ZL-803A Instruction Manual V1.0

ZL-803A can work in cooling mode, or constant temperature control mode. With a 30A output, it can drive up to 1.5HP compressor. The controller adopts IP 30 level front panel protection, convenient to operate, easy to install. It can be applied to cold storage room control, sea food machine, aquarium temperature control, and similar controls.

1. Main function

- Working mode: cooling, or constant temperature control
- Defrost control: intelligent defrost, or timer defrost
- Maintenance timer
- Compressor delay protection
- Instant start compressor
- Auto restart
- Temperature measurement and display
- Temperature calibration
- External alarm input

2. Main specification

- Power supply: AC185 ~ 245V, 50/60HZ
- Temp. sensor: NTC 5K/3470, plastic sealing, L = 5 meters
- Load: 5A/250Vac, 30A/250Vac (resistive loads)
- Setting range: -9.9 ~ 50.0℃
- Display range: -9.9 ~ 50.0℃
- Working temp.: -10 ~ 45℃, 5 ~ 85%RH (without dew)
- Storage temperature: -30 ~ 70℃
- Case: PC + ABS, fire proof
- Protection level: IP 30
- Dimension: 120 x 51.5 x 90 mm
- Hole dimension: 114 x 45.5 mm

3. Display indication

Panel

LED indication

LED	On	Off	Blinking
Power	Online		Standby
Set		Not in parameter setting status	Parameter setting status
Cool	Compressor running	Compressor off	
Heat	Compressor running	Compressor off	Dropping after defrosted

* Defrosting Indication: COOL and HEAT LEDs are blinking simultaneously.

* Instant start compressor: COOL and HEAT LEDs are on simultaneously.

* Timer maintenance: four LEDs are blinking simultaneously.

Warning code indication

No.	Code	Indication
1	E1	Room temperature sensor failure (short circuit, or open circuit)
2	E2	Defrost sensor failure (short circuit, or open circuit)
3	E3	External warning (Controller will shut all outputs when there is external warning)

4. Operation

Parameter setting

Enter into parameter setting status:

Keep【S】depressed for 3 seconds, display the input password “000” for edit.

The left digit will be blinking for edit. Press【▼】or【▲】to edit its value.

Press【S】to edit the next digit.

When the right digit is blinking, press【S】to confirm the input password.

If the password is correct, enter into parameter setting status, and the 1st parameter code “F01” displayed, else quit.

Factory default set password is “000”.

Set parameters:

Press【▲】or【▼】to select the parameter code. Press【S】to show its value. Press【▲】or【▼】to set the value. Press【S】to return to parameter code selection. Keep up/down keys depressed can fast set.

After all parameter codes are set, keep【S】depressed for 3 seconds to save and exit the status.

The setting status will exit without saved, if there is no key operation for 30 seconds.

Temperature setting

Press【▲】or【▼】to set temperature when online. The SET LED will blink. The display will show the set point for 3 seconds.

The factory default set point is 25℃. The set resolution is 0.1℃ when the set point is higher than 0 degree.

Check the pipe temperature

Click【P】key to display the blinking pipe temperature for 3 seconds when online.

Parameters instruction

No.	Code	Function	Range	Instruction	Default
01	F01	Temperature hysteresis	1 ~ 20℃		2℃
02	F02	Room temperature sensor calibration	-10 ~ 10℃	Resolution: 1℃	0℃
03	F03	Pipe temperature sensor calibration	-10 ~ 10℃	Resolution: 1℃	0℃
04	F04	Compressor delay protection time	0 ~ 10 min		3
05	F05	Defrosting start temperature	-20 ~ 20℃		-5℃
06	F06	Defrosting end temperature	-20 ~ 20℃		10℃
07	F07	Max defrosting time	0 ~ 60 min		3
08	F08	Control mode	1 ~ 2	1: Constant temp. control 2: Cooling	1
09	F09	4 way valve control mode	1 ~ 2	1: Valve on when heating 2: Valve on when cooling	1
10	F10	External warning mode	0 ~ 2	0: Disable 1: Effective when closed 2: Effective when open	0
11	F11	External warning delay time	0 ~ 120 sec		3
12	F12	Minimum defrosting launch time	10 ~ 240 min		30
13	F13	Maintenance period	0 ~ 999 day	0: Disable	999
14	F14	Password	0 ~ 999		000
15	F15	left time of the maintenance period	0 ~ 999	Cannot be set, on for check	999

5. Control

5.1 ON/OFF:

Keep【P】depressed for 3 seconds to switch between online and offline.

