

# Operation Manual



**BSTH-101**

## Thermo Shaker Incubator

Thank you for Choosing Biolab products. Please read the "Operating Instructions" and "Warranty" before operating this unit to assure proper operation.

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## Foreword

Thank you for purchasing Thermo Shaker Incubator. This Manual for users contains function and operation of the Instrument. In order to use the instrument properly, please read this manual carefully before operating the Instrument.

### Opening Check

Please check the instrument and appendix with the packing list when you first open the packing case. If you find there is something wrong with the instrument or the appendix, please contact the vendor or the producer.

# Safety Warnings and Guidelines

## 1. Important operation information of the security

Before operation, please have a perfect conception of how to use the Instrument. Read this manual carefully before using it.



Operation before reading the Manual is forbidden. Read the guidelines and directions below and carry out the countermeasure according to them.

## 2. Security

The operation, maintenance and repair of the Instrument should comply with the basic guidelines and the remarked warning below. Otherwise, it will affect the scheduled using life of the Instrument and the protection provided.



This product is a normal and an indoor Instrument which conforms to Standard B style- I type.



Before operation, read the manual carefully. These units are designed for using in the laboratory environments by who are knowledgeable in safe laboratory practices.



The operator should not open or repair the Instrument by himself, which will result in losing the qualification of repair guarantee or occur accident. If there is some wrong with the Instrument, the company will repair it.



A.C. power's grounding should be reliable to safeguard against an electric shock. The 3-pin plug supplied with thermo-shaker's power cable is a safety device that should be matched with a suitable grounded socket.



Before power on, guarantee the voltage used should be accordant to the voltage needed, and the rated load of electrical outlet should not lower than the demand. If the electric line is damaged, you should replace it with the same type. You should assure there's nothing on the electric line and you should not put the electric line in the ambulatory place. Hold the jack when you pull out the electric line, and don't pull the electric line.



Power off when you finish your work. Pull off the connector plug when there's long time no use of the Instrument and cover it with a cloth or plastic paper to prevent from dust.

Pull the connector plug from the jack immediately in the following

cases, and contact the vendor:



- There is some liquid flowing into the Instrument.
- Drenched or fire burned.
- Abnormal operation such as abnormal sound or smell.
- Instrument dropping or outer shell damaged.
- The function has obviously changed.

### **3. The maintenance of Instrument**

The platform and clamp should be cleaned by the cloth stained with a little alcohol. If there are stains on the Instrument, clean them by soft cloth stained with cleaning cream.

### **4. After Sale Service Commitment**

#### **A) Content of warranty**

The company will be responsible for replacement due to fault caused by the materials and manufacturing from the date of delivery within 1 month. The company will provide free warranty due to fault caused by the materials and manufacturing from the date of delivery within 12 months. In the warranty period, the company will provide free repair service or replacement for those machines which are proved as defective apparatus selectively.

#### **B) Scope of Warranty**

Improper use or use under unmoral condition, damage caused by repair or modify without authority etc. do not belong to the scope of warranty.

Out of Warranty period, charge the cost of fees appropriately.

# 01 Introduction

The Thermo Shaker Incubator allows aqueous solutions and suspensions to be effective in a wide range of micro test tubes or plates. The Thermo Shaker Incubator supports from 0.2 ml PCR tubes to 2.0 ml micro test tubes as well as PCR plates, MTP and DWP up to 384 wells plates.

## Features

- 2D Mix-Control
- Optimized mixing
- Anti-spill technology
- 3-in-1 format allows great flexibility
- Preprogrammed soft keys
- Reliable universal holder
- LED display, easy to set-up and use.
- Extremely quiet operation (<50 dB(A))
- Integrated vortex function

## 02 Specifications

### 1. The normal operating condition:

Ambient Temperature: 4°C~45°C

The Relative Humidity: ≤70%

Power Supply: 24VDC 2.0 A

### 2. The basic parameters and function

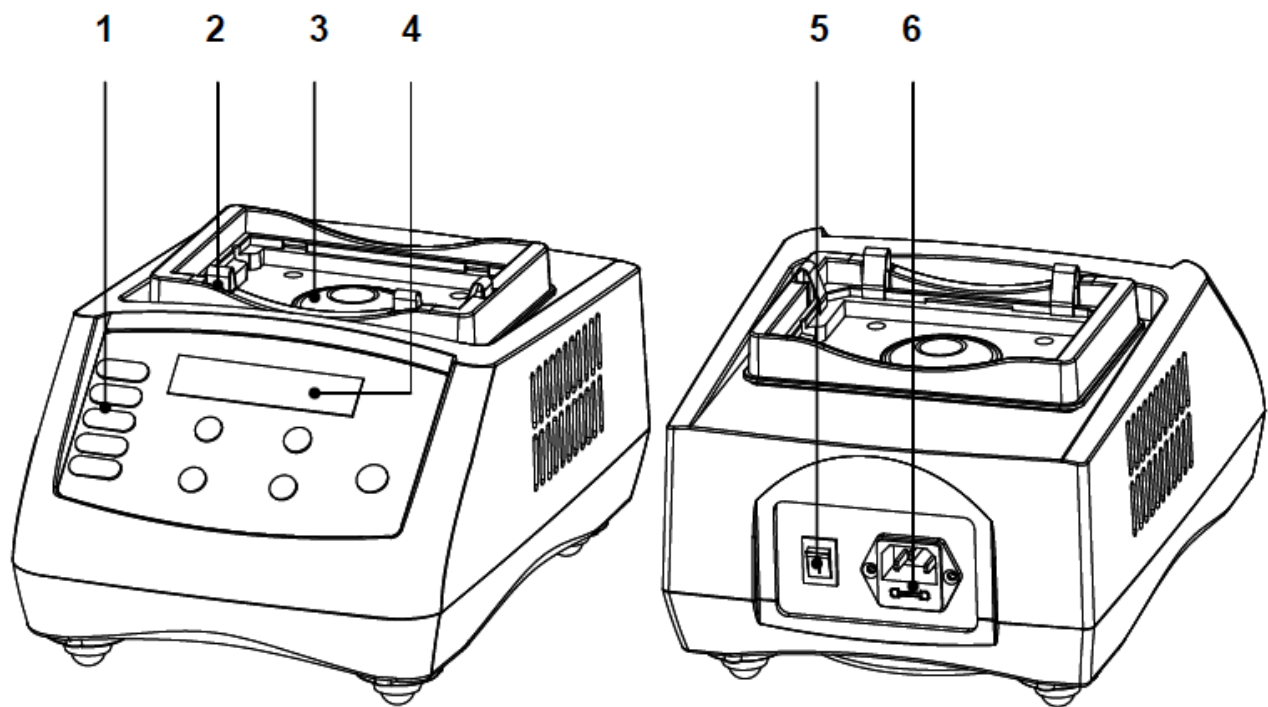
Mixing Frequency	300 ~3000rpm (10rpm increment)
Touch Vortexing Frequency	3500rpm
Adjustable Mixing Time	1s ~99h59min
Mixing and Vortexing Radius	1.5mm (3mm mixing stroke)
Noise Level	<50 db
Power Consumption	40W
Weight	4.3 Kg
Dimension (LxWxH)	270 x 196 x 170 mm



