

ZL-R200A Heat Pump Water Heater Controller

Instruction Manual V2.4

Main Function

- Auxiliary heating function
- Water flowing audit
- Ventilation pump control
- Antifreeze function
- Sensor failures action

- Auto defrosting function
- Auto restart function
- Exhaustion temperature protection
- Compressor delay and pressure protection

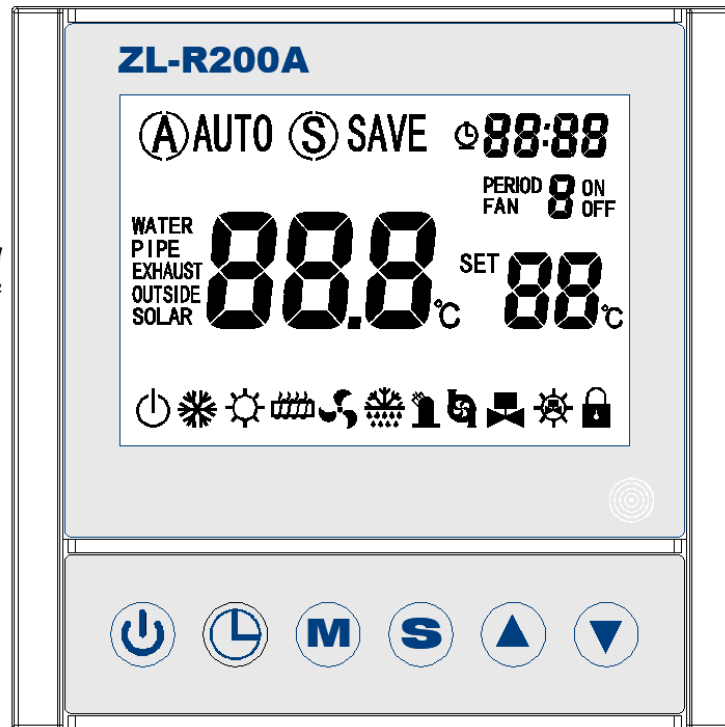
Working Mode

Technical Specification

- Sensor:
NTC 10K/3470
- Set range:
10 ~ 70°C
- Display range:
-40 ~ 130°C
- Working temperature:
0 ~ 50°C
- Storage temperature:
-10 ~ 60°C
- Ambient humidity:
20 ~ 85%RH without dew
- Power supply:
220Vac ±10% 50/60Hz
- Outputs:
Compressor 30A
Heater 8A
Others 3A

Measured Temperature

Working Status



Timer or Time

Working Period

Set Point

Failure Code

No.	Code	Failure
1	E01	Water container sensor failure
2	E02	Pipe Coil sensor failure
3	E03	Exhaustion sensor failure
4	E04	Outdoor sensor failure
5	EH	Exhausting alarming

No.	Code	Failure
6	E05	Water flow warning
7	E06	High/low pressure input warning
8	E09	Communication failure
9	AdF	Filling refrigerant
10	UnL	Restore password to "11"

Display Indication

Icon	Display	Not shown
	Online	Offline
	Heating	Not heating
	Electrical heating	Electrical heater off
	Outdoor fan running	Outdoor fan stop
	Defrosting	Not defrosting now

Icon	Displaying	Not shown
	Compressor running	Compressor stops
	Pump running	Pump stop
	Four valves on	Four valves off
	Locked	Unlocked

Key Operation



Temperature Inquiry

Under non-system parameter setting status, press **S** key to check all sensors' temperature consecutively. The result keeps displaying for 3 seconds.


On/Off




Keep **Power** key depressed for 3 seconds to switch between online and offline.

Set (water) Temperature (SP)




Press   key to set. Keeping depressed can fast set. The setting will be saved 5 seconds later after set. Factory setting is 40°C.




System Parameter Set


Keep  depressed for 3 seconds, the big digits show "P00" for password edit.

Press   key to set password, press  to confirm.

If the password is wrong, exit. Else enter parameter set status:

Press   to select parameter. Press  to show the value of the parameter.

Press   to set the value. Press  to return to parameter selection.

Keep  depressed for 3 seconds to save the settings, and exit.

The status will exit, if there is no key operation for 15 seconds, and the settings will not be saved.

System Parameter Table:

