NA8014 User Guide

☞ Main Function and Technique Index

Main Function:

The controller is the special controller for heat pump water heater, it contains 1 temperature sensor (water temperature), 1 control outputs (compressor) and 3 alarm signal inputs (used for high and low pressure protection). Its main function is showing below:

☞ **Temperature Display and Controlling (Refrigerate or Heat):** It can display water tank temperature, and control the temperature in water tank between the temperature upper and lower limit.

☞ **Special control function:** It has the independent sencond temperature control function .The temperature when start and stop can be set.

☞ **Time interval control function:**It can be set to six working period. The controller start to work when in the working period.

☞ **External alarm:** 3 External alarm inputs, it can be set to 5 modes: always open, always open locked, always closed, always closed locked or forbidden.

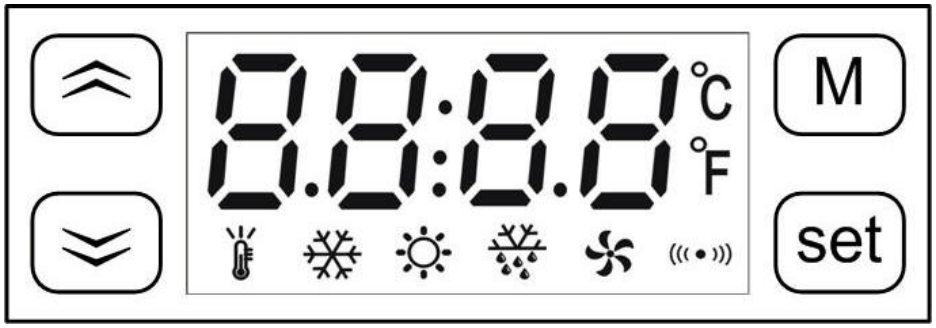
☞ **Others:** Temperature upper and lower limit can be set, compressor start delay protection, temperature sensor error alarm and so on.

Main Technique Index:

- **Temperature display range:** -50～150℃(The resolution is 0.1℃)
  -58～302℉(The resolution is 0.1℉)
- **Power supply:** AC 220V±10% or AC 380V±10% (Refer to the wiring diagram)
- **Operating 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 (NA8014-CHT)

🕮 Operating Guide

Panel:



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

The function of the LED on the panel is showing below:

Index Light	Name	Light	Flash
	Temp Setting	In the state of temp setting	-
	Refrigeration	Refrigerating	Ready to refrigerate, in the state of compressor start delay protection
	Heat	Heating	Ready to heat, in the state of compressor start delay protection
	-	-	-
	-	-	-
	Alarm	-	Alarm state

☝ ***The meaning of the LED display***

The LED 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
FLS	External alarm 1	External alarm signal 1, please refer to the internal parameter code "F51"
HPOP	External alarm 2	External alarm signal 2, please refer to the internal parameter code "F52"

LPOP	External alarm 3	External alarm signal 3, please refer to the internal parameter code "F53"
A21	Water temperature sensor error	Open or short（showing "OPE" or "SHr"）
A99	Over probation time	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?***

Press the key "set" for at least 2 seconds, then enter the state of temperature setting, here the LED displays the setting temperature, then using "▲" key or "▼" key can change the parameter（the key"▲"adds 0.1℃, the key"▼"minuses 0.1℃, press and hold it over 0.5 seconds can add or minus rapidly）. After setting, press "set" again, then exit the state of parameter setting. (The setting temp range is limited by the parameters F13 and F14, please refer to the senior operation). Pressing the key "M" in the setting process means cancel and exit, but the setting value will not be saved.

☝ ***How to check and adjust the real time?***

Press the key "Set" to enter the state of displaying time when in the state of displaying temperature. Press the key "Set" for some time to enter the state of adjusting time, and press the key "Set" to return to the state of displaying temperature.

In the state of adjusting time, the hour part of the LED flashes, and you can adjust the hour by using the key "▲" and "▼", then press the key "Set", and the minute part of the LED flashes, you can also use the key "▲" and "▼" to adjust the value, then press the key "Set" again to exit. Press the key "M" in the adjusting process means give up and exit, but the changed time will not be saved.

☝ ***How to heat and refrigerate forcibly?***

When displaying current temperature, the temperature is between "setting temperature－temperature difference" and "setting temperature", the system may or not heat, here you press the key "▲" and hold it for 5 seconds, the controller will enter the heat state forcibly when in the heat state, and stop heating when the temperature is above "setting temperature"; When the temperature is between "setting temperature" and "setting temperature＋temperature difference", the system may or not refrigerate, here you press the key "▲" and hold it for 5 seconds, the controller will enter the refrigeration state forcibly when in the refrigeration state, and stop refrigerating when the temperature is below "setting temperature".

✓ Advanced Operation

Press the key "M" and hold it for 5 seconds, and if you have set the password, the LED display the "PAS" to hint you to enter the password, you can use the key "▲" and "▼" to enter the password, if the password is correct, the LED will display the 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(pressing the key and not release can add or minus rapidly), then press the "set" key to return to the state of showing parameter code after finishing setting. Pressing the key "M" can exit the parameter setting state when display the parameter code, pressing the key "M" means cancel when in the process of setting parameter, and the parameter will not be changed.

