

INCU-MIXER™ MP

HEATED MICROPLATE VORTEXER

Operation Manual

H6000 Series



Benchmark
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Foreword

Thank you for purchasing Benchmark Scientific's Incu-Mixer MP. This user manual contains all pertinent information concerning the function and operation of the instrument. In order to use the instrument properly, please read this manual carefully before operation. Please keep for later reference

Unpacking and Pre-Installation

Please check the instrument and appendix against the packing list upon receipt. If you find there is something wrong or missing, please contact Benchmark Scientific immediately.

Safety Warnings and Guidelines

1. Important information regarding operation:

Please read and understand this manual completely prior to operation.



Do not use the instrument without reading this instruction manual. Read the guidelines and directions below and use the instrument accordingly.

2. Security:

The operation, maintenance and repair of the Instrument should comply with the basic guidelines and warnings listed below. Noncompliance may result in damage to the product and/or bodily harm to the user.



This product a 115V electrical instrument suitable for indoor use.



Read the manual carefully before operation. Only trained electricians should configure internal wiring.



The operator should not open or repair the instrument. This may void any warranty, written or promised. In the event of product failure, please contact Benchmark Scientific.



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



During normal operation, the temperature of the heating block will be very high, and will cause injury. Please avoid personal contact with the heat block while it is on.



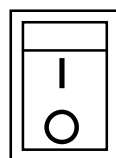
Close all tube lids before placing the tubes into the block. Heated liquids may escape their vessels. Spilled liquids may cause internal damage to the instrument.



Before powering on, please confirm that the electrical output of the instrument matches the outlet. If the electric line is damaged, you should replace it with an identical line. Please be sure there is nothing on the electrical line and avoid placing the line in a pedestrian thoroughfare. Hold the jack when you pull out the electric line; do not pull the cord itself



The Instrument should be placed in a cool, dust free environment, away from direct sunlight. In addition, the environment should have good ventilation, lack corrosive gases or strong disturbing magnetic field, and be located far away from any central heat source. Do not place instrument where it may be subjected to moisture. The vent on the Instrument is designed for ventilation. Do not cover the vent, or the instrument may over heat. Please be sure to leave at least 100cm between the instrument and other instrument or wall.



Main power switch is on the rear of the device. Push "I" to power on the device, and push "O" to power off the device.



Power off when you finish your work. Disconnect the power supply and cover the instrument with a cloth when not in used for extended periods of time.



Pull the plug from the jack immediately and contact the vendor if the following occurs:

- **There is liquid flowing into the Instrument;**
- **Subjected to liquid or fire damage.**
- **Abnormal operation: such as abnormal sound or smell.**
- **Instrument drop or outer shell damage.**
- **Any other change to normal operation.**

3. Instrument Maintenance

The heating plate should be cleaned on a regular basis with a soft cloth and alcohol to prevent variance in heat translation. Contamination on the plate may cause abnormal smell, smoke, and poor heat transfer.



Power off when cleaning the Instrument.

When cleaning the heating plate, do not douse or submerge in liquid. Corrosive cleaning solution may damage the instrument..

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Chapter 1 Introduction

The Incu-Mixer for micro plates is designed to shake and heat 2 or 4 standard, 96-well micro plates.

Features of this product are as follows:

- 1) Microprocessor controlled time, speed and temperature
- 2) Simultaneous display of set and actual time, temperature and shaking speed
- 3) Audio signal and cessation of shaking motion after program completion
- 4) Heating platform for standard micro test plate
- 5) Soft start, easy to setup and use

