



Laboratory Equipment Pty Ltd

**INSTRUCTION MANUAL
FOR LABEC SOXHLETT BATHS**

Laboratory Equipment Pty Ltd
"Proudly Australian Owned and Operated."
26 Farr Street, Marrickville NSW 2204
Phone +61 02 95602811 Fax +61 02 95606131
www.labec.com.au

Contents

I . Summary	1
II . Structure features	1
III. Main technical parameters	2
IV. Working Conditions	2
V . Attentions	2
VI. Temperature Controller Operation	2

I . Summary

DK-98-II/DK-98-IIA Water Bath is applicable for distillation, concentration, drying and thermostatic heating of medical units, universities and colleges, scientific research units and laboratories of industrial and mining enterprises like chemical printing and dyeing enterprises and pharmaceutical enterprises.

II . Structure features

1. The enclosure of the product is formed and machined by using high-quality steel plate. Static electric spraying process is adopted on the surface, which is sturdy and durable.
2. The liner and upper cover are made of high-quality stainless steel plate, featuring strong corrosion resistance.
3. U-shaped heating pipe is adopted for direct heating in water. The temperature rise is quick and the thermal loss is small.
4. Single-row digital display or intelligent temperature controller boasts simple operation and favorable application effect.

III. Main technical parameters

Model	DK- 98-II/ DK- 98-IIA						
voltage	220-240V/50-60Hz						
Temp. Range	Room temperature +5°C~100°C						
Temp.fluctuation	±0.5°C						
Specification	1 hole	1 row 2 holes	1 row 4 holes	1 row 6 holes	2 rows 4 holes	2 rows 6 holes	2 rows 8 holes
Power (w)	400	500	1000	1500	1000	1500	2000
Inner Chamber Size (mm)	168x168 x120	325×168 ×120	653×168 ×120	945×168 ×120	325×325 ×120	480×325 ×120	635×325 ×120

With A, it means intelligent temperature controller;

Without A, it means single-row digital display temperature controller.

IV. Working Conditions

Temperature ranges between 5~40°C;

Relative humidity less than 85% RH;

Power: voltage 220-240v, frequency 50-60Hz;

No violent vibration and corrosive gas surround the equipment.

V. Attentions

1. Before use, add 50mm water until the water reaches above the clapboard, then connect to power supply and heat. It is not allowed to heat with insufficient water.
2. During use, do not touch the heating pipe by your hands to avoid being scalded.
3. After use, timely discharge the water, dry it and keep it clean in order to extend the service life.

VI. DK-98-IIA model Temperature Controller Operation

Before using this product, please read the instructions carefully for proper use. And give it a good preservation for reference at any time.

Operational attention

Clean the equipment after turning off. Use a soft cloth to clean stains on the display. The monitor is easily scratched; do not wipe or touch using hard objects.

DO NOT USE hard objects such as screwdrivers or lettering pens to operate the panel keys. This could cause the buttons to be damaged or scratched.

1 Product model selection

This product is a kind of intelligent controller. Its automatic tuning PID algorithm is very suitable for the requirements of medical devices and laboratory instruments. And the product is fully functional and easy to use. It is the best replacement for the analog digital display temperature controller.

Please refer to the code table below to confirm whether the product delivered is exactly the same as the model you selected.

YLJY□-1 0 □ □ □ □ □

① ② ③ ④ ⑤ ⑥

① External dimension

R, 72*72

② Input type

0: Thermal resistor(PT100、CU50)

1: Thermal couple(K、E)

④ Graduation mark

PT100(-199-500degrees): CU50(-50-150degrees): ⑤ Upper range

K(0-700degrees): E(0-400degrees) ⑥ Lower range

③ Output type

G: Trigger thyristor

V: Solid-state relay(SSR)

R: Relay(3A)