No.	Code	Setting function	Range	Indication	Default
1	U01	Hysteresis	2 ~ 10°C		5
2	U02	Water sensor calibration	-9.9 ~ 9.9°C		0.0
3	U03	Heater energized from	-20 ~ 25°C	The outdoor temperature	12
4	U30	Defrost start time	10 ~ 90 min		45
5	U31	Defrost start temperature	-20 ~ 0°C		-5
6	U32	Defrost stop temperature	2 ~ 30°C		10
7	U33	Max defrost time	2 ~ 15 min		8
8	U34	Valve working mode	0 ~ 1	0: Heat off, defrost on 1: Heat on, defrost off	0
9	U50	Exhaustion protection mode	0 ~ 2	0: Disable the protection 1: Protect, fan keeps 2: Protect, fan stops	1
10	U51	Exhaust protection temperature	50 ~ 125°C		110
11	U52	Avoid frozen in winter	0 ~ 1	0: Disable. 1: Enable	1
12	U60	High/low pressure warning mode	0 ~ 2	0: Disable 1: Warning when closed 2: Warning when Open	0
13	U61	Water flowing switch mode	0 ~ 2	0: Disable 1: Effective when closed 2: Effective when open	0
14	U65	Buzzing alarming	0 ~ 1	0: Disable. 1: Enable	1
15	U66	Backlight brightness when no key operation	0 ~ 1	0: Shut off. 1: Dim	1
16	U80	Auto restart function	0 ~ 1	0: Disable; 1: Enable	0
17	U81	Keypad lock	0 ~ 1	0: Unlocked; 1: Locked	0
18	U90	passwords	00 ~ 99		11




Working Mode




Press  to switch between "AUTO" and "SAVE" working mode.

"AUTO" mode: always heating according setting. "SAVE" mode: only heating within three set periods.

When "Auto restart function" is disabled (U80 = 0), it will be "AUTO" mode after power supplied.

Clock Setting




Press  key, the hour digits will blink, press   key to set hour.

Press  key again, minute digits will blink, press   key to set minute.

Press  key to exit.

Periods Setting for "SAVE" Mode

Keep  key depressed for 3 seconds to enter the period setting status.

Press  key to select the period and on/off. Press   to set the value of the time.

Keep  key depressed for 3 seconds to save the settings, and exit.

The status will exit, if there is no key operation for 15 seconds, and the settings will not be saved.

The maximum periods are 3. Every period has an on-time and an off-time.

If one period's on-time = off-time = 0, this period will be shut off.

If one period's off-time is earlier than its on-time, this off-time is the time of the 2nd day.

Keypad Lock

When U81 = 1, only  and  have reaction.

Control Function

Temperature Control

When $T\text{-water} \leq SP - U01$, start heating. When $T\text{-water} \geq SP$, stop heating.

Heating start procedure:

Pump is on; 30 seconds later, outdoor fan is on, valve acts; 30 seconds later, compressor is on.

Heating stop procedure:

Compress is off; 30 seconds later, outdoor fan is off, valve acts; 30 seconds later, pump is off.

Note: the four-way valve works according to U34.

Aux Electrical Heater Control

When $T\text{-outdoor} \leq U03$, and $T\text{-water} \leq SP - U01$, heater is on.

When $T\text{-outdoor} \geq U03 + 3^{\circ}\text{C}$, or $T\text{-water} \geq SP$, heater is off.

If compressor is on, the heater will be on 10 seconds later when condition meets.

If compressor is off, the heater will be off 10 seconds later.

Note: Heater will be on during defrosting.

Water Ventilation Pump Control

The pump will be on 60 seconds before the compressor is on, be off 60 seconds after the compressor is off.

The pump will always be on during defrosting.

If there is no water flowing for 10 seconds, stop compressor and heater, and keep warning.

When the water flowing restores, restore the system control.

Avoid Freezing in Winter (See U52)

In offline standby status:

When $T\text{-outdoor} \leq 2^{\circ}\text{C}$, start anti-freezing pumping, the pump run 3 minutes for every 30 minutes.

When $T\text{-outdoor} \geq 3^{\circ}\text{C}$, stop this anti-freezing protection pumping.

Auto Defrost

Start auto defrosting: When compressor has been running for U30, and if $T\text{-pipe} \leq U31$, start defrosting.

Compressor and outdoor fan stop; 55 seconds later, valve acts; 5 seconds later, start compressor.

Stop defrosting: When $T\text{-pip} \geq U32$, or the compressor has been running for U33, stop defrosting:

Stop compressor; 55 seconds later, valve acts; 5 seconds later, start heating control.

Defrost after turning the system online: When turn online, if the $T\text{-pipe} \leq U31$, defrost 1st.

Timer Defrost

If pipe sensor fails, and the compressor has been running for U30,

If outdoor sensor is ok, and $T\text{-outdoor} \leq 3^{\circ}\text{C}$, start defrosting.

If outdoor sensor fails, start defrosting.

Manual Forced Defrost

In online status, keep  and  depressed simultaneously for 3 seconds, if $T\text{-pipe} \leq U31$, start defrosting.

The process of the defrosting is same as the process of Auto Defrost.

Exhaustion Protection for Over Hot

If U50 = 0, no exhaustion protection.

If U50 = 1 or 2:

When $T\text{-exhaustion} \geq U51 + 10^{\circ}\text{C}$, stop heating and start alarming.

When $T\text{-exhaustion} \leq U51 - 10^{\circ}\text{C}$, stop protection and alarming, heating again.

If U50 = 2: When $T\text{-exhaustion} \geq U51$, stop fan.

High/Low Pressure Warning and Protection

When compressor running, if the high/low pressure is effective for 15 seconds, start pressure protection:

Stop compressor, until the high/low pressure is not effective.