Chapter 2 Specifications

1. Normal operating condition:

Ambient temperature: 5°C ~30°C

Relative humidity: ≤70%

Power supply: AC115V 50-60Hz

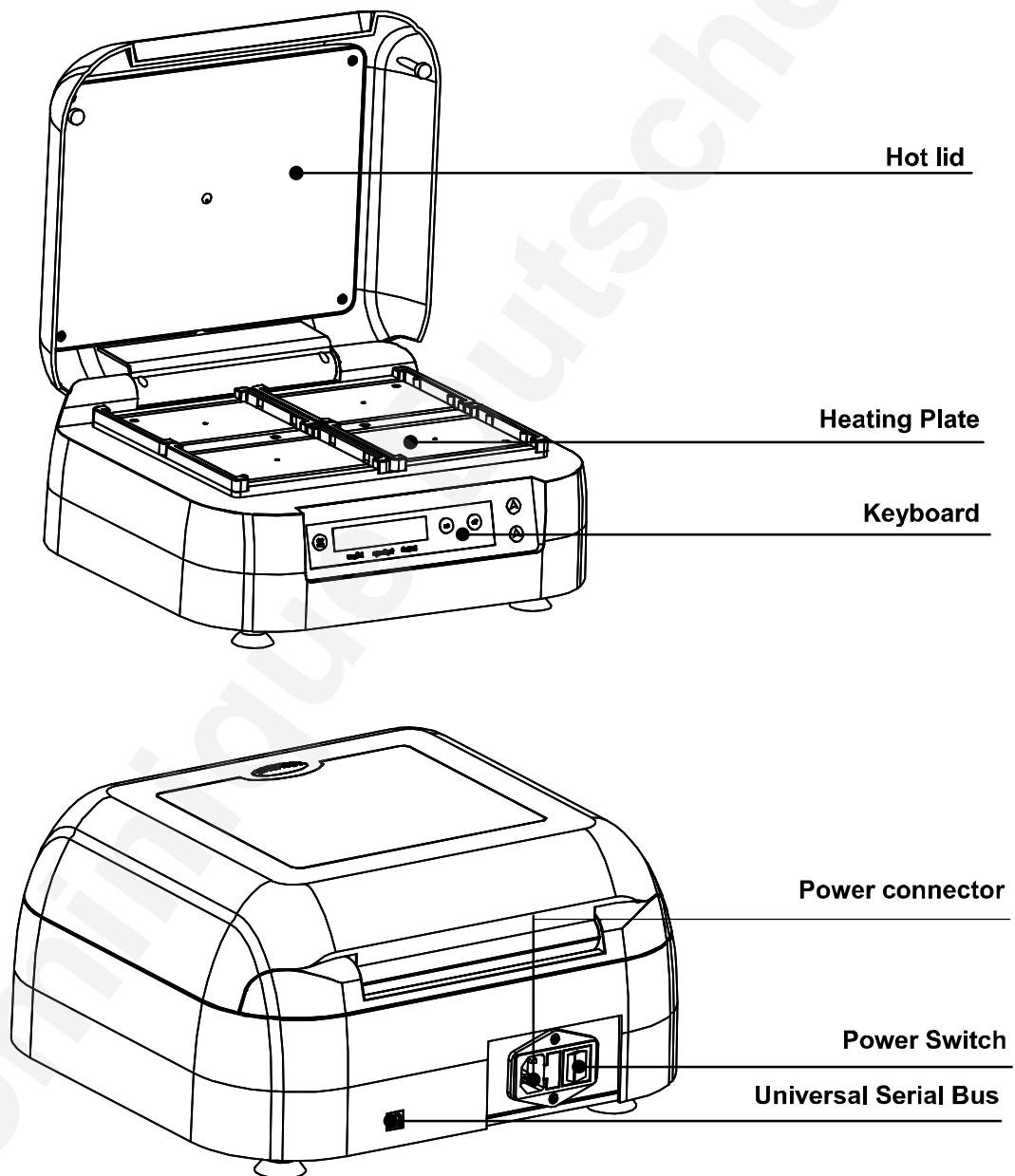
2. The basic parameters and performance

Model Parameter	Incu-Mixer
Mixing rate	100~1500 rpm
Orbit	2mm
Temperature range	RT+5°C~70°C
Timing range	1min ~ 99h59min
Accuracy of the temperature	≤0.5°C
Heating time	≤25min (From room temperature to 70°C)
Standard Block	2 or 4 micro test plates
Dimension (mm)	350(D)×320(W)×185(H)
Net weight (kg)	9.0

Chapter 3 Preparation

This chapter introduces the Incu-Mixer's mechanical structure, the keyboard and key function, as well as preparations to make before power-on. You should be fully familiar with this chapter before the Incu-Mixer is first operated.

