变频控制器使用说明

温度传感器变频

Operating Instructions for Variable Frequency Unit with Temperature Controller Version

1. 温控器说明 Temperature controller operating instructions

1.1温控器功能 Temperature controller function

温控器可以监控和更改部分变频控制器设置，可通过 485 通讯控制变频控制器工作；温控器配备库温和化霜（蒸发器）传感器探头，可查看实时柜温和频率；温控器配有故障显示和蜂鸣报警功能；

The temperature controller can monitor and change some settings of the inverter, and it can control the operation of the inverter through 485 communication; The temperature controller is equipped with temperature and defrosting (evaporator) sensor probes, which can view real-time cabinet temperature and frequency; The temperature controller is equipped with fault display and buzzer alarm functions;

1.2 温控器工作条件 Operating conditions of temperature controller

工作电压Working voltage：220VAC±10%，50HZ/60HZ

工作环境Working condition：-5℃~60℃，工作相对湿度Working relative humidity：10%~90%不可结露（No condensation allowed）；

储存温度Storage temperature：-25℃~75℃；

1.3规格尺寸 Specifications and Dimensions

整机尺寸Dimensions：长 L85 *高 H35 * 深D 63.8(mm), 安装尺寸Installation Dimensions：长L 71*宽W 29(mm)，

传感器长度The sensor length：2 米(m)

(5米可选 Sensor length of 5m is available)

1.4技术参数 Technical Parameter

温度控制范围Temperature control range：-40℃~85℃；

传感器类型Sensor type：NTC (10KΩ /25℃,B value is 3435K)

1.5操作及显示面板 Operation and display panel

显示板可以显示三个数字，

The display board can display three numbers

两个状态指示符 （按键锁、风机），

Two status indicators (lock button, Fan),

四个参数描述字（开机温度（ON Temp）、停机温度（OFF Temp）、化霜周期(Def cycle)、化霜时间(Def time）。

Four parameters (ON temperature, OFF temperature, Def cycle, Def time).

1.5.1按键说明Key Description

温控器上共有六个按键 There are six buttons on the Temperature controller:

解锁键/OK; 强制化霜键; “开机温度键(ON Temp)”；“停机温度键(OFF Temp)” ；上调键；下调键

unlock/ok ; Forced defrosting key ; ON Temp ; OFF Temp ; up key ; down key.

1.5.2工作指示说明Work instructions

符号code	状态status	描述 CN	Description(EN)
	亮light	锁定	lock
	灭Extinguish	非锁定	unlock
开机/ON	灭Extinguish	压缩机关机	Compressor shutdown
	闪烁flicker	延时开机	Delayed startup
	亮light	压缩机开机	Compressor startup
化霜/Def	闪烁（慢）flicker (slow)	化霜滴水	Drip water
	灭Extinguish	风机停止	Fan stop
	闪烁flicker	风机延时	Fan delay
	亮light	风机运行	Fan run

1.5.3温控器解锁、锁定、用户菜单设置 Temperature controller unlock, lock, user menu settings

①解锁Unlock：温控器在无任何按键动作 30 秒后会自行锁定按键，以防止误触；

温控器在锁定状态下，按住 “ 解锁键/OK ” 1 秒钟后，可以将锁定的温控器解锁；

The Temperature controller will automatically lock the buttons after 30 seconds without any button action to prevent accidental touch;

When the Temperature controller is in a locked state, press and hold the "unlock button/OK" for 1 second to unlock the Temperature controller;

②温度快捷设置 Temperature Quick Settings:

在正常运行状态下，按下“ON Temp”键（或“OFF Temp”键），相应的参数描述字点亮，显示窗口显示“开机温度”（或“停机温度”）值，则表明进入设置“开机温度”（或“停机温度”）菜单。可以“∧”键或“∨”键进行参数调整，按住“∧”键或“∨”键不放，可以进行参数快速调整。在设置状态下，通过按下并松开 “ 解锁键/OK ” 或 30 秒内无按键动作则退出设置状态，并保存参数.

In normal operation, press the "ON Temp" button (or "OFF Temp"button), the corresponding parameter description word will light up, and the display window will show the "ON Temp" (or "OFF Temp") value, indicating that you can set the "Start Temperature" (or "OFF Temperature") now . You can use the “∧” or “∨” keys to adjust parameters, and hold down the “∧” or “∨” keys to quickly adjust parameters. The parameters can be saved by one press on the "unlock key/OK" button or if no button action within 30 seconds, the settings will be saved automatically.

1.5.4快捷操作 Quick Actions

温控器默认显示当前库温 The temperature controller defaults to show the current cabinet temperature.

温控器未锁定的情况下 When the temperature controller is not locked:

点击 “ 解锁键/OK”可以打开或者/关闭 灯； （需要将灯接入温控器继电器）

Click on the "unlock button/OK" to turn on or off the light; (The light needs to be connected to relay of the temperature controller)

按住“∧”可查看当前运行频率 Press and hold "∧" to view the current operating frequency.

按住“∨”可查看化霜探头温度 Press and hold "∨" to view the temperature of the defrosting probe.

1.5.5系统设置 System settings

温控器在非锁定状态下，长按“解锁键/OK”5 秒以上直至出现“F1”进入温控器参数设定界面；

When the temperature controller is in an unlocked status, press and hold the "unlock button/OK" for more than 5 seconds until "F1" appears to enter the temperature controller parameter setting interface

在非锁定状态下, 按“∧键”或 “∨键”可转换参数代码项；按“解锁键/OK”显示相应的参数值，按“∧键”或“∨键”进行参数调整，按住按键不放，可以进行参数快速调整；按“解锁键/OK”暂时存储所修改的参数数值，返回显示参数代码.

