30 .0	【 Mode Selection 】 =When heating, the temperature control target
Temperature control method	air supply/return air	--	Return air	Select the temperature control method of the unit
mode selection	Cooling/Heating/Ventilation		Heating	Switch the operating mode in the shutdown state; press the "←" key to switch the mode
Incoming call self-start	disable/enable	--	disabled	Enabled = start automatically when incoming call , disable = start automatically when no incoming call ;
forced defrost	disable/enable	--	disabled	When heating, the time interval is not considered, only the fin temperature is considered, and it is forced to enter the defrosting logic
Auxiliary heat opening temperature	-30.0 ~ 50.0	℃	7.0	

Auxiliary heat opening temperature	5.0 ~ 70.0	℃	30.0	
Auxiliary heat deviation	1.0 ~ 20.0	℃	5.0	
Warm up remaining time	--	h	--	View the remaining warm-up time
exit warmup	--	--	--	When the unit enters the preheating function, press the "  " button on this page to forcibly cancel the preheating function
time setting	--	--	--	--
segment settings	--	--	--	--
Timing settings	--	--	--	--
Fault alarm setting	Silent/Mono/Long	--	Mono	

1.2 segment settings

Example: When the segment function is enabled, the segment start time is set to 8:00, and the segment end time is set to 18:00, then segment temperature 1 is executed every day from 08:00 to 18:00. The time period outside the time period executes segment temperature 2, and the segment enable setting is disabled to disable the above functions.

When the segment function is enabled, the cooling setting/heating setting temperature value in the user setting interface is consistent with segment temperature 1 or segment temperature 2. When the user changes the cooling setting/heating setting temperature value, the segment temperature 1 or segment temperature 2 value changes accordingly; when the user changes the segment temperature 1 or segment temperature 2 temperature value, the cooling setting/heating setting The setpoint changes accordingly.

name	value	unit	default	significance
Segment start time	0~23	---	08	The time is the whole hour, and the restriction requirement is: segment start time < segment end time
Segment end time	0~23	---	18	
Segment temperature 1	-15.0 ~ 70.0	℃	40.0/15.0	40.0 for heating and 15.0 for cooling
Segment temperature 2	-15.0 ~ 70.0	℃	45.0/20.0	.0 for heating and 20 .0 for cooling
segment enable	disable/enabl e	---	disabled	

1.3 Timing settings

name	value	unit	default	significance
Timing on 1	00:00 ~ 23:59	---	8:00	Restriction requirements: Timing on 1 < Timing off 1;
timer off 1	00:00 ~ 23:59	---	11:00	
Timing 2	00:00 ~ 23:59	---	13:00	Restriction requirements: Timing on 2 < Timing off 2; Timing 1 off < Timing on 2;
timer off 2	00:00 ~ 23:59	---	16:00	
Timing 3	00:00 ~ 23:59	---	18:00	Restrictions: Timing on 3 < Timing off 3; Timing 2 off < Timing

timer off 3	00:00 ~ 23:59	---	22:00	on 3;
Timing function	Disable/1 segment/2 segment/3 segment	---	disabled	Disabled: no timing function, all segment times default to 0; 1 segment: only run the first timing period, the default value of the 2nd and 3rd segment is 0; 2 segments: run the 1st and 2nd timing periods, the third segment defaults to 0; 3 segments: all three timing periods are valid; After segment setting, each segment will return to the default value;
Sunday timing	disable/enable	---	disabled	If it is set to enable, the timing function of the above table will be used for timing power on and off;
Monday time	disable/enable	---	enable	
scheduled on tuesday	disable/enable	---	enable	
Wednesday timed	disable/enable	---	enable	
thursday timing	disable/enable	---	enable	
Friday time	disable/enable	---	enable	
Saturday timing	disable/enable	---	disabled	



If there is a communication failure on the display and the unit is running within the time period set by the timer switch, the unit will continue to run;

If the power is turned on, if the current time is within the interval between timing on and timing off, the unit needs to be turned on;

If the power is turned on, if the current time is between the timing off and the next timing on, the unit will perform the shutdown action;

1.4 Module Status Query

1.4.1 Input Status Inquiry

input point status		
name	show	Remark
blower overload	 means run,  means stop	
failure cascade		
remote control		
electricity failure		
Fan 1 overload		
Compressor 1 High Pressure		
Compressor 1 low pressure		
Compressor 1 overload		
Fan 2 overload		
Compressor 2 High Pressure		

Compressor 2 low pressure		
Compressor 2 overloaded		

1.4.2 Output status query

output status		
name	show	Remark
Blower	0~100	unit: %
fresh air valve	0~100	unit: %
Blower	 means run,  means stop	
Fan 1-1 low speed		
Fan 1-2 high speed		
Four-way valve 1		
Compressor 1		
Fan 2-1 low speed		
Fan 2-2 high speed		
Four-way valve 2		
Compressor 2		
crankshaft heating 1		
crankshaft heating 2		
Auxiliary electric heating		
chassis heating		
Fault output		
1 # electric preheating		
2 # electric preheating		