1. Structure Description



2. Keyboard and Display panel



Display Panel:

	Current temperature	Current speed	Remnant time
P:	60.1	1501	10:30
S:	60.0	1500	15:00
	Setting temperature	Setting speed	Setting time

3. Key Functions

OFF Stop temperature, speed or time function

SET Setting key, used together with “▲” and “▼” to set the temperature , speed and time

STOP/START Stop/start key. Press this key to stop or start the procedure. Press momentarily to start, Pressing continuously to stop.



Increase key for temperature, speed or time



Decrease key for temperature, speed or time

Chapter 4 Operation Guide

1. Temperature, speed and time set

a) The LCD will display the message to the right when the instrument powers on. Initialization will be indicated by an audio signal.

b) About 6s later, P line will display: 25.5 is the heating block's current temperature; 0 is the current speed; 00:00 is the current remnant time. S line will display: 37.0 is the former set temperature; 1500 is the former set speed; 10:00 is the former set time.

c) Press "SET" key momentarily. Then look at the "S:" line. A cursor "_" will appear. Use ▲ or ▼ to change the digital indicator above the cursor. Press "SET" key again to save the change. (for example: shown to the right the instrument is set such that the current temperature is 25.5°C, the set temperature is 60°C; the current speed is 0 rpm, the set speed is 1000 rpm; and the set mixing time is 20h.

d) If you want to shut off temperature function, press "SET" and move the cursor "_" to the temperature column. Press "OFF" key and the temperature column will display "OFF". Function is similar for speed and time operations.

System-Testing
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P: 25.5	▼ 0	00:00
S: _37.0	1500	10:00

P: 25.5	0	00:00
S: _60.0	1000	20:00

P: 25.5	0	00:00
S: _OFF	1000	20:00

- Notes: 1) When time is set to “OFF”, the instrument functions continuously.
 2) Temperature, speed and time can not be set to “OFF” simultaneously
 3) The instrument will start to heat automatically according to the previous set temperature as soon as the instrument is powered on.

2. Run, Pause and stop functions

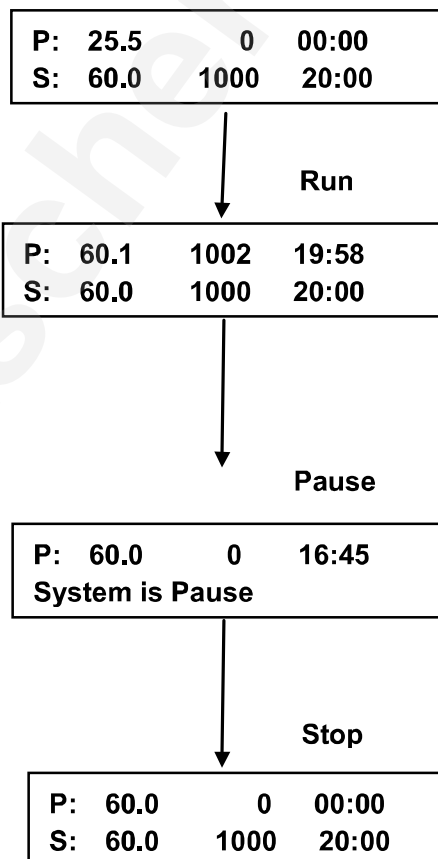
- a) Press “STOP/START” key momentarily to run.

Notes:

1. When the current temperature arrives to the set temperature, the time will start to count backward and the symbol “:” will flicker in 2s intervals.
2. When the run is over , an audio indicator will begin.

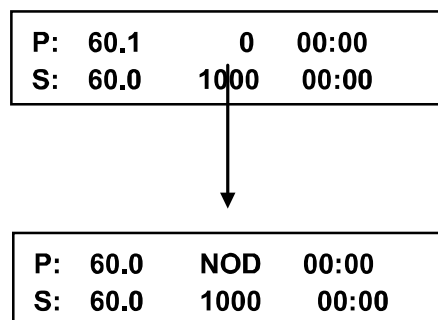
- b) Press “STOP/START” key momentarily to pause the program when it is running, press “STOP/START” again to continue the program.

- c) Press “STOP/START” for 1 second continuously to stop. The instrument will maintain temperature, the speed will display 0, the time will display 00:00.