When the temperature controller is in an unlocked status, press the "∧" or "∨" buttons to choose settings from F1 to F14; Press the "Unlock key/OK" to display the corresponding parameter values, press the "∧" or "∨" keys to adjust the parameters, and hold either of the 2 buttons to quickly adjust the parameters; Press the 'unlock key/OK' to temporarily store the modified parameter values and show the corresponding parameter.

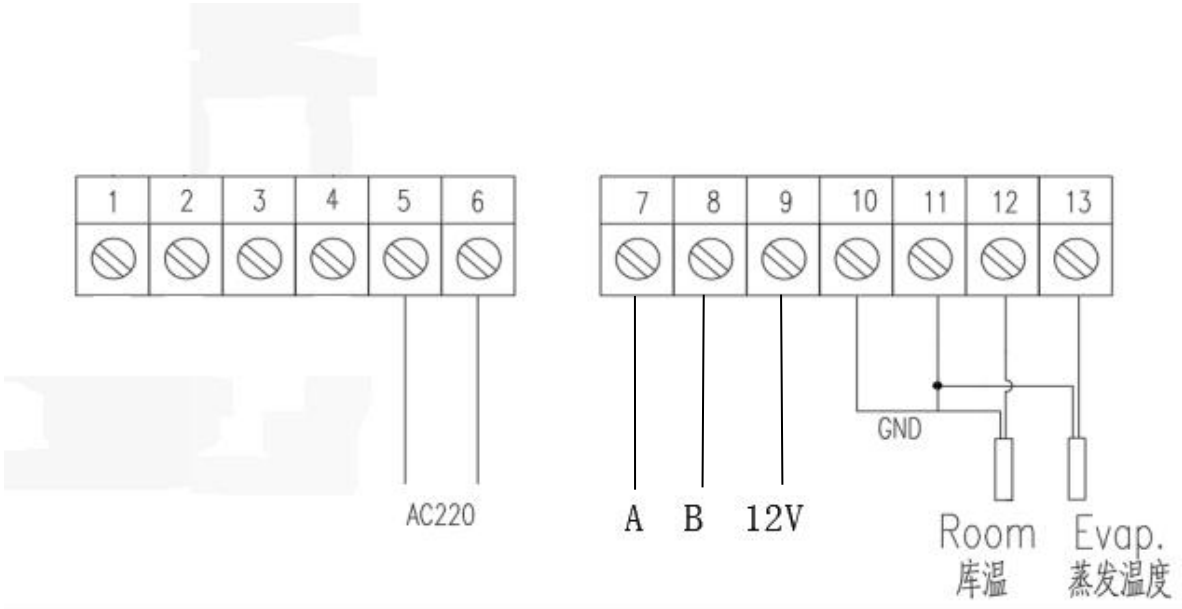
在系统菜单设置状态下，按住 “解锁键/OK”3 秒或 30 秒内无按键动作，则保存所修改的参数值，退出系统菜单设置状态。

In the system menu setting process, if there is no button action within 3 seconds or 30 seconds of holding the "Unlock Key/OK" button, the modified parameter values will be saved and exit the setting status.

1.5.6温控器设置参数表

参数 Parameters	默认值 Default Value	数值范围 Range	含义 Meaning	说明 Description
F1	10	-9.9~85℃	开机温度 ON Temp	
F2	-10	-40~9.9℃	关机温度 OFF Temp	
F3	20	1~120min	化霜时间 Defrosting time	化霜持续时间 Defrosting Duration
F4	3	0~120h	化霜周期 Defrosting cycle	
F5	3	0~120min	化霜滴水时间 Defrosting dripping time	
F6	10	-40~50℃	化霜停止温度 Defrosting stop Temp	高于该温度自动退出化霜When the temp reaches, defrost process will stop
F7	24	0~24h	开机超温报警延时 Alarm delay of ambient over temp when startup	开机此时间内不超温报警No over temp alarm rise within this time range when start up
No over temperature alarm when the startup time is less than F7				
F8	50	0~50℃	超温报警值ambient over temp alarm	开机温度+F8，时间持续F9时间后超温报警

F9	120	0~120min	超温报警延时 ambient over temp alarm delay	
Startup temperature +F8, and for more than F9 time, over temperature alarm rises				
F10	0	-10~10℃	柜温传感器校正 Cabinet temperature sensor calibration	
F11	0	-10~10℃	蒸发器传感器校正 Evaporator sensor calibration	
F12	1	0/1/2	除霜显示模式 Defrost display mode	0/1/2
0:正常柜温Cabinet Temp； 1：显示DEF Display DEF 2:显示除霜时柜温 cabinet Temp at the beginning of defrosting				
F13 (reserved)	2	0/1/2	温控器风机工作模式 Fan working mode	0/1/2
0：持续运行Continuous operation；1：与压缩机同启停as the compressor；2：除霜停止Stop during defrosting				
F14	1	0/1/2	化霜模式 Defrosting mode	0/1/2
0：电化霜Electric Defrost；1：热氟化霜Thermal Defrost；2：风除霜Wind defrosting				
①F13风机设置仅对温控器自带风机有效 F13 fan setting is only valid for the built-in fan of the temperature controller				



注：交流/直流供电选一种即可，以实际温控器上接线为准

Note: You can choose either AC or DC power supply. Please follow the wiring instructions on the actual temp controller.

