

# TBI Biochemical Incubator

## Instruction



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Thanks for purchasing the equipment, please carefully read the manual before operating.

## I. Precautions

1. Handle with care. The angle between the instrument and the ground shall not be less than 45°.

2.  Please do not put inflammable, explosive or toxic, strong acid and strong alkali articles in the working chamber of the instrument!

3. When lighting is not needed in the chamber, please turn off the light, to avoid affecting the temperature of the upper layer. Turn off the power supply before changing the light tube.

4. There is a water outlet pipe behind the equipment. When the inside temperature is low, a small amount of water will be discharged. Please use a pipe to connect to the container or sewer.

5. If set temperature is lower than the room temperature, the over temperature alarm will be generated when the door opened too long, which is not a fault.

6.  When change the fuse tube, please cut off the power supply and replace with the same model and specification.

7.  Fans are installed in the operation room. Don't put fingers or any objects into the cover. Please cut off the power supply before maintenance.

8. Do not use acid or alkali and other corrosive articles to wipe the surface. The inside chamber can be cleaned regularly with dry cloth.

9. Please turn off the power switch when stop using.

## II: Application

It's widely used for drying, baking, melting wax and sterilization in factories, mines, universities, scientific research and laboratories.

### III. Technical Specifications

| Model                  | TBI-80                    | TBI-150   | TBI-200   | TBI-250   | TBI-300   | TBI-400   |
|------------------------|---------------------------|-----------|-----------|-----------|-----------|-----------|
| Chamber Volume         | 80L                       | 150L      | 200L      | 250L      | 300L      | 400L      |
| Temperature Range      | 0~60 °C                   |           |           |           |           |           |
| Display Resolution     | 0.1 °C                    |           |           |           |           |           |
| Temperature Stability  | ±1°C                      |           |           |           |           |           |
| Temperature Uniformity | ±1°C                      |           |           |           |           |           |
| Timing Range           | 0~9999min                 |           |           |           |           |           |
| Power Rating (W)       | 180                       | 250       | 300       | 350       | 400       | 550       |
| Refrigerant            | R134a                     |           |           |           |           |           |
| Power Supply           | 220V , 60Hz               |           |           |           |           |           |
| Continuous Operation   | Long continuous operation |           |           |           |           |           |
| Chamber Size(WxDxH)cm  | 40x37x55                  | 45x42x85  | 45x45x100 | 48x49x107 | 52x50x117 | 58x54x127 |
| Exterior Size(WxDxH)cm | 54x57x107                 | 59x62x137 | 59x64x152 | 62x68x159 | 66x69x169 | 72x74x179 |
| Package Size (WxDxH)cm | 70x73x126                 | 75x78x156 | 75x80x171 | 78x84x178 | 82x85x188 | 88x90x198 |
| Net/Gross Weight(kg)   | 50/85                     | 90/120    | 95/138    | 103/147   | 115/157   | 135/170   |

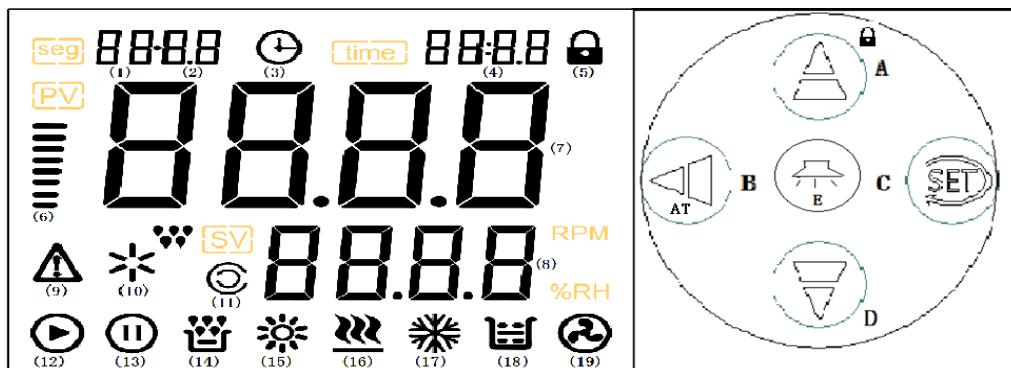
**Note:**Performance parameters are tested under non-load conditions: ambient temperature is 20°C, relative humidity is 50% RH.

