NA8632 Heat Pump Water Heater Controller
# Operation Instruction (v5.0)

☞ Main Function and Technique Index

The controller is the special controller for heat pump water heater, it controls heat pump compressor, cross electromagnetic valve and fan. It has main panel and display panel, operation panel is standard 86 panel, liquid crystal display, touch switch; the size of main panel is 85*100mm, it is connected to the operation panel with a three-core cable, the cable can have the length about 100 meters. 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 temperature in water tank at the set 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, and it has the function of defrosting failure alarm.
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. **Leakage Protection**：If the leakage occurs, the controller will shut off all output.
5. **Others**：Real Time Clock, On-off State Memory When the power is off(Can be set), Direction of cross valve can be set, Boot delay protection of compressor, Sensor Error Alarm, High Temperature Alarm, Add Fluorin, Test and so on.

Main Technique Index:

- ☞ **Range of Temperature Display**：-50～125°C
- ☞ **Range of Temperature Set**：35～60°C
- ☞ **Power Supply**：220V±10%
- ☞ **Operation Environment**：Temperature -10℃～50℃，humidity ≤85%.
- ☞ **Output Load Capability**：Compressor 10A/250VAC，Others 2A/250VAC
- ☞ **Leakage Protection Current**：9～15mA，action time≤0.2s
- ☞ **Temperature Sensor Type**：NTC R25=5kΩ,B(25/50)=3470K
- ☞ **Executive standard**：Q/320585 XYK 01-2004　(NA8632-HTD)

📖 Operating Guide

Ⅰ Display

The controller usually displays the temperature in water tank, press the key of down to display the temperature of outdoor machine.

Ⅱ On-off

Press "⊙" to turn on and off the controller, "OFF" means the controller is off. The state of boot can display "Heat", "heat preservation" or "defrost". 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°C，the key "▼" minuses 1°C，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".

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 Time 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 which you don't need as "00:00".

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

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. 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 key "S" 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 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
Compressor	F21	Compressor delay time	0 – 10	3	min	
Defrosting	F31	Defrost start temperature	-20 – 10	-2	°C	
	F32	Defrost end temperature	0 – 20	10	°C	
	F33	Defrost start time	1 – 240	30	min	
	F34	Max defrost time	1 – 30	10	min	
System Set	F61	Set whether memorize the on-off state after power off	0 - 1	1	-	0: unmemorize 1: memorize
	F62	Setting the direction of cross valve(whether open the cross valve when heating)	0 - 1	1	-	0: closed when heating, open when defrosting 1: open when heating, closed when defrosting
State Display	F81	Showing model and software version				
Test	F97	Showing leakage detecting state	Debug for leakage check circuit 0:leakage hasn't been checked, 1:leakage has been checked			
	F98	Add fluorin	The controller shows "AdF" after entering this function, turn on compressor and fan, turn on cross valve(When F62=0)or shut off cross valve(When F62=1). Press any key to exit or exit automatically after 20 minutes.			
	F99	Check	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.			
	F00	Exit				

Ⅷ Alarm

The controller enters the alarm state and the system turns off heating when the abnormal state below happens:

1. Temperature sensor of water tank error（showing "ERROR"，water temperature shows "OPE" or "SHr"， "OPE" means open circuit ，"SHr" means short）
2. Temperature sensor of outdoor machine error（showing "ERROR"，outdoor machine temperature shows "OPE" or "SHr" ，"OPE" means open circuit，"SHr" means short）
3. Communication error with outdoor machine panel（showing "OFFLINE"）
4. Leakage（showing "LEAKAGE"）
5. Defrosting failure（Outdoor temperature can't go up to the defrosting temperature which has been

set within the defrosting time which has been set.）

6. High temperature(HT) alarm（Water temperature is higher than upper limit temperature for 10℃）

For sensor error and offline error, they will be relieved automatically after the sensor or communication resumes.

High temperature alarm will relieve automatically when water temperature goes down to below the alarm line.

For leakage error, press the key "⊙" to relieve the alarm. After turning off, you must check and remove error carefully, if it gives an alarm after turning on immediately, you must call the professional to deal with it.

For Defrosting failure alarm, you can relieve it as below:

1. The alarm will be relieved automatically when the outdoor machine temperature goes up above "defrosting boot temperature".

2. Press the key "⊙"to turn off, here the alarm will be relieved.

❄ Basic Operating Principle

☞ *Temperature controlling*

Controlling temperature can set according to "Upper limit" and "Lower limit" .If "Upper limit" is 55°C, "Lower limit" is 50°C, it begins to heat when the water temperature is lower than 50°C, and it stops heating when the water temperature is higher than 55°C. Thus temperature can be controlled between 50°C and 55°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. 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 will turn on the compressor and turn off the fan after defrosting, the state of cross valve rests with "F62"（on when F62=0, and off when F62=1）, 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 and touch off the defrosting failure alarm, so the system will enter the alarm state.

