NA620 User Guide (V2.00)

Main Function and Technique Index

Main function:

☞**Temperature Controlling:** temperature showing, temperature controlling, compressor start 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:** 2 defrost modes (electric heat, hot gas), 2 defrost start mode (time alternation, accumulative compressor running time, real time clock), 2 defrost end mode (timing, controlled by both temperature and time), dripping, manual defrost, defrost sensor error alarm.

☞**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.

☞**Password Protection:** You can set the password for advanced menu to prevent parameters from changing accidentally.

Main technique index:

- **Temperature display range:** -50～150°C（The step between -9.9 and 99.9°C is 0.1°C，else 1°C)
- **Temperature setting range:** -45～145°C（The range can be set)
- **Power supply:** 220V±10% or 380V±10% (Refer to the wiring diagram)
- **Operation Environment:** temperature -20℃～50℃, humidity≤85%.
- **Relay contact capability:** 2A/250VAC (pure resistive load)
- **Temperature sensor:** NTC R25=5kΩ, B (25/50) =3470K
- **Executive standard:** Q/320585 XYK 01 (NA620-CTDA)

Operation Guide

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

The function of the index lights on the panel is showing below：

Indicator light	Indicator light name	Light	Flash
	Temperature setting	In the state of temperature setting	-
	Refrigeration	Refrigerating	Ready to refrigerate, in the state of compressor start delay protection
	Not use	-	-
	Defrost	Defrosting	Dripping or compressor start delay protection state

The meaning of the nixietube display:

The nixietube usually shows temperature, if it shows "SHr", it means the temperature sensor is short, and "OPE" means the temperature sensor is open.The temperature and the alarm code (Axx) will show alternately when in the alarm state.

The code is showing below:

Code	signification	Explanation
A11	External Alarm	External alarm input, refer to the internal parameter code "F50"
A21	Temp sensor error	Open or short (showing "SHr" or "OPE")
A22	Evaporator sensor error	Open or short（showing "OPE" or "SHr" when press the key "▼"）. If you don't need to use the evaporator sensor, you can use the F59 to close the alarm.
A99	Probation time ends	If you have set the probation time F87, the alarm occurs when the accumulative running time is over probation time, and the controller can not work.

How to set the temperature

In the state of displaying current temperature, press the keys "▲" and "▼" at the same time，indicator light lights, then enter the state of temperature setting，here the nixietube shows the temperature of setting, then use the key "▲" or key "▼" to change the value of setting（"▲"adds 0.1°C，"▼"minuses 0.1°C，press and hold them over 0.5 seconds can add or minus rapidly）.Press both keys at the same time or without any operation for 5 seconds to exit the state of setting (The temperature range is limited by F13 and F14, please refer to the advanced operation).

How to defrost manually?

Press the key "▼" 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 "▼".

✓ Advanced Operation

Press the key "▲" for 5 seconds to enter the state of parameter setting, and if you have set the password, the LED display the "PAS" to hint you to enter the password, you can use the key "▲" to change number and use the key "▼" to shift. If the password is correct, the LED will display the parameter code, use "▲" or "▼" to select the parameter code， and the press the key "▲" and "▼" at the same time to display the parameter valve, here you can use the key "▲" and "▼" to set the parameter (pressing the key and not release can add or minus rapidly),then press the both keys at the same time to return to the state of showing parameter code after finishing setting.

Internal parameter code is showing below:

Sort	Code	Parameter Name	Range	Factory setting	Unit	Remark
Temperature	F11	Setting temperature	F14 – F13	0	℃	The setting range is limited by F13 and F14
	F12	Temperature difference	0.1 – 20	1.0	℃	Control the temperature difference, please refer to the temperature controlling
	F13	Max setting temperature	-45 - 145	145	℃	Notice: the controller will follow the rule of F14<F11<F13 forcibly, if you find out that one parameter can not be adjusted, it is because the parameter is limited by other parameters, you must first adjust other parameters
	F14	Min setting temperature	-45 – 145	-45	℃	
	F18	Evaporator sensor adjustment	-20.0 – 20.0	0.0	℃	Adjust the evaporator sensor bias
	F19	Temp sensor adjustment	-20.0 – 20.0	0.0	℃	Adjust the temperature sensor bias
Compressor	F21	Compressor delay time	0 -- 10	3	min	
	F22	Compressor running frequency when error	0 -- 100	0	%	Enable when the temperature sensor is error
	F23	Compressor on/off cycle when error	5 -- 999	60	min	
Defrosting	F31	Defrost alternation time (Enable when F35=1 and 2)	0.1 – 99.9	12	hour	
	F32	Defrost end temperature	0.0 – 50.0	15.0	℃	
	F33	Defrost end time	1 -- 99	30	min	
	F34	Dripping time	0 -- 99	5	min	
	F35	Defrost start mode	OFF 1 -- 2	1	-	OFF: defrost is off 1: time alternation start 2: accumulative running time
	F36	Defrost stop mode	0 or 1	1	-	0:only controlled by time 1:controlled by both time and temp
	F37	Defrost heat mode	0 or 1	0	-	0: electric heat 1: hot gas
Alarm	F50	External alarm mode	0 -- 4	0	-	0: without external alarm 1: always open, unlocked 2: always open, locked 3: always closed, unlocked 4: always closed, locked
	F59	Whether use the evaporator sensor error alarm	YES/NO	YES	-	
System setting	F80	Password	OFF 001 -- 999	OFF	-	OFF means no password 000 means clearing password
Testing	F98	Reserved				
	F99	Test self	**This function can attract all relays in turn, and please don't use it when the controller is running!**			
	End	Exit				

