NA810DC User Guide
(9~24V DC)

Main Function and Technique Index

Main Function

The controller is a single refrigeration controller, and it contains compressor start delay protection, temperature sensor error alarm and other functions. It has one external alarm, and the alarm can be set to 5 states: always open, always open locked, always closed, always closed locked and forbidden.

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:** 9～24V DC ±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

Operating Guide

What's the meaning of the LED on the panel?

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

LED	light	flash
Temperature upper limit	Set temperature upper limit	-
Temperature lower limit	Set temperature lower limit	
Null	-	-
Refrigeration	Refrigerating	The state of compressor boot delay protection

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. The nixietube usually shows temperature, the temperature and the alarm code (Axx) will show alternately when in the alarm state.

The parameter code is showing below:

Code	signification	Explanation
EE	Temperature sensor short	
-EE	Temperature sensor open	
A11	External alarm	Alarm from external alarm signal, please refer to the internal parameter code "F50"

How to set the upper limit and lower limit temperature?

Press the key "▲" and "▼" at the same time for at least 2 seconds, the Micro-controller displays temperature that is "upper limit", also "upper limit" LED lights, then using the key "▲" or "▼" can adjust the parameter. After setting, press "▼", then enter the "lower limit", using the key "▲" or "▼" can adjust the parameter, press the key "▲" or "▼" at the same time again, then exit the state of setting parameter. （the key"▲"adds 0.1°C, the key"▼"minuses 0.1°C, press and hold it over 0.5 seconds can add or minus rapidly）

Notice：1. In the state of temperature setting，it will exit the state of setting if no one presses the key within 5 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. 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 controlling	F19	Temp sensor revision	-9.9 -- 10	0	°C	Revise the temp sensor bias
Compressor	F21	Compressor delay time	0 – 10	3	min	
Alarm	F50	External alarm mode*	0 - 4	0	-	0: nonuse external alarm 1: Always open, unlocked 2: Always open, locked 3: Always closed, unlocked 4: Always closed, locked
Testing	F98	Test the external alarm input signal	Used when testing before leaving factory, display the state of the input signal, 0 means unconnected, 1 means connected			
	F99	Check	**This function can attract all relays in turn, and please don't use it when the controller is running!**			
	F00	Exit				

*Annotation: "Always open" means in normal state, external alarm signal is open, if closed, the controller will give an alarm; "Always closed" is on the contrary. "Locked" means that when external alarm signal becomes normal, the controller is still in the alarm state, and it needs to press the "resume" key to resume.

❄ Basic Operation principle

Temperature controlling

Temperature controlling can set according to "upper limit" and "lower limit" .If "upper limit" is 20°C, "lower limit" is 18°C, temperature sensor (refrigerator sensor) apperceives the temperature higher than 20°C, compressor runs, then the temperature lower than 18°C, compressor stops. Through this, temperature can be controlled between 18°C and 20°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 booting the compressor next time, the program will immediately boot the compressor if the calculagraph reach 3 minutes ,if the calculagraph doesn't reach 3 minutes ,it will boot 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.）

External Alarm

The controller has one channel switching value alarm signal（Pin2,3）, and it can be set to forbidden, always open or always closed by F50. "Always open" means that external alarm signal is in the open state, and it generates alarm when closed. "Always closed" means it is on the contrary. The controller will cut off the refrigeration output when the external alarm occurs and no longer refrigerate, and the nixietube shows the code "A11". In addition, the controller may still be in the alarm state (Being related to F50) when the alarm signal becomes normal, press any key to resume.

Notice：

1. **Please place the temperature sensor at the place of air return of the air-cooler.**
2. **Please use the temperature sensors and transformer which are supplied by our company.**