ZL-62XXA Series Electronic Thermostat Instruction Manual

1. Feature

ZL-62XXA series is cooling/heating 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

- Cooling/heating working mode
- Temperature measurement and display
- Temperature calibration
- Output delay protection
- Buzzer alarm output
- Periodic defrost
- External warning input
- Relay alarm output
- Max high-temperature or min low-temperature exceed warning.
- Sensor failure warning

3. Model List

Model	Function
ZL-6210A	Cool/heating Control+External Alarm Input
ZL-6220A	Cool/heating Control+External Alarm Input+Periodic Defrost in Cool Mode
ZL-6230A	Cool/heating Control+External Alarm Input+Relay Alarm Output

4. 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)

5. Technical Specification

- Temperature Sensor: NTC
- Setting Range: -40 ~ 120℃
- Display Range: -40 ~ 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: 7A 250Vac（Resistive load）

● Case: PC + ABS Fire Proof

● Protection Degree: IP65 (front panel)

6. Display Indication

Display Sign Description

Icon	Function	On	Off	Blinking
	Output	On	Off	Output will be on after protection delay
	Defrost	Defrosting	Non defrosting	Water dripping during defrosting
	Cool Mode	In the cool mode	Not in cool mode	Setting temperature
	Heat Mode	In the heat mode	Not in heat mode	Setting temperature
	Repairing	----	No fault	Faulty
	Warning	----	No warning	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	dEF	Defrosting operation
8	UnL	Restore the default parameters

7. Keypad Operation

7. 1 Set Cool/heat Temperature

Keeping 【S】 pressed for 3 seconds to enter temperature setting mode. In cool mode, the

indicator ❄ is blinking, and the digital shows the set temperature; In heat mode, the indicator 💡 is blinking, 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 keys for 30 seconds; the device will leave the set mode without saving the set data.

7. 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(0-9), 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. 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.

ZL-6210A/ZL-6230A:

No	Parameter code	Function	Range	Note	Factory setting
1	U10	Output power on delay time	0 ~ 100min		3
2	U11	Output MIN continuous work time	0 ~ 100min		3
3	U12	Output 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	U52	Over-temperature warning delay time	1 ~ 180min		30
7	U53	First over-temperature warning delay time after power supply	0~180 hour	0: Disable	2
8	U54	High-temperature warning deviation value to Max Temp	Temperature difference~60℃; OFF	OFF(>60.0℃): Disable	OFF

9	U55	Low-temperature warning deviation value to Min Temp	Temperature difference~60℃; OFF	OFF(>60.0℃): Disable	OFF
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	0
13	U90	Working mode	CO: Cool; HE: Heat		CO
14	U99	Password	0000~9999		1111
15	End	Finished setting			

ZL-6220A:

No	Parameter code	Function	Range	Note	Factory setting
1	U10	Output power on delay time	0 ~ 100min		3
2	U11	Output MIN continuous work time	0 ~ 100min		3
3	U12	Output 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	U30	Defrosting cycle	0~180 hour	0: Not defrost	12
7	U31	Defrosting（end）time	1 ~ 180min		30
8	U33	Dripping water time	0 ~ 180min		5
9	U34	Over temperature warning delay time after defrost ends	0~180 hour	0: Disable	2
10	U35	Defrost when the device starts	0~1	0: Disable 1:Enable	0
11	U36	Defrost delay time when the device start	0 ~ 180min		0
12	U52	Over-temperature warning delay time	1 ~ 180min		30
13	U53	First over-temperature warning	0~180 hour	0: Disable	2

		delay time after power supply			
14	U54	High-temperature warning deviation value to Max Temp	Temperature difference~60℃; OFF	OFF(>60.0℃): Disable	OFF
15	U55	Low-temperature warning deviation value to Min Temp	Temperature difference~60℃; OFF	OFF(>60.0℃): Disable	OFF
16	U60	External input warning mode	0~4	0:Warning off 1:On, Lock 2:On, Unlock 3:Off, Lock 4:Off, Unlock	0
17	U61	External warning input delay	0~120min		0
18	U62	Buzzer warning	0~1	0:Warning off 1:Warning on	0
19	U90	Working mode	CO: Cool; HE: Heat		CO
20	U99	Password	0000~9999		1111
21	End	Finished setting			

8. Control Function Description

8.1 In the Cool Mode

8.1.1 Controlled output

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

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

For example:

If set temperature is 18℃,【U22】is 2℃. When the temperature ≧ 20℃, the output starts.

If the temperature≦ 16℃, output stops. The room temperature will be between 18±2℃.

