

# ***Eppendorf Thermomixer***

## ***Instruction Manual Mode d'emploi Manual de Instrucciones Istruzioni d'impiego Bedienungsanleitung***



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# ***1 Features of the Thermomixer***

The Thermomixer incubates and mixes liquids in 1.5 ml micro test tubes (e.g. Eppendorf Safe-Lock).

Temperatures between 4 °C above room temperature and 99 °C can be maintained exactly and constantly. Mixing frequencies can be set between 300 rpm and 1400 revolutions per minute (rpm).

The Eppendorf IsoRack allows 24 micro test tubes to be transferred to the thermoblock at one time. The IsoRack is part of the IsoTherm system, which consists of:

IsoRack = work rack for 24 test tubes

IsoPack = cooling block for 0 °C and –21 °C

IsoSafe = insulating box for IsoRack and IsoPack.

(For further information, see Section 12 "Ordering Information".)

The Thermomixer and the IsoTherm System can thus be used on a laboratory worktop with micro test tubes at all commonly-required temperatures.

The robust, space-saving construction of the Thermomixer, together with its chemical-resistant plastic housing and keypad, make this Eppendorf device the ideal assistant for your everyday work routine.

## ***2 Operating Limitations and Safety Precautions***

The Thermomixer is designed for incubating and mixing aqueous solutions in sealed micro test tubes.

The Thermomixer should be handled only by experienced laboratory staff.

The Thermomixer must not be operated in a flammable environment and must not be used to mix/incubate explosive or highly reactive substances.

It can be operated in a temperature range between 4 °C to 35 °C. The technical data is valid with an ambient temperature between 15 °C and 35 °C.

When mixing and incubating toxic liquids or liquids containing pathogenic bacteria, a safe working environment (adequate ventilation, a laboratory which fulfils the necessary safety regulations) must be guaranteed.

In connection with this, please note that the lids of micro test tubes can pop open, for example, in cases of high steam pressure of the reagents, where the lid hasn't been closed correctly or the leakage seal has been damaged.

Details on handling pathogenic bacteria or biological material can be found in national and international regulations.

After transferring the device from a cooling room to a warmer room, do not use the device for approximately one hour to allow condensation to dry. Condensation may also form if the nominal temperature values are below room temperature in rooms with high humidity.

The Thermomixer is an electrical device. Do not spill large quantities of liquid onto the device.

When the device is operating at maximum speed, please remove all objects from the work surface which could fall over as a result of the vibrations.

### ***3 Contents of Package***

- 1 Thermomixer
- 1 Main power cable
- 1 IsoRack + 1 IsoPack, 1.5/2.0 ml for 0 °C (Eppendorf IsoTherm system)
- 1 Set of fuses
- 1 Instruction manual

## ***4 Installing the Device***

Place the device onto a flat, stable work surface. To ensure sufficient ventilation, a safety distance of 10 cm between the thermomixer and the wall or other devices should be observed.

Plug in the device (the electrical cable is included in the delivery package). The device is fitted with a combinational circuit component which allows the device to work with voltage values between 100 V and 240 V.

Switch on the thermomixer (the switch is located next to the electrical outlet at the rear of the device).

It is advisable to carry out a test run at maximum speed (see Sections 6.2 and 6.3) to check the stability of the device and to ensure that it does not move during mixing.

