ZL-7958A Humidity and Temperature Controller for Incubator A1.0

Feature

With **standalone cooling, de-humidifying, ventilation fan outputs control, both A/C and 12/24VDC turning motor control, and optional door switch detection and control,** ZL-7958A incubator controller would meet much more market requirements.

It is applicable for climate chamber, warehouse, and so on for temperature and humidity control, as well as for incubator.

Specification

Power supply:

100 ~ 240Vac, 50/60Hz.

Device dimension:

160 * 80 * 95 mm.

Installation drilling size: 151.5 * 76.5 mm.

Outputs:

Output	Load	Output	Load
Main Heat (HEAT1) *	1500W@220Vac, **1000W@110Vac**	Ventilation (CIR. FAN)	7.5A@250Vac
Aux Heat (HEAT2) *	1500W@220Vac, **1000W@110Vac**	Illumination (LAMP)	300W@220Vac, **150W@110Vac**
Cool (COOL)	5A@250Vac	Exhaustion (EXHAUST)	5A@250Vac
Humidify (HUMI.)	7.5A@250Vac	A/C turner motor (PIN 24/23)	3A@250Vac
Dehumidify (DEHUMI.)	5A@250Vac	DC turner motor (PIN 12/11)	1.5A, 12/24Vdc

*. If with tungsten / filament lamp as heater(s), its power rate must lower than 500W@220Vac, **300W@110Vac** for each heat output.

Inputs: One temperature sensor (5K/3470, L = 1.5 meter), one humidity sensor (L = 2.0 meter). One door switch.

Display range: Temperature -9.9 ~ 99.9℃. Humidity 0 ~ 99%RH.

Accuracy: Temperature ±1%@25℃. Humidity ±3%@25℃.

Hatched day counter: the maximum counted value is 99 days.

Egg turn control: Turn period: 1 ~ 999 minutes. Turn driving time: 0 ~ 999 seconds. Turn times counter: 0 ~ 999 times.

Air exhaustion control: Period: 1 ~ 999 minutes. Exhausting time: 0 ~ 999 seconds.

Illumination control: Period: 1 ~ 999 minutes. Illuminating time: 0 ~ 999 seconds.

Operation environment: -10 ~ 45℃, less than 90%RH without dew.

Version Information

When power supplied, the display shows the model “795 8A”, and version “A1.0” one by one.

Setting and Query

Set setpoints

Press【*Set*】to enter into setpoints setting status.

Press【*Enter*】to select between setting temperature and setting humidity:

SV windows display: “xx.x” + “**tt**”, “xx.x” is setpoint for temperature.

SV windows display: “ xx” + “**HH**”, “ xx” is setpoint for humidity.

Press【▲】or【▼】to set the setpoint. Keeping the key depressed can fast set.

Keeping【*Enter*】depressed for 2 seconds will exit the setting status, and the settings **will be saved**.

The setting status will exit **without saving** if there is no key operation for 15 seconds.

Factory default settings are 37.8℃ and 60%RH. Setting ranges are 1.0 ~ 85.0℃ and 0 ~ 99%RH.

Set parameters

Keeping【*Set*】depressed for 2 seconds to enter into parameter setting status.

Press【*Enter*】or【*Set*】to select among parameter codes:

SV windows display: “value of the parameter code” + “**parameter code**”.

Press【▲】or【▼】to set the value. Keeping the key depressed can fast set.

Keeping【*Enter*】depressed for 2 seconds will exit the setting status, and the settings **will be saved**.

The setting status will exit **without saving** if there is no key operation for 15 seconds.