● Output emergent on

Press and hold "▼" key for 5 seconds, it will emergency on for cooling if the following meets:

◆ The output has stopped for "U10";

◆ The controller is not in defrosting or dripping water states;

◆ Room temperature is between "Set temperature"+"U22" and "Set temperature"-"U22".

After emergent on, when room temperature goes down to "Set temperature"-"U22", it stops cooling.

● Output emergent stop

In the state of output emergent on, if meet "U10", press and hold "▼" key for 5 seconds, it will emergency stops the controller.

8.1.2 Output delay protection

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

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

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

8.1.3 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 output 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，output runs for 9 minutes and then stops 21 minutes, move in circles. If U12=0, system stops when sensor fails

8.1.4 Periodic defrost (for ZL-6220A)

● When continuously working time reaches "U30", it will start defrosting;

● After defrosting, the defrost time meets "U31", it will stop defrosting.

If in the state of water dripping during defrosting, the output will stop until the end of dripping water.

8.1.5 Manual forced defrosting (for ZL-6220A)

◆ When in non-defrosting stage, keep 【▲】 pressed for 7 seconds, the system starts forced defrosting and dripping water.

◆ When in defrosting stage, keep 【▲】 pressed for 7 seconds, the defrosting stops and enters into water dripping stage.

8.1.6 Dripping water function (for ZL-6220A)

● After defrosting, system will drip water for the time (U33), then start cooling.

● This function will not work when:

◆ After manual forced defrosting   ◆Defrosting temperature sensor fails

8.1.7 Check the left time of defrosting or dropping (for ZL-6220A)

Depress 【▼】 to show the left time of defrosting, or dripping. Do not keep depressed for 7 seconds, to avoid the device stops forced defrosting.

8.2 In the Heat Mode

8.2.1 Controlled output

● When the temperature ≦"Set temperature"-"U22", and the output has run for "U10", the output starts.

● When the temperature ≧"Set temperature"+"U22", and the output has stopped for "U11", the output stops.

  For example:

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

● Output emergent on

  Press and hold "▼" key for 5 seconds, it will emergency on for heating if the following meets:

  ◆ The output has stopped for "U10";

  ◆ Room temperature is between "Set temperature"+"U22" and "Set temperature"-"U22".

  After emergent on, when room temperature goes down to "Set temperature"-"U22", it stops

heating.

● Output emergent stop

   In the state of output emergent on, if meet "U10", press and hold "▼" key for 5 seconds, it will emergency stops the controller.

8.2.2 Compressor delay protection

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

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

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

8.2.3 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 output will run and stop with the period of 30 minutes. The output works for U12* 3 minutes, stops for 〔30 - (U12* 3)〕minutes.

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

8.3 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.

8.4 Warning Output (For ZL-6230A)

When the system fails or external warning input, the warning output opens; When the system returns normal, or press 【P】 key to close warning output.

8.5 High-temperature and Low-temperature Warning

● When the room temperature ≥ "set temperature"+ "U54", and the time reaches to "U52 or U53 or U34", high temperature warning starts.

● When the test temperature ≦ "set temperature"+ "U55", and the time reaches to "U52 or U53 or U34", low temperature warning starts.

Note: High/low temperature warning has no influence in the state of defrost output and control output.

8.6 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.

   Note: When external warning starts, output control will be emergent closed.

8.7 Temperature Calibration Function

When there is tolerance between the measured temperature and real temperature, set parameter U20 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.

8. 8 Restoring the Default Parameters and Password

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

9. Controller Installation

9.1 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.

9.2 Installation Procedure

Insert the controller into hole (step one)   Slide the bracket to fix the device (step two)
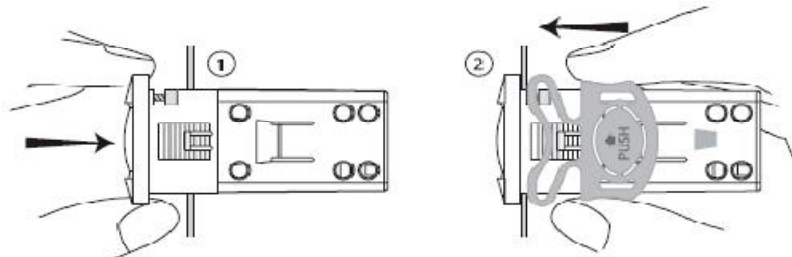
10. Electrical Connection

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:

ZL-6210A

R1: 7A/250V~   AMB.T: Air Ambient Sensor   DI: Digital Input

ZL-6220A

R1,R2: 7A/250V~   AMB.T: Air Ambient Sensor   DI: Digital Input

ZL-6230A

R1,R2: 7A/250V~   AMB.T: Air Ambient Sensor   DI: Digital Input