1.4.3 Environment Status Query

environmental status			
name	show	unit	Remark
return temperature air	Resolution 0.1	Unit: °C	
Supply temperature air	Resolution 0.1	Unit: °C	
ambient temperature	Resolution 0.1	Unit: °C	
1# fin temperature	Resolution 0.1	Unit: °C	
1 # Inner plate temperature	Resolution 0.1	Unit: °C	
1 # suction temperature	Resolution 0.1	Unit: °C	
1# superheat	Resolution 0.1	Unit: °C	
1# exhaust temperature	Resolution 0.1	Unit: °C	
2 # fin temperature	Resolution 0.1	Unit: °C	
2# inner plate	Resolution 0.1	Unit: °C	

temperature			
2# suction temperature	Resolution 0.1	Unit: °C	
2# superheat	Resolution 0.1	Unit: °C	
2 # exhaust temperature	Resolution 0.1	Unit: °C	
spare	Resolution 0.1	Unit: A	
spare	Resolution 0.1	Unit: A	
1# drive output current	Resolution 0.1	Unit: A	
2# drive output current	Resolution 0.1	Unit: A	
1# low pressure	Resolution 0.1	unit: bar	
2 # low pressure	Resolution 0.1	unit: bar	
1# high pressure/standby	Resolution 0.1	unit: bar	
2 # High Pressure/Standby	Resolution 0.1	unit: bar	
1# fan output	Resolution 1	unit:%	
2 # fan output	Resolution 1	unit:%	
1- 1 feedback speed	Resolution 1	rpm _	
1- 2 feedback speed	Resolution 1	rpm _	
2 - 1 feedback speed	Resolution 1	rpm _	
2 - 2 feedback speed	Resolution 1	rpm _	
1# press feedback speed	Resolution 1	Unit: rps	
2# press feedback speed	Resolution 1	Unit: rps	
1# drive temperature 1 / 1# drive temperature	Resolution 0.1	Unit: °C	When 【driver selection】 =dark blue, it will display " 1 #driver temperature 1 " When 【drive selection】 =Danfoss, display " 1 # drive temperature"
1# drive temperature 2 /1# fault code	Resolution 1	Unit: °C	When 【drive selection】 =dark blue, display "1# drive temperature 2" When 【Drive Selection】 =Danfoss, 1# will display the drive fault code. When there is no fault, it is displayed as 0.
2# drive temperature 1 /2 #drive temperature	Resolution 0.1	Unit: °C	When 【driver selection】 =dark blue, it will display " 2 #driver temperature 1 " When 【drive selection】 =Danfoss, display " 2 # drive temperature"
2# drive temperature 2 /2# fault code	Resolution 1	Unit: °C	When 【driver selection】 =dark blue, it will display " 2 #driver temperature 2" When 【drive selection】 =Danfoss, 2 #display the drive fault code. When there is no fault, it is displayed as 0.
1# main road EV opening	Resolution 1	Unit: step	

2 #main road E EV opening	Resolution 1	Unit: step	
1# side road E EV opening	Resolution 1	Unit: step	
2 #Auxiliary road E EV opening	Resolution 1	Unit: step	
Drive Fault Codes/Backup	Resolution 1	unit:--	【Drive selection】 = dark blue, it is displayed as backup
1# compressor model	Resolution 1	--	When [drive selection] = Danfoss, it is displayed as spare
2# compressor model	Resolution 1	--	

1.5 failure interlock

Failure interlock input point, used to detect external alarm signals such as fire.

1.6 Unit preheating function

The preheating function logic is as follows:

	condition	action	Remark
Power-on	a. The ambient temperature is lower than [preheating temperature]	1. Turn on all crankshaft electric heating, and exit the preheating logic after running [preheating time]; 2. When the unit meets the shutdown anti-freezing conditions, the compressor needs to start for 5 seconds, then stop [compressor shortest stop], then start for 5 seconds, and then stop [compressor shortest stop] before entering the compressor anti-freezing operation	1. The preheating logic is executed only when the conditions a and b are met at the same time; 2. The preheating logic can be exited by manual operation;
	b. The unit satisfies power failure for 24 hours		



1. The time is sent from the display screen to the main board; if the time recorded by the main board is less than the time sent by the display screen, it is determined that the unit has been powered off for more than 24 hours;

1.7 Driver and expansion board communication protocol

The communication between the main control board and the variable frequency drive [driver selection] = dark blue

The communication mode between SL8335 and air conditioner main control board (indoor main control board) is RS485. The communication protocol is the standard Modbus-RTU communication protocol.