Parameter code table

Code	Function	Range	Remark	Default
t0	Temp. calibration	-9.9 ~ 9.9℃		0.0
t1	Hysteresis for HEAT1	0.1 ~ 20.0℃	Absolute value is (setpoint - t1)	0.1
t2	HEAT2 on point	0.1 ~ 20.0℃	Relative value. Absolute value is (setpoint - t2)	0.5
t3	HEAT2 off point	0.1 ~ 20.0℃	Relative value. Absolute value is (setpoint - t3), t3 < t2	0.3
t4	COOL on point	0.1 ~ 20.0℃	Relative value. Absolute value is (setpoint + t4)	0.2
t5	COOL off point	0.1 ~ 20.0℃	Relative value. Absolute value is (setpoint + t4 - t5)	0.1
t6	Too hot warning point	0.0 ~ 20.0	If t6 = 0.0: disable the warning Relative value. Absolute warning point is (setpoint + t6)	**0.0**
t7	Too cold warning point	0.0 ~ 20.0	If t7 = 0.0: disable the warning Relative value. Absolute warning point is (setpoint - t7)	**0.0**
H0	Humidity calibration	-20 ~ 20%		0
H1	Hysteresis for humidify	0 ~ 99%	Absolute value is (setpoint - H1)	5
H2	Hysteresis for de-	0 ~ 99%	Absolute value is (setpoint + H2)	5
H3	Too wet warning point	0 ~ 99%	If H3 = 0: disable the warning Relative value. Absolute warning point is (setpoint + H3)	0
H4	Too dry warning point	0 ~ 99%	If H4 = 0: disable the warning Relative value. Absolute warning point is (setpoint - H4)	0
F0	Egg turn period	1 ~ 999 min.		90
F1	Egg turn time	0 ~ 999 sec.	If F1 = 0: disable egg turn function	180
F2	Egg turn set times	0 ~ 999 times	If F2 = 0: disable egg turn times counting	0
F3	Air exhaustion period	1 ~ 999 min.		120
F4	Air exhaustion time	0 ~ 999 sec.	If F4 = 0: disable air exhaustion function	30
F5	Illumination period	0 ~ 999 min.	If F5 = 0: disable periodical illumination function	0
F6	Illumination time	0 ~ 999 sec.		120
F7	Door switch	0 / 1	If F7 = 0: neglect the switch. F7 = 1: detecting the switch	0
F8	Buzzer alarming	0 / 1	If F8 = 0: disable. F8 = 1: enable	0
F9	Incubated days counter	0 ~ 99 day	When online, increase 1 every day.	0

Check counters

Press【*Enter*】and【▲】simultaneously, *SV* window displays〖Incubated days counter, F9〗: “days” + “**d**” for 2 sec.
Press【*Enter*】and【▼】simultaneously, *SV* window displays〖Egg turned counter〗: “times” + “**C**” for 2 sec.

Control and Operation

On/off operation

Keep【*Lamp-I/O*】depressed for 2 seconds, switch between online and offline.

Illumination control

Manual on/off:

Press【*Lamp-I/O*】to switch the output LAMP on/off.
When turned on manually, it will be off automatically after〖Illumination time, F6〗.

Timer on/off:

This control is effective in online status, and when〖Illumination period, F5〗≠ 0.
Output LAMP will be energized for〖Illumination time, F6〗every〖Illumination period, F5〗.

Door switch control:

If〖Door switch, F7〗= 1, after the door is open, the output LAMP will be energized for〖Illumination time, F6〗.
When output LAMP is on, it will be de-energized when the door is closed.

Temperature control

Main heater:

When *room temperature* ≤ (〖setpoint〗-〖t1〗), output HEAT1 will be energized.
When *room temperature* ≥〖setpoint〗, output HEAT1 will be de-energized.

Aux. heater:

When *room temperature* ≤ (〖setpoint〗-〖t2〗), output HEAT2 will be energized.
When *room temperature* ≥ (〖setpoint〗-〖t3〗), output HEAT2 will be de-energized.

Cooling control:

When *room temperature* ≥ (〖setpoint〗+〖t4〗), output COOL will be energized.
When *room temperature* ≤ (〖setpoint〗+〖t4〗-〖t5〗), output COOL will be de-energized.

Over temperature alarming:

If *room temperature* ≥ (〖setpoint〗+〖t6〗), alarm LED blinks, buzzing, alternatively display temperature and “tH”.
If *room temperature* ≤ (〖setpoint〗-〖t7〗), alarm LED blinks, buzzing, alternatively display temperature and “tL”.
Buzzing alarming can be stopped by press【*Enter*】key.

Door switch control:

Temperature outputs will be de-energized when the door is open. And their control continues when door is closed.

Humidity control

Humidify:

When *room humidity* ≤〖setpoint〗-〖H1〗, output HUMI. will be energized.

When *room humidity* ≥〖setpoint〗, output HUMI. will be de-energized.

