NA320 User Guide

Main Function

☞ **Refrigerating controlling:** temperature display, temperature controlling, compressor boot delay protection, temperature sensor error alarm. It can run periodically with the rate of start and stop which has been set when the temperature sensor is broken.

☞ **Defrosting controlling:** defrosting timely, controlled both by time and temperature, manual defrosting.

☞ **External alarm:** one channel external alarm, it can be set to 5 modes: always open, always open locked, always closed, always closed locked or 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: AC 220V±10% or 380V±10%, 50Hz (Refer to the wiring diagram)

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 (NA320-CTDA)

Operating Guide

The meaning of the LED:

LED	light	flash
Temperature upper limit	Set upper limit temperature	-
Temperature lower limit	Set lower limit temperature	-
Defrost cycle	Set the defrosting cycle	-
Refrigeration/ Defrost	Refrigerating or Defrosting (when defrosting, the nixietube is showing “DEF”)	The state of compressor start delay protection or 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. The temperature and the alarm code (Axx) will show alternately when in the alarm state.

Alarm codes are as follows:

Code	signification	Explanation
DEF	Defrosting or Dripping	Refer to the light instruction of “refrigeration/Defrosting”
A11	External alarm	External alarm input, refer to the internal parameter code “F50”
A21	Refrigerator sensor error	Open or short (showing “EE” or “-EE”)
A22	Defrosting sensor error	Open or short (showing “EE” or “-EE”)

How to set “upper limit” “lower limit” and “Defrosting cycle”?

Press “set” at least 2 seconds, the nixietube shows the upper limit temperature, and “upper limit” LED lights, then using “▲” or “▼” can adjust the parameter. After setting, press “set”, then enter the “lower limit”, using “▲” or “▼” can adjust the parameter, press “set”, enter the “Defrosting cycle”, using “▲” or “▼” can adjust the parameter, press “set” ,then finish the setting parameter. （“▲”adds 0.1°C，“▼”minuses 0.1°C，holding 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.

How to defrost manually?

Press “▼” key at least 5 seconds, and then enter the defrosting state. In defrosting state, if press“▼” key at least 5 seconds, this can finish the defrosting compulsively.

How to read the temperature of the defrosting sensor?

When displaying current temperature, press “▼” key, Micro-controller will display defrosting temperature. Loose “▼” key, then return to the state of display current temperature.

✓ 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	F18	Defrosting sensor revision	-10 -- +10	0	°C	Revise the defrosting sensor bias
	F19	Temp 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	-	*
Defrosting	F31	Defrost cycle	0 -- 99	12	hour	0 means no defrosting
	F32	Defrost end temperature	5 -- 50	15	°C	
	F33	Defrost end time	1 -- 99	30	min	
	F34	Dripping time	0 -- 99	5	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
	F00	Exit				

*Annotation: 1"Compressor running frequency" is used when temperature sensor has error. This lets compressor run in 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 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 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. The compressor can be protected. The time of boot delay protection can be adjusted, and 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 probe the evaporator temperature by defrosting temperature sensor. If this temperature reach the "Defrosting temperature", defrost will stop, if defrosting time is longer than "defrosting time", Micro-controller will also finish.

Defrosting and Dripping

Set a dripping time, such as 5 minutes, after finishing defrosting in 5 minutes, compressor doesn't run, in this state, "Refrigeration/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. **Please use the temperature sensors which are supplied by our company.**