

NA8625 Heat Pump Water Heater Controller








Operation Instruction (v3.3)

Main Function and Technique Index

The controller is the special controller for heat pump water heater, it contains 2 temperature sensors (water temperature, outdoor temperature), 2 control outputs (compressor, fan) and one alarm signal input (used for high and low pressure protection). Its main function is showing below:

- 1、**Temperature Display and Controlling:** It can display water tank temperature and outdoor machine temperature, and it can also control the water tank temperature between the upper and lower temperature.
- 2、**Auto Defrosting Controlling:** It has defrosting controlling logic of heat pump optimization design, and can defrost effectively in order to ensure that the outdoor machine can run normally at low temperature. Compressor is enable when the controller transfers the state between defrost and heat. The fan is on and the compressor is off when defrosting.
- 3、**Running in different period of time:** The controller has two modes: “Auto” and “Econ”, in “Econ” mode, the controller can set 3 periods of time at most, it can only heat in these periods of time.
- 4、**Others:** Real Time Clock, On-off State Memory When the power is off(Can be set), compressor start delay protect, Sensor Error Alarm, Test and so on.

Main Technique Index:


-  **Range of Temperature Display:** -50~150℃
-  **Range of Temperature Set:** 0~100℃, the range can be limited.
-  **Power Supply:** 220V±10%
-  **Operation Environment:** Temperature -10℃~50℃, humidity ≤85%.
-  **Output Load Capability:** Compressor 30A/250VAC, Others 5A/250VAC
-  **Temperature Sensor Type:** NTC R25=5kΩ, B(25/50)=3470K
-  **Executive standard:** Q/320585 XYK 01-2004 (NA8625-HTDX)

Operating Guide

I Display

The controller normally displays the water tank temperature, press the key “▼” to display the outdoor machine temperature.

II On-off

Press “” to turn on and off the controller. The state of boot can display “Heat”, “heat preservation” or “defrost”. The controller shows “OFF” when in Off state. The controller will always display current time and water temperature in spite of on or off.




III Water Temperature Set

Press the key “S”, and then enter the state of temperature set, the LCD shows “upper limit temperature”. use the key “▲” or “▼” to change the setting value (The key “▲” adds 1℃, the key “▼” minuses 1℃, press and hold them over 0.5 seconds can add or minus rapidly). Press the key of “S” again and then set the lower limit temperature in the same way, in the end, you can press the key of “S” again to exit the setting state.

The controller begins to heat when it detect that the water temperature is below “lower limit temperature”, and stop heating when the water temperature is higher than “upper limit temperature”, thus the water temperature can be controlled between “lower limit temperature” and “upper limit temperature”.

The range of temperature upper and lower limit can be limited, please refer to “Advanced Set” (F13 and F14).





IV Time Set

Press the key “”, the hour part of the time display is coruscating, and use the key “▲” or “▼” to adjust the hour. Press the key “” again after adjusting, then you can adjust the minute in the same way, finally you can press the key “” to exit the state of time setting.

V Run Mode Set

Press the key “M” to select the “Auto Mode” and “Econ Mode”. In “Auto Mode”, the controller controls the heat pump to heat according to the setting temperature. In “Econ Mode”, the controller can only heat in the 3 start periods of time.





VI Period of economical mode Set

Press the key “” and hold it for 2 seconds, the controller can enter the state of heat period of time setting, you can set 3 heat periods of time in turn according to the display of LCD. (The key “” switches setting items, the key “” or “” changes its value)

The controller can be set 3 heat periods of time at most, if you don't need some periods of time, you can set the starting time and ending time as “00:00” which you don't need.

In addition, if the ending time is earlier than starting time, the controller considers this ending time is next day. For example, the period of time is “22:00” to “03:30”, the controller considers it as 22:00 at night to 03:30 next day.

VII Advanced Set

Press the key “S” for 5 seconds, you can enter the state of parameter setting, here the LCD shows “Fxx”, there into xx is a number, it means parameter code. Use “” or “” to select the parameter code, Pressing the key “S” can make it to show the value of the parameter after select the parameter, here you use the key “” or “” to set the parameter, then press the key “S” 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	Temp upper limit	F12 – F13	55	℃	Notice: the controller will follow the rule of F14<F12<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
	F12	Temp lower limit	F14 – F11	50	℃	
	F13	Max setting temperature	0 – 100	60	℃	
	F14	Min setting temperature	0 – 100	10	℃	
	F18	Outdoor machine sensor adjustment	-20 – 20	0	℃	Adjust the outdoor machine sensor bias
	F19	Temp sensor adjustment	-20 – 20	0	℃	Adjust the temperature sensor bias
Compressor	F21	Compressor delay time	0 -- 10	3	min	
Defrost	F31	Defrost start temperature	-20 – 80	-2	℃	
	F32	Defrost end temperature	0 – 100	10	℃	
	F33	Defrost start time	1 – 999	30	min	
	F34	Max defrost time	Off 1 – 99	10	min	Off means no defrost
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
Function Setting	F61	Whether memorize the on/off state or not after power is off	Yes/No	Yes	-	Yes: memorize No : unmemorize
	F63	Backlight delay	Off 1 – 99 On	On	sec	Off means backlight is always on. On means backlight is always off. 1-99 means the backlight delay to be off after key operating.
Test	F90	Showing model and software version				
	F97	Test input signal	Used for testing input signal			
	F99	Test output signal	The controller shows “CCC” after entering this function and attracts all relay in turn, used as outdoor machine panel, please don't use it when the controller is running! Press any key to exit or exit automatically after 30 seconds.			
	End	Exit				

