NA310 User Guide

Main Function

The controller is a single refrigeration controller, it contains compressor startup delay protection, temperature sensor error alarm and other functions, the controller can run regularly with set on-off rate when error. It has one external alarm，the alarm can be set to 5 states: always open, always open locked, always closed, always closed locked and forbidden.

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：** AC 220V±10% or 380V±10% 50Hz(Refer to the wiring diagram)
- **Operating environment：** temperature -10℃～45℃, humidity≤85%.
- **Relay contact capability:** 2A/380VAC
- **Temperature sensor ：** NTC R25=5kΩ,B(25/50)=3470K
- **Executive Standard：** Q/320585 XYK 01-2004 (NA310-CTA)

Operating Guide

The meaning of the LED:

LED	light	flash
Current temperature	Display current temperature	-
Temperature upper limit	Setting upper limit temperature	-
Temperature lower limit	Setting lower limit temperature	-
Refrigeration	Refrigerating	The state of compressor start delay protection

The meaning of the nixie 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.

Alarm codes:

Code	signification	Explanation
A11	External alarm	External alarm input, refer to the parameter “F50”
A21	Temperature sensor error	Open or short (showing “EE” and “-EE”)

How to set the upper limit and lower limit temperature?

Press the key “set” and hold it for at least 2 seconds, the controller displays the upper limit temperature, and “upper limit” LED lights, then using the key “▲” or “▼” can adjust the parameter. After setting, press “set”, then enter the state of setting “lower limit temperature”, using the key “▲” or “▼” can adjust the parameter, press the key “set” 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 don’t press the key within 30 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.

✓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 showing below:

Sort	Code	Parameter name	Range	Factory Setting	Unit	Remark
Temperature	F19	Temperature sensor revision	-10 -- +10	0	°C	Revise the temp bias
Compressor	F21	Compressor delay time	0 – 10	3	min	
	F22	Compressor running frequency*	0 – 10	0	-	
Alarm	F50	External alarm mode*	0 - 4	0	-	0 : nonuse external alarm 1 : open, unlocked 2 : open, locked 3 : closed, unlocked 4 : closed, locked
	F00	Exit the parameter setting				

*Annotation: 1 "Compressor running frequency" is used when temperature sensor has error. This lets compressor run in the protecting 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 has error, compressor runs 9 minutes, stops 21 minutes, in the cycle. If don't need the function, F22 sets 0.

2 "External alarm mode": "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 Operating Principle

Temperature controlling

Temperature controlling can be set according to "upper limit" and "lower limit" .If "upper limit temperature" is 22°C, "lower limit temperature" is 20°C, temperature sensor (refrigerator sensor) apperceives the temperature higher than 22°C, compressor runs, then the temperature lower than 20°C, compressor stops. Thus temperature can be controlled between 20°C and 22°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.）

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 the temperature sensors which are supplied by our company.**