## 03 Preparations

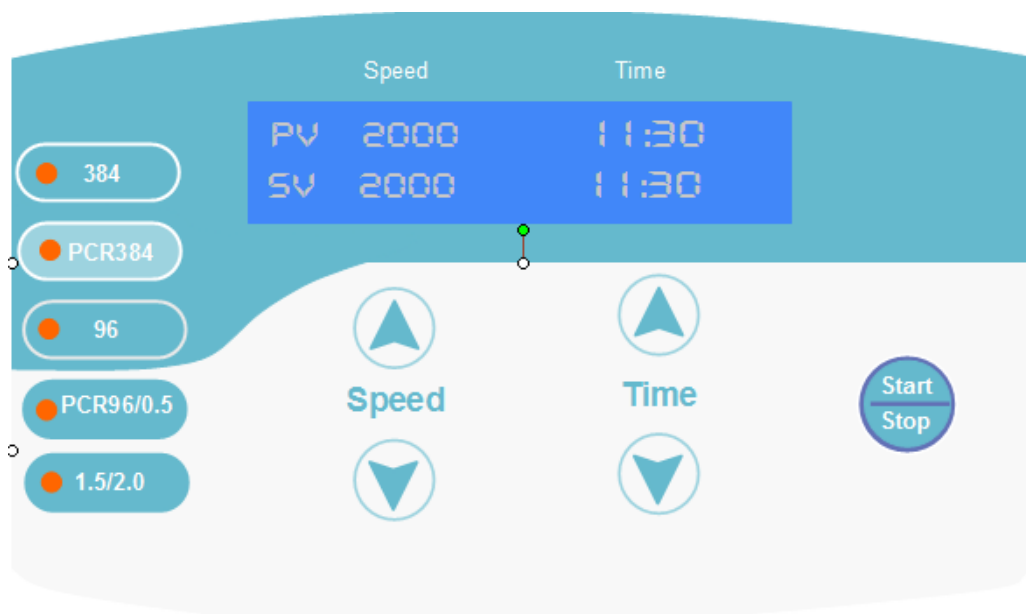
This chapter introduces the instrument mechanical structure, the central panel functions and some preparations before operation. You should be familiar with this chapter before first operating it

### 1. Structure Description



- 1) Soft keys: For selecting preset mixing parameters
- 2) Plate holder: To hold skirted PCR plates, MTP and DWP as well as tube holders
- 3) Vortexing mat: For direct vortexing of various tubes
- 4) LED display: Display mixing frequency and mixing time.
- 5) Mains power switch: Switch for switching the device on and off. "I" is off, "O" is on.
- 6) Power input socket: 90 ~240VAC

## 2. Keyboard and Display panel



Start/stop mixing run



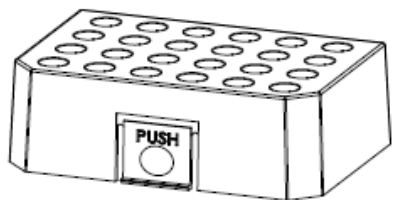
Increasing key for speed and time, it can setup speed and time



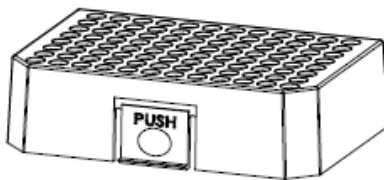
Decreasing key for speed and time, it can setup speed and time

Softkey	Speed(rpm)	Time(S)	Tube/Plate	fill level(%)
384	2000	15	MTP and DWP (384 well)	10-60
PCR_384	2600	15	PCR Plate (384 well)	10-50
96	1000	30	MTP(96 well)	5-60
PCR96/0.5	1650	30	PCR tubes(0.2ml) and micro test tubes (0.5ml)	5-50
1.5/2.0	1400	60	micro test tubes (1.5/2.0ml)	5-80

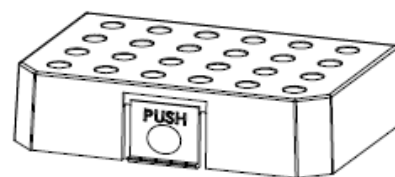
### 3. Optional tube holder for the Mix Smart