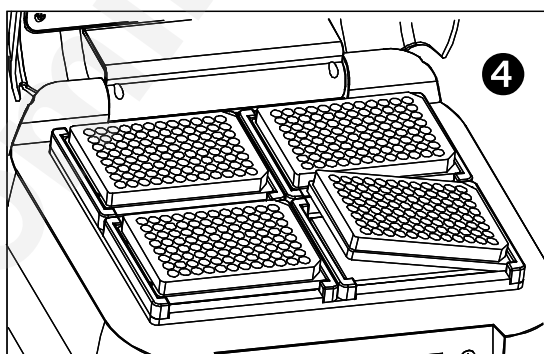
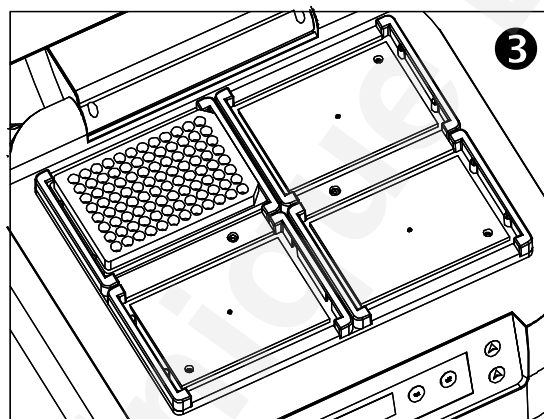
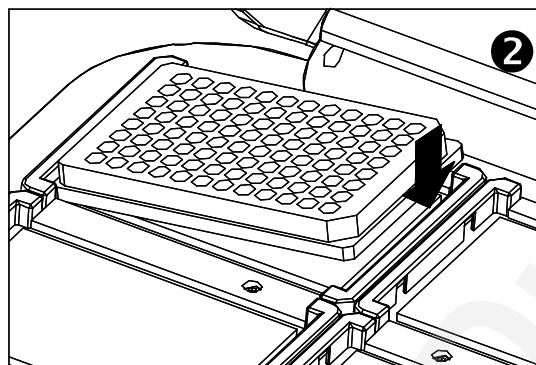
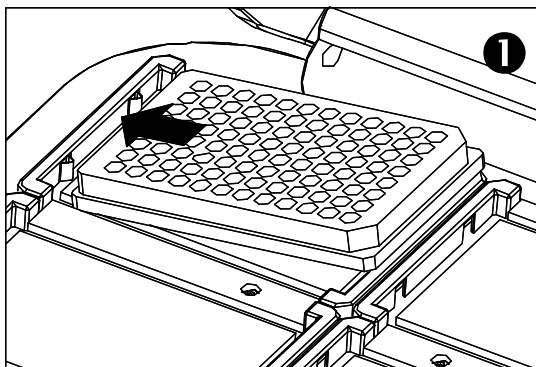


3. Instantaneous mixing functions

- a) Press “SET” key. After the “S:” the cursor “_” will appear. Press “SET” key to move the cursor, and place the cursor under the time column. Press “▼” or “▲” , to change the time to 00:00.
- b) Press “STOP/START”, the instrument will mix for 6s and then stop.



