NA824 User Guide

☞ Main Function and Technique Index

Main Function:

The controller is the special controller for hot pump water heater, and it controls the compressor and cross valve. The controller will turn on the compressor and turn off the cross valve when heating, and turn on the compressor and cross valve when defrosting.

When begin to heat, the controller will judge whether needs to defrost by checking the temperature of outdoor machine. In the process of heating, the controller will judge whether needs to defrost according to the accumulative low temperature time of outdoor machine, and not defrost when waiting.

Main Technique Index:

- **Temperature display range:** -50～125℃（The step between -9.9 and 99.9°C is 0.1°C，else 1°C)
- **Temperature setting range:** -45～120℃（The step between -9.9 and 99.9°C is 0.1°C，else 1°C)
- **Power supply:** 9～12V AC （use the transformer with the controller，primary voltage 220V±10% or 380V±10%）
- **Operation 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 (NA824-HTD)

🕮 Operating Guide

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

The function of the LED is as follows.

LED	light	flash
Temperature setting	In the state of temperature setting (not revised)	In the state of temperature setting (has been revised)
Temp difference setting	In the state of temperature difference setting (not revised)	In the state of temperature difference setting (has been revised)
Heat	Heating	In the state of compressor start delay protection
Defrost	Defrosting	In the state of compressor start 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.

☝ ***How to set temperature and temperature difference?***

Press "▲" and"▼"at the same time, the Micro-controller displays temperature that is "set temperature", then using "▲" key or "▼" key can change the parameter. After setting, press "▲" and"▼" synchronously, you will enter the "temperature difference setting", then use the key "▲" or "▼" to change the parameter, after that, press "▲" and "▼"at the same time again, then the controller will 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 5 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 read the temperature of outdoor machine?***

Press the key "▼" when display the current temperature, the nixietube will display the temperature (the temperature of defrosting sensor) of outdoor machine. The nixietube will return to the state of displaying the current when release the key "▼".

✓ 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 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 as follows:

Sort	Code	Parameter Name	Range	Factory Setting	Unit	Remark
Temperature	F19	Temperature revision	-5 -- +5	0	℃	Revise the sensor bias
Compressor	F21	Compressor delay time	0 -- 10	3	min	
Defrosting	F31	Defrost start temperature	-20 -- 20	3	℃	
	F32	Defrost end temperature	-20 -- 20	8	℃	
	F33	Defrost start time	1 -- 240	30	min	
	F34	Max defrost time	1 -- 60	3	min	
Testing	F99	Check	**This function can attract all relays in turn, and please don't use it when the controller is running!**			
	F00	Exit				

❄ Basic Operation principle

Temperature controlling

Temperature controlling is based on "temperature setting" and "temperature difference setting", suppose "temperature setting" is 50℃，"temperature difference setting" is 5℃，so it begins to heat when the temperature of the temperature sensor is below 45℃, and it stops heating when the temperature is higher than 55℃, thus the temperature can be controlled between 50±5℃.

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.）

Auto defrosting principle

The controller first detects the temperature of outdoor machine when it begins to heat. If it is lower than "defrost start temperature", the controller will first turn on defrosting, then turn on heating after defrosting ends. In addition, the controller will supervise the temperature of outdoor machine when heating normally, and decide whether need to defrost according to the time of the outdoor machine in the continuous low temperature state. In other words, the defrosting calculagraph begins to time when the outdoor machine temperature is lower than "defrost start temperature", and turns on the defrosting when the value of time reaches "defrost start time". The calculagraph will be cleared if the outdoor machine temperature is higher than "defrost start temperature" when timing, and it begins to time again when the outdoor machine temperature is lower than "defrost start temperature" next time. In other words, the value of defrosting calculagraph shows the continuous low temperature time of the outdoor machine.

The controller will turn on the compressor and cross valve after defrosting, and the heat pump is used for defrosting. The controller can check the defrosting effect with the temperature of outdoor machine, if the temperature of outdoor machine goes up to the "defrost end temperature", the controller will turn off the function of defrosting. If the defrosting time is above "max defrost time", the controller will turn off defrosting forcibly.

The process above can only run in heating state, in other words, the controller will not turn on defrosting in non-heating state.

Notice：

1. **Please place the temperature sensor at the place where can check the temperature of outdoor machine correctly.**
2. **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.**
3. **Please use the transformers and temperature sensor which are supplied by our company.**