ZL-660A-R Electronic Thermostat Instruction Manual

1. Feature

ZL-660A-R is an electronic thermostat, dedicated to control the cold storage, seafood machine, water heaters, etc.

Front panel water-proof level is IP65. The small case size is same as those on the market.

2. Main Function

- Temperature measurement
- Temperature display
- Temperature calibration
- Cooling/heating working mode
- Delay load output
- Buzzer alarm output
- Max high-temperature or min low-temperature exceed warning.
- Sensor failure warning
- External warning input
- Dry contact alarm output
- RS 485

3. Size Specification

1. Front panel dimension：78* 34.5mm
2. Drilling template：71* 29mm
3. Whole machines dimension：78* 34.5* 71mm
4. Length of sensor(s)：3m (including the sensor probe)

4. Technical Specification

- Temperature Sensor：NTC
- Setting Range：-40 ~ 120℃
- Display Range：-50 ~ 130℃
- Working Temperature：-10 ~ 45℃
- Storage Temperature： -30 ~ 70℃
- Humidity：5 ~ 85%RH (without dewing)
- Power Supply：AC185 ~ 245V 50HZ
- Terminal Wire：<= 2 * 1.5mm^2 or 1 * 2.5mm^2
- Load Current：10A 250Vac（Resistive load）
- Case：PC + ABS Fire Proof
- Protection Degree：IP65 (front panel)

5. Operation Instruction

5.1 Display Indication

Display Sign Description

Icon	Function	On	Off	Blinking
	Load	On	Off	Being delay load output
	Cooling TEMP. Setting	In the setting state	----	----
HACCP	Heating TEMP. Setting	In the setting state	----	----
	Repairing	Faulty	No fault	----
	Warning	Warning	No warning	----

Panel Digit Indication

Four red digits display the measured temperature and warning code.

No.	Display Code	Warning Information
1	E01	Room temperature sensor fault (short circuit or open circuit)
2	Hi	Temperature exceeds the MAX value
3	Lo	Temperature exceeds the MIN value
4	EE	Data access error
5	Err	Password error
6	iA	External warning
7	UnL	Restore the default password ”1111”

6.2 Keypad Operation

6.2.1 Set coo/heat temperature

Keeping 【S】 pressed for 3 seconds to enter temperature setting mode. The indicator  or “HACCP” is on, and the digital shows the set temperature. Press key 【▲】 or 【▼】 to change the set temperature (Keeping 【▲】 or 【▼】 pressed, it will be adjusted quickly.). Press 【S】, the set temperature will be saved and leave the setting mode. Or do not press any key for 30 seconds; the device will leave the set mode without saving the set data.

6.2.2 Set system parameters

Enter Into System Parameter Setting Mode

Use the password to enter into the parameter setting mode, the factory password is “1111”. Keep 【P】 pressed for 3 seconds to enter the mode. The digital displays 『---0』, then press 【▼】 to the digit of the password, press 【▲】 to the value of the digit, press 【S】 to confirm. If the password is wrong, it will shows 『Err』, and returns to the measuring temperature states after the buzzer beeping 3 times. If the password is right, the buzzer beeps

once and enters into the mode. Digital will display a parameter code『U10』. Press 【▲】 or【▼】to select the parameter code. Press【S】to show its value. Press【▲】or【▼】 to set the value. Press【S】 to return parameter code display status.

Exit the Mode

Keep depressing 【P】 for 3 seconds, the set parameters will be saved, the mode exits.

If do not press any key for 30 seconds, the mode will exit without saving all the set data.

6.3 Parameter Code and Description Table:

No	Parameter code	Function	Range	Note	Factory setting
1	U10	Load power on delay time	1 ~ 100min		3
2	U11	Load MIN continuous work time	0 ~ 100min		3
3	U12	Load run frequency	0 ~ 8	0: Disable	5
4	U20	Room temperature sensor calibration	-9.9 ~ +9.9		0
5	U22	Temperature difference	0.1～+10.0℃	The hysteresis of control	1.0
6	U50	High-temperature warning deviation value to Max Temp	0~60℃	0: Disable	0
7	U51	Low-temperature warning deviation value to Min Temp	0~60℃	0: Disable	0
8	U52	Over-temperature warning delay time	1 ~ 180min		30
9	U53	First over-temperature warning delay time after power supply	0~180 hour	0: Disable	2
10	U60	External input warning mode	0~4	0:Warning off 1:On, Lock 2:On, Unlock 3:Off, Lock 4:Off, Unlock	0
11	U61	External warning input delay	0~120min		0
12	U62	Buzzer warning	0~1	0:Warning off 1:Warning on	
13	U90	Working mode	CO: Cool; HE: Heat		CO
14	U97	Baud rate setting	0 ~ 3	0: 2400bps 1: 4800bps 2: 9600bps 3: 19200bps	3
15	U98	Device address	1 ~ 99	----	1
16	U99	Password	0000~9999		1111
17	End	Finished setting			

7. Control Function Description

7.1 Load Control

Cooling Mode

● When the temperature ≧"Set temperature"+"U22", and the load has stopped for "U10", the load starts.