### IV. Installation requirements

- 1) The instrument should be placed in a constant temperature environment, and the recommended temperature difference is  $23 \pm 5$  °C;
- 2) The distance between the equipment and the wall must be more than 10cm and the button operation position shall be reserved on the right side.
- 3) Avoid direct sunlight and keep away from heating equipment;
- 4) Place the equipment on the horizontal ground, lock the front caster to make the box flat.
- 5) Turn on the power supply and it should be grounded. The equipment shell should be grounded reliably and placed in a sheltered place from the sun, cool and ventilated.

## V. Operation instruction

Panel:



### 2) Controller instructions:

- (1) Cycles: display the number of cycles when it is a program segment;;
- (2) Program segments: display the number of segments in program mode;
- (3) Appointment time indicator: it lights when the appointment is turned on;
- (4) Time: program segment time or fixed value timing time;
- (5) Key lock;
- (6) Reminder of temperature rise or fall;
- (7) Measuring temperature;
- (8) Set temperature;
- (9) Alarm indicator: flashes when the machine is shut down or abnormal;
- (10) Standby;
- (11) Spare lights;
- (12) Fan running indicator: it lights up when it starts running;
- (13) Stop indicator: it turns on when the machine stops;
- (14) Standby;
- (15) Ultraviolet or illuminating lamp indicator: always on for illumination, flashing for UV disinfection;
- (16) Heating indicator light: on when heated;
- (17) The refrigeration indicator: lights when there is refrigeration output and flashes when refrigeration is delayed;
- (18) Standby;
- (19) Fan indicator light: lights up when the fan is working; °C symbol: lights up when the temperature unit is Celsius, °F symbol: lights up when it is Fahrenheit;

### 3) Keyboard operation instructions

A: Key  $\Delta$ : modify the parameter value; (long press for 5S to modify the existing running time, with program has this function). Tap Lock or Unlock.

B: Shift key: Shift modification of parameter value, long press to start/stop temperature auto-tuning, click to query ambient temperature.

C: SET key: Enter parameter setting, long press for 5 seconds to enter LK or exit

parameter setting.

D: Key v: Modify the parameter value, long press for 5 seconds to enter manual UV disinfection.

E: Illumination key: Press to start or stop the illumination.

### Temperature and timing set

The SV row displays setting temp. PV row shows real time temp. Press set key, the value in SV area is flashing, press left, up and down key to modify to required temp. Press set key again, time area "0000" is flashing, modify to required timing, the time unit is minute, max timing is 9999 minutes, after finishing setting, press set again to exit and the instrument will start to work as setting. If need the instrument work all the time, pls don't set timing and keep as "0000".

### Parameter specifications:

1. In the standard state, long press the SET button, the upper row on screen displays LK, adjust LK=8, press the SET button to enter setting

| Symbol | Item                    | Value  | Description  | Factory set value |
|--------|-------------------------|--------|--|-------------------|
| KS     | Power on/Start          | 0~2    | 0: Stop state when power is on 1: Run from the first stage when power is on; 2: Run from the place where the power was last cut off after power on.  | 0                 |
| md     | Program mode            | 0~1    | 0: Customized control; 1: Multi-segment programming control.   | 0                 |
| tn     | Timing method           | 0~1    | 0:Start running timer, 1:when temperature stable start timing (only fixed value)   | 1                 |
| Hn     | Timing Unit             | 0~1    | 0:minutes, 1:hour  | 0                 |
| Fn     | High and low fan switch | 0~100  | Start the low-speed fan when the temperature is between the( set value + Fn) and (the set value-Fn); start the high-speed fan when the temperature is outside (the set value + Fn) to (the set value-Fn)     | 1                 |
| Ly     | Lighting delay          | 0~9999 | The lighting lamp is turned on, it will automatically turn off when the delay time is not 0. when "Delay time is 0 ", the delay is invalid, the lighting must be turned off manually.                        | 0~9999M/h (0)     |
| srt    | Disinfection delay      | 0~9999 | The disinfection lamp is turned on, when the delay time is not 0, it will automatically turn off when the time is up. When delay time is 0 , the delay is invalid, the lighting must be turned off manually. | 0~9999M/h (0)     |