Communication category: Modbus communication

Baud rate: 4800bps

Transmission mode: RTU mode

Start bit: 1 bit

Data bits: 8 bits

Check digit: none

Stop bit: 1 bit

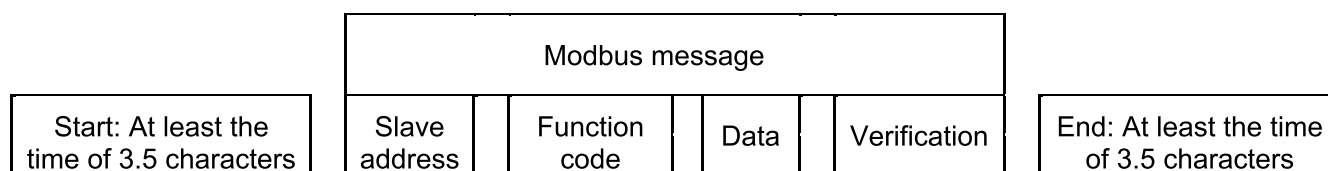
Communication port: A4 , B 4

1 # Compressor drive communication address: 1

2# compressor driver communication address: 2
 Fan expansion board SL1050 Communication address: 3
 Damper expansion board SL1050 Communication address: 4
 1 # Fan drive S P305 Communication address: 100
 2# fan drive S P305 Communication address: 101
 1 # 1030 Mailing address: 1 0
 2 # 1030 Mailing address: 1 1

The communication between the main control board and the variable frequency drive [driver selection] = Danfoss time

The communication mode between the driver and the main control board of the air conditioner is RS485; the driver is a slave, and the main control board of the air conditioner is a master; the communication protocol is Modbus, and the protocol only supports RTU. The specific mailing address format is as follows:



Communication method: asynchronous serial half-duplex

Baud rate: 4800 bps

Parity bit: no parity

Data bits: 8 bits

1 # Compressor drive communication address: 1

2# compressor driver communication address: 2

Start bit: 1 bit

Stop bit: 1 bit

address	function code	content	set value	word length	Functional description	Remark
51000	0x03/0x06	control commands	--	double byte	0x0000: no function (keep the original status unchanged) 0x0001: start 0x0005: stop 0x0007: fault reset	
51001	0x06	set speed	--	double byte	Unit : 0.01 rps	Units required * 100 to display
1 6129	0x03	output speed	--	double byte	Unit : 0.1 rps	Units need * 10 display
1 6139	0x03	Output current	--	double byte	Unit : 0.01A	Units need * 10 display
1 6339	0x03	Inverter temperature	--	double byte	Unit : 0.1 °C	The unit needs to be * 0.1 to display
16899	0x03	drive failure	--	--	--	alarm value



When 【Drive Selection】 = Danfoss, the drive max and min reference value should be set as speed regulation.

1.8 Host computer communication protocol

The controller adopts RS485 communication mode, the communication protocol is Modbus RTU, the parameters are as follows:

Communication method: serial asynchronous half-duplex;

Baud rate: 9600BPS;

Data bit length: 8 bits (LSB first);

Parity bit: None;

Start bit: 1 bit;

Stop bit: 1 bit.

1.9 Remote download function

The controller can realize the function of remote update program, and it needs to be matched with the company's SL305 GPRS DTU 4G module to realize remote cloud platform monitoring and remote update program function.

2. Fault input and protection alarm

2.1 Master control fault list

According to the system setting, each fault point is a normally closed point. If the fault point forms a circuit with the COM (common end) of the row of sockets, it means normal, and if it is disconnected, it means fault. If you need to shield the fault of this digital input, you only need to short-circuit the corresponding input terminal and the common terminal. When a fault occurs, the system automatically pops up a fault message.

fault name	Detection conditions	delay time	duration	Alarm action	Reset condition/method	shutdown detection
blower overload	【Blower Overload】=normally closed (normally open), the blower overload is disconnected (closed) and reaches the alarm duration	0S	2S	stop machine	Manual reset after troubleshooting	yes
electricity failure	[Power failure] = normally closed (normally open), power failure disconnection (closed) reaches the alarm duration	0S	2S	Shut down all devices, the motherboard does not stop heating	Manual reset after troubleshooting	yes
failure cascade	[Fault chain] = normally closed (normally open), fault chain disconnected (closed) reaches the alarm duration	0S	2S	stop machine	Manual reset after troubleshooting	yes
Return air high temperature alarm	5 minutes after the fan is turned on , the return air temperature sensor is normal, and the return air temperature is $\geq$ [return air temperature is too high], and the alarm duration is reached; 49	0S	30S	stop all presses	Return air temperature $\leq$ [return air temperature is too high] -2 degrees; automatically reset after troubleshooting	no
Return air low temperature alarm	5 minutes after the fan is turned on , the return air temperature sensor is normal, and the return air temperature $\leq$ [return air temperature is too low] reaches the alarm duration; 15	0S	30S	alarm only	Return air temperature $\geq$ [return air temperature is too low] + 2 degrees; automatically reset after troubleshooting	no
Air supply	5 minutes after the fan is turned on , the	0S	30S	Alarm triggered, stop	Supply air	no