● When the temperature ≦"Set temperature"-"U22", and the load has run for "U11", the load stops.

For example:

If set temperature is 18℃,【U22】is 2℃. When the temperature ≧ 20℃, compressor starts. If the temperature≦ 16℃， compressor stops. The room temperature will be between 18±2℃.

Heating Mode

● When the temperature ≦"Set temperature"-"U22", and the load has stopped for "U11", the load starts.

● When the temperature ≧"Set temperature"+"U22", and the load has run for "U10", the load stops.

For example:

If set temperature is 18℃,【U22】is 2℃. If the temperature≦ 16℃，compressor starts. If the temperature ≧ 20℃, compressor stops. The room temperature will be between 18±2℃.

7.2 Delay Load Output

● After power supply, the load is able to start only after the time (U10) has passed.

● After the load stops, it is able to restart again only after the time (U10) has passed.

● After the load starts, it is able to stop only after the time (U11) has passed.

7.3 Protection Running Mode When Room Temperature Sensor Fails

When the room temperature sensor fails, the system will automatically run into the protected running mode. In this mode, the compressor will run and stop with the period of 30 minutes. Compressor works for U12* 3 minutes, stops for ｛30 - (U12* 3) ｝minutes.

For example: Set 【U12】 is 3，when the temperature sensor fails，compressor runs for 9 minutes and then stops 21 minutes, move in circles. If U12=0, system stops when sensor fails

7.4 Buzzer Function

Buzzer sounds shortly for every key press. When confirming the parameter setting, it sounds longer. 3 short beeps means invalid. When the system comes wrong or external alarm input, the buzzer alarm function will be off if U62=0, or the buzzer continuous alarming if U62=1. After the system problem solved and disappears, press 【P】 key to stop warning.

7.5 High-temperature and Low-temperature Warning

● When the room temperature ≥ "set temperature"+ "U50", and the time reaches to "U52 or U53 or U34", high temperature warning starts.

● When the test temperature ≦ "set temperature"+ "U51", and the time reaches to "U52 or U53 or U34", low temperature warning starts.

7.6 Dry Contact Alarm Output

When the sensor fails, high/low temperature warns, or external warning input, the dry contact relay opens and dry contact alarm outputs.

7.7 External Input Warning

There are following ways for the external warning input, when the condition meets, the device will warn:

Normal On: If close, warning starts.

Normal Off: If open, warning starts.

Lock: when the external warning input signal disappears, system keeps warning, until pressing the【P】key to stop the warning.

Unlock: when the external warning input signal disappears, warning stops.

7.8 Temperature Calibration Function

When there is tolerance between the measured temperature and real temperature, set parameter U20 and U21 to calibrate. The calibration range is ±9.9℃. When setting the parameter, the step is 0.1℃ for every key press. Keep the key pressed, the set data will increase/decrease continuously and quickly.

7.9 Restore the Default Parameters and Password

Keep【P】and【▲】keys pressed for 5 seconds, the device displays "UnL", press【▼】twice, buzzer sounds, system auto restores the default parameters and password"1111".

8. Controller Installation

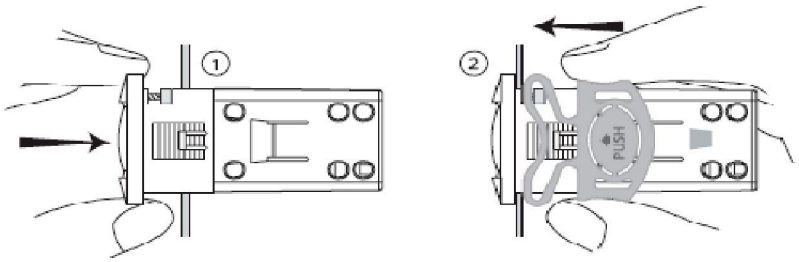
8.1 Warning

Avoid installing the device in the following environment:

- Relative humidity is greater than 90%, or possibly dewing.
- Strong vibration.
- Possibility be dropped, or within fog.
- Exposed to eroding and polluting gases (such as: air containing sulfur and ammonia, salty fog, smoky mist) to prevent erosion and oxidation.
- Ambient containing explosive or inflammable materials/gases.

8.2 Installation Procedure

Insert the controller into hole (step one) Slide the bracket to fix the device (step two)



9. Electrical Connection

Warning

- Electrical wiring must be manipulated by certified electrician.
- Wrong power supply may damage the device and system seriously.
- Try with effort to layout the sensors and switches line apart from inductive load lines and

power supply lines. The sensors and switches lines are not allowed go with the power supply lines and inductive load lines in a same pipeline, and are not allowed to pass near the contactor, breaker and the similar.

● Reduce the length of sensors' wiring as possible, avoid forming a spiral shape near the power devices.

● Avoid direct contact with the internal electronic components.

● After finish and check the electrical wiring layout, before connect them to the device, please follow this instruction: Pay attention the "electrical wiring diagram" below, wrong connection possibly damages the device and the system, and may be dangerous to the user. All security and protecting device for the equipments are necessary. They are very important to protect the equipments, and the user's safety.

Electrical wiring diagram