1.6温控器故障报警参考 Temperature controller malfunction alarm reference

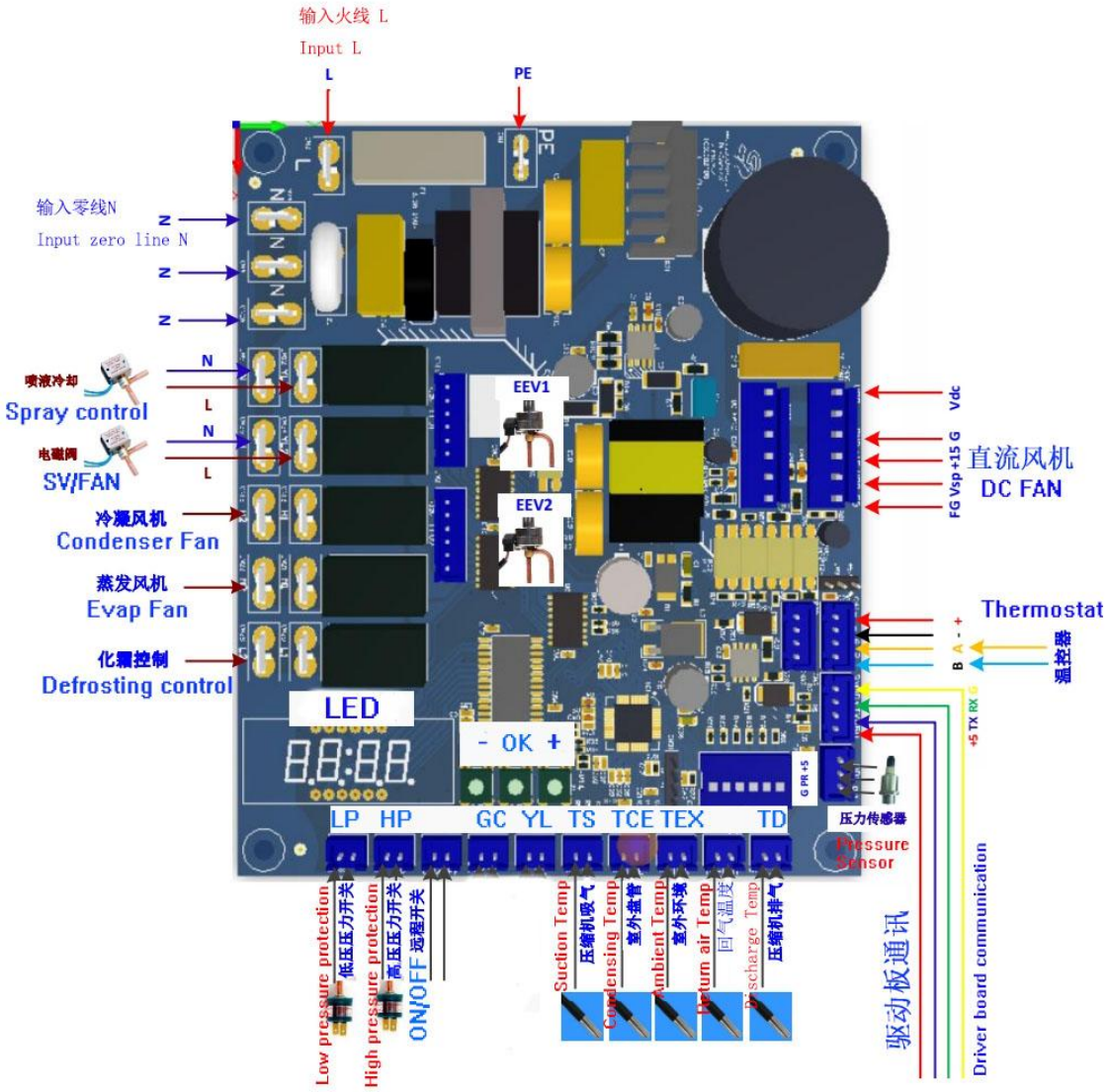
当机组发生某些故障时，温控器会提示相应的代码并声音报警，代码表可供参考排查故障

When certain faults occur in the unit, the temperature controller will present corresponding codes and sound alarm. The code table can be used as a reference for troubleshooting

代码Code	描述Description	原因/解决方法Reason/Solution
E00	温控器通讯故障Communication Failure	检查温控器是否接好 check the if the temp controller is connected well
E01	环境温度传感器故障 Ambient temperature sensor fault	检查对应传感器是否接触不良或者损坏 Check if the corresponding sensor on the main control board has poor contact or is damaged
E02	冷凝温度传感器故障 Condensate temperature sensor fault	
E03	排气温度传感器短断路故障 Discharge temperature sensor fault	
E04	相电流过流故障 Phase overcurrent fault	相电流过高 phase current too high
E06	总电流过流故障 Total overcurrent falut	输入电流过高 Input current too high
E07	无负载故障No-load fault	驱动板故障，联系厂家 failure on the inverter, cotact manufacturer
E08	过压、欠压故障over or under voltage fault	电压过高、过低故障 voltage is too high or too low
E09	U相电流非零硬件故障Hareware fault if current on U phase is not Zero	驱动板故障，联系厂家 failure on the inverter, cotact manufacturer
E10	制冷过载故障 overload on the refrigeration cycle	
E11	超温报警 over heat alarm	温度过高故障 temp is too high
E12	模块FO故障 fault on module FO	驱动板故障，联系厂家 failure on the inverter, cotact manufacturer
E13	EEPROM读取失败故障Failure to read EEPROM	
E14	EEPROM写入失败故障Failure to write EEPROM	
E16	V相电流非零硬件故障Hareware fault if current on V phase is not Zero	
E17	压机过热故障 compressor overheat fault	
E20	IPM过热故障 IPM overheat fault	
E28	模块驱动高低电平错误故障Incorrect electrical level of driving module	
E29	IPM故障脚FO电平错误故障 IPM error because of electrical level error to pin FO.	
E30	PFC故障脚FO电平错误故障 PFC error because of electrical level error to pin FO.	

2. 主控板功能说明 Main control board Function Description

主控板功能连接示意图 Schematic Diagram of the functional connection of the main control board



注：上电后LED会显示版本号，此版本为1178；

Note: After power on , LED will show the version code 1178.