4. Installing micro test plates



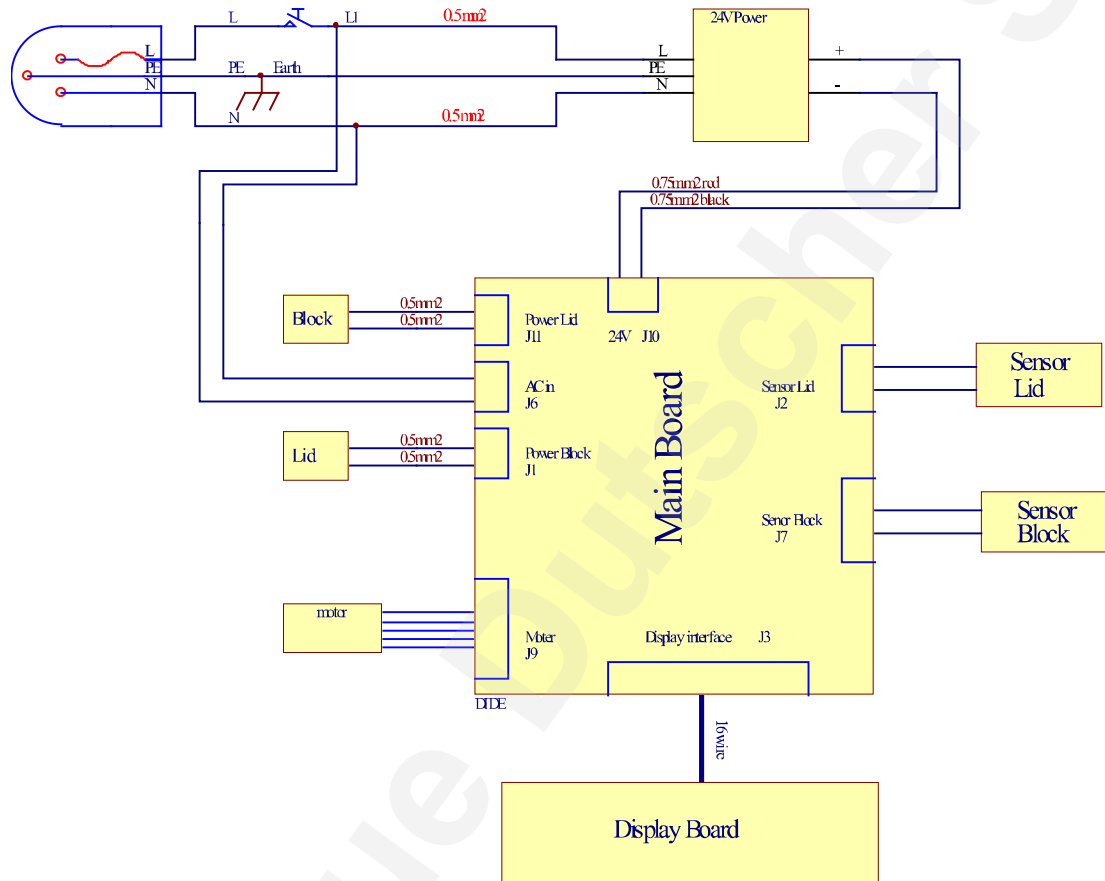
Chapter 5 Failure analysis and troubleshooting

Failure analysis and processing procedures

No.	Phenomenon	Possible Causes	Processing Procedure
1	No signal on the display when instrument is powered on.	No power	Check the power
		Broken Power Line	Repair Power Line
		Broken switch	Repair the switch
		Others	Contact Benchmark Scientific
2	The actual and displayed temperatures are quite different.	Broken sensor	Contact Benchmark Scientific
3	“OPE.1” in the temperature display with an audio alarm	Temperature sensor in the lid is disconnected	Contact Benchmark Scientific
4	“OPE.2” in the temperature display with an audio alarm	Temperature sensor in the heating plate is disconnected	Contact Benchmark Scientific
5	“SHO.1” in the temperature display with an audio alarm	Temperature sensor in the lid is shorted	Contact Benchmark Scientific
6	“SHO.2” in the temperature display with an audio alarm	Temperature sensor in the heating plate is shorted	Contact Benchmark Scientific
7	“HHH.1” in the temperature display with an audio alarm	Over temperature alarm for lid	Contact Benchmark Scientific
8	“HHH.2” in the temperature display with an audio alarm	Over temperature alarm of heating block	Contact Benchmark Scientific
9	“ERR1” in the speed display with an audi alarm	Rotor locked	Contact Benchmark Scientific
10	“ERR2” in the speed display with an audio alarm	Rotor is running, but display is “0 rpm”	Contact Benchmark Scientific
11	“ERR3” in the speed display with an audio alarm	Actual Speed over max. speed	Contact Benchmark Scientific
12	No heating of the heating block	Broken heater	Contact Benchmark Scientific
13	Press invalid	Broken film switch	Contact Benchmark Scientific

Annex 1 Wiring Diagram of Incu-Mixer MP

(This diagram is just for your reference. Subject to change without notice.)



Note



Dominique Dutcher SAS