high temperature alarm	electric heating is turned on, the supply air temperature sensor is normal, and the supply air temperature $\geq$ [supply air temperature is too high] reaches the alarm duration; 48			auxiliary electric heating	temperature $\leq$ [supply air temperature is too high] -2 degrees; automatically reset after troubleshooting	
Air supply low temperature alarm	5 minutes after the fan is turned on , the compressor is turned on, the supply air temperature sensor is normal, and the supply air temperature $\leq$ [supply air temperature is too low] reaches the alarm duration; 6	0S	30S	stop all presses	Supply air temperature $\geq$ [supply air temperature is too low] + 2 degrees; automatically reset after troubleshooting	no
1# press high voltage disconnect	[Press 1 high voltage] = normally closed (normally open), the high pressure of compressor 1 is disconnected (closed) and reaches the alarm duration	0S	2S	If the fault already exists when the machine is shut down, the compressor will not be started and the system will alarm; if the equipment is running, see 3.19 "High Voltage Protection Logic" for details	After troubleshooting and meet the [minimum downtime] automatic reset + three lock manual reset	yes
2 # press high voltage disconnect	[Compressor 2 high voltage] = normally closed (normally open), the high pressure of compressor 2 is disconnected (closed) and reaches the alarm duration	0S	2S	If the fault already exists when the machine is shut down, the compressor will not be started and the system will alarm; if the equipment is running, see 3.19 "High Voltage Protection Logic" for details	After troubleshooting and meet the [minimum downtime] automatic reset + three lock manual reset	yes
1# press high pressure is too high	Detect when 【High Pressure Compression Enable】 =Enabled When the 1# compressor is disabled, the probe is not detected 1# high pressure value $\geq$ [high pressure protection value] reaches the alarm duration	0S	2S	If the fault already exists when the machine is shut down, the compressor will not be started and the system will alarm; if the equipment is running, see 3.19 "High Voltage Protection Logic" for details	After troubleshooting and meet the [minimum downtime] automatic reset + three lock manual reset	yes
2 # Compressor high pressure	Detect when 【High Pressure Compression Enable】 =Enabled When the 2# compressor is disabled, the	0S	2S	If the fault already exists when the machine is shut down, the compressor will	After troubleshooting and meet the	yes

is too high	probe is not detected 2 #High pressure value $\geq$ [high pressure protection value] reaches the alarm duration			not be started and the system will alarm; if the equipment is running, see 3.19 "High Voltage Protection Logic" for details	[minimum downtime] automatic reset + three lock manual reset	
1# compressor low pressure disconnect	[Compressor 1 low voltage] = normally closed (normally open), the low pressure of compressor 1 is disconnected (closed) and reaches the alarm duration	[Low voltage detection delay]	Refrigeration: [Refrigeration low pressure delay] Heating: [Heating low pressure delay]	If the fault already exists when the machine is shut down, the compressor will not be started, and the system will alarm; if the equipment is running, see 3.20 "Low Voltage Protection Logic" for details	After troubleshooting and meet the [minimum downtime] automatic reset + three lock manual reset	yes
2 # Compressor low pressure disconnect	[Compressor 2 low voltage] = normally closed (normally open), the low pressure of compressor 2 is disconnected (closed) and reaches the alarm duration	[Low voltage detection delay]	Refrigeration: [Refrigeration low pressure delay] Heating: [Heating low pressure delay]	If the fault already exists when the machine is shut down, the compressor will not be started, and the system will alarm; if the equipment is running, see 3.20 "Low Voltage Protection Logic" for details	After troubleshooting and meet the [minimum downtime] automatic reset + three lock manual reset	yes
1# compressor low pressure is too low	When cooling, the 1# low pressure value $\leq$ [refrigeration low pressure protection value] reaches the alarm duration When heating, the 1# low pressure value $\leq$ [heating low pressure protection value] reaches the alarm duration	[Low voltage detection delay]	Refrigeration: [Refrigeration low pressure delay] Heating: [Heating low pressure delay]	If the fault already exists when the machine is shut down, the compressor will not be started, and the system will alarm; if the equipment is running, see 3.20 "Low Voltage Protection Logic" for details	After troubleshooting and meet the [minimum downtime] automatic reset + three lock manual reset	yes
2 # Compressor low pressure is too low	When cooling, 2 # low pressure value $\leq$ [cooling low pressure protection value] reaches the alarm duration When heating, 2 # low pressure value $\leq$ [heating low pressure protection value] reaches the alarm duration	[Low voltage detection delay]	Refrigeration: [Refrigeration low pressure delay] Heating: [Heating low pressure delay]	If the fault already exists when the machine is shut down, the compressor will not be started, and the system will alarm; if the equipment is running, see 3.20 "Low Voltage Protection Logic" for details	After troubleshooting and meet the [minimum downtime] automatic reset + three lock manual reset	yes
1# compressor overload	[Compressor 1 overload] = normally closed (normally open), the overload of compressor 1 is disconnected (closed) and reaches the alarm duration	Power-on delay 30 s	2S	Stop the corresponding compressor and fan	Manual reset after troubleshooting	yes
2 # press	[Compressor 2 overload] = normally closed	Power-on delay 30 s	2S	Stop the corresponding	Manual reset after	yes

