NA923 User Guide

Main Function and Technique Index

Main Function:

The controller is a constant temperature controller (refrigeration + heat pump 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℃（The step between -9.9 and 99.9°C is 0.1°C，else 1°C)
- **Temperature setting range:** -45～120℃（The step between -9.9 and 99.9°C is 0.1°C，else 1°C)
- **Power supply:** 9～12V AC (Use the transformer with the controller，primary voltage, 220V±10% or 380V±10%)
- **Operation Environment:** temperature -10℃～45℃, humidity≤85%.
- **Relay contact capability:** 2A/380VAC (Pure resistive load)
- **Temperature sensor:** NTC R25=5kΩ, B (25/50) =3470K
- **Executive standard:** Q/320585 XYK 01-2004 (NA923-CHTD)

Operating Guide

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

The function of the LED on the panel is as follows:

LED	light	flash
Temperature setting	The state of temperature setting (not revised)	The state of temperature setting(have been revised)
Refrigeration	Refrigerating	The state of compressor boot delay protection
Heat	Heating	The state of compressor boot delay protection
***Annotation: The lights of refrigeration and heating lighting at the same means the state of defrosting.**		

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.

How to defrost manually?

Press the key **"▼"** and hold it for 5 seconds, and then enter the state of defrosting. The state of defrosting can be ended forcibly when you press the key **"▼"** and hold it for 5 seconds again.

How to read the temperature of the temperature sensor?

Press the key "▼" when it shows the current temperature, and it can show the temperature of the defrosting temperature sensor .It will show the current temperature when release the key "▼". Notice that if you press the key "▼" over 5 seconds it can enter or exit the state of defrosting forcibly.

✓ 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" key）**

Internal parameter code is as follows:

Sort	Code	Parameter Name	Range	Factory Setting	Unit	Remark
Temperature	F12	Temperature difference	0.2 -- 10	2.0	°C	Control the temp return difference. Please refer to the instruction of the operating principle for details.
	F19	Temperature Revision	-10 -- +10	0	°C	Revise the sensor bias
Compressor	F21	Compressor delay time	0 -- 10	3	min	
Defrosting	F31	Defrost cycle	0 -- 99	6	hour	0 means no defrosting
	F32	Defrost end temp	5 -- 50	15	°C	
	F33	Defrost start time	1 -- 99	30	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 Operation 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.）

Auto defrosting principle

In the heating state, the controller will add up the running time of heat pump, if it reaches time of the "defrost cycle", the controller will turn on defrosting. The defrosting will not be turned on in the refrigeration mode, and the controller will clear the accumulative running time of the heat pump once it begins to refrigerate.

The controller will check the defrosting effect through defrosting sensor after the defrosting is turned on, if the temperature of sensor reaches "defrost end temperature", the controller will turn off defrosting. If the defrosting time is longer than the "defrost end time", the controller will turn off the defrosting forcibly.

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.**