De-humidify:

When *room humidity* ≥〖setpoint〗+〖H2〗, output DEHUMI. will be energized.

When *room humidity* ≤〖setpoint〗, output DEHUMI. will be de-energized.

Over humidity alarming:

If *room humidity* ≥ (〖setpoint〗+〖H3〗), alarm LED blinks, buzzing, alternatively display temperature and “HH”.

If *room humidity* ≤ (〖setpoint〗-〖H4〗), alarm LED blinks, buzzing, alternatively display temperature and “HL”.

Buzzing alarming can be stopped by press【*Enter*】key.

Door switch control:

Humidity outputs will be de-energized when the door is open. And their control continues when door is closed.

Ventilation control

When online, and when the door is closed, output CIR. FAN will be energized.

When offline, output CIR. FAN will be de-energized.

Door switch control:

When door is open, output CIR. FAN will be de-energized. Its control continues when door is closed.

Egg Turn control

The controller has 220/110Vac outputs control and 12/24VDC outputs control for egg tray turning.

Timer control for turn:

Automatic timer turning will work in online status, and when the door is closed.

For every〖Egg turn period, F0〗, egg tray will turn for〖Egg turn times, F1〗.

Left and right turning will be executed alternatively.

Counter counts method: one left turn + one right turn will be counted as one time.

Manual control for turn:

Keeping【▲】depressed for 2 seconds can force left turning. It will stop when the key is released.

Keeping【▼】depressed for 2 seconds can force right turning. It will stop when the key is released.

Force turning stop:

During automatic timer turning, keeping【▲】and【▼】depressed simultaneously for 2 seconds could force turning stop. LED (*L/R*) blinks between red and green color.

At this status, same operation will cancel the status, and restore the automatic turning.

Egg turn times:

When〖Egg turned counter〗has reached〖Egg turn set times, F2〗, stop egg turning. LED (*L/R*) blinks.

At this status, keeping【▲】and【▼】depressed simultaneously for 2 seconds will clear the〖Egg turned counter〗, and automatic timer egg turning will continue.

When door is open, the automatic turning will pause. When door is closed, the control for turning continues.

Attention: Turn off the controller (see **On/off operation**) will clear (reset) the〖Egg turned counter〗.

Door switch control:

When door is open, the **automatic** turning will pause. The control for turning continues when door is closed.

Exhaustion control

For every〖Air exhausting period, F3〗, the output EXHAUST will be energized for〖Air exhausting time, F4〗.

Door switch control:

When door is open, the output EXHAUST will de-energized. The control for it continues when door is closed.

Door switch

Switch function: S1 open, door open. S1 short, door closed.

If〖F7〗= 1, controller audits S1. If〖F7〗= 0, controller does not check S1, the door is considered closed for control.

Door open: alarm (buzzing, blinkingly display “door”, alarm LED blinks), all outputs are de-energized.

Door close: alarm stops, control for all outputs continues.

Buzzing alarming can be stopped by: press【*Enter*】key.

Sensor calibration

The sensors have tolerance. They can reach to absolute 0.1℃ and 1% RH accuracy by calibration.

Room temperature can be calibrated by setting〖t0〗.

Room humidity can be calibrated by setting〖H0〗.

Sensor failure

If temperature sensor fails (short or open), alarm (buzzing, display “Et”, alarm LED blinks), all temperature outputs will be deenergized.

If humidity sensor fails, alarm (buzzing, display “Eh”, alarm LED blinks), all humidity outputs will be de-energized.

Buzzing alarming can be stopped by: press【*Enter*】key.

Incubated days

Parameter〖Incubated days counter, F9〗records the incubated days. Fast check for〖F9〗, see **Check counters**
We can not set it to any other value except zero. When we set it (see **Set parameters**), it will be reset to zero.
Attention: power supplied, and on/off operation will not reset it. Please edit it to zero before every new incubation.

Restore to factory setting

Keep【*Lamp-I/O*】and【▲】depressed simultaneously for 2 seconds, *SV* window displays "UnL" + "00".
Press【▼】twice, display "000" + "00", and there is a long beep, all the parameters will be reset to factory default settings.