VIII Alarm Processing

The controller enters the alarm state when the abnormal status below happens:

Abnormal status	Alarm indication	Alarm Code	Action	Resume way	Explanation
External alarm	Error	A11	Stop heating	Auto or Manual, it can be set (F50)	Manual resume way: turn off the controller then turn on
Water temp sensor error	Error	A21	Stop heating	Auto	
Outdoor sensor error	Error	A22	-	Auto	
Communication interrupt	Offline		Stop heating	Auto	The LCD displays“---”

Explanation:

1. When the sensor is error, "OPE" means open, and "SHr" means short. You can press the key "▲" "▼" to look over the temperature of each sensor.
2. "Alarm Code" It displays alternately with temperature.
3. "Auto Resume" The controller exits the alarm state automatically when the abnormal state disappears.
4. "Manual Resume" When the abnormal state disappears, the controller is still in the alarm state, it can only resume by turning off the controller first then turning on.

✳ Basic Operating Principle

🌀 Temperature controlling

Temperature controlling can set according to "Upper limit" and "Lower limit". If "Upper limit" is 55℃, "Lower limit" is 50℃, it begins to heat when the water temperature is lower than 50℃, and it stops heating when the water temperature is higher than 55℃. Thus temperature can be controlled between 50℃ and 55℃.

🌀 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. (*Annotation: the time of boot delay protection can be adjusted, it sets to 3 minutes above.)

🌀 Auto Defrosting

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 can check the defrosting effect through 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 and touch off the defrosting failure alarm.

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

The different states of compressor and fan refers to the table below: (1 means on, 0 means off)

State	Compressor Output	Fan Output
Heat	1	1
Defrost	0	1
Stand By	0	0

🌀 Running in different period of time

The controller contains real time clock (RTC), and it can time accurately. In "Economical mode", whether heat or not is not only according to the water temperature, but also according to whether during the set running time, if not in the period of time, the controller will not heat in spite of high or low temperature.

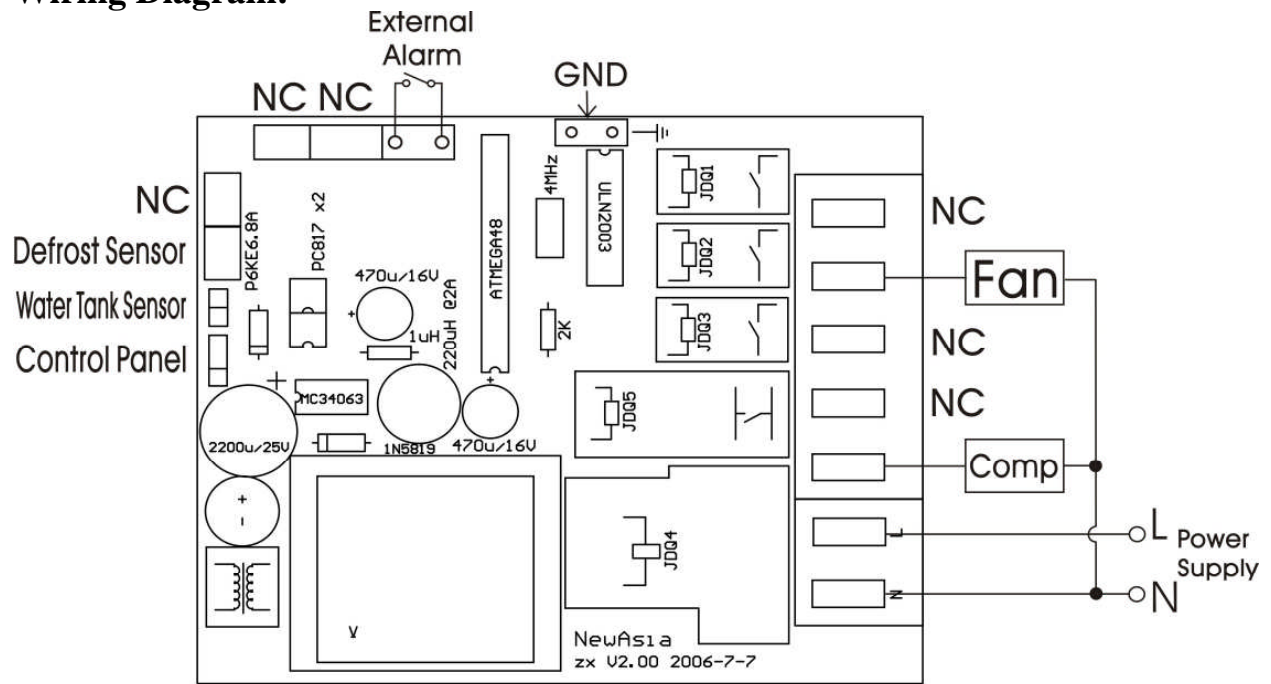
🌀 External alarm

The controller can connect a switching value as external alarm source, 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 resume manually.

Wiring Diagram:



Notice:

1. The RTC power of the controller is supplied by super capacitance, and the RTC can run for 72 hours when power cut, if the power cut time is over 3 days, you may adjust the RTC again.
2. Water temperature sensor and outdoor sensor must be fixed at the right place.
3. Please connect the ground of outdoor machine panel and outdoor machine reliably.
4. The operating panel must be fixed indoor and sheltered from direct sunlight.