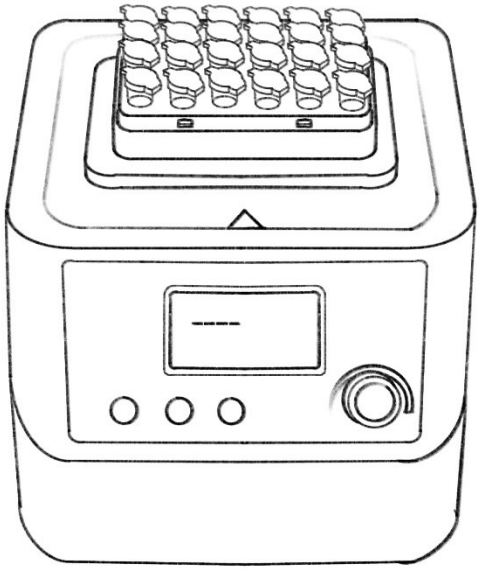
Thermal Control

Thermo Control & Thermo Mix user manual



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Preface

Welcome to the Thermo Control & Thermo Mix User Manual. Users should read this Manual carefully, follow the instructions and procedures, and be aware of all the cautions when using this instrument.

Service

When help needed, you can always contact the Service Department of manufacturer for technical support in the following ways:

Please provide the customer care representative with the following information:

- Serial number (on the rear panel)
- Certification
- Description problem (i.e., hardware or software)
- Methods and procedures adopted to resolve the problems
- Your contact information

Warranty

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a

Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This instrument is warranted to be free from defects in materials and workmanship under normal use and service, for a period of 24 months from the date of invoice. The warranty is extended only to the original purchaser. It shall not apply to any product or parts which have been damaged on account of improper installation, improper connections, misuse, accident or abnormal conditions of operation.

For claims under the warranty please contact your local supplier. You may also send the instrument directly to manufacturer, enclosing the invoice copy and by giving reasons for the claim.

1. Safety Instructions

	**Warning!** ● Read the operating instructions carefully before use. ● Ensure that only trained staff works with the instrument.
	**Risk of burn!** ● Caution when touch the housing parts and the hotplate which can reach temperature of 110 ℃（ Please refer to technical parameters）. ● Pay attention to the residual heat after switching off.
	**Protective ground contact!** ● Make sure that socket must be grounded (protective ground contact) before use.

- When working wear personal safety guards to avoid the risk from:

  - Splashing and evaporation of liquids

  - Release of toxic or combustible gases

- Set up the instrument in a spacious are on a stable, clean, non-slip, dry and fireproof surface. Do not operate the instrument in explosive atmospheres, with hazardous substances or under water.

- Temperature must always be set at least 50℃ lower than the fire point of the

media used.

- Be aware of hazards due to:

  - Flammable materials or media with a low boiling temperature

  - Overfilling of media

  - Unsafe container

- Process pathogenic materials only in closed vessels.
- Check the instrument and accessories prior to each use.
- Do not use damaged components. Safe operation is only guaranteed with the accessories provided by the manufacturer. Accessories must be securely attached to the device and can't come off by themselves. Always disconnect the plug before fitting accessories.
- The instrument can only be disconnected from the main power supply by pulling out the main or the connector plug.
- The voltage stated on the label must correspond to the main power supply.
- Ensure that the main power supply cable does not touch the dry bath. Do not cover the device.
- The instrument may only be opened by experts.

2. Proper use

The instrument is designed for mixing and/or heating liquids in schools, laboratories or factories.

- Observe the minimum distances between the devices, between the device and the wall and above the assembly (min. 100 mm)
- This device is not suitable for using in residential areas or other constraints mentioned in Chapter 1.