1



2



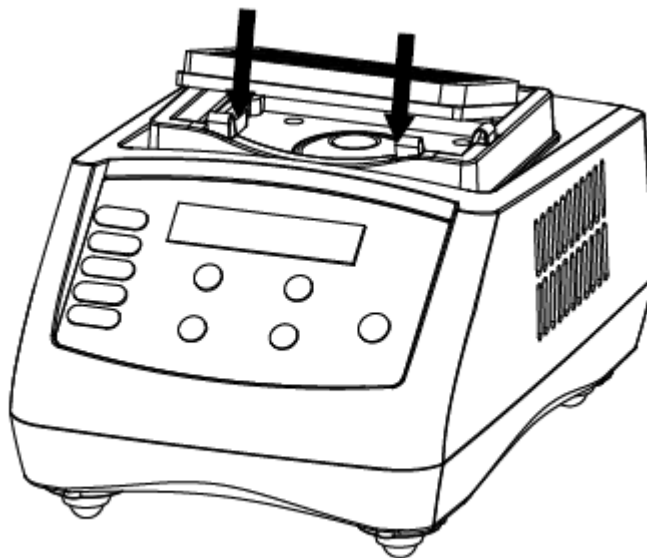
3

1. 1.5/2.0ml tube holder: for max. 24 micro test tubes (1.5 and 2.0ml)
2. PCR 96 tube holder: For one PCR plate (96-well, semi-skirted or un-skirted) or a max. of 96 micro test tubes (0.2ml)
3. 0.5ml tube holder: For max. 24 micro test tubes (0.5ml)

#### 4. Insert plates and tubes

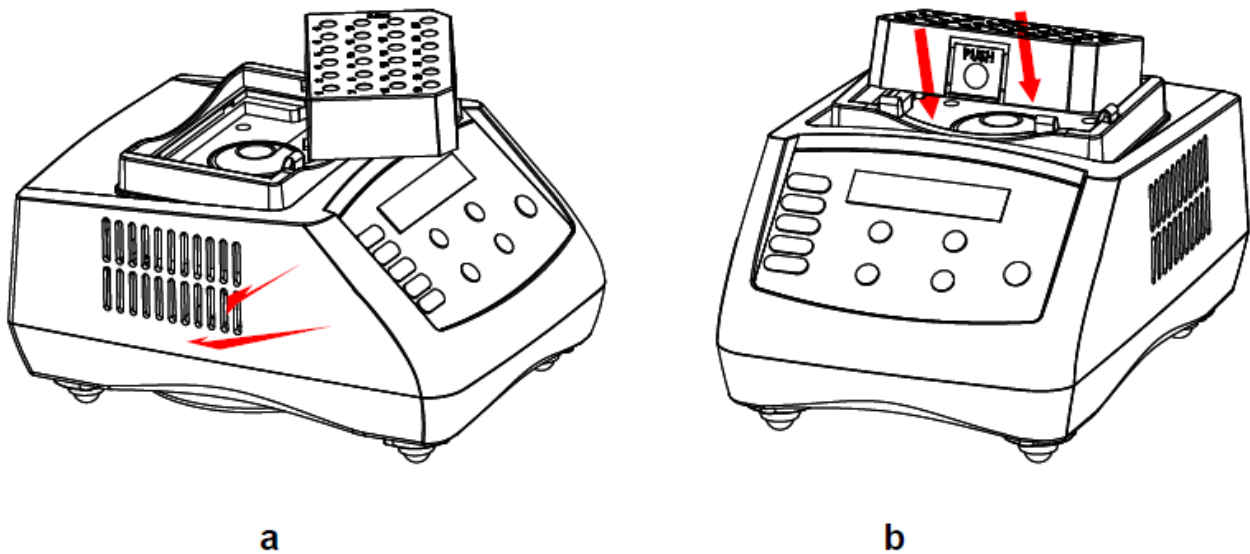
##### 4.1 Insert plate in the plate holder

- a) Place the plate up against the back of the plate holder firstly.
- b) Then press the plate into the plate holder. In doing so, ensure that it is properly engaged.