A: 10A High-power relay

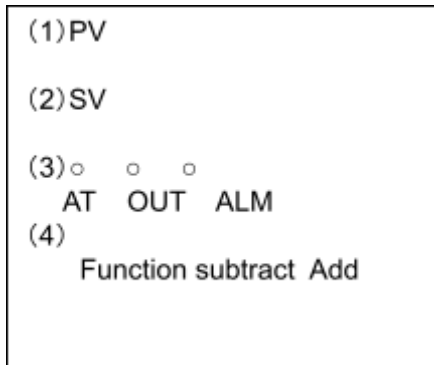
2 Technical indicators

① Supply voltage : 220VAC

② Ambient temperature : 0---50°C

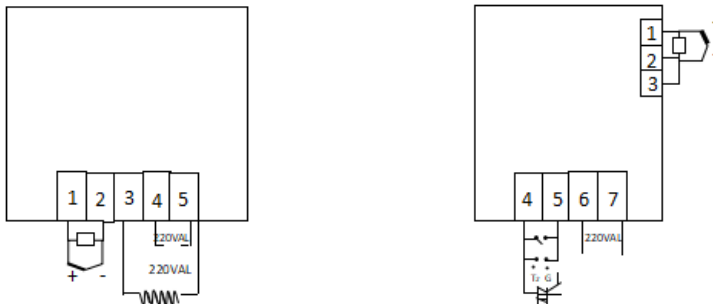
③ Measurement accuracy : ±0.5°C

3 Panel description



- ①PV monitor: Display the measured temperature, and display various types of prompts according to the state of the controller;
- ②SV monitor: Display the setting temperature, and display various types of parameters according to the state of the controller;
- ③Indicator light
 - AT(Acting indicator light): Lights up when the controller is working, flashing from the self-tuning timing;
 - OUT(Heating output indicator): Lights up when there is heating output;
 - ALM(Alarm output indicator): Lights up when there is an alarm output;
- ④key
 - Function key: Used for parameter call-out, parameter modification confirmation;
 - Subtract key: Used to adjust the size of the value or start self-tuning;
 - Add key: Used to adjust the size of the value or start self-tuning;

4 Wiring



Pure resistive heating wire under 2KM

5 Operation

5.1 Calling order of each function

After the instrument is energized, InP will be displayed on the upper row and graduation mark will be displayed on the lower row, which indicates the input type. After 2 seconds, upper range will be displayed on the upper row and lower range will be displayed on the lower row, which indicates the measurement range. After another 2 seconds, measurement value will be displayed on the upper row and set value will be displayed on the lower row, which indicates the instrument is in the normal working state.

Temperature setting: Press the function key to display SP in the upper row. Press and to display the required temperature value in the lower row, and then press the setting key to return to standard mode.

Setting control parameters: Press the function key for more than 4 seconds, then the prompt of control parameters will be displayed in the upper row(See the list of control parameters for details). Press ▲ and ▼ to make the lower row display the required value. Continue to press the function key, the upper row will display the prompts of each parameter in proper order. Press ▲ and ▼ until it displays the required value for each control parameter. Then press the function key for more than 4 seconds, and return to standard mode. (Press no key for 1 minute and automatically return to standard mode.)

If 000 appears below the display of the upper row digital tube, which means the thermocouple is inversely connected. If 000 appears above the display, which means the thermocouple/thermal resistor is open or the temperature exceeds the adjustable range.

Boiling point function: Selecting water bath pan and setting the temperature ≥ 99 , with whole heating output, to make the water boil.



Self-setting function: Press for 5 seconds and the running indicator light will flash, and the controller will start self-setting. Then the indicator light will run for a long time which means the self-setting is completed. After that, a group of optimal PID parameters will be obtained to control the controller.

5.2 List of functional parameters

Prompt	Name	Setting range	Instructions	Initial value
AL	Alarm setting	0...range°C	Alarm setting: Alarm insensitive area is 0.4 fixed value.	5.0
P	Proportional band	1.0...300°C	Proportional adjustment: The larger the P is, the smaller the proportional action is, and the lower the system gain is.	5.0
I	Integration time	20...999 seconds	Integral action time constant: The larger the I is, the weaker the integral action is.	300
d	Differential time	0...999 seconds	Differential action time constant: The larger the D is, the stronger the differential action is. And it can overcome overshoot, D=0 PI control.	300
Ar	Overshoot inhibition	0(0.0)-100%(100.0%)	PID: Overshoot inhibition. Ar is determined as: 1.5-2 times steady-state output duty cycle.	100
T	Control cycle	1...100 seconds	Relay output < 20 seconds, SSR and silicon-controlled switch < 3 seconds	3
Pd	Measuremen	whole	Correct the measurement error	0

	t correction	range	caused by the sensor and thermocouple compensation wires	
PK	Self-tuning	-199~199	When the zero error of the instrument is small and the fullness error is large, the value should be adjusted. PK=1000*(the fixed value-the actual display value)/the actual display value	0
LK	Coded lock	0-999	When the LK=18, the above parameters could be modified.	0