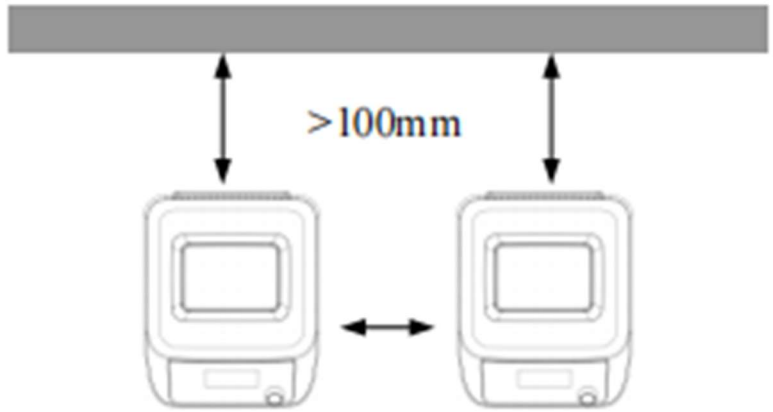


Fig. 1

3. Inspection

3.1 Receiving Inspection

Unpack the equipment carefully and check for any damages which may have

arisen during transport. Please contact manufacturer/supplier for technical support.

	**Note:** If there is any apparent damage to the system, please do not plug it into the power line.

3.2 Listing of Items

The package includes the following items:

Items	Qty
Main unit	1
Power cable	1
Block	1
User Manual	1

Tab. 1

4. Control & Display

4.1 Control

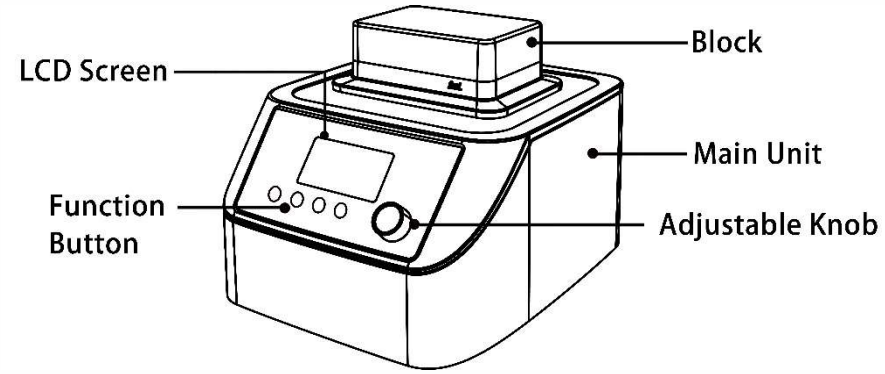


Fig. 2 Thermo Mix

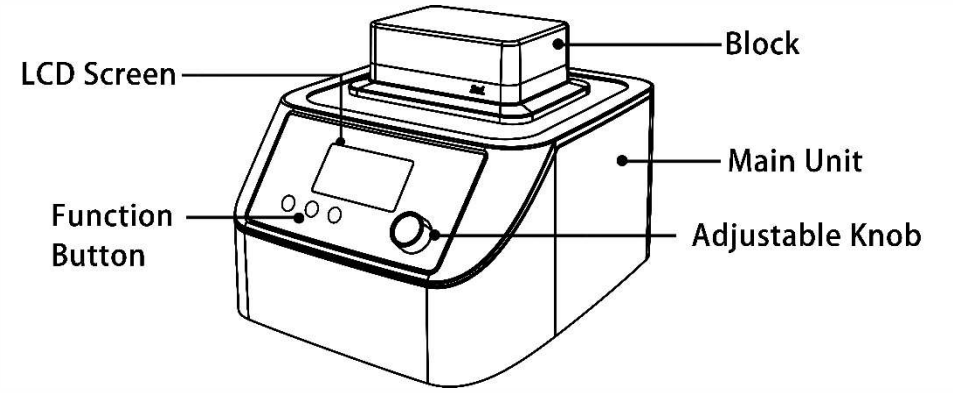


Fig.3 Thermo Control

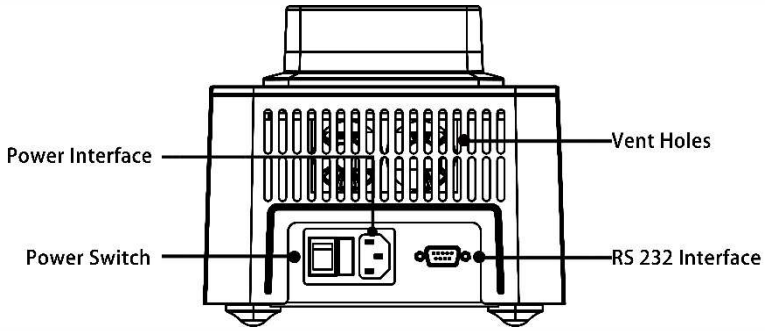
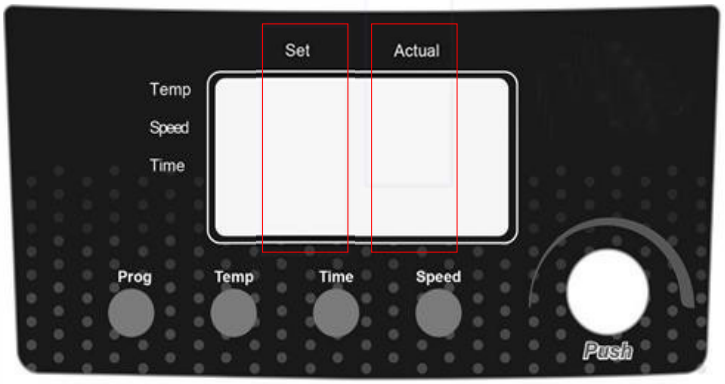


Fig.4 Interface & Power Switch

Item	Description
Block	Changeable unit, suit for different tubes
LCD Screen	Display the setting and actual parameters
Function Button	Switch the input parameters or programming
Adjustable Knob	At parameter setting state, rotate this knob can input values; After setting, push it to start work. At working state, short push to pause; Long push to stop working
RS232 Interface	Used for factory internal temperature calibration
Power Interface	Connect the power cable
Power Switch	Power on/off

Tab. 2

4.2 Display



Items	Description
Set	Display the setting parameters
Actual	Display the actual parameters
Prog	Program button, used for programming
Temp	Temperature setting button， when press this button, the temperature characters of the setting area are flashing.
Time	Time setting button, when press this button, the time characters of the setting area are flashing. **In timed working mode, the time shows the countdown time. In continuous working mode, the time show running time. Refer to below figure.**
Speed	Mixing speed setting button, when press this button, the speed characters of the setting area are flashing （Thermo mix models）
Adjustable knob	At parameter setting state, rotate this knob can input values; When finish the parameters setting, push it to start work. At working state, short push to pause; Long push tostop working.

5. Operation

5.1 Parameter setting methods

A. Respectively, press the function button, the corresponding characters of the setting area are flashing.

B. Rotate parameter knob, input the target parameters.

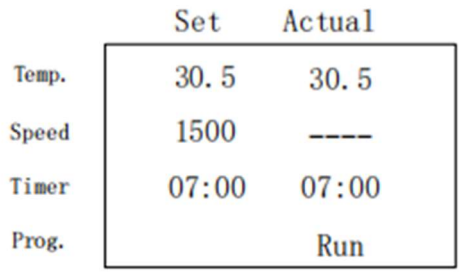
C. Wait 3s, the corresponding character will stop blinking, complete parameter setting.

Note: when power on, the setting area of the screen will display parameters of the last run.

When the time is adjusted to 00:00, means the product will run the continuous mode.

5.2 Start and Stop

1. Start: When finish the parameter input, push the adjustable knob to start work. And in the last line in the actual value area will display the characters “Run”. Refer to below figure.



2. Pause: In the working state, short push the adjustable knob to pause. Refer to below figure.

	Set	Actual
Temp.	30.5	30.5
Speed	1500	----
Timer	07:00	07:00
Prog.		Pause

And in the last line in the actual value area will display the characters “Pause”. When in this state, only the timer and mixing functions are paused, the temperature control function is still working. (Thermal Control doesn’t support mixing function).

Resume: In the pause state, push the adjustable knob, will resume to working state. And in the last line in the actual value area will display the characters “Run” again.