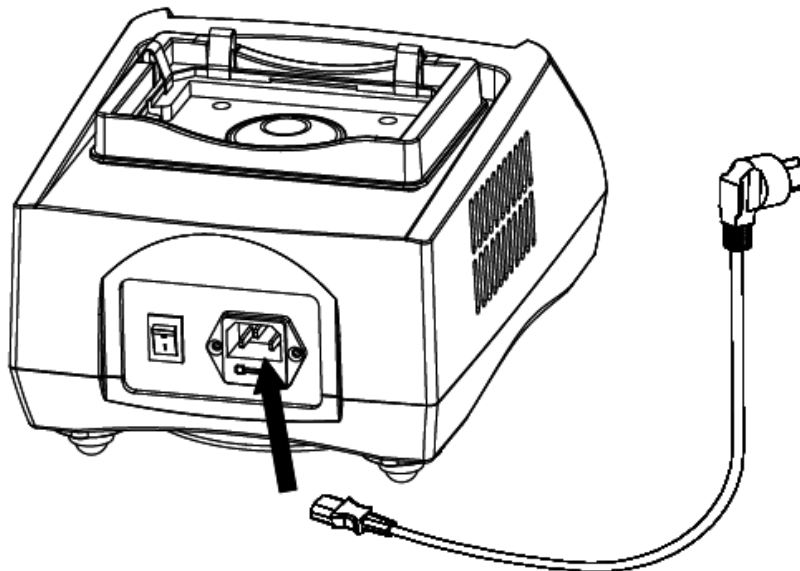
##### 4.2 Insert the tube holder in the plate holder

- a) Hold the tube holder up against the back edge of the plate holder so that the engaging lugs fit in the holes. (See fig. a)
- b) Engage the tube holder by pressing gently on the front. (See fig. b)



## 5. Power connection

Place the instrument on a horizontal and steady work surface. Make sure the air slots on the underside of the instrument are not blocked. Connect the device to the mains power supply via the mains power socket using the mains cable supplied. The external power supply unit (power adapter AC100-240V) ensures the external safety of the unit.





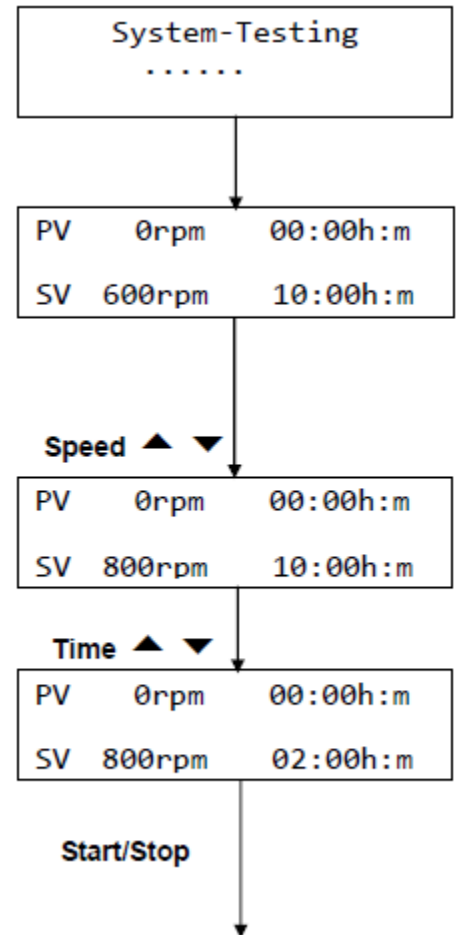
# 04 Operation Guide

## 1. Speed and time setting

a) When the instrument powers on, display screen will show " .... ". one by one. The instrument goes into the initial state with the sound of "du..."

b) After about 2s later, time display window shows 10: 00 as the set timing time. It means that the timing time is 10 hours. The speed display window shows 600. It means the set shaking speed is 600rpm.

c) Press the key  or  below speed, tens digits of set value will increase or decrease, and also increase or decrease in hundred digits and thousand digits. For instance, press the key and hold on for 2s, the digits will be moved from tens to hundreds, increasing the alteration range. If you press the key for 2s again, the digits will be moved from hundreds to thousands quickly. In this way, the speed and time are set. Press the key "stop/start", the device will run the present setting.



