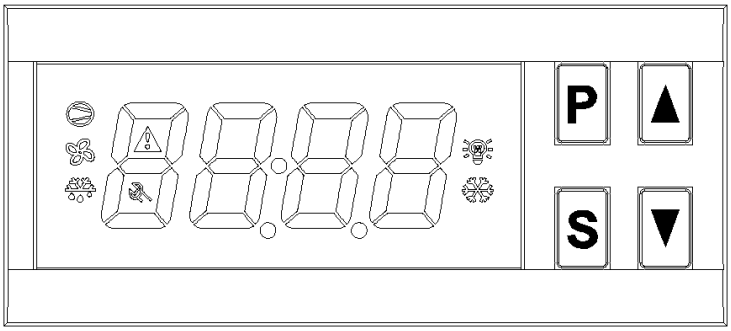
ZL-62x0A, ZL-62x0A+
Version 2.0d

1 Introduction
ZL-62x0A(+) series thermostat is for cooling or heating control, with IP65 front panel, buzzer beeping and warning function.
ZL-62x0A, 10A temperature relay output,
ZL-62x0A+, 30A temperature relay output.

2 Model

Model	Function
ZL-6210A(+)	Cooling or heating, Warning input, Timer defrost (only in cooling mode, defrost method: stop cooling)
ZL-6220A(+)	Cooling or heating, Warning input, Timer defrost (only in cooling mode, defrost method: optional heater or hot gas)
ZL-6230A(+)	Cooling or heating, Warning input, Timer defrost (only in cooling mode, defrost method: stop cooling), Alarming output

3 Specification
Power supply: 185 ~ 245Vac, 50/60Hz
Sensor: NTC, 2 meters long
Output: ZL-62x0A, 10A, 250Vac **resistive**
ZL-62x0A+, R1, 30A. R2, 5A. 250Vac **resistive**
Setting range: -40 ~ 120℃
Display range: -40 ~ 130℃
Working: -10 ~ 45℃, 5 ~ 90%RH without dew
Dimension: W78 x H34.5 x D71 (mm)
Installation drilling: W71 x H29 (mm)
Case materials: PC + ABS fire proof
Protection level: IP65 (Front side only)



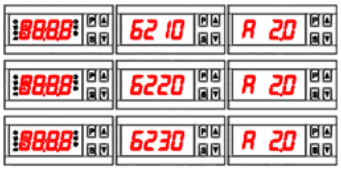
4 Display
4.1 Sign

Icon	Function	On	Off	Blinking
	Temp. control output (R1)	R1 energized	R1 de-energized	Within protecting delay
	Defrost	Defrosting	Not defrosting now	Dripping water
	Work mode	Cooling mode		Setting set-point
	Work mode	Heating mode		Setting set-point
	Maintenance	----	No failure	Has failure
	Alarm	----	No alarm	Alarming

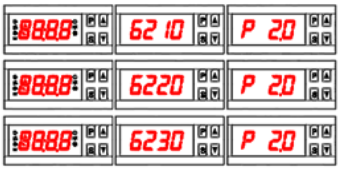
4.2 Characters

Displa	Remark
E01	Sensor failure (short or open)
Hi	Room temp. is higher than the high limit
Lo	Room temp. is lower than the low limit
EE	Memory error
Err	Password error
iA	External warning
dEF	Defrosting
UnL	Parameters Will restore to factory default settings

4.3 Display after power supplied
Display all segments, model and version, one by one: ZL-62X0A:



ZL-62X0A+ (P = plus):



5 Operation
5.1 Set Set-Point
Keep〖S〗depressed for 3 seconds to enter into the setting status. The current set-point value displays.
Press〖▲〗or〖▼〗 to set the value (keeping depressed can fast set).
Press〖S〗to exit the setting status, and **save** the setting.
The setting status will exit, and the setting **will not be saved**, if there is no key operation within 30 seconds.

5.2 Set Parameters
Keep〖P〗depressed for 3 seconds, digits show "00".
Press〖▼〗or〖▲〗to input password, the range is 00-99.
Press〖S〗 to confirm: If the password is correct, enter into the parameter setting status, else display "Err", and exit.

Set in parameter setting status:
Press 〖▲〗 or 〖▼〗 to select the parameter code (see parameter code table below).
Press 〖S〗 to display the value of the code.
Press 〖▲〗 or 〖▼〗 to set the value.
Press 〖S〗 to return to parameter code selection.
Keep 〖P〗 depressed for 3 seconds to exit parameter setting status, and **save the settings**.
The parameter setting status will exit, and the settings **will not be saved**, if there is no key operation for 30 seconds.