注意：主控板拨码出厂预设，请勿随意改动拨码位置,否则可能会导致机组运行异常；

The dialing code is preset at the factory, please do not change the dialing position arbitrarily,Otherwise, it may cause abnormal operation of the unit.

①机组可使用无源开机信号控制整机开停，ON/OFF短接则开机正常运行，断开则整体待机；出厂默认短接该端口。

②主控板连接化霜设备时，需要使用继电器中继，不可直接连接大功率设备，以免造成主控板损坏。 蒸发风机允许直连小功率负载，蒸发风机端口负载不得超过1.3A；主控板整体负载不得超过3.5A

①The unit can use a passive start signal to control the start and stop of the entire machine. If ON/OFF is short circuited, it will start and operate normally, and if disconnected, it will be in standby mode; ON/OFF is short circuited before delivered from the factory.

②When connecting the defrosting equipment to the main control board, a relay should be used, and high-power equipment should not be directly connected to avoid damage to the main control board.The evaporation fan is allowed to directly connected to small power loads, and the port load of the evaporation fan shall not exceed 1.3A; The overall load of the main control board shall not exceed 3.5A

2.1开关机控制 On/Off Control

温控器开关温度控制 Temperature control：

温控器检测柜内温度，控制器无异常报警的情况下，根据设定的开机/停机温度开停机控制；

The temperature controller detects the temperature inside the cabinet, and when there is no abnormal alarm from the main control board , it starts and stops the control according to the set of start/stop temperature;

开机：柜内温度＞开机温度

Startup: When cabinet temperature is higher than the set of startup temperature

关机：柜内温度＜停机温度（温控器设定的值）-目标温度补偿（P31的值）

Shutdown: When the cabinet temperature is lower than the set of shutdown temperature minus target temperature compensation (P31 value).

控制器根据当前柜温和设定的停机温度进行压缩机运行频率的调节，默认压缩机开机延时 180 秒；

The controller adjusts the compressor operating frequency based on the current cabinet temperature and the set of shutdown temperature, with a default set of 180 seconds delay start of the compressor after receiving startup signal from the temp controller ;

2.2风机控制 Fan control

2.2.1冷凝风机 Condenser Fan

压缩机启动后，冷凝风机根据室外环温和室外盘管温度控制冷凝风机的工作模式：可根据需求选择交流/直流风机；交流风机为开停控制，直流风机具有调速功能；

After the compressor is started, the condensing fan controls the working mode of the condensing fan based on the outdoor ambient temperature and outdoor coil temperature: AC/DC fans can be selected according to demand; The AC fan is controlled with **on** or **off**, while the DC fan has a speed regulation function;

①交流风机 AC Fan

控制器上电，当冷藏柜内温度＞设定温度时；压缩机启动，冷凝风机启动。

After power on of the temp controller, when the ambient temperature probe detects the ambient temp is higher than the set, the compressor will start and the condensing fan is forced to open;

压缩机启动后，冷凝风机根据室外环温和室外盘管温度控制冷凝风机的工作模式：

After compressor starts, the condenser fan controls the working mode of the fan based on the outdoor ambient temperature and outdoor coil temperature:

当环温温度探头监测到温度高于25℃，冷凝风机开；

When the ambient probe detects a higher temp of 25℃, condenser fan starts.

2）当室外机环温低于25℃时,冷凝风机根据冷凝温度开停。当冷凝温度≥35℃时，冷凝风机启动; 当室外盘管低于30℃，风机停止；（可通过P41，P42设置风机开停温度）

When the ambient temp is lower than 25℃,the fan starts and stops according to condensing temp. When the

condensation temperature is ≥ 35 ℃, the condensation fan starts.; When the outdoor coil is below 30 ℃, the fan stops (the start and stop temp can be set through P41 and P42)

②直流风机 DC Fan

直流风机设定完成以后可根据当前冷凝温度自动调节风速；使用直流风机时，风机数量必须与当前设定匹配。通过拨码选择启用/不启用直流风机；直流风机可通过P45设置启动温度；当冷凝温度大于设定值+10℃时，风机开启并根据当前的冷凝温度进行调速，直到冷凝温度低于开启温度时，风机停机.

After the DC fan is set, the wind speed can be automatically adjusted based on the current condensation temperature; When using DC fans, the number of fans must match the current setting. By dialing the code to select whether to enable or not to enable the DC fan(Factory preset), the starting temperature of the fan can be set;

2.2.2蒸发风机 Evaporation Fan

蒸发风机默认工作方式　default working mode for Evaporation Fan

蒸发风机在温控器和变频控制器上电后就自动开启。

The evaporation fan automatically starts after the temperature controller and variable frequency controller are powered on.

化霜、化霜滴水状态下蒸发风机不运行，化霜滴水时间结束后蒸发风机开启

The evaporation fan does not operate in the defrosting and defrosting drip status. When the defrosting drip time is over, the evaporation fan starts.

2.3化霜控制 Defrosting control

2.3.1化霜类型 Defrosting type

可通过温控器 F14 参数的修改更改化霜类型，不同化霜类型蒸发风机以及化霜继电器工作方式有所不同

The defrosting type can be changed by modifying the F14 parameters of the temperature controller. The operation mode of evaporation fans and defrosting relays varies for different defrosting types.