## 2. Touch-Vortex mode with 3500rpm

Hold the tube to touch the depression in the vortexing mat to start vortexing mode.

Remove the load from the vortexing mat to end the Touch-Vortex mode.

### 3. Key combination

a) **Time unit switch mode:** Press  $\triangle$  key and  $\nabla$  key below time simultaneously to switch time unit from h/m to m/s, flicks three times, then save automatically. The way to switch from m/s to h/m is the same to above.

PV 0rpm	00:00h:m
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SV 800rpm	02:00h:m
-----------	----------

PV 0rpm	00:00m:s
---------	----------

SV 800rpm	02:00m:s
-----------	----------

**Notice:** During running the device, Touch-Vortex, Shortcut Keys and Key combination all can not be opened.

# 05 Failure Analysis and Handling

## Failure analysis and processing procedures

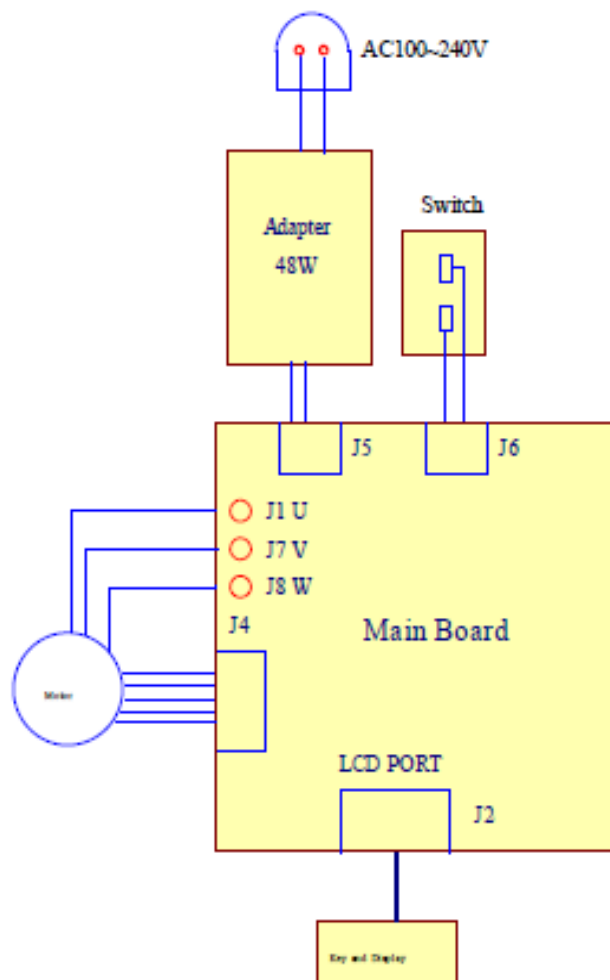
No.	Phenomenon	Cause	Remedy
1	Display window doesn't response after power on	Power supply interrupted	Check the mains connection and the power supply to the lab
2	Shaking too heavily	Mixing load is too heavy for the selected mixing frequency.	Reduce the mixing frequency or the weight of the mixing load
		Mixing load not properly positioned in the plate holder	Check that the mixing load is fixed in position.
		Continuous vortexing at frequencies >2000rpm.	Reduce the continuous vortexing frequency to $\leq 2000$ rpm.
3	The actual speed is different from the displayed speed	Broken sensor or loose contact of the module	Contact the seller
4	"ERR" in the display	Shaking speed is out of control	Contact the seller
5	Press invalid	Knob failure	Contact the seller



## Annex 1

### Wiring Diagram of Thermo Shaker Incubator BSTH-101

(Below diagram is just for reference. It is subject to change without prior notice.)









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