## 5 Operating Controls

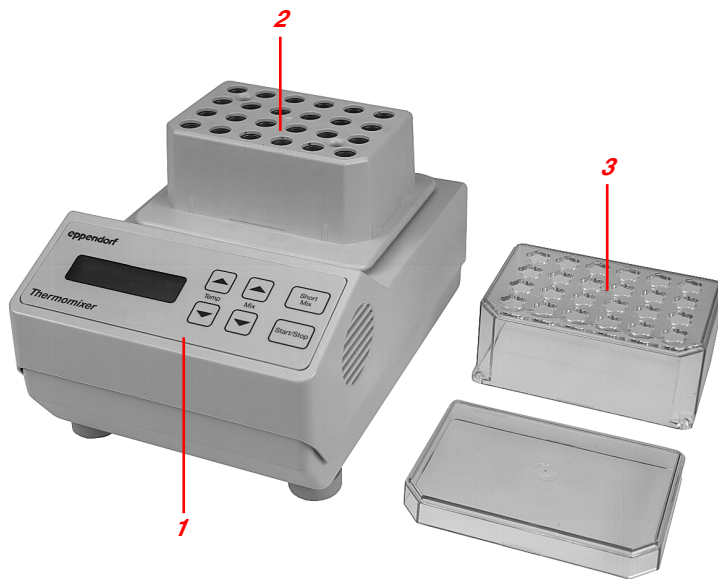


Fig. 1

- 1) Operating panel with display and keypad
- 2) Thermoblock
- 3) IsoRack with lid, for transferring micro test tubes to the thermoblock

## 6 Mode of Operation

### 6.1 Inserting micro test tubes

It is advisable to place tubes into Eppendorf IsoRacks and to transfer the rack to the thermoblock. This ensures that the temperature data does not change (see Section 10).

Using your hand or the reverse side of the lid of the IsoRack, carefully push the micro test tubes completely into the bores.

It is not necessary to attach the lid of the IsoRack.

### 6.2 Setting the temperature and mixing frequency

After the device has been switched on, the values of the last run appear in the display.

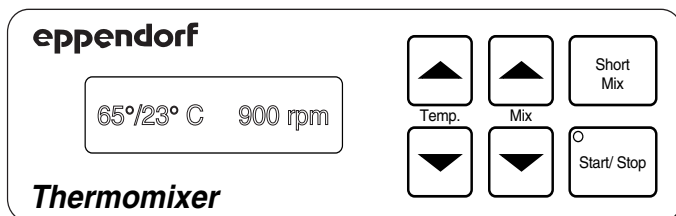


Fig. 2: Operating panel, display and keypad

The temperature and mixing frequency can be set using the cursor keys **Temp.** and **Mix**. The values can be changed in short steps by pressing the keys quickly, and scrolling is possible by holding down the keys.

The parameter values can also be changed during a run. The run then continues with the new nominal value.

**Temp.:**



The temperature can be set between 1 °C and 99 °C. Each time the key is pressed, the temperature changes by 1 °C.

The nominal temperature and the actual temperature both appear in the display until the nominal value has been attained. Thereafter only the nominal value is displayed.

The actual value in the display begins to flash as soon as the device is switched on. When incubating begins, the actual value stops flashing.

Incubating begins

- after the **Start/Stop** key or
- one of the **Temp.** cursor keys has been pressed

When using the **Temp.** cursor keys (i.e. without pressing **Start/Stop**), the thermoblock begins heating as soon as the desired temperature value has been set.

The device then functions as a **thermostat without a mixing facility**.

The lowest adjustable value is approximately 4 °C above room temperature.

The lowest programmable value is **"off °C"**. Thermostating is not possible at this setting and the device remains at room temperature. At this setting, the device functions as a **mixer without an incubating facility**.

**Mix:**



The mixing frequency can be set between 300 and 1400 revolutions per minute (rpm).

Each time the key is pressed, the mixing frequency changes by 50 rpm.

### **6.3 The routine mixing/incubating run**

After the parameter values have been entered, the mixing/incubating run can be started by pressing **Start/Stop**.

Please note that incubating may have already begun with a different nominal temperature (see previous page).

During the run, the green indicator lamp in the **Start/Stop** key lights up.

Mixing ends when **Start/Stop** is pressed. However, the temperature which has been set is **maintained until the device is switched off**.

### **6.4 Short Mix**

The device mixes at the frequency visible in the display for as long as the **Short Mix** key is held down.

### **6.5 Storing parameters**

All parameters which have been set remain stored after the device has been switched off.

## ***7 Cleaning and Maintenance***

The device is maintenance-free. The thermoblock should be cleaned immediately if liquid is accidentally spilled into the bores.