3. Stop: In the working state, long push the adjustable knob to stop the current work.

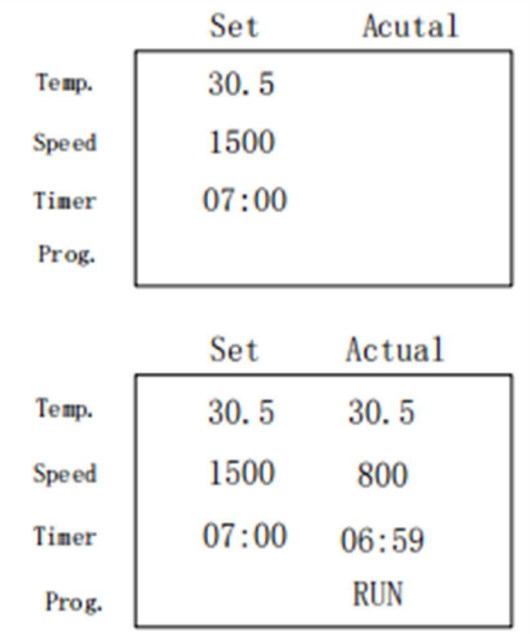
	Set	Actual
Temp.	30.5	
Speed	1500	
Timer	07:00	
Prog.		

(Thermal Control doesn’t support mixing function). Refer to below figure.

5.3 Running

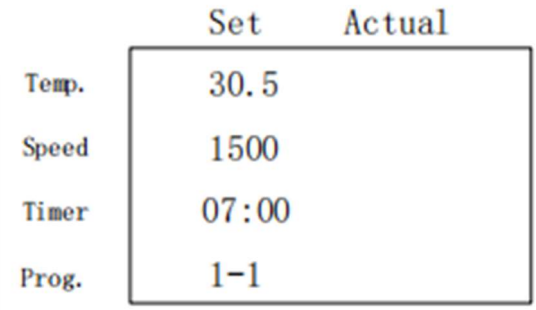
5.3.1 Single Step Work Without Saving

When power on, the screen shows the parameters of the last run, or factory settings. Push the Temp, Speed, Time button respectively, the corresponding characters will flash. Rotate the Adjustable knob to set the parameters. If time is set to 00:00, it means continuous working mode. After the setting completed, push the adjustable knob to start work. Refer to below figure

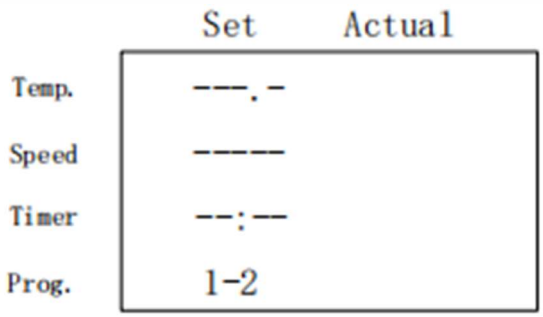


5.3.2 Multiple Step work without Saving

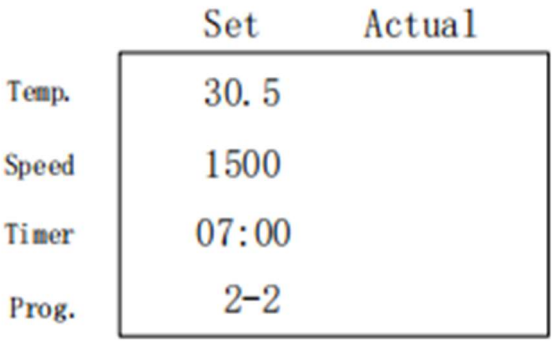
A. The program set in the single step is the first step by default. Refer to below figure.



B. Push the Prog. button, start to set the second step. The last line of in the Set column shows 1- 2 now. Refer to below figure.



Note: Before the setting of the second step complete, system consider there is only one step by default. But after the setting complete, the actual steps will be shown correctly. Refer to below figure.



C In the same way, complete the later steps. Then push the adjustable knob to start work. Refer to below figure.