Internal parameter code is showing below:

Sort	Code	Parameter Name	Range	Factory setting	Unit	Remark
Temperature	F11	Setting temperature	F14 – F13	20	℃/℉	The setting range is limited by F13 and F14
	F12	Temperature difference	0.1 – 20	0.5	℃/℉	Control the temperature difference, please refer to the temperature controlling
	F13	Max setting temperature	-58 - 302	60	℃/℉	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	-58 – 302	10	℃/℉	
	F19	Temp sensor adjustment	-20 – 20	0.0	℃/℉	Adjust the temperature sensor bias
Compressor	F21	Compressor delay time	0 -- 10	5	min	
	F29	Compressor controlling mode (temp controlling mode)	COOL / HEAT	HEAT	-	COOL: refrigeration mode HEAT: Heat mode
Special control	F31	Start temperature of special control	-20.0 – 100.0	20.0	℃/℉	
	F32	Stop temperature of special control	-20.0 – 100.0	20.0	℃/℉	
	F33	Start time of special control	0.1 – 999.9	999.9	hour	
	F34	Reset time of special control	OFF 1.0 – 999.9	OFF	hour	

Alarm	F51	External alarm 1	0 -- 4	0	-	0: without external alarm 1: always open, unlocked 2: always open, locked 3: always closed, unlocked 4: always closed, locked 5: on/off signal*[1]
	F52	External alarm 2	0 -- 4	0	-	0: without external alarm 1: always open, unlocked 2: always open, locked 3: always closed, unlocked 4: always closed, locked
	F53	External alarm 3	0 -- 4	0	-	0: without external alarm 1: always open, unlocked 2: always open, locked 3: always closed, unlocked 4: always closed, locked
Time interval	F60	Time interval switch	ON/OFF	OFF	-	ON : time intercal function on OFF: time intercal function off
	F61	Time interval 1 start time	00:00-23:59	00:00	-	If need to close one of the time interval, please set both the start and stop time to 00:00
	F62	Time interval 1 stop time	00:00-23:59	00:00	-	
	F63	Time interval 2 start time	00:00-23:59	00:00	-	
	F64	Time interval 2 stop time	00:00-23:59	00:00	-	
	F65	Time interval 3 start time	00:00-23:59	00:00	-	
	F66	Time interval 3 stop time	00:00-23:59	00:00	-	
	F67	Time interval 4 start time	00:00-23:59	00:00	-	
	F68	Time interval 4 stop time	00:00-23:59	00:00	-	
	F69	Time interval 5 start time	00:00-23:59	00:00	-	
	F70	Time interval 5 stop time	00:00-23:59	00:00	-	
	F71	Time interval 6 start time	00:00-23:59	00:00	-	
	F72	Time interval 6 stop time	00:00-23:59	00:00	-	
System setting	F80	Password	OFF 0001 -- 9999	OFF	-	OFF means no password 0000 means clearing password
	F81	Temperature unit	C/F	C	-	C: Centigrade F: Fahrenheit
	F84	Display compressor start times	-	-	-	
	F85	Display accumulative running time	-	-	hour	
	F86	Accumulative running time reset	-	-	-	
	F87	Probation time	OFF 1 -- 9999	OFF	hour	The controller will stop if the accumulative time is over probation time, and show the alarm code “A99”. OFF means no probation time
Testing	F95	Display the input voltage				
	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				

*1: When F51=5, External alarm 1 becomes on/off signal, the controller runs when it is shorted, and the controller has no display when it is open.

❄Basic Operating Principle

Temperature controlling

In heat mode, temperature controlling is controlled by “setting temperature (F11, or press the “set” key for some time to set)” and “temperature difference (F12)”. The controller begins to heat when the temperature of the temperature sensor is below “setting temperature － temperature difference”, and it stops heating when the temperature is above “setting temperature”.

In refrigeration mode, temperature controlling is controlled by “setting temperature (F11, or press the “set” key for some time to set)” and “temperature difference (F12)”. The controller begins to refrigerate when the temperature of the temperature sensor is above “setting temperature ＋ temperature difference”, and it stops refrigerating when the temperature is below “setting temperature”.

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

Special control function

No matter the controller in the cooling or heating state,when the temperature below “start temperature of special control (F31)” and continuous surpass the start time of special control(F33)” (stop counting time if the temperature above “start temperature of special contro(F31)). Then the controller will compulsory start output and stop when the temperature achieve “stop time of special control(F32)” and continue “reset time of special control(F34)”,reset special function time calculgraph (it stops time counting if the temperature below “reset time of special control(F34).”

External alarm

The controller can connect 3 switching value signals as external alarm source (Pin 4,5,6,7), when the external alarm occurs, the controller stops, displays the alarm code “FLS” , “HPOP”, “LPOP”,and generates alarm output. External alarm signal has 5 modes (Parameter F51, F52, F53):

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.

Time interval working

The controller contains real time clock which can time accurately. In “time interval” mode, the controller will start to work according to the water temperature and whether in the time interval.It will not start to work if it is not in the time interval no matter how high or low temperature the water is.

The controller can be set 6 time intervals at most, if you don’t need some time intervals, you can set both start time and stop time which you don’t need to 00:00.Or set “time interval switch (F60)” to OFF if you don not use time interval function.

In addition, if the stop time is earlier than start time, the controller considers this stop time is the next day. For example, the time interval is “22:00”to“03:30”, the controller considers it as 22:00 at night to 03:30 the next morning .

Probation time

A probation time can be set (F87), the controller can add up the running time after power is on, if the accumulative running time is over the probation time, the controller will stop and display the alarm code A99, if you want to eliminate the limit of probation time, set the F87 to “OFF”, also you can use the F86 to clear the accumulative running time, and you can try to use it again. The parameter F85 can be used to examine the accumulative running time of the controller (hour).

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: