NA338 User Guide

☞ Main Function and Technique Index

Main Function:

☞**Refrigeration Controlling:** temperature showing, temperature controlling、boot delay protection of compressor, alarm of temperature sensor abnormity, it can run periodically with the on-off rate and stop which has been set when the temperature sensor is broken.

☞**Fan Controlling:** fan delay startup（double controlling of temperature and time）, delay shut down of fan. It can be set as "controlled mode" and "free mode".

☞**Defrosting Controlling:** Timing to startup the operation of defrosting, the condition of defrosting finished is double controlling of temperature and time, defrosting and dripping, manual defrosting, defrosting sensor error alarm. The timing mode of the defrosting cycle can be set as timing directly or accumulating compressor running time.

☞**Deficient-phase and phase sequence protection:** when the phase is missing or wrong, the controller will turn off the compressor immediately.

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 380V±10% 50Hz, three phase
- **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 (NA338-CTDFAX)

🕮 Operating Guide

☝ ***What's the meaning of the index lights on the panel?***

The function of the LED on the panel is as follows:

LED	light	flash
Temp setting	In the state of temperature setting	-
Refrigeration	Refrigerating	The state of compressor boot delay protection
Defrost	Defrosting	Dripping
Fan	Fan running	-

☝ ***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.

The code is as follows:

Code	signification	Explanation
A21	Temperature sensor error	Open or short（showing "EE" or "-EE"）
A22	Defrosting sensor error	Open of short（showing "EE" or" -EE" when press the key "▼"）
A31	Deficient-phase alarm	
A32	Phase wrong alarm	

☝ ***How to set the temperature?***

Press "set" at least 2 seconds, and enter the state of temperature setting, the nixietube displays the current temperature, the LED of temperature setting lights, then using "▲" or "▼" can adjust the parameter. （"▲"adds 0.1°C，"▼"minuses 0.1°C，holding it over 0.5 seconds can add or minus rapidly）After setting, press "set" again, then exit the state of parameter setting.

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 prober?***

When displaying current temperature, press "▼" key, Micro-controller will display defrosting temperature. Loose the key "▼", then return to 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 as follows:

Sort	Code	Parameter Name	Range	Factory Setting	Unit	Remark
Temperature	F12	Temperature difference	0.1 – 10.0	1.0	°C	Control the temp return difference. Refer to the instruction of the operating principle for details.
	F18	Defrosting sensor revision	-10 -- +10	0	°C	Revise the defrosting sensor bias
	F19	Temp sensor revision	-10 -- +10	0	°C	Revise the temp 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 temp	0.5 – 50.0	15.0	°C	
	F33	Defrost end time	1 – 99	30	min	
	F34	Dripping time	0 – 99	5	min	
	F35	Defrosting cycle timing mode	0 or 1	0	-	0: timing directly 1: accumulating compressor running time
Fan	F41	Fan start temperature	-45 -- 120	-10	°C	
	F42	Fan start delay	0 -- 240	60	sec	
	F43	Fan stop delay	0 -- 240	0	sec	
	F44	Fan mode	0 or 1	0	-	0: controlled mode 1: free mode
	F00	Exit				

*Annotation: "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.

❄ 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", 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.

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 the temperature reaches the “Defrost end temperature”, defrosting will stop, if defrosting time is longer than “defrost end time”, the defrosting will be turned off forcibly.

The defrosting cycle has two timing modes (F35), F35=0 means timing directly, F35=1 means accumulating the compressor running time.

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 the controller can’t enter the dripping state: one is finishing the defrosting manually, and the other is defrosting temperature sensor’s error.

About fan controlling

Fan has two operation modes: “controlled mode” and “free mode”.

In “controlled mode”，fan only runs in the state of cooling, but after cooling, fan don’t start immediately, controller probes the evaporator temperature by defrosting temperature sensor, when evaporator temperature is lower than “Fan start temperature”, fan runs. After cooling, if the evaporator temperature doesn’t drop during a time, longer than “Fan start delay”, fan will run compulsively. If fan runs immediately, setting “Fan start delay” is 0, after compressor stops, fan don’t stop immediately, it will delay some time through “Fan stop delay”, if don’t need delay, setting “Fan stop delay” is 0.

In “free mode”，fan always runs，only in defrosting fan stops. In this mode, “Fan startup temperature”, “Fan start delay”, “Fan stop delay” has no operation.

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.**