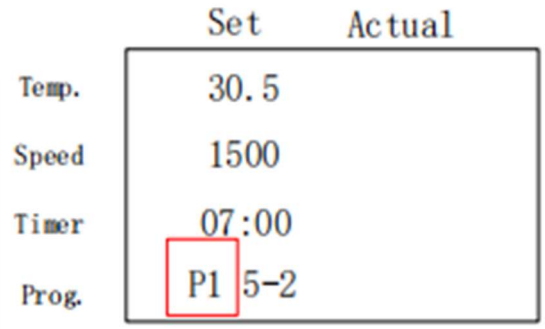
	Set	Actual
Temp.	30.5	30.5
Speed	1500	800
Timer	07:00	06:59
Prog.	2-2	RUN

Prog. shows the program and step number. Refer to the figure, there are 2 steps totally, now it's the second step.

Note: Before the time is set, the step will not take effect. If set time to 00:00, it means continuous working mode. Before completing the setting for the current step, can't enter next step.

5.3.3 Program with Saving mode

Programming method is similar with Multiple Step without Saving mode. After the programming complete, long push the adjustable knob, program name characters flash (refer to the red part in below figure). Rotate the Adjustable knob to input the number of the name, then push the adjustable knob to complete the input. The program saving is complete now.



Prog. shows P1, 5-2， means the program and step number. Refer to the figure, there are 5 steps totally, now it's the second step.

5.3.4 Load Program

In the power on state, long push the prog. button, enters the load program mode. Rotate the adjustable knob to show the saved program, from P1 to the last, at most 9 programs. Switch to the program you want, and short push the prog. Button to check the program in detail. Then push the adjustable knob to start the program.

5.3.5 Single function running

If Temp. is set to---. -, then it means working without temperature control function. If Timer is set to 00:00, it means work continuous. If speed is set to -----, it means work without mixing function.

5.4 Temperature calibration

1. The temperature of the instrument had been calibrated before delivery, but due to some other factors the temperature may vary from the actual temperature and the deviation can be corrected by temperature calibration.

2. In order to ensure the temperature control accuracy, based on the temperature calibration function, it is recommended to calibrate the temperature whenever the heating block is changed.

The device adopts the three-point temperature calibration method, Heating & cooling, Heating&cooling &mixing calibration temperature is 10℃, 50℃ and 90℃， Heating, Heating &mixing calibration temperature is 37℃， 60℃ and 90℃.

The linear calibration of the three temperature points ensures that the accuracy of the three temperature points of the system within ±0.5℃. At the time of temperature calibration, the ambient temperature must be 15 to 25℃.

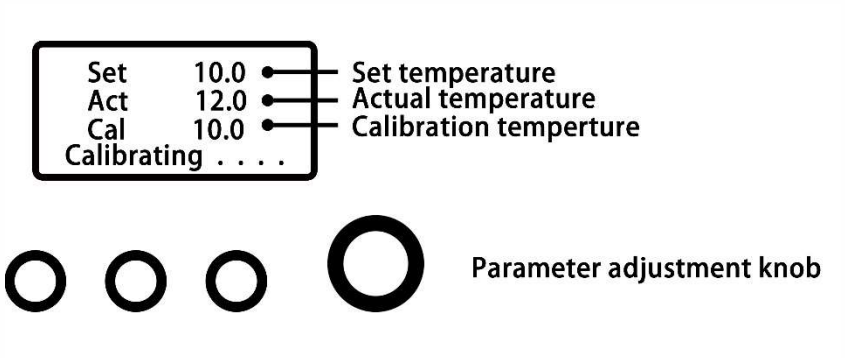
	**Caution:** The temperature of device has been calibrated before delivery, so please don’t use this function at will.

Calibration procedure:

Inject silicon oil into the hole in the center of the heating block. Place the thermometer probe in the oil filled hole.

1. Switch power ON the instrument，Press both the Prog and Temp buttons at the same time to enter into calibration mode while self-checking only. (Please note that the instrument cannot enter into calibration mode if the self-check is complete.)

The picture followed is Calibration interface:



2. Rotate the parameter adjustment knob to set target temperature for calibration. Press the parameter adjustment knob and confirm the set values.

3. If the actual temp. reaches the set temperature and remains 20min-30min,and other blocks will be stable after 5min), The calibration area will display the corresponding temperature on display.