5.2 Cooling mode:

When Troom ≥ set-point + F01, and the compressor has been stopped for F04, compressor energized.

When Troom ≤ set-point, compressor de-energized.

5.3 Constant temp control mode:

When Troom ≥ set-point + F01, and compressor has stopped for F04, cooling starts.

When Troom ≤ set-point, compressor de-energized.

When Troom ≤ set-point – F01, and compressor has stopped for F04, heating starts.

When Troom ≥ set-point, compressor de-energized.

5.4 Defrost (only in heating status):

Intelligent defrost

When Tpipe ≤ F05, and the cooling has continued for F12, defrost starts.

When Tpipe ≥ F06, or defrosting has continued for F07, defrost stops. After 60 seconds dropping, heating starts again.

Timer defrost

If defrost sensor is connected or fails, controller will defrost periodically.

When compressor has run for F12, defrost starts.

When defrosting has continued for F07, defrost stops. After 60 seconds dropping, heating starts again.

Forced defrost

If Tpipe < F06, keeping【▲】and【▼】depressed simultaneously for 6 seconds can start forced defrosting.

When Tpipe ≥ F06, or defrosting has continued for F07, defrost stops. After 60 seconds dropping, heating starts again.

The forced defrost is not able to stop, until it stops by itself.

5.5 Instant start compressor:

When online, keep【P】and【S】depressed simultaneously for 6 seconds to force compressor energized immediately.

The compressor will be de-energized after 90 seconds.

It can also stop by keeping【P】and【S】depressed simultaneously for 6 seconds.

5.6 Maintenance State Instruction:

When the accumulated online time reach to F13, it will enter into *maintenance mode*:

Four LED will be blinking together, buzzer sounds continually, display shows Troom, and all outputs de-energized.

Keep【P】depressed for 3 seconds, then press【▲】and【▼】simultaneously, controller exits the *maintenance mode*, and enters into offline status, and the counter for maintenance will be cleared.

5.7 External warning mode (for alarm input S1):

F10 = 0, the function disabled.

F10 = 1, when S1 input shorts circuit for F11, all outputs will be de-energized, buzzer will sound, display will show “E3”.

F10 = 2, when S1 input opens circuit for F11, all outputs will be de-energized, buzzer will sound, display will show “E3”.

5.8 Sensor failure instruction:

When room sensor shorts or opens circuit, all outputs will be de-energized, display shows “E1”.

When defrost sensor shorts or opens circuit, controller works, defrosts periodically. If check Tpipe, it will show “E2”.

5.9 Auto restart function:

If the power supply loses, and comes back again, controller will return back to the working status before power supply lost.

5.10 Restore to the factory default parameter settings:

Keep【P】,【S】,【▲】and【▼】keys depressed simultaneously for 6 seconds, all parameter settings will be restored to factory default settings.

6. Attention

Electrical connection attention

Electrical wiring operation must be performed by a qualified electrician.

Use the power supply other than required will bring serious harm to the system.

As far as possible to lay the sensor and alarm input signal wires separately with the inductive load and power wires. Do not lay them in the same pipe. Do not install the controller near the power equipment (such as contactors, circuit breakers or the like) to avoid electromagnetic interference.

Avoid direct touch the internal electronic components.

Connect according to electrical wiring diagram. Wrong connection is harmful to users and could result in devices failure.

Make sure the equipment has all necessary safety devices, which guarantee the normal operation and safety of the user.

Controller installation tips

Avoid the controller being installed in the following environments:

* Relative humidity greater than 90%, or where the presence of condensation.
* Strong vibration or percussion.
* Continuous exposure to spray mist.
* Exposure to aggressive and polluting gases (for example: flue gas containing sulfur and ammonia, salt mist, smoke) to avoid corrosion and oxidation.
* Strong magnetic field and radio frequency interference (avoid installation near transmitting antennas); close to the transmitting antenna, broadly speaking to.

Avoid RF emitting elements in the vicinity:

* A wide range of ambient temperature fluctuations or rapid fluctuations.
* Containing explosive materials or flammable gas mixture environment.
* Exposure to dust (formation of corrosive and may be oxidized patina, reduce the insulation performance).

7. Wiring Diagram