User Guide

Main Function and Technique Index

Main Function:

The controller is a constant temperature controller (refrigeration + electric heating), it can switch automatically from refrigeration mode to heating mode, and it contains the function of compressor boot delay protection, temperature sensor error alarm.

Main Technique Index

- **Temperature display range:** -50～125°C（The step between -9.9 and 99.9°C is 0.1°C，else 1°C)
- **Temperature setting range:** -45～120°C（The step between -9.9 and 99.9°C is 0.1°C，else 1°C)
- **Power supply:** AC 220V±10% （Refer to the wiring diagram）
- **Operation environment:** temperature -10℃～45℃, humidity≤85%.
- **Relay contact capability:** 20A/250VAC (Pure resistive load)
- **Temperature sensor:** NTC R25=5kΩ, B (25/50) = 3470K

Operating Guide

What's the meaning of the index lights on the panel?

The function of the LED on the panel is showing below:

LED	light	flash
Temperature setting	In the state of temperature setting (not revised)	In the state of temperature setting (has been revised)
Difference setting	In the state of temperature difference setting (not revised)	In the state of temperature difference setting (has been revised)
Refrigeration	Refrigerating	The state of compressor boot delay protection
Heat	Heating	-

The meaning of the nixietube display

The nixietube usually shows temperature, if it shows "EE", it means the temperature sensor is short, and "-EE" means the temperature sensor is open.

How to set the temperature?

Press the key "set" and hold it for 2 seconds, the Micro-controller displays temperature that is the "set temperature", then using "▲" key or "▼" key can change the parameter（"▲"adds 0.1°C，"▼"minuses 0.1°C，press and hold them over 0.5 seconds can add or minus rapidly）. After setting, press the key "set" again, you will enter the "temperature difference", then using "▲" key or "▼" key can change the parameter. Press the key "set", to exit the state of setting after finishing.

Notice：1. In the state of temperature setting，it will exit the state of setting if no one presses the key within 30 seconds.

2. The value can be only saved after exiting the state of setting. The value which has been set can not be saved if the power is off before exiting the state of setting.

✓ Advanced Operation

The controller can adjust some internal parameter to meet all kinds of need. The parameter is supplied for special technologist, and common users don't need to know. Please don't change the internal parameter of the controller casually, lest lead to the abnormity of the controller. The way to set the internal parameter is as below:

Use the code to enter the state of parameter setting, the code is "up-down-up-down-up-up-down"，Press the key"▲","▼" continuously in the state of showing current temperature, and it must be finished within 3 seconds，if the code is right, you can enter the state of parameter setting, here the nixietube shows "Fxx"，there into xx is a number，it means parameter code.

Use "▲" or "▼" to select the parameter code，Pressing the "set" key can make it to show the value of the parameter after select the parameter, here you use"▲" or "▼" to set the parameter, then press the "set" key to return to the state of showing parameter code after finishing setting.（**Notice：The parameter which has been changed can be only saved after returning to the state of "Fxx" by pressing the "set" keys**）

Internal parameter code is showing below:

Sort	Code	Parameter Name	Range	Factory Setting	Unit	Remark
Temperature	F19	Temperature Revision	-5 -- +5	0	℃	Revise the sensor bias
Compressor	F21	Compressor delay time	0 -- 10	3	min	
Testing	F99	Check	**This function can attract all relays in turn, and please don't use it when the controller is running!**			
	F00	Exit				

❄ Basic Operating Principle

Temperature controlling and the principle of refrigeration and heating auto switch

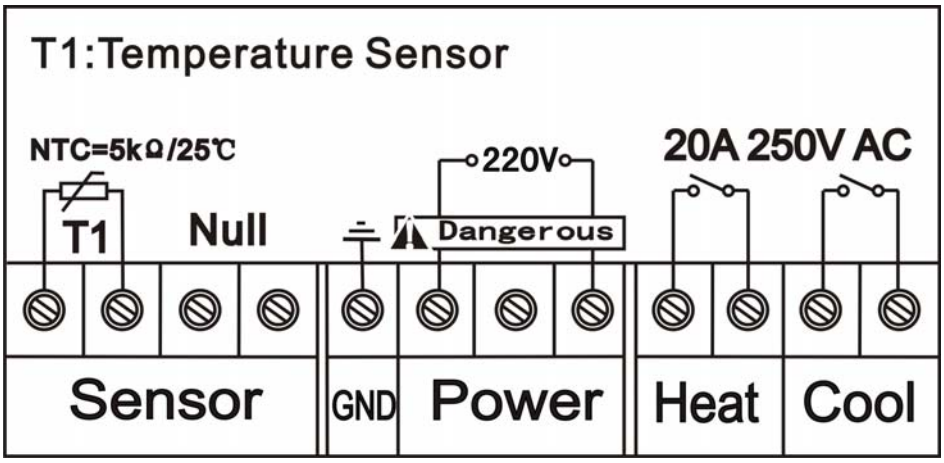
Temperature controlling is based on the "setting temperature" and "temperature difference", if the "setting temperature" is 25°C and "temperature difference" is 5°C, then the controller turns on refrigeration when the temperature of the sensor goes up to 30°C, the controller will turn off refrigeration when the temperature of the sensor goes down to 25°C. In the same way, the controller will turn on heating when the temperature is below 20°C, and the process of heating will end when the temperature goes up to 25°C. Thus the controller can achieve auto switch of refrigeration and heating, and the temperature will be controlled between 20°C and 30°C.

Compressor delay time

The controller contains a "compressor halt calculagraph", and it begins to time when compressor stops, the program first check the calculagraph before starting the compressor next time, the program will immediately start the compressor if the calculagraph reach 3 minutes ,if the calculagraph doesn't reach 3 minutes ,it will start again when the calculagraph reaches 3 minutes. Thus you can ensure that the boot alternation is over 3 minutes after halt, so it can prevent to breaking the compressor as a result of frequent boot.

In addition, the controller doesn't boot the compressor within 3 minutes after turning on the power supply, thus the compressor can also be protected in the state of power cut and then power on. （*Annotation：The time of boot delay protection can be adjusted, it sets to 3 minutes above.）

Wiring Diagram:



Notice：

1. **The earth terminal of the controller should be connected with the earth terminal of the electric cabinet reliably，be sure to connect the earth well.**
2. **Please use sensors which are supplied by our company.**