The exterior of the device should be cleaned with a mild soap solution. The soap solution should then be removed by rinsing with distilled water. An alcohol-based disinfectant should be used for microbial decontamination.

## ***8 Controlling the Temperature***

The limitations given in Section 10, Technical Specifications, refer to the imprecision and possible deviations of all positions of the mixing/incubating block. The temperature is held constant in individual positions. If the exact temperatures have to be determined in addition to the display, a probe with a low heat capacity (e.g. thermoelement) must be used. Refer to [www.eppendorf.com](http://www.eppendorf.com) for detailed test protocol.

## 9 Troubleshooting Guide

### Thermomixer

Error	Cause	Solution
No display.	<ul style="list-style-type: none"><li>– Power not connected.</li><li>– Device not switched on.</li></ul>	<p>Connect power.</p> <p>Switch on device.</p>
Nominal temperature not reached.	<ul style="list-style-type: none"><li>– For nominal temperatures <math>&gt;4\text{ }^{\circ}\text{C}</math>:</li></ul>	<p>Move the device to a cooler environment.</p>
Device does not mix or incubate.	<ul style="list-style-type: none"><li>– Defective fuse.</li></ul>	<p>Replace fuse (fuses in delivery package, fuse holder next to device socket). If error recurs, contact Service.</p>
Display:		
'MOTOR ERR'	<ul style="list-style-type: none"><li>– Motor is not functioning.</li></ul>	<p>In the event of any of these error messages, it is advisable to switch off the device, wait ten seconds and then switch it on again. If the error recurs, contact Service.</p>
'SPEED ERR'	<ul style="list-style-type: none"><li>– Motor speed is too high.</li></ul>	
'TOO HOT!'	<ul style="list-style-type: none"><li>– Temperature of thermoblock is greater than <math>110\text{ }^{\circ}\text{C}</math>.</li></ul>	
'T-SENSOR ERR'	<ul style="list-style-type: none"><li>– Error in temperature sensor.</li></ul>	
'TEMP ERR!'	<ul style="list-style-type: none"><li>– Nominal temperature has not been reached.</li></ul>	
'EEChksumERR', 'RAM ERR' 'EEPROM ERR'	<ul style="list-style-type: none"><li>– Storage error.</li></ul>	
'HEAVY LOAD'	<ul style="list-style-type: none"><li>– Motor does not reach its nominal speed.</li></ul>	<p>Check whether the movement of the thermoblock is obstructed.</p> <p>If no solution can be found, contact Service.</p>

## ***10 Technical Specifications***

### ***10.1 Temperature control range and incubating accuracy***

All specifications are valid for room temperatures from 15 °C to 35 °C.

Temperature control range: From 4 °C above room temperature to 99 °C

Incubating accuracy:            $\pm 2$  °C from the set nominal value.  
For nominal values between 20 °C  
and 45 °C:  $\pm 1.0$  °C.

Heating-up speed of  
the thermoblock:           approx. 5 °C/min.  
Temperature changes are slower in tubes  
filled with liquid!

Mixing frequency:           300 to 1,400 rpm

Mixing stroke:               3 mm

### ***10.2 Physical characteristics***

Power supply:               100 to 240 V / 50 to 60 Hz

Power requirement:       90 W

Weight:                      Basic device:   2.4 kg  
Fully equipped: 2.6 kg

Size  
(Width x Depth x Height): 16.5 x 24 x 14.5 cm

### ***Permitted ambient conditions for operation***

Max. humidity:             70 %





Ambient temperature:     4 °C to 35 °C

Technical specifications subject to change!

## 11 Short Instructions

These short instructions should only be used if the user is fully acquainted with the detailed operating instructions!

### a) Routine run

Use     to set the temperature and mixing frequency.






The device begins to incubate/mix. Mixing finishes after **Start/Stop** has been pressed. However, incubation continues.

### b) Short Mix






The device mixes at the set frequency for as long as the key is held down.

### c) Device as a thermostat only

The  key can be used to interrupt mixing. Use the   keys to set the desired temperature.

### d) Device as a mixer only

Set the temperature value "off". Use the   keys to set the