If the pressure protection occurs 3 times within an hour, the controller will be in machine protection mode:

Never start heating again, until remove power supply and supply power again.

When compressor has just started, the high/low pressure will not be in checking for 3 minutes.

Note: the high/low pressure mode is set in U60.

Compressor Delay Protection

After power supplied, the compressor can start after 3 minutes.

After compressor stops, it can re-start 3 minutes later.

Water Sensor Failure Warning

When this sensor fails, system stops heating, until the sensor becomes well again.

Refrigerant Filling

In online status, keep **S** **▲** depressed simultaneously for 3 seconds, display “AdF”, start refrigerant filling. There will be no pressure and exhaustion alarming during the filling status.

Keep **S** **▲** depressed simultaneously for 3 seconds, exit the filling status.

If the filling status has been for 15 minutes, it will exit automatically.

The action: pump on, fan on 30 seconds later, valve acts (acts oppositely to the U34 setting), compressor on 30 seconds later.

Auto Restart

If U80 = 0, the controller will be in offline status after power supplied.

If U80 = 1, the controller will be the same status as that before the power supply lost.

Restore to Factory Settings

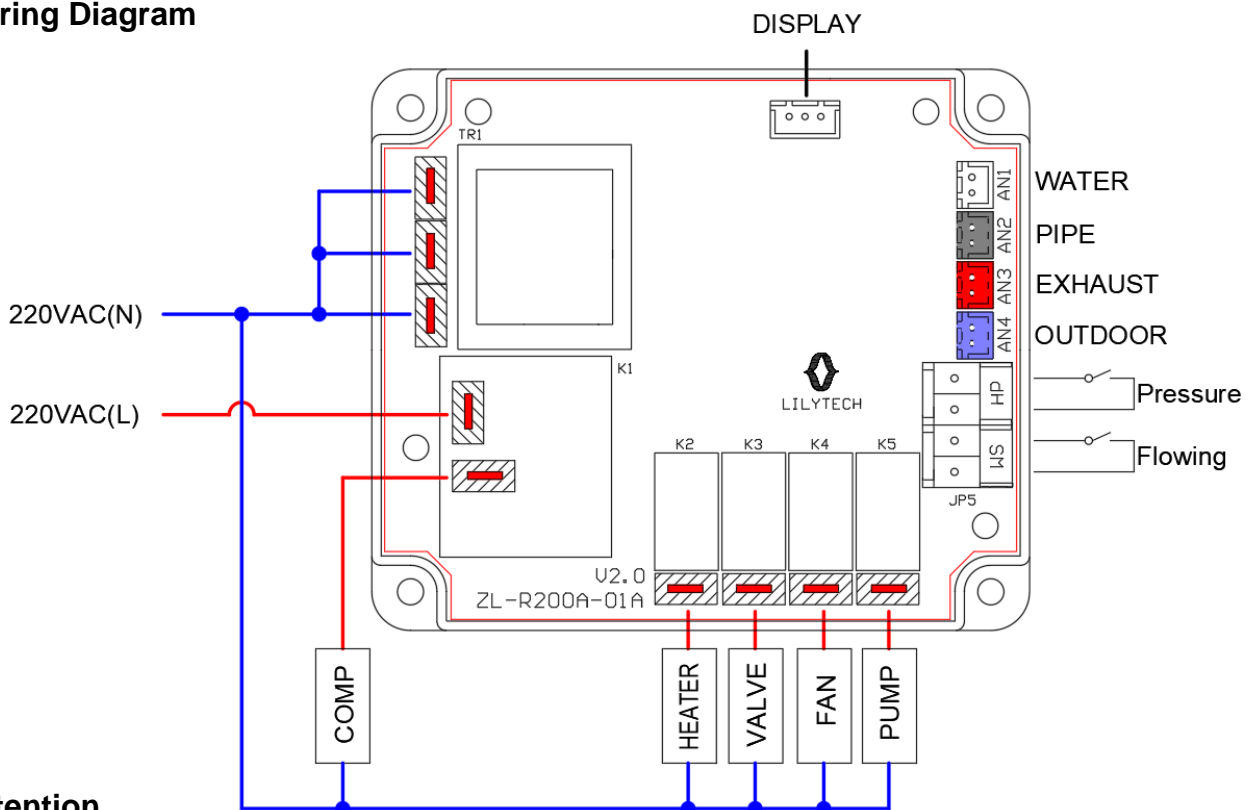
Restore password:

Press **▲** **▼** keys simultaneously, display “UnL”, the password will be restored to “11” 3 seconds later.

Restore all parameters:

Press **⌚** **S** keys simultaneously, all parameters, including password, will be restored to factory settings.

Wiring Diagram



Attention

Set U34 correctly, otherwise system does not work correctly.

The real clock can only keep running correctly for 72 hours after power supply loses.

All sensors must be installed at correct position.

Do not plug in/out panel bundle with power supplied.

Panel should be installed indoors, instead of outdoors.