ZL-7815A Temperature Controller

Version 1.0b

Feature

ZL-7815A thermostat has two universal timer outputs:

One timer output (R5) could be used as timer air exhaustion, and/or over temperature protecting exhaustion.

Another timer has two outputs (R3/R4). It could control 2 wires motor, or 3 wires/2 direction motor.

Function

Besides the function introduced in **Feature**, it has:

Heating / Cooling mode option,
Temperature output delay protection,
Over temperature warning,
Buzzing hint and warning.

Specification

Power supply: 100 ～ 240Vac, 50/60Hz
Sensor: NTC, $R_{25℃}$ = 10K, $B_{25/85℃}$ = 3435K
Setting range: 1.0 ~ 75.0℃
Display range: -9.9 ~ 99.9℃
Terminal: 2*1.5mm^2, or 1*2.5mm^2
Outputs (resistive specification):
Temperature control R1 16A, R3/R4 3A, R5 5A

Working: -10~45℃, 5~85%RH without dew
Case materials: PC + ABS, fireproof
Protection level: IP65 (Front side only)
Dimension: W78 x H34.5 x D71 (mm)
Installation drilling: W71 x H29 (mm)

Keypad and Display

Key

Key	Function 1	Function 2
P	Keep depressed for 3 sec. to set system parameters	
S	Keep depressed for 3 sec. to set set-point	
▼ *T1*	Set value down	Keep depressed for 5 sec. to switch timer 1's outputs (R3/R4) status
▲ *CNT*	Set value up	Short press to display for 2 sec. the times of R3 or R4 status changed. Lamp *Set* blinks in 2Hz

Lamp

Lamp	Function	On	Off	Blink
Set	Set set-point or system parameter	Setting set-point	----	Slow blink: Setting system parameter Fast blink: the times of R3 or R4 status changes has reached U24. R3 and R4 will not switch any more
T2	R5 status	R5 energized for T2	R5 de-energized	R5 energized for over hot protection, ref. U16
H/C	Temperature output	R1 energized	R1 de-energized	R1 under delay protection, ref. U12

Display Code

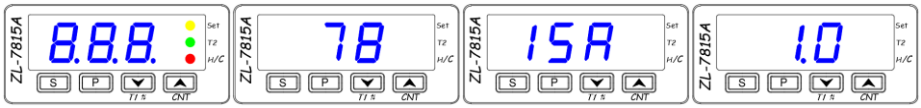
When there is problem, the code and the room-temperature will display alternatively.

Code	Remark
E1	Sensor failure, short or open
Hi	High temperature alarming
Lo	Low temperature alarming

Power up (Reset) display

Display the following information consecutively:

All units are on,
Model name (78 15A),
Software version (1.0):



Operation

Fast check

Keep ▼（*T1*⇵）depressed for 5 sec. to switch the outputs (R3 and R4) status.

Press ▲（*CNT*）to display the counter value for 2 sec., and the Lamp *Set* blinks at 2Hz.

The counter value counts the switching times of R3 or R4.

Set set-point (factory default setting is 37.8℃)

Keep "**S**" key depressed for 3 sec.: Lamp *Set* on, the current set-point displays.

Press ▲ or ▼ to set the new value. Keeping depressed can fast set.

Press "**S**" to exit, and the setting will be saved.

The status will exit, and the setting will be saved, if there is no key operation for 30 sec.

Set system parameters

Keep "**P**" key depressed for 3 sec.: Lamp *Set* blinks, one system parameter code displays.

Press ▲ or ▼ to select a code.

Press "**S**" to display the value of the code.

Press ▲ or ▼ to set the value of the code. Keeping depressed can fast set.

Press "**S**" to return to code display, for code selection.

Keep "**P**" key depressed for 3 sec. to exit the status, and the settings will be saved.

The status will exit, and the setting will be saved, if there is no key operation for 30 sec.

System parameter table

Code	Function	Range	Remark	Factory Set
U10	Control mode	CO/HE	CO: Cool; HE: Heat	HE
U11	Hysteresis	0.1 ~ 20.0℃		0.1
U12	Delay protection time for Temp. output (R1)	0 ~ 999 sec.		0
U13	Temperature calibration	-9.9 ~ +9.9℃		0.0
U14	*Temp. high warning* point (relative value)	0.0 ~ 99.9℃	If Room-temp ≥ Set-point + U14 warning (display Hi, buzzing); If Room-temp < Set-point + U14 stop warning 0.0: disable *Temp. high warning* function	0.0
U15	*Temp. low warning* point (relative value)	0.0 ~ 99.9℃	Room-temp ≤ Set-point – U15 warning (display Lo, buzzing); Room-temp > Set-point – U15 stop warning 0.0: disable *Temp. low warning* function	0.0
U16	*Temp. high protecting* point (relative value)	0.0 ~ 20.0℃	If Room-temp ≥ Set-point + U16, for U19 protecting exhausting on, R5 energized 0.0: disable Temp. high protecting function	0.2
U17	*Temp. high protecting* hysteresis	0.0 ~ 20.0℃	Room-temp < Set-point + U16 - U17, protecting exhausting stops 0.0: disable *Temp. high protecting* function	0.1
U18	1st *Temp. warning* delay time	0 ~ 600 min.		0
U19	Delay time for *Temp. high protecting*	0 ~ 600 sec.		0

System parameter table (continued)

Code	Function	Range	Remark	Factory Set
		Timer 1		
U20	Time unit for R3 being energized	0 ~ 2	0: sec.; 1: min.; 2: hour	1
U21	Time for R3 being energized	1 ~ 999		60
U22	Time unit for R4 being energized	0 ~ 2	0: sec.; 1: min.; 2: hour	1
U23	Time for R4 being energized	1 ~ 999		60
U24 *	Times for R3 or R4 being energized.	0 ~ 999	If U24 = 0, R3 and R4 never stop switching	0
		Timer 2		
U30	Time unit for R5 being energized	0 ~ 2	0: sec.; 1: min.; 2: hour	0
U31	Time for R5 being energized	1 ~ 999		30
U32	Time unit for R5 being de-energized	0 ~ 2	0: sec.; 1: min.; 2: hour	1
U33	Time of R5 being de-energized	1 ~ 999		30
U34	Working mode for R5	0 ~ 3	0: No function at all for R5 1: Timer 2 2: *Temp. high protecting* 3: Timer 2 + *Temp. high protecting*	1
U40	Buzzing warning	0 ~ 1	0: Shut down buzzing warning 1: Enable buzzing warning	0

* Note: When set U24 a new value, the counter value of timer 1 will be reset to zero.

Example 1: U24 = 200, the counter of timer 1 is 90, R3 or R4 status will still change 110 times. Now set U24 = 201, the counter will become 0, R3 or R4 status will change 201 times.

Example 2: U24 = 200, the counter of timer 1 is now 200, R3 or R4 status will not change any more. Now set U24 = 201, the counter will become 0, R3 or R4 status will change 201 times.

Control

Temperature control

Cooling

If Temp. ≥ Set-point + Hysteresis (U11), and R1 has been de-energized for protection time (U12), R1 will be energized.

If Temp. ≤ Set-point, R1 will be de-energized.

Heating

If Temp. ≤ Set-point - Hysteresis (U11), and R1 has been de-energized for protection time (U12), R1 will be energized.

If Temp. ≥ Set-point, R1 will be de-energized.

Delay protection for R1

After power supplied, R1 could be energized after protection time (U12) has passed.

After R1 is de-energized, it could be energized again after protection time (U12) has passed.

Timer 1, to control R3 and R4, set by U20 to U24

R3/R4 switching counter

The counter counts the switching times. From the start of R3 on to next start of R3 on, it is one period, counter adds 1.

If U24 = 0, R3/R4 will keep switching without stop. Else, when the counter value reaches U24, R3/R4 stops switching.

Check the value of the counter: press ▲（*CNT*）, the value will display for 2 sec., and the Lamp *Set* will blink in 2Hz.

Manually switching R3/R4

Keep ▼（*T1*⇵）depressed for 5 sec. to switch outputs (R3 and R4) status.

After switched, it will take full set time (U20 to U23) for next status switching.

Multifunction R5

As timer 2 output (when U34 = 1 or 3)

During the time set by U30 and U31, R5 will be energized.

During the time set by U32 and U33, R5 will be de-energized.

As *temp. high protecting* output (only in heating mode, when U34 = 2 or 3)

If Temp. ≥ Set-point + U16 for U19 time, R5 will be energized.

If Temp. < Set-point + U16 – U17, stop *temp. high protecting*.

Temp. warning

When U40 = 0, no buzzing warning, only display warning code.

After power supplied, the *temp. warning* will not be effective, until the U18 (1st *Temp. warning* delay time) time has passed.

Temp. high warning

If Temp. ≥ Set-point + U14, warning: beep, and display “Hi” and Temp. alternatively.

If Temp. < Set-point + U14, stop warning.

Temp. low warning

If Temp. ≤ Set-point - U15, warning: beep, and display “Lo” and Temp. alternatively.

If Temp. > Set-point - U15, stop warning.

Sensor

When the measured Temp. is not accurate enough, we could calibrate by setting the deviation to U13.
When the sensor is not connected well, or broken, display “E1”, R1 will be de-energized.
Do not install or dismount sensor under power supplied.

Buzzer Warning

When U40 = 0, there is no beeping warning, only display the warning code if any problem.

When U40 = 1, there will be beeping warning, and display of warning code if any problem. Pressing any key could stop beeping.

Restore to Factory Default Settings

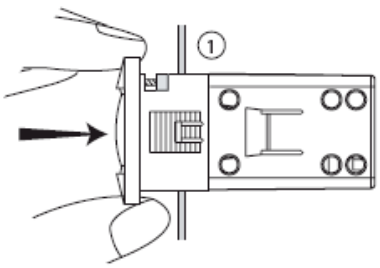
Keep **P** key and ▲ key depressed simultaneously for 3 seconds, controller displays “UnL”.

Press ▼ key twice, all the settings will be restored to Fctory Set (see System parameter table).

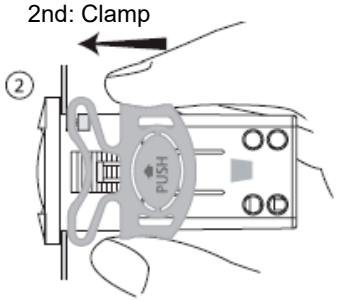
Installation

Installation

1st: Insert into drilling hole



2nd: Clamp



Wiring diagram

The parameter in the wiring diagram is resistant value.