LED indication

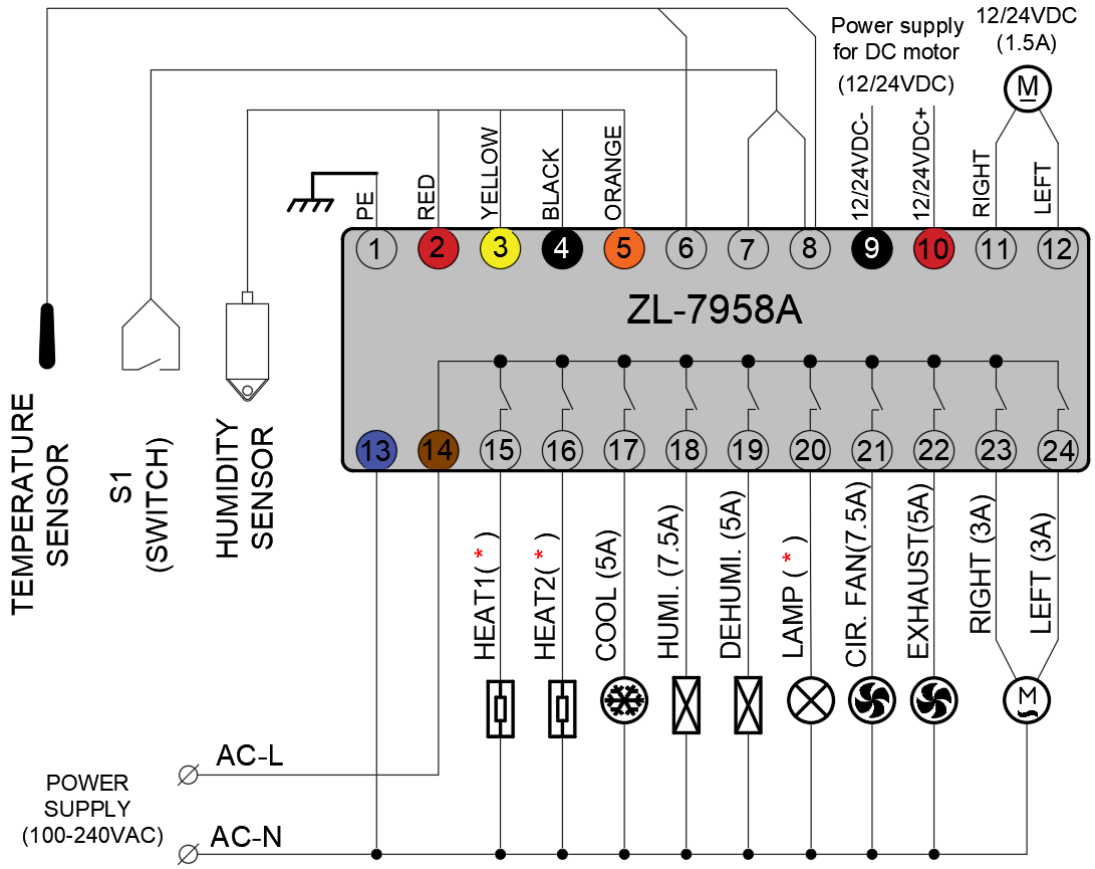
LED	On	Blinking	Remark
WET (Red)	Output HUMI. on		
WET (Green)	Output DEHUMI. on		
L/R (Red)	Left turning		2 colors blinking alternatively: forced stop for turning.
L/R (Green)	Right turning		1 color blinking: turn times reached to set value.
FAN (Green)	Output EXHAUST on		
ALARM (Red)		Over limits, failure, door open	
HEAT1 (Yellow)	Output HEAT1 on		
HEAT2 (Yellow)	Output HEAT2 on		
COOL (Green)	Output COOL on		

Warning code

Code	Remark	Code	Remark	Code	Remark
Et	Temperature sensor fails	tH	High temperature alarm	HH	High humidity alarm
Eh	Humidity sensor fails	tL	Low temperature alarm	HL	Low humidity alarm
door	Door open alarm				

Wiring Diagram

* **Outputs load specification, see Specification. Over driving will destroy the controller's output(s).**



Attention

Humidity sensor will not work correctly when covered with dust, water, or dew. Please keep it clean and dry.