NA820 User Guide

Main Function and Technique Index

Main Function

- **Refrigeration controlling:** temperature measure，temperature control，delayed protect，sensor's error alarm.
- **Defrosting controlling:** defrost timely, controlled by both time and temperature，manual defrosting

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:** 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 resistive load)
- **Temperature sensor:** NTC R25=5kΩ, B (25/50) =3470K
- **Executive standard:** Q/320585 XYK 01-2004 (NA820-CTD)

Operating Guide

The meaning of the LED

LED	light	flash
Temperature setting	In the state of temperature setting (not revised)	In the state of temperature setting (has been revised)
Temperature difference setting	In the state of temperature difference setting (not revised)	In the state of temperature difference setting (has been revised)
Refrigeration	Refrigerating	Compressor delay
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 setting" and "Temperature difference setting"?

Press "▲" and"▼"at the same time, the Micro-controller displays temperature that is "set temperature", then using "▲" key or "▼" key can change the parameter. After setting, press "▲" and"▼" synchronously, you will enter the "temperature difference", then using "▲" key or "▼" key can change the parameter, press "▲" and"▼", that finish the setting parameter.

Notice：1. In the state of temperature setting，it will exit the state of setting if don't press the key within 5 seconds.

2. The value can be only saved after exiting the state of setting. The value which has been adjusted 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 both keys at the same time 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 both keys at the same time 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 both keys at the same time**）

Internal parameter code is showing below:

Sort	Code	Parameter name	Range	Factory Setting	Unit	Remark
Temperature	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				

*"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 Operation Principle

Temperature controlling

Temperature controlling is based on "temperature setting" and "temperature difference setting", suppose "temperature setting" is 20°C，"temperature difference setting" is 2°C，so it begins to refrigerate when the temperature of the temperature sensor is over 22°C, and it stops refrigerating when the temperature is under 18°C, thus the temperature can be controlled at about 20±2°C.

Compressor delay time

The controller contains a "compressor halt calculagraph"， 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 will also 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, controller couldn't enter the state of dripping: one is that finishing the defrosting manually, the other is that defrosting end which caused by 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 sensors and transformer which are supplied by our company.