5.3 Parameter Code

Code	Function	Range	Remark	Factory Default	ZL-6210	ZL-6220	ZL-6230
U10	Minimum time for R1 to keep de-energized	0 ~ 100 min		3	●	●	●
U11	Minimum time for R1 to keep energized	0 ~ 100 min		3	●	●	●
U12	Frequency for R1 to be on / off	0 ~ 8	0: disable	5	●	●	●
U20	Sensor calibration	-9.9 ~ +9.9℃		0.0	●	●	●
U22	Hysteresis for temp. control	0.1 ~ +10.0℃	U22 < U54, U55	1.0	●	●	●
U30	Defrost period	0 ~ 180 hour	0: never defrost	12	●	●	●
U31	Defrost time	1 ~ 180 min		30	●	●	●
U33	Dripping water time	0 ~ 180 min		5	●	●	●
U34	Over temp. alarming delay after defrosted	0 ~ 180 hour	0: disable	2	●	●	●
U35	Defrost after online	0 / 1	0: disable / 1: enable	0	●	●	●
U36	Delay for defrost after online	0 ~ 180 min		0	●	●	●
U38	Defrost method	0 / 1	0: by heater, 1: by hot gas			●	
U52	Over temp. alarming delay	0 ~ 180 min		30	●	●	●
U53	1st over temp. alarming delay	0 ~ 180 hour	0: disable	2	●	●	●
U54	Hysteresis for high temp. alarming	U22 ~ 60.0℃ / OFF	OFF (> 60.0℃): disable alarming	OFF	●	●	●
U55	Hysteresis for low temp. alarming	U22 ~ 60.0℃ / OFF	OFF (> 60.0℃): disable alarming	OFF	●	●	●
U60	External input warning mode	0 ~ 4	0: disable 3: NC, locked 1: NO, locked 4: NC, unlocked 2: NO, unlocked	0	●	●	●
U61	Delay for external input warning	0 ~ 120 min		0	●	●	●
U62	Buzzing alarming	0 / 1	0: no alarming / 1: enable alarming	0	●	●	●
U90	Control mode	CO: cool / HE: heat		CO	●	●	●
U99	Password	00 ~ 99		11	●	●	●

6 Control

6.1 Cooling Control (U90 = C0)

6.1.1 Temperature control

If **Troom** ≥ Set-point + U22, and R1 has been de-energized for U10, then R1 energized.
If **Troom** ≤ Set-point, and R1 has been energized for U11, then R1 de-energized.
For example, if set-point = 18, U22 = 0.2, then the controller will control the temperature between 18.2℃ and 18.0℃.

6.1.2 Forced cooling

Keep 〖▼〗 depressed for 5 seconds can force R1 energized under following conditions:
R1 has been de-energized for U10,
Troom is between (Set-point + U22) and (Set-point),
Not in defrosting and dripping water status.
The forced cooling will finish, R1 will be de-energized, when **Troom** arrives at Set-point.

6.1.3 Stop forced cooling

During forced cooling, if R1 has been energized for U11, keeping 〖▼〗 depressed for 5 sec. will stop forced cooling.

6.2 Heating Control (U90 = HE)

6.2.1 Temperature control

If **Troom** ≤ Set-point - U22, and R1 has been de-energized for U10, then R1 will be energized.
If **Troom** ≥ Set-point, and R1 has been energized for U11, then R1 will be de-energized.
For example, if set-point = 18, U22 = 0.2, then the controller will control the temperature between 17.8℃ and 18.0℃.

6.2.2 Forced heating

Keep 〖▼〗 depressed for 5 seconds can force R1 energized under following conditions:
R1 has been de-energized for U10,
Troom is between (Set-point - U22) and (Set-point).
The forced heating will finish, R1 will be de-energized, when **Troom** reaches Set-point.

6.2.3 Stop forced heating

During forced heating, if R1 has been energized for U11, keeping 〖▼〗 depressed for 5 sec. will stop forced heating.

6. 3 Delay Protection

After power supplied, R1 could be energized after U10.
After R1 de-energized, it could be energized again after U10.
After R1 energized, it could be de-energized again after U11.

6.4 Protecting Run (Function Disabled when U12 = 0)

When sensor fails, R1 will be energized and de-energized periodically.
For every 30 minutes, R1 will be energized for U12 * 3 minutes, de-energized for (30 - U12 * 3) minutes.
For example: U12 = 2, if sensor fails, R1 will be energized for 2 * 3 = 6 min., de-energized for 30 – 2 * 3 = 24 min., periodically.

6.5 Defrost

6.5.1 Periodically defrost

When R1 has been energized for U30, defrost for U31.
Note: After defrosted, start dripping water for U33. R1 keeps de-energized during dripping water.