overload	(normally open), the overload of compressor 2 is disconnected (closed) and reaches the alarm duration			compressor and fan	troubleshooting	
1# fan overload	[Fan 1 overload] = normally closed (normally open), fan 1 overload disconnection (closed) reaches the alarm duration	0S	2S	Stop the common system when the air duct is shared ([Fan speed control selection] = SP305*2, stop the corresponding compressor), and stop the corresponding compressor when the independent air duct is used	Manual reset after troubleshooting	yes
2 # fan overload	[Fan 2 overload] = normally closed (normally open), fan 2 overload disconnection (closed) reaches the alarm duration	0S	2S	Stop the common system when the air duct is shared ([Fan speed control selection] = SP305*2, stop the corresponding compressor), and stop the corresponding compressor when the independent air duct is used	Manual reset after troubleshooting	yes
Return air probe failure	The return air probe is missing or the short circuit reaches the alarm duration	0S	5S	Stop all equipment except the blower	Automatic reset after troubleshooting	yes
Air supply probe failure	air supply or short circuit reaches the alarm duration	0S	5S	Stop all equipment except the blower	Automatic reset after troubleshooting	yes
Environmental probe failure	Ambient temperature missing or short circuit reaches alarm duration	0S	5S	alarm only	Automatic reset after troubleshooting	yes
1# fin probe failure	When the 1# compressor is disabled, the probe is not detected 1 # fin probe missing or short circuit reaches the alarm duration	0S	5S	Stop the corresponding compressor and fan	Automatic reset after troubleshooting	yes
2 # fin probe failure	2 # When the compressor is disabled, the probe is not detected 2 # fin probe missing or short circuit reaches the alarm duration	0S	5S	Stop the corresponding compressor and fan	Automatic reset after troubleshooting	yes
1# Exhaust probe failure	When the 1# compressor is disabled, the probe is not detected	0S	5S	Stop the corresponding compressor and fan	Automatic reset after	yes

	Exhaust probe missing or short circuit reaches alarm duration	0S	5S	Stop the corresponding compressor and fan	troubleshooting Automatic reset after troubleshooting	yes
2# Exhaust probe failure	2 # When the compressor is disabled, the probe is not detected Exhaust probe missing or short circuit reaches alarm duration					
1# suction probe failure	When the 1# compressor is disabled, the probe is not detected The inspiratory probe is missing or short-circuited for the duration of the alarm	0S	5S	Stop the corresponding compressor and fan	Automatic reset after troubleshooting	yes
2# suction probe failure	2 # When the compressor is disabled, the probe is not detected The inspiratory probe is missing or short-circuited for the duration of the alarm					
1 # Inner plate temperature	When the 1# compressor is disabled, the probe is not detected The internal disk temperature probe is missing or the short circuit reaches the alarm duration	0S	5S	Stop the corresponding compressor and fan	Automatic reset after troubleshooting	yes
2 #Inner plate temperature	2 # When the compressor is disabled, the probe is not detected The internal disk temperature probe is missing or the short circuit reaches the alarm duration	0S	5S	Stop the corresponding compressor and fan	Automatic reset after troubleshooting	yes
1 # high pressure probe is missing	When 【Enable High Voltage Compression Transmission】 =Enabled, detect the fault of the probe 1 # When the compressor is disabled, the probe will not be detected Probe missing or short circuit reaches alarm duration	0S	5S	Stop the corresponding compressor and fan	Automatic reset after troubleshooting	yes
2# high pressure probe is missing	When 【Enable High Voltage Compression Transmission】 =Enabled, detect the fault of the probe 2 # When the compressor is disabled, the probe is not detected Probe missing or short circuit reaches alarm duration	0S	5S	Stop the corresponding compressor and fan	Automatic reset after troubleshooting	yes

1 # low pressure pressure probe is missing	1 # When the compressor is disabled, the probe will not be detected It is detected that the 1# low-voltage sensor is disconnected or short-circuited and reaches the alarm duration	0S	5S	Stop the corresponding compressor and fan	Automatic reset after troubleshooting	yes
2# low pressure pressure probe is missing	2 # When the compressor is disabled, the probe is not detected It is detected that the 2 # low voltage sensor is disconnected or short circuited for the duration of the alarm	0S	5S	Stop the corresponding compressor and fan	Automatic reset after troubleshooting	yes
1# Exhaust temperature is too high	Exhaust temperature $\geq$ [exhaust temperature is too high] reaches the alarm duration	0S	10S	When the exhaust temperature $<$ [exhaust high recovery] fault recovery; if it occurs 3 times within 1 hour, stop the corresponding compressor system, then lock the fault and need to reset manually	After troubleshooting and meet the [minimum downtime] automatic reset + three lock manual reset	no
2 # Exhaust temperature is too high	Exhaust temperature $\geq$ [exhaust temperature is too high] reaches the alarm duration	0S	10S	When the exhaust temperature $<$ [exhaust high recovery] fault recovery; if it occurs 3 times within 1 hour, stop the corresponding compressor system, then lock the fault and need to reset manually	After troubleshooting and meet the [minimum downtime] automatic reset + three lock manual reset	no
frost protection	In refrigeration mode, the compressor starts to run, and the temperature of the inner disk $\leq$ [antifreeze protection alarm value] reaches the alarm duration	0S	6 0S	If the temperature of the 1# inner panel $\leq$ [antifreeze protection alarm value], stop the 1# compressor, and the unit will report "1# antifreeze protection" If the temperature of the 2# internal plate $\leq$ [antifreeze protection alarm value], stop the 2# compressor, and the unit will report "2# antifreeze protection"	Inner panel temperature $\geq$ [anti-freezing protection alarm value] + 5°C, automatic fault reset	no
Phase sequence protection	【 Onboard phase sequence protection 】 =Enabled and the phase sequence protection reaches the alarm duration	0S	2S	Stop the corresponding module	Power on again	yes

1# press drive board is missing	Detection reaches the alarm duration 1 # When the compressor is disabled, the probe will not detect faults	0S	30S	Stop the compressor and the corresponding fan	Automatic reset after troubleshooting	yes
2 # Press drive board is missing	Detection reaches the alarm duration; 2 # When the compressor is disabled, the probe will not detect faults	0S	30S	Stop the compressor and the corresponding fan	Automatic reset after troubleshooting	yes
EC fan S L1050 is missing	【Fan speed adjustment selection】=S L1050 . Detection reaches the alarm duration	0S	30S	Shutdown fan and corresponding compressor	Automatic reset after troubleshooting	yes
Fresh air valve L1050 is missing	[Fresh air valve enable] = enable or [Blower enable] = enable. Detection reaches the alarm duration	0S	30S	[Blower enable] = When disabled, only alarm 【 Blower fan enable 】 = When enabled, stop all equipment except the blower fan	Automatic reset after troubleshooting	yes
1# fan drive is missing	[Fan speed adjustment selection] = SP305 *1 , SP305 *2 , SL1030 when the detection reaches the alarm duration	0S	30S _	Shutdown fan and corresponding compressor	Automatic reset after troubleshooting	yes
2 # fan drive missing	【Fan speed adjustment selection】=SP305 *2 , SL1030 detects that the 2# fan drive reaches the alarm duration	0S	30S _	Shutdown fan and corresponding compressor	Automatic reset after troubleshooting	yes
1# fan failure	Detection after the fan starts Detect when 【Fan speed adjustment selection】 = SP305*1 or SP305*2 or S L1030 .	0S/ 60S	2S / 30S	Shutdown fan and corresponding compressor	1. S L350 fault triggering and recovery, see "SP305-ST Variable Frequency Three-phase Fan Controller Specifications" fault automatic reset 2. SL1030 fault triggering and recovery After the fan is turned on, it is delayed for 60 seconds to judge that the feedback	[Fan speed adjustment selection] = SP305 is yes 【 Fan speed adjustment selection 】=S L103 is no
2 # fan failure	Detection after the fan starts when 【Fan speed adjustment selection】 = SP305*2 or S L1030 .	0S/ 60S	2S / 30S	Shutdown fan and corresponding compressor		

					speed is less than 150 rpm and the fault is triggered for 30 seconds. When recovering from a fault, manual reset is required	
1# Abnormal oil return	When the accumulative time of the oil return interval of 1# compressor $\geq$ "low speed/high speed oil return interval", after the speed delivered by the main control reaches [compressor oil return speed], it is judged that the feedback speed of the compressor $\neq$ [compressor oil return speed] $\pm 5\text{rps}$ over 3 00S	0	3 00S	Report abnormal failure of oil return without stopping the machine. The crew continued to wait for oil return.	Automatic reset after troubleshooting	no
2 # Abnormal oil return	When the accumulative time of oil return interval of 2 #compressor is $\geq$ "low speed/high speed oil return interval", after the speed sent by the main control reaches [compressor oil return speed], it is judged that the compressor feedback speed $\neq$ [compressor oil return speed] $\pm 5\text{rps}$ over 3 00S					