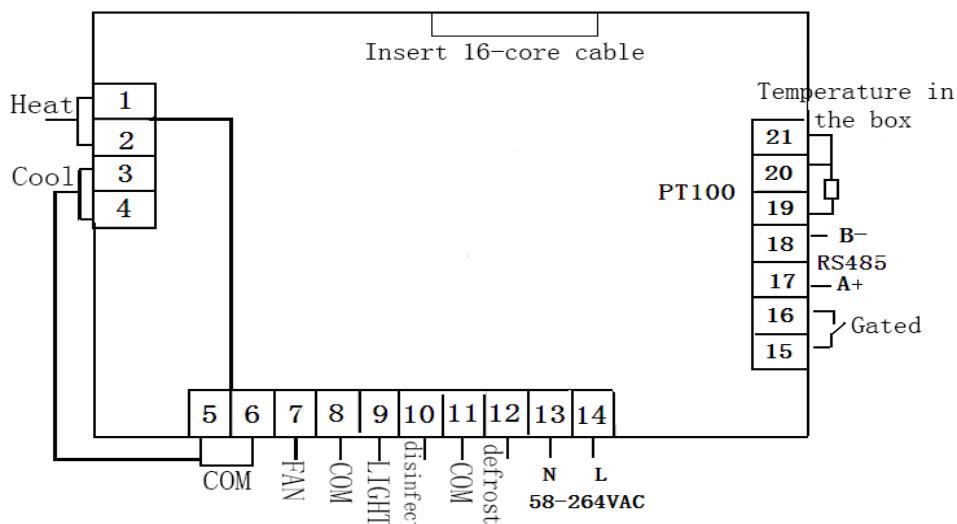
|     |  |        |  |   |
|-----|--|--------|--|---|
| mon | Scheduled boot time setting/<br>scheduled boot month setting | 0~9999 | Function one; the meter without Beijing time will automatically turn on after mon minutes;<br>Function two; the instrument with Beijing time, when Beijing time reaches the set time (day, Hr, mTn) here, it will be turned on, when Mon is greater than 12 ,the same as function one. | 0 |
|-----|--|--------|--|---|

2. Temperature parameter setting: In the standard state, long press the SET button, the upper row on screen displays LK, adjust LK=3, press the SET button to enter the temperature setting.

| Symbol | Item                                    | Value                 | Description  | Factory set value |
|--------|---|-----------------------|--|-------------------|
| AL     | Setting value for lower deviation alarm | -50.~100.0°C          | 0 means no alarm, 1 means lower deviation alarm. When the temperature is less than (temperature set value-AL) °C, the refrigeration will be turned off. The abnormal indicator lights up and the buzzer sounds.  | 6.0°C             |
| AH     | Setting value for upper deviation alarm | -50.~100.0°C          | Upper deviation alarm, when the temperature exceeds (temperature set value + AL) °C, turn off the heating. When the temperature is lower than (temperature setting value-AL) °C, turn off the refrigeration. The abnormal indicator light is on and the buzzer sounds. | 6.0°C             |
| AP     | Max. Protection temp                    | Max.measurement temp. | When the temp. exceeds AP, the heating will be cut off. When the temp. exceeds the AP parameter for 2 minutes, the buzzer keeps beeping and all outputs are turned off. It must be powered off to recover.   | 120.0°C           |
| P      | Heating proportional band               | 1.0~60.0°C            | Proportional adjustment, the smaller the Pu, the faster the response speed.  | 6.5°C             |
| I      | Heating integration time                | 1~3600S               | Integral action time constant, the smaller the Iu, the stronger the ability to correct the static error.   | 240               |
| d      | Heating differential time               | 0~3600S               | Differential action time constant, the larger the du, the stronger the ability to prevent over-temperature.  | 180               |
| Ar     | Heating overshoot suppression           | 0~100%                | Used to suppress temperature overshoot.  | 80%               |
| t      | Heating control cycle                   | 1~99S                 | Control heating output cycle   | 5S                |
| ct     | Compressor protection delay             | (0~9999)S             | Compressor delay protection time, the two start-up time is $\geq$ CT seconds; Note that when Ct=0, there is no refrigeration function.   | 120S              |