Record the measurement on a Thermometer, rotate the parameter knob to adjust

the calibration Temp. to actual thermometer temp. value (Calibration temp. adjustment range is Set temp±5℃) and press the same knob to confirm settings.

4. To ensure the calibration temperature adjustment set correctly, press the push knob and the instrument will enter the second calibration temperature, repeat step 3, after the third temperature calibration completed, the screen displays “Calibration Success" on interface and the instrument will automatically enter into the self- check mode. Then calibration is complete.

If the display screen shows the “Cali Failed” interface, the input value of calibration may be wrong. Hence restart the instrument and repeat the calibration steps again

5.5 Restore the factory settings

1. Switch power ON the instrument, Press Temp and Prog buttons at the same time to enter into calibration mode while the instrument is in self- check mode. (Please note that the instrument cannot enter into calibration mode if the self-check is complete.)

2. After entering the calibration mode, press both the Prog and Time keys to reset, the interface will display “RESET Success," and the instrument will restart automatically.

6. Trial run

- Make sure the required operating voltage and power supply voltage match.
- Ensure the socket must be properly grounded.
- Add the medium into the vessel
- Place vessel on the block.
- Plug in the power cable，ensure the power is on and begin initializing.
- Set the target parameters or pragraming.
- Start working
- Observe the LCD display
- Stop working, and power off.

If these operations above are normal, the device is ready to operate. If not, the device may be damaged during transportation, please contact manufacturer /supplier for technical support.

7. Faults

- Instruments can’t be power ON
  - Check whether the power line is unplugged
  - Check whether the fuse is broken or loose
- Fault in power ON self-test

- Switch OFF the unit, then switch ON and reset the instruments to factory default setting.

If these faults are not resolved, please contact dealer/ suppler.

8. Maintenance and Cleaning

- Proper maintenance can keep instruments working properly and lengthen its lifetime.
- Do not spray cleanser into the instrument when cleaning.
- Unplug the power line when cleaning.

	**Note:** ● Electronic device cannot clean with cleanser. ● If you require maintenance service, must be cleaned the instrument in advance to avoid pollution of hazardous substances, and to send back into original packing. ● If the instrument will not use for a long time, please switch off and place in a dry, clean, room temperature and stable location.

- Only use recommended cleansers:

Dyes	Isopropyl alcohol
Construction materials	Water containing tenside /Isopropyl alcohol
Cosmetics	Water containing tenside /Isopropyl alcohol
Foodstuffs	Water containing tenside
Fuels	Water containing tenside

- Before using other method for cleaning or decontamination, the user must ascertain with the manufacturer that this method will not harm the instrument. Wear the proper protective gloves during cleaning of the instrument.

9. Associated standards and regulations

Construction in accordance with the following safety standards:
EN 61010-1
UL 3101-1
CAN/CSA C22.2(1010-1)
EN 61010-2-10
Construction in accordance with the following EMC standards:
EN 61326-1
Associated EU guidelines:
EMC-guidelines: 89/336/EWG
Instrument guidelines: 73/023/EWG

10. Specifications

	Thermo Mix		Thermo Control	
Functions	Heating &cooling& mixing	Heating & mixing	Heating & cooling	Heating
Temp. range	15℃ below room temp.~100℃	room temp.+5℃~ 100℃	25℃ below room temp.~ 110℃	25℃ below room temp.~ 100℃
Temp. setting range[℃]	0-100℃	15-100℃	-5-110℃	15-110℃
Control accuracy [℃ @20-45℃]	±0.5	±0.5	±0.5	±0.5
Uniformity [℃@20-45℃]	Max ±0.5	Max ±0.5	Max ±0.5	Max ±0.5
Max heating rate[℃/s]	5.5	5.5	5.5	5.5

Max cooling rate[℃/s]	5（100℃- Room temp.） 0.5（ Below room temp.）	-	5（110℃- Room temp.） 0.5（Below room temp.）	
Speed range [rpm]	200-1500	200-1500	-	-
Mixing diameter[mm]	3	3	-	-
LCD display	LCD	LCD	LCD	LCD
Program	6 stages, 9 programs			
Voltage	100-240V	100-240V	100-240V	100-240V
Frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz
Power	200W	200W	200W	200W