2.2 【Drive Selection】 = Fault list when dark blue

fault name	Detection conditions	delay time	duration	Alarm action	Reset condition/method	shutdown detection
1# instantaneous overcurrent alarm	Detect compressor output phase current $\geq 48\text{A}$ at any time	0S	10S	stop compressor	automatic	yes
1# compressor drive failure	Compressor output short circuit detected at any time	0S	0S	stop compressor	Power-on	yes

1# temperature sensor failure	A short circuit or an open circuit is detected at the detection point of the radiator temperature probe at any time	0S	3S	stop compress or	automatic	yes
1# overheating protection	At any time, the temperature of the heat sink is detected to be $\geq 90^{\circ}\text{C}$	0S	10S	stop compress or	automatic	yes
1# DC bus overvoltage	Detect the drive bus voltage $\geq 440\text{VDC}$ at any time	0S	10S	stop compress or	automatic	yes
1# DC bus undervoltage	Detect the drive bus voltage $\leq 320\text{VDC}$ at any time	0S	10S	stop compress or	automatic	yes
1# busbar input overcurrent	Drive bus overcurrent detected at any time	0S	10S	stop compress or	automatic	yes
1# analog sampling failure	Any abnormality detected in the sampling circuit at any time	0S	0S	stop compress or	Protection when the sampling circuit is abnormal, if it cannot be recovered after power on again, it needs to be repaired	yes
1# motor stalled	Abnormality of compressor motor rotor detected at any time	0S	10S	stop compress or	automatic	yes
1# phase line overcurrent alarm	At any time, it is detected that the effective value of the output phase current of the compressor is $\geq 25\text{A}$	0S	10S	stop compress or	automatic	yes
2 #instantaneous overcurrent alarm	Detect compressor output phase current $\geq 48\text{A}$ at any time	0S	10S	stop compress or	automatic	yes
2 # Compressor drive failure	Compressor output short circuit detected at any time	0S	0S	stop compress or	Power-on	yes
2 # temperature sensor failure	A short circuit or an open circuit is detected at the detection point of the radiator temperature probe at any time	0S	3S	stop compress or	automatic	yes
2 #overheat protection	At any time, the temperature of the heat sink is detected to be $\geq 90^{\circ}\text{C}$	0S	10S	stop compress or	automatic	yes

2 # DC bus overvoltage	Detect the drive bus voltage $\geq 440\text{VDC}$ at any time	0S	10S	stop compressor	automatic	yes
2 # DC bus undervoltage	Detect the drive bus voltage $\leq 320\text{VDC}$ at any time	0S	10S	stop compressor	automatic	yes
2# bus input overcurrent	Drive bus overcurrent detected at any time	0S	10S	stop compressor	automatic	yes
2# analog sampling failure	Any abnormality detected in the sampling circuit at any time	0S	0S	stop compressor	Protection when the sampling circuit is abnormal, if it cannot be recovered after power on again, it needs to be repaired	yes
2 # motor stalled	Abnormality of compressor motor rotor detected at any time	0S	10S	stop compressor	automatic	yes
2 # phase line overcurrent alarm	At any time, it is detected that the effective value of the output phase current of the compressor is $\geq 25\text{A}$	0S	10S	stop compressor	automatic	yes



1. The fault indication of the main module is the total alarm output, and any module is closed if there is a fault; the fault indication of the slave module is the fault indication of this module.

2.3 【Drive selection】=Danfoss fault list

fault name	address	Triggering conditions	fault action	reset condition
1 # Compressor drive failure	1 084	read from drive	stop compressor	See the driver specification for details
2# compressor drive failure	1 085	read from drive	stop compressor	See the driver specification for details

error code (address 6 0809)	fault name	cause of issue	Reset condition/method
E.03 _	motor lost	1. The motor line is not connected properly 2. The power of the inverter is much greater than the power of the motor	1. Check the motor wiring 2. The inverter power should match the motor power

E.04 _	Input phase loss	1. The three - phase input power supply is abnormal 2. The frequency converter hardware is abnormal	1. Check and eliminate the problems existing in the peripheral circuit; 2. Seek technical support;
E.07	Overvoltage	1. The deceleration time is too short 2. The load inertia is too large 3. The load fluctuates too much 4. During the operation of the equipment, there is an external force to drive the motor to run 5. The input voltage is too high 6. Parameter setting is unreasonable	1. Extend the deceleration time 2. Install braking resistor 3. Check the load 4. Cancel the external power or add a braking resistor 5. Detect input voltage 6. Adjust parameters related to load and motor
E.08	Undervoltage	1. Momentary power failure 2. The input voltage is low and the load is heavy 3. The frequency converter hardware is abnormal	1. Reset fault 2. Adjust the voltage to the normal range or turn on the low voltage mode 3. Seek technical support
E.09	Inverter overload	1. The VF curve is set too high during VF control 2. Load compensation and slip compensation are set too large during vector control 3. Overloaded _ 4. Improper motor parameter setting	1. Reduce the VF curve setting too high 2. Reduced load compensation, slip compensation 3. Reduce the load or use a higher power inverter 4. Correctly set according to the nameplate of the motor
E.10	Motor overload	1. The VF curve is set too high during VF control 2. Load compensation and slip compensation are set too large during vector control 3. Improper motor parameter setting 4. The motor stalls or the sudden change of load is too large 5. Overloaded	1. Reduce the VF curve setting too high 2. Reduced load compensation, slip compensation 3. Correctly set according to the motor nameplate 4. Check the cause of motor stall or load condition 5. Reduce the load or use a higher power motor
E.12	over torque	The output torque exceeds the set value of parameters C04.16 and C04.17	Correctly set motor parameters or handle according to E.13 Inverter overcurrent countermeasures
E.13*	Overcurrent	1. Acceleration and deceleration time is too short 2. The VF curve is set too high during VF control 3. Load compensation and slip compensation are set too large during vector control 4. Low input voltage 5. The load mutation of the equipment is too large during operation 6. Start the rotating motor 7. There is a grounding or short circuit in the output circuit of the inverter 8. The selection of frequency converter is too small	1. Extend the acceleration and deceleration time 2. Reduce the VF curve setting too high 3. Reduced load compensation, slip compensation 4. Adjust the voltage to the normal range 5. Reduce load sudden change 6. Select speed tracking start or start after the motor stops 7. Check the insulation of motor wiring and motor wires 8. Choose a higher power inverter
E.14*	Ground Fault	1. Motor line to ground leakage 2. The insulation problem of the motor to the ground	1. Reduce the carrier speed or replace the cable or reduce the cable length 2. Replace the cable or motor
E.16*	output short circuit	Short circuit in motor or output terminals	Check the motor wiring, check the insulation of the motor wire and the motor
E.17	Communication control word timeout (see	1. The upper computer is not working properly 2. Communication wiring is abnormal 3. The setting of communication parameter 08 is incorrect	1. Check the host computer program 2. Check the communication cable 3. Correctly set the communication parameters

	parameters C08.03 and C08.04 for details)	4. Communication Interference	4. Use shielded cables or seek technical support
E.18	Startup failed		Check parameters C01.77~79
E.30*	Motor U phase loss	1. The three-phase unbalance of the motor 2. Motor wiring is loose 3. The acceleration and deceleration time is very short and the load is heavy 4. The power of the motor is much smaller than the power of the inverter	1. Replace the motor 2. Check the motor wiring 3. It is recommended to turn off the motor phase loss protection 4. Please set C1.24 motor current correctly
E.31*	Motor V phase loss		
E.32*	Motor W phase loss		
E.36	main power failure	The power supply voltage of the inverter is missing, please refer to the description of C14.10 for details	check power
E.38*	Inverter internal fault	1. The frequency converter is disturbed 2. Hardware damage	1. Please refer to section 3.5 for correct wiring 2. Seek technical support
E.47*	Power card 24V failure	Damaged power card	seek technical support
E.49	speed limit	Check parameter C01.86	
E.59	current limit	The output current exceeds the setting value of parameter C04.18	Correctly set motor parameters or handle according to E.13 Inverter overcurrent countermeasures
E.62	PMFOC mode output speed over limit		
E.68	STO alarm	STO1 and STO2 terminals are disconnected at the same time	
E.69*	IGBT temperature is too high	1. The air duct is blocked 2. The fan is working abnormally	1. Clean up the air duct 2. Replace the fan
E.80	Parameter restore factory value	The user executes the operation of restoring the factory value of the parameter	Press "OFF" to reset
E.189	STO power failure	STO power supply failure	



1. Faults marked with * are trip-locked faults.
2. When the address 60809 is displayed in the following way: for example, when 60809 is displayed as 13 , it is E.13 fault code

VI. Maintenance

1. The on-off of the unit per hour should not exceed four times, otherwise the service life of the unit will decrease.
2. The surroundings of the units should keep clean and tidy. Clean the leaves and rubbish absorbed by the fin on time.
3. Clean the air return filter once three months to guarantee the quality of the air.
4. Check if the condensing water pipe is smooth regularly. Make sure the drainage is clear.
5. Not allowed to reset the unit by force without any reason of the trouble if something is wrong with the unit. Contact the agent or the technician.
6. All diameters have been setup at the ex-work of the units. If the customer needs to adjust the diameter, please contact the agent and the technician. It is not allowed to adjust the diameter automatically.