|    |  |             |  |       |
|----|--|-------------|--|-------|
| CL | Turn off refrigeration                 | (0~10.0) °C | In the switching mode, the measured temp. <(set temperature + CL), turns off the refrigeration. Used to initialize parameters. Note: when CL=0, manual mode is valid.  | 0     |
| CH | Turn on refrigeration                  | (0~10.0) °C | In the switching mode, the measured temp.> (set temp. + CH) ,turns on the refrigeration. Used to initialize parameters. Note: Manual mode is valid when CH=0   | 0     |
| pb | Zero adjustment of temperature         | (-199~999)  | Correction around zero degrees, can be used to correct the error generated during the temp. sensor measurement. PB=Mercury thermometer reading value-current measurement value.  | 0     |
| pk | Full adjustment of temperature (Slope) | (-19~2000)  | In the vicinity of the set temperature, when there is a deviation in the temperature, the value can be adjusted $Pk=4000 \times [\text{mercury reading value-current measurement value}] \div \text{current measurement value.}$ | 0     |
| cb | Ambient temperature correction         | -60.~100.0  | cb = actual ambient temp.-currently measured ambient temp.   | 0     |
| rl | Temp. lower limit setting              | -60.~100.0  | The lower limit of set measurement temperature   | -40.0 |
| rh | Temp.upper limit setting               | -60.~100.0  | The upper limit of set measurement temperature   | 100.0 |

## VI: Wiring diagram



## VII:Malfunction handling

| Problems                              | Causes                               | Solution                          |
|---------------------------------------|--------------------------------------|-----------------------------------|
| No power supply                       | Socket without power                 | Change socket                     |
|                                       | Not plugged or wire broken           | Plug well or connect wire well    |
|                                       | Fuse is open                         | Change fuse                       |
|                                       | Power switch not on                  | Switch on.                        |
| The temperature does not rise or fall | Setting temperature is wrong         | Adjust setting temperature        |
|                                       | The temperature controller is broken | Change the temperature controller |
|                                       | The cable is loose                   | Tighten the cable.                |
|                                       | Timing setting is incorrect          | Reset or cancel timing            |
| Big deviation of temperature          | Temperature sensor is broken         | Change temperature sensor         |
|                                       | Fan is broken                        | Change the fan                    |
|                                       | The meter is not corrected           | Correct the meter                 |

**Note:** Maintenance operations shall be carried out by qualified personnel. Please turn off the power supply before repairing.

## VIII. Transportation and storage

- 1) Handle with care. Do not transport upside down.
- 2) Store the instrument in a room with relative humidity no more than 80%, no corrosive gas and good ventilation.

## IX:After-sales service

The warranty for the drying oven is 24 months from delivery (except for the heating elements). If damaged due to non-human factors or can not work normally during warranty period, our company is responsible for free repair or replacement of product parts. Beyond the warranty, we try our best to provide convenience for users.

## X: Packing List

| Item | Name                  | Category    | Qty.   | Remark |
|------|-----------------------|-------------|--------|--------|
| 1    | Biochemical incubator | Machine     | 1 Set  |        |
| 2    | User Manual           | Document    | 1 Copy |        |
| 3    | Fuse                  | Spare parts | 1pc    |        |
| 4    | This packing list     | Document    | 1 pc   |        |

We reserve the right to change the data in the manual without prior notice. The company has the final interpretation right.