NA920 User Guide

☞ Main Functions

- ☞ **Refrigeration controlling:** Temperature display, Temperature controlling, Delay protecting, Sensor error alarm.
- ☞ **Defrosting controlling:** Defrost timely, Defrosting ending depend on both temperature and time, Dripping, Manual defrosting

¤Main Technical Parameter

- **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:** 9～12V AC （Use the transformer with the controller，primary voltage, 220V±10% or 380V±10%）
- **Operating environment:** temperature -10℃～45℃,humidity≤85%.
- **Relay contact capability:** 2A/380VAC (Pure resistant load)
- **Temperature sensor:** NTC R25=5kΩ, B (25/50) =3470K
- **Executive standard:** Q/320585 XYK 01-2004 (NA920-CTD)

🕮 Operating Instruction

☝ **The meaning of the LED**

Indicator light	light	flash
Setting temperature	The state of temperature setting (not revised)	The state of temperature setting(have been revised)
Refrigeration	Compressor running	Compressor start delay protection
Defrost	Defrosting	Dripping

☝ **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, then enter the state of temperature setting, here nixietube shows the temperature of setting, then use the key of up or key of down to change the value of setting （“▲”add 0.1°C，“▼”minus 0.1°C，press and hold them over 0.5 seconds can add or minus rapidly）.Press the key “set” to exit the state of setting after setting.

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 defrosting 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 again）

Internal parameter code is showing below:

Sort	Code	Parameter Name	Range	Factory Setting	Unit	Remark
Temperature	F12	Temperature difference	0.2 -- 10	1.0	℃	
	F19	Temperature revision	-10 -- +10	0	℃	Revise the sensor bias
Compressor	F21	Compressor delay time	0 -- 10	3	min	
	F22	Compressor running frequency	0 -- 10	0	-	Refer to the annotation
Defrosting	F31	Defrost cycle	0 -- 99	12	hour	0 means no defrosting
	F32	Defrost end temperature	5 -- 50	15	℃	
	F33	Defrost end time	1 -- 99	30	min	
	F34	Dripping time	0 -- 99	5	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				

* Annotation: "Compressor running frequency" is used when temperature sensor is error. This let compressor run the protected state. In this state, the cycle 30 minutes, compressor runs F22 x 3 minutes, stops 30-(F22 x 3) minutes. For example, F22 sets 3, when temperature sensor is error, compressor runs 9 minutes ,stops 21 minutes ,in the cycle .If don't need the function, F22 sets 0 .

❄ Basic Operating Principle

Temperature controlling

Controlling temperature can set according to "Temperature set" and "Temperature difference" .If "set temp" is 20°C, "temp difference" is 2°C, temperature sensor apperceives the temperature higher than 22°C, compressor runs, then the temperature lower than 18°C, compressor stops. Thus temperature can be controlled between 20±2°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

Micro-controller starts the defrosting function according to the defrosting cycle. After defrosted, Micro-controller can apperceive the effect of defrosting by defrosting temperature sensor. If this temperature reach the "Defrosting temperature" defrost will stop, If defrost time is longer than defrosting time, Micro-controller also will finish.

Dripping

Set the dripping water 5 minutes, after finishing defrosting, in 5 minutes, compressor doesn't run, in this state, "Defrost" LED will flash. But in two conditions Micro-controller can't come in dripping water state: one is finishing the defrosting manually, and the other is defrosting temperature sensor's error.

Notice:

1. **Please place the temperature sensor at the place of air return of the air-cooler, and the defrosting sensor above the air return pipe of the air-cooler.**
2. **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.**
3. **Please use the transformers and temperature sensors which are supplied by our company.**