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

☞ *Running in different period of time*

The controller contains real time clock, and can time accurately. In "Econ Mode", the controller will ensure that whether need to heat according to water temperature, otherwise the current time is in or not in the setting period of time, if it is not in the setting period of time, then the controller will not heat whether the water temperature is high or low.

☞ *Leakage Protection*

The controller judges whether leakage through checking current whether equals on the source wire （live wire and null line）in the state of turning on, if the current on the live wire and null line is not equal, the controller will cut off all output immediately, and give a alarm signal. Notice that the controller will not check the leakage in the state of shutting down.

Notice specially that because of the circuit structure of the controller, it can only cut off the live wire
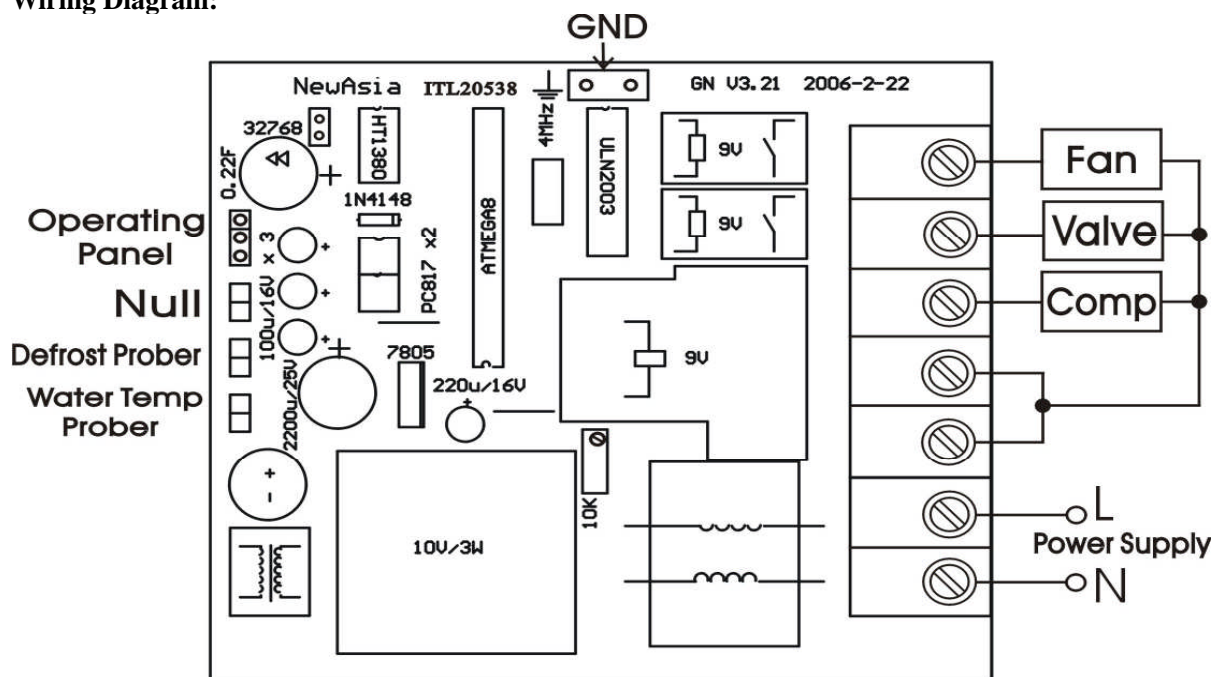
when the leakage happens, so it is different from ordinary domestic leakage protector. So the live wire and null line can not be connected on the contrary, or the function of leakage protecting will do nothing.

Friendly Reminding：the electrical outlet of common families can not ensure the correct position, so the function of leakage protecting of controller can only be as assistant protecting and supply alarm signal, we suggest that you had better install the special leakage protector.

☖ Notice:

1. Please set the parameter of "F62" correctly, the meaning of F62 is whether opens the cross valve when heating, it need to be consistent with the heat pump system, or the system can not run normally.
2. The real time clock depends on the internal super capacitance when power is off, and can only ensure that the time will be correct within 72 hours. If the power is off and over 3 days, you must revise the clock again.
3. Because of the function of leakage protecting, all the loads (compressor, fan, cross valve and so on)of the controller can not be directly connected to the null line of power supply, and must be connected to the output null line of the controller（Please refer to the wiring diagram）, or it will give alarm immediately when turning on.
4. The sensor of the outdoor machine must be fixed at the correct position where the sensor can sense the correct temperature of fan, thus you can ensure the defrosting effect.
5. When fixing the outdoor machine panel, please make sure that the GND (The two fixed holes at the left side of outdoor machine panel) of the outdoor machine panel can be connected to the ground reliably, for details you can refer the wiring diagram and its instruction.

Wiring Diagram:

*Annotation： There are four fixed holes on the outdoor machine panel, the two are at the side of connection end, please isolate from the metal part of the outdoor machine because of it is near the part of the heavy electronics. The other two is the ground of the outdoor machine panel, and can be directly connected to the metal part of the outdoor machine. Moreover, we fiercely suggest that it must be connected to metal part of the outdoor machine ground reliably.（Such as using metal mat）, thus we can improve the anti-jamming ability.