6.5.2 Defrost method option

For ZL-6220A only, for cooling mode only.
Electrical heater defrosting (U38 = 0): During defrosting, R1 de-energized, R2 energized.
Hot gas defrosting (U38 = 1): During defrosting, R1 energized, R2 energized.

6.5.3 Forced defrost

During none-defrost status, keeping 〖▲〗 depressed for 7 seconds will start forced defrost. When defrosted, start dripping water.
When defrosting, keeping 〖▲〗 depressed for 7 seconds will stop defrost, and start dripping water.

6.5.4 Dripping water after defrosted

After defrosted, start dripping water for U33. R1 keeps de-energized during dripping water.

6.5.5 Left time of defrost or dripping water

When defrosting or dripping water, press 〖▲〗 will show the left time.
Attention: If the key is keeping depressed for 7 seconds, it will switch the defrost status.

6.6 Beeping

There will be a short beep for normal key press, long beep for confirmation of setting, three short beeps for error operation.
When there is failure, or external warning input: If U62 = 0, no beep warning. If U62 = 1, there will be continuous warning beeping.
The waring will stop, if press 〖P〗, or warning condition disappears.

6.7 Alarm Output (Only for ZL-6230A)

When there is failure, or external warning input, alarm output will be energized.
The alarm will stop, if press 〖P〗, or alarming condition disappears.

6.8 Over Temperature Alarming

When **Troom** ≥ Set-point + U54, there will be high temperature alarming if the following conditions meet.
When **Troom** ≤ Set-point – U55, there will be low temperature alarming if the following conditions meet.
If power just supplied, and U53 has passed.
The **Troom** keeps the up condition for U52.
If just defrosted, and U34 has passed.

Note: Over temperature alarming **does not affect** the temperature control and defrost process.
Alarming by beeping. For ZL-6230A, the alarming output will be energized during alarming.

6.9 External Warning Input

NO: normal open. If open, no warning; if closed, warning.
NC: normal close. If closed, no warning; if open, warning.
Locked: Warning keeps after the external warning disappeared. Press 〖P〗 to stop warning.
Unlocked: Warning stops after the external warning disappeared.
Note: When there is external warning, the output(s) **will be de-energized**.

6.10 Sensor Calibration

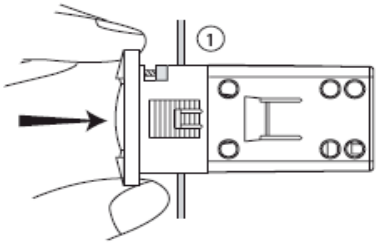
The sensor can be calibrated by U20.

6.11 Restore to Factory Default Settings

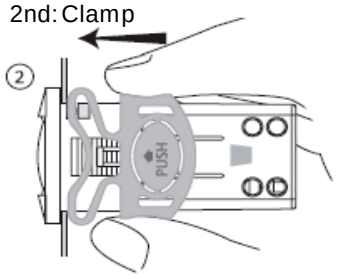
Keep 〖P〗 and 〖▲〗 depressed simultaneously for 5 sec, there will be a beep, and "UnL" displays.
Press 〖▼〗 twice, there will be a beep, all settings will be restored to factory default settings.

7 Installation

1st: Insert into drilling hole



2nd: Clamp



Attention

- Wiring work should be manipulated by certified technicians.
- Wrong connection could damage the controller, and the loads. Power supply to pin 7,8 for ZL-62x0A, pin 5, 6 for ZL-62x0A+ to check the controller. If there is a multimeter, check the outputs, as well as input, by the help of settings.
- Sensor and input signal wires should not be laid together with power supply wire, and even in same pipe.
- Sensor wire is better as short as possible. Not wind the redundant length wire to electrical noise equipment.
- The loads should be within the specification of the controller output driving ability. If using ac/dc module as load, or tungsten lamp, or motor, following the below requirements to avoid surging current damaging or shorten the life time of the controller outputs:

  For ac/dc module as load, the rated current should be no more 1/10th of output specification **under pure resistance**.

  For tungsten lamp as load, the rated current should be no more 1/15th of output specification **under pure resistance**.

  For motor, the rate current should be no more 1/5th of output specification **under pure resistance**.

For example: if drive a 1500W tungsten lamp with 7A (**pure resistance** spec.) relay, the **relay contactor will be burnt immediately**.

- Don't touch inside components.
- Avoid installing controller in the following environment:

More wet than 90%RH, or easily dew; Vibrating, or will be shocked; Possible sprayed; Under erosive air; Under explosive air.

8 Electrical Wiring