①电热化霜：压缩机停机，蒸发风机停止运行，电加热（连接到变频控制板上继电器）启动运行，冷凝风机（连接到变频控制板上继电器）停止。（默认此模式）

Electric defrosting: The compressor stops, the evaporation fan stops running, the electric heating (connected to the relay on the variable frequency control board) starts running, and the condensing fan (connected to the relay on the variable frequency control board) stops running. (Default Mode)

②热氟化霜：采用热气化霜前，压缩机先停机，之后打开化霜继电器，启动运行压缩机进行化霜，为保证系统的稳定性，压缩机运行时间不少于2分钟。化霜时主路制冷电磁阀启动，蒸发风机停机，电加热继电器开启, 冷凝风机开启。 热气除霜后压缩机延时 2 分钟才可在满足条件的情况下启动。

Thermal frost: Before using hot gas defrosting, the compressor should be stopped first, and then the defrosting relay should be turned on to start and run the compressor for defrosting. To ensure the stability of the system, the compressor should run for no less than 2 minutes. During defrosting, the main refrigeration solenoid valve is activated, the evaporation fan is stopped, the electric heating relay is activated, and the condensation fan is activated. After defrosting, the compressor can only be started after a delay of 2 minutes when the conditions are met;

③风除霜：压缩机停止，蒸发风机保持工作.

Wind defrosting: The compressor stops and the evaporation fan remains operation.

④化霜滴水时间：化霜完成后为排除化霜时产生的积水，防止再次结冰，设定化霜滴水时间。化霜滴水时间内，压缩机、

蒸发风机、冷凝风机均停止运行。可通过温控器（F5）设置。

Dripping time：After the defrosting is completed, in order to eliminate the water generated during defrosting and prevent icing again, the defrosting dripping time is set. During the defrosting and dripping time, the compressor, evaporator fan, and condenser fan all stop running. It can be set through the temperature controller (F5).

2.3.2化霜模式 Defrosting mode

①强制化霜：长按“强制化霜”按键，在符合化霜条件情况下，冷藏柜强制进入化霜状态（需温控器操作）；

Forced defrosting: Press and hold the "Forced defrosting" button on the temperature controller, and if the defrosting conditions are met, the refrigerator will be forced to enter the defrosting state

②定时化霜：当冷藏柜盘管温度低于化霜停止温度时，且压缩机开机运行达到设定时间（温控器设置）后自动进入化霜模式。

Timing defrosting: When the coil temperature of the cabinet is lower than the temperature at which defrost stops, and the compressor is turned on, running till the set time (set by the temperature controller),the system automatically enters defrosting mode.

③化霜停止条件 Defrosting stop conditions

主动停止：冷藏柜进入化霜模式后，如果检测到冷藏柜内盘管温度高于化霜停止温度(F6)，冷藏柜主动退出化霜模式。

Active stop: After the cabinet enters defrosting mode, if the coil temperature inside the cabinet is detected to be higher than the defrosting stop temperature(F6), the cabinet actively exits defrosting mode.

自动停止：冷藏柜进入化霜模式后，如果冷藏柜内盘管温度低于化霜停止温度(F6)，则在化霜时间（F3）后，自动退出化霜模式。

Automatic stop: After the cabinet enters defrosting mode, if the coil temperature inside the cabinet is lower than the defrosting stop temperature(F6), it will still automatically exit defrosting mode when reaches the defrost setting time (F3)

强制退出化霜： 可通过长按温控器强制化霜按钮强制退出当前化霜；强制退出时无滴水时间；

Forced exit from defrosting: You can exit the current defrosting by long pressing the forced defrosting button on the temperature controller; No dripping time is followed;

2.4超温报警功能 Over temperature alarm function

检测到压缩机上电制冷运行 24（F7） 小时后，**进行检测柜内温度＞开机温度+F8；柜内温度＜停机温度-F8**超过 120（F9）分钟，蜂鸣器输出。（可通过温控器F7,F8,F9调整相关控制参数，出厂以当前机组实际设置为准）

After detecting that the compressor has been running for 24(F7) hours , the buzzer will alarm if the temperature inside(F8) the cabinet has been higher than the set startup temperature+F8 for more than 120(F9) minutes or the temperature inside the cabinet has been lower than the stopping temperature−F8 for more than 120(F9) minutes. (The relevant control parameters can be adjusted through temperature controllers F7, F8, and F9, and the actual settings of the current unit shall prevail when leaving the factory)

2.5电磁阀控制 Solenoid valve control

①喷液电磁阀/喷液电子膨胀阀开启条件：

Opening conditions of spray control solenoid valve/electronic expansion valve：

压缩机运行过程中，当检测到排气温度≥90（P26）时，喷液电磁阀/喷液电子膨胀阀打开，当排气温度≤75（P27）时，电磁阀断电/电子喷液膨胀阀关闭。

During the operation of the compressor, when the exhaust temperature is detected to be ≥ 90 (P26), the spray control solenoid valve will be powered on/the EEV will open. When the exhaust temperature is ≤ 75 (P27), the spray control solenoid valve will be powered off/the EEV will close.

②主路制冷电磁阀：提前压缩机打开，压缩机关闭时，电磁阀关闭；

Main refrigeration solenoid valve: powered on before compressor starts, and when the compressor stops, the solenoid valve is closed;

2.6控制器保护功能 Controller protection function

①ON/OFF 控制 ON/OFF Control

如果主控板此端口闭合，则整机根据目标温度正常运转；如果此端口断开，则整机停止待机，数码管显示 OFF

if this port on the main control board is closed, the entire machine will operate normally according to the target temperature; If this port is disconnected, the entire machine will be in standby and the digital tube will display OFF

②高低压力保护 High and low pressure protection.

压力保护端口断开则控制器显示对应高低压保护故障码，机组停机；

If the pressure ports are disconnected, the controller displays the corresponding high or low pressure protection fault code, and the unit shuts down

压缩机启动 1 分钟内不检测低压端口.

The low-pressure port is not detected within 1 minute of starting the compressor.

2.7主控板调试/操作 Main control board debugging/operation

2.7.1按键操作 Key Functions

可通过主控制对控制器状态进行查询、设置

The main control board status can be queried and set through the temp controller

按键定义：下降键；确认键；上升键（从左到右）

Key definition: Down key（-）; Confirm key(OK); Up key(+) (from left to right);

正常情况下显示当前压缩机频率；

Display the current compressor frequency under normal conditions;

有故障时闪烁显示故障类型；

Flashes to display the fault type when there is a fault;

通过上下键可以进入状态查询信息；

You can enter the status query information through up(+) and down keys(-);

通过长按确认键（3s）可以进入或退出参数设置界面；

Press and hold the confirmation key (3s) to enter or exit the parameter query interface;.

参数设置界面下，通过”＋ “，“-“键可以设置参数值；

The parameters value can be adjusted by pressing’ +’ ’ - ‘;

通过确认键可以保存设置参数，返回查询状态；

Click OK to save the setting parameters and return to the query status

2.7.2控制拨码状态. Control dialing status （DIP）

拨码出厂预设，请勿随意改动拨码位置：

The dialing code is preset at the factory, please do not change the dialing position arbitrarily.

拨码开关 DIP	功能 Function	选择（ON）	选择（OFF）	说明 description
SW1	化霜判定温差 Take the temp difference into account or not before defrost	化霜判定温差 Yes	化霜不判定温差 No	默认 OFF 档 Default OFF
SW2	低压传感器 Pressure sensor	有 Available	无 N/A	
SW3	风机类型 Fan type	DC	AC	
SW4	直流风机数量 Number of DC fans	2	1	SW3 选 ON 时有效; Valid when SW3 selects On
SW5	/	/	/	默认 OFF 档 Default OFF
SW6	定频控制开关 frequency control switch	定频 fixed frequency	变频 Variable frequency	定频时按设定最高频率运行 When choose ON, the unit operates at the highest frequency that is set.

2.7.3状态查询表Status Query Table

代码Code	项目名称 Entry name	备注Note
C00	运行频率 Operating frequency	
C01	运行交流电流（有效值）Operating AC current (effective value)	
C02	运行相电流（峰值）Operating phase current (peak)	
C03	交流电压 AC voltage	
C04	母线电压 Bus voltage	
C05	驱动故障代码 Inverter fault code	EXX对应驱动板FXX，E00为无故障（EXX corresponds to the inverter board FXX and E00 indicates no faults）
C06	限频代码 Frequency limiting code	
C07	散热器温度 Radiator temperature	
C08	主控故障代码 Main control fault code	
C09	冷凝温度 Condensation temperature	
C10	回气温度Return air temperature	
C11	室外温度 Ambient temperature	
C12	排气温度 Discharge temperature	
C13	柜内温度 Cabinet temperature	
C14	蒸发温度 Evaporator temperature	
C15	低压压力传感器数值 Low pressure sensor value	100=1Mpa=10bar
C16	化霜类型0/1/2 Defrosting type	温控器F14 Corresponding to F14 of the temp controller
C17	当前EEV1开度 Current EEV1 opening	
C18	当前EEV2开度 Current EEV2 opening	
C19	当前风机1转速 Current fan 1 speed	仅限使用直流风机 Available with DC FAN
C20	当前风机2转速 Current fan 2 speed	仅限使用直流风机 Available with DC FAN
C21	当前过热度Current overheating	周期刷新Cyclic Refresh
C22	制冷状态 Refrigeration Type	0：温控器控制 1：冷冻 2：冷藏

		0: by temp controller 1: freezing 2: cooling
C23	最近故障记录Recent fault records	
可查询最多9条历史故障，长按“+”可清除全部历史故障记录maximum 9 historical faults available, long press “+” to delete the historical faulty records.		

2.7.4控制器设置参数 Controller setting parameters

1）电子膨胀阀相关设置 Electronic expansion valve related settings

代　码 Code	项目名称 Description	最小值 min	最大值 Max	步长 Step	默认值 Defaul t	单位 Unit
P00	EEV1最小开度Minimum opening of EEV1	50	250	10	50	步
P01	EEV1最大开度Maximum opening of EEV1	300	500	10	500	步
P02	EEV1默认初始开度Default initial opening of EEV1	100	450	10	400	步
P03	EEV1默认初始开度持续时间Initial opening duration of EEV1	50	500	5	60	s
P04	EEV1调节Kp值The adjustment Kp value of EEV1	1	200	1	30	
P05	EEV1调节Ki值The adjustment Ki value of EEV1	1	200	1	25	
P06	EEV1调节Kd值 The adjustment Kd value of EEV1	1	200	1	10	
P07	EEV1调整周期adjustment cycle of EEV1	20	500	5	30	s
P08	EEV2最小开度Minimum opening of EEV2	50	100	10	50	步
P09	EEV2最大开度Maximum opening of EEV2	450	500	10	500	步
P10	EEV2默认初始开度Default opening of EEV2	100	450	10	200	步
P11	EEV2默认初始开度持续时间 Initial opening duration of EEV2	30	500	5	30	s
P12	EEV2调节Kp值The adjustment Kp value of EEV2	1	200	1	18	
P13	EEV2调节Ki值The adjustment Ki value of EEV2	1	200	1	4	
P14	EEV2调节Kd值The adjustment Kd value of EEV2	1	200	1	8	
P15	EEV2调整周期adjustment cycle of EEV2	20	500	5	60	s
P32	排气温度较高EEV1开度不减小 EEV1 opening does not decrease when discharge temperature is at	60	120	1	100	℃
P33	排气温度较低EEV1开度不增加 EEV1 opening does not increase when discharge temperature is at	10	80	1	40	℃
P34	冷媒选择Type of refrigerant	0	5	1	0	0:R404 1:R448 2:R290 3:454C 4:410A 5:R32

P35	主回路电子膨胀阀过热度Overheating degree of the main loop EEV	0	50	1	9	

2）压缩相关参数设置 Compression related parameter settings

代 码 Code	项目名称 Description	最小值 min	最大值 Max	步长 Step	默认值 Default	单位 Unit
P16	压缩机最低运行频率Minimum frequency	10	50	1	30	Hz
P17	压缩机最高运行频率Maximum frequency	50	120	1	70	Hz
P17值无法设定成小于P16设定值P17 The P17 value cannot be set to be less than P16 setting value (Compressor operating frequency)						
P18	压缩机PID周期Compressor PID cycle	5	500	5	60	s
P19	压缩机Kp值Compressor Kp value	1	200	1	35	
P20	压缩机Ki值Compressor Ki value	1	200	1	10	
P21	回油进入频率Entering return oil logic during continuous low-frequency operation	10	70	1	35	Hz
P22	回油运行频率Operating frequency during oil return	10	80	1	50	Hz
P23	回油间隔时间Oil return interval time	5	600	5	70	Min
P24	回油运行时间Return oil running time	5	1000	5	300	s
P24时间有30秒缓冲时间实际，实际时间需在设置值上加10s（其中升频时间20s）						
P47	压力开关延时动作时间Delay action of low pressure switch	0	240	1	0	s

3）风机运行相关参数 Fan related parameters

代 码 Code	项目名称 Description	最小值 min	最大值 Max	步长 Step	默认值 Default	单位 Unit
P41	风机开机温度AC Fan Startup Temp	15	105	1	35	℃
P42	风机停机温度AC Fan Shutdown Temp	10	100	1	30	℃
P43	直流风机低风风速Low wind speed of DC fan	50	500	10	100	RPM
P44	直流风机高风风速High wind speed of DC fan	500	1200	10	900	RPM
P45	直流风机开停温度 Temp at which DC fan starts and stop	10	35	5	10	℃

直流风机开启温度P45+10℃，关闭温度为P45值 The start temperature of the DC fan is P45+10 ℃, and the stop temperature is P45 value						
P46	冷凝风机延时关闭时间Delayed shutdown time of condenser fan	0	240	1	10	s
P51	交流风机环境温度强制开启温度The ambient temperature at which the AC fan is forced to start	10	100	1	32	℃

4）压缩保护相关参数 Compressor protection related parameters

代　码 Code	项目名称 Description	最小值 min	最大值 Max	步长 Step	默认值 Defaul t	单位 Unit
P25	低压压力开关开机延时判定时间delay judge of low pressure switch	5	240	1	60	秒
P26	喷液冷却开启温度Spray cooling opening Temp	60	120	1	90	℃
P27	喷液冷却停止温度Spray cooling stop Temp	50	110	1	75	℃
P28	压缩机相电流过高停机点Compressor stops at phase current of	10	50	0.5	35	A
P29	排气温度过高停机温度点Compressor stops at discharge temp of	90	120	1	110	℃
P30	冷凝器高温过载停机温度点Compressor stops at condensing temp of	40	80	1	62	℃
P31	目标温度补偿 Target temperature compensation	1	5	1	1	℃
P39	压缩机延时启动时间 Delay startup of compressor	0	250	1	10	s
P40	压机最小停机时间Minimum downtime duration of the compressor	60	1000	10	180	s
P48	YL闭合时开机温度	1	5	1	3	℃
P49	YL闭合、GC闭合时停机温度（冷藏）	-10	15	1	2	℃
P50	YL闭合、GC断开时停机温度（冷冻）	-30	-10	1	-20	℃

5）除霜运行相关参数 Compression operation related parameters

代　码 Code	项目名称 Description	最小值 min	最大值 Max	步长 Step	默认值 Defaul t	单位 Unit
P36	热气化霜时主回路电子膨胀阀开度EEV1 opening value during defrosting	50	500	5	450	步
P37	压缩机除霜计时方式Compressor defrosting timing method	0	1	1	0	
0：控制板上电计时；1：压缩机开启计时 0：After controller power on；1：After compressor starts						
压缩机除霜计时方式说明（1：压缩机运行时计时，停机时计时时间不增加且不清除，化霜时清除计时；0：上电，压缩机首次运行时开始计时，后续压缩机停止运行时计时不停止，直到化霜时清除计时。两种方式在ON/OFF开关断开后计时均清零） Compressor Defrost Timing Method Description						

1: Timing is measured during compressor operation. When the compressor stops, the time does not increase or cleared. The timing is cleared when defrost starts; 0: When the power is turned on, timing begins when the compressor starts running for the first time. when the compressor stops running, timing does not stop. The timing is cleared when defrost starts. Both methods reset the timing to zero after the ON/OFF switch is turned off.)						
P38	热气化霜压缩机运行频率compressor operating frequency during Thermal defrosting	30	120	1	55	HZ
P52	化霜温差Defrost temperature difference	0	50	1	10	℃
P53	化霜后蒸发风机延迟启动时间Evap Fan Startup delay after defrost	0	600	5	30	s
该设置仅在拨码ON时生效；当满足化霜条件时，需额外判断 库温-蒸发温度 > P52设置参数时，方可进入化霜；The set is only effective when the dial switch is ON; When meeting defrost standard, only enter defrost process when cabinet temp minus evap temp > P52.						

6）调试模式相关参数 Compression operation related parameters

代 码 Code	项目名称 Description	最小值 min	最大值 Max	步长 Step	默认值 Defaul t	单位 Unit
P60	调试模式 Start debugging model 0：关闭；1：调试模式 0: off 1: on	0	1	1	0	
P61	压缩机强制运行频率Force the compressor to run at fixed frequency	0	120	1	0	Hz
P62	强制风机1运行转数 Forced Rotary Speed of FAN1	0	1000	10	0	RPM
P63	强制风机2运行转数Forced Rotary Speed of FAN2	0	1000	10	0	RPM
P64	EEV1运行步数 EEV1 Operation Steps	0	500	10	0	步
P65	EEV2运行步数 EEV2 Operation Steps	0	500	10	0	步

2.6 附：故障代码表Fault Code Table

1) 主控板故障代码 Main control board fault code

代码Code	描述Description	原因/解决方法Reason/Solution
E00	温控器通讯故障Communication Failure	检查温控器是否接好
E01	回气温度传感器故障 Ambient temperature sensor fault	检查对应传感器是否接触不良或者损坏 Check if the corresponding sensor on the main control board has poor contact or is damaged
E02	室外温度传感器故障 Condensate temperature sensor fault	
E03	冷凝温度传感器故障 Discharge temperature sensor short circuit fault	
E04	排气温度传感器故障 Discharge temperature sensor short circuit fault	
E05	柜内温度传感器故障 Cabinet Temp Sensor Failure	
E06	蒸发温度传感器故障	

	Evaporator Temp Sensor Failure	
E07	低压保护High pressure protection	1、制冷剂不足 Refrigerant is not enough；2、EEV 开度过小 Open value of EEV is too small；3、蒸发器脏堵或风机风量不足 Evaporator is dirty or blocked/ not enough airflow（此为常见原因，可优先排除此项）
Er7	低压压力传感器故障 Low Pressure Sensor failure	检查低压压力传感器是否插好Check if the sensor is connected well
E08	高压保护High pressure protection	1、制冷剂过量 Refrigerant overcharged；2、环境温度过高或冷凝器散热差；High ambient temp or Poor heat dissipation of the condenser 3、冷凝器脏堵或风机风量不足 Condenser is dirty or blocked/ not enough airflow（此为常见原因，可优先排除此项）
E09	变频驱动通信故障Drive communication failure	检查驱动板与主板间连接 Check the connection between the inverter board and the motherboard
E10	直流风机故故障DC fan failure	检查直流风机是否插好 Check the connection of the DC fan
E11	变频驱动故障Drive failure	可通过C05查看当前驱动板故障 Current inverter board faults can be viewed through C05
E12	内盘冻结故障（预留）**Self-evaporate Pan Frozen (reserved)**	内盘温度过低**temp too low in the Pan**
E13	冷凝过载故障 Condensation overload fault	冷凝温度过高Excessive condensation Temp
E14	排气保护故障 discharge Temp protection fault	排气温度过高discharge Temp too high
E15	交流过电流故障AC over current fault	控制器电流过大Controller current too high
E16	过热度低**Sup heat too low**	1、制冷剂过量 Refrigerant Overcharged；2、EEV 开度过大 Open value of EEV is too large；3、蒸发器脏堵或风机风量不足 Evaporator is dirty or blocked/ not enough airflow（此为常见原因，可优先排除此项）

2) 驱动板故障代码 Inverter board fault codes

备注：主控板产生E11驱动故障时，可以通过主控板C05查询当前驱动故障代码

Note: When the main control board generates an E11 drive fault, the current drive fault code can be queried through the main control board C05;

可用于C05查询对照 Used for C05 query comparison

故障代码 Code	故障类型 Fault Type	原因/解决方法 Reason/Solution
F1	直流输入过电压（母线） DC input over voltage	检查输入电Check input power
F2	直流输入低电压（母线） DC input low voltage	
F3	相电流输出过电流Phase current output	电机异常Abnormal motor
F4	失步检出Out of step fault	驱动板或电机异常Abnormal drive board or motor
F5	缺相error0（速度判断） Missing phase error0	
F6	缺相error1（电流判断） Phase loss error1(current)	
F7	逆变器IPM故障（边沿） Inverter IPM fault(edge)	驱动板异常，需要更新程序或更换驱动板The driver board is abnormal and needs to be updated or replaced
F8	逆变器IPM故障（电平） Inverter IPM fault(level)	
F9	PFC-IPM故障（边沿）PFC_IPM fault(edge)	
F10	PFC-IPM故障（电平）PFC_IPM fault(level)	
F11	交流电源缺相（三相电输入） AC power supply	检查输入电Check input power
F12	交流过电流检出故障AC over current fault	
F13	总功率超限故障Total power over load fault	检查压缩机运行是否异常Check compressor operation
F14	交流电压检出异常Abnormal AC voltage	检查输入电Check input power
F15	偏置电压异常检出故障 Abnormal bias voltage	
F22	通信故障Communication failure	检查驱动板与主板间的四芯通讯线连接 Check the communication line
F23	电机参数设置故障 Motor parameter setting fault	驱动板异常，需要更新程序或者更改驱动板 The driver board is abnormal and needs to be updated or replaced
F24	直流电机故障DC motor fault	检查压缩机运行是否异常 Check compressor operation
F28	模块温度异常Control board temperature	驱动板温度过高Drive board Temp too high
F29	热保护故障Thermal protection fault	驱动板热保护Drive board thermal protection

3.电路原理图. Electrical Schematic Diagram

注：机组采用无源开关通断信号控制开停（出厂默 认断开），禁止直接给 ON/OFF 端输入任何电信号，以免损坏控制器；
Note: The unit adopts the on-off signal of passive switch to control the on-off (the factory default is off). It is forbidden to directly input any electrical signal to the ON/OFF terminal to avoid damaging the controller;

实际使用的驱动板可能会因当前机组的功率而有所不同，因此接线方式可能会发生变化，请以实际机组的配置为准。
The actual inverter used may be different due to the different power of the condensing unit , so the wiring method may vary. Please refer to the configuration of the actual unit.

*仅供参考 For reference only

接线原理图