❄ Basic Operation principle

Temperature controlling

Temperature controlling point is controlled by "setting temperature (F11, or press the both keys to set)" and "temperature difference(F12)".In refrigeration mode, the controller begins to refrigerate when the temperature of the temperature sensor is over "setting temperature ＋ temperature difference", and it stops refrigerating when the temperature is under "setting temperature － temperature difference"; In heat mode, the controller begins to heat when the temperature of the temperature sensor is under "setting temperature － temperature difference", and it stops heating when the temperature is over "setting temperature ＋ temperature difference"

Compressor delay time

The compressor delay time is set by F21, for example, 3 minutes. 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.

Compressor running timly when temperature sensor is error

When the temperature sensor is error, in order to avoid that the goods in the coldroom destroy, you can make the compressor continues to run with a setting on/off rate. It is set by F22 and F23, for example, F22=20, F23=50, that when the temperature sensor is error, the cycle is 50 minutes, and the compressor stops for 40 minutes and runs for 10 minutes.

Auto defrosting principle

The controller has 4 defrost start modes which can be selected（F35）:

OFF: Defrost is off.

1. Time alternation: the controller will start defrost according to the setting alternation time which can be set in "Defrost alternation time (F31)".

2. Accumulative compressor running time: if compressor accumulative running time reaches the time which set in "defrost alternation time (F31)", the controller starts defrost.

3. RTC start: the controller turns on defrost according to the actual time (for example, 6:00 AM), 6 points can be set at most (F61-F66), in this mode, "defrost alternation time (F31)" does nothing.

The controller has 2 defrost end modes which can be selected（F36）:

0: time control: the defrost time can be set by F33, the controller will stop defrosting when it reaches the defrost time.

1: controlled by both time and temperature: the controller will check the defrost effect through evaporator sensor after starting defrost, If the sensor temperature reaches the "Defrost end temperature (F32)", the controller will turn off defrosting, if the defrost time is longer than "defrost end time (F33)", the defrosting will be turned off forcibly.

You can select 2 defrost heat modes (F37):

0: electric heat: the compressor stops and the defrost output is turned on (the defrost output controls the electric heater);

1: hot gas: the compressor and defrost output is turned on (the defrost output controls the four-way valve).

Dripping

A dripping time can be set (F34). For example, set the dripping water with 5 minutes, after finishing defrosting, in 5 minutes, compressor doesn't run, in this state, "Defrost" indicator light 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.

External alarm

The controller can connect a switching value as external alarm source (Pin 4, 5), when the external alarm occurs, the controller stops, displays the alarm code "A11" and generates alarm output. External alarm signal has 5 modes (F50):

0: without external alarm

1: always open, unlocked

2: always open, locked

3: always closed, unlocked

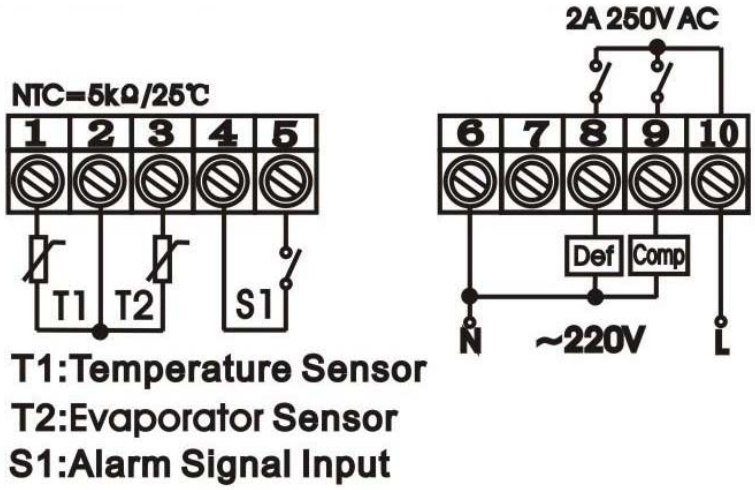
4: always closed, locked

"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 any key to resume.

Password

In order to prevent irrespective persons from changing the parameters, you can set a password (F80), and if you have set a password, the controller will hint you to enter the password after you press the key "M" for 5 seconds, you must enter the correct password, and then you can set the parameters. If you don't need the password, you can set F80 to "OFF". Notice that you must remember the password, and if you forget the password, you can not enter the set state.

Wiring Diagram:



Notice:

1. **Please read the guide carefully before using, and set the parameter accurately.**
2. **Please place the temperature sensor at the place of air return of the air-cooler.**
3. **The evaporator sensor must be fixed on the air return pipe of the evaporator, and if you don't use the evaporator sensor, please set the F59 to NO, or the controller will generate alarm.**
4. **Please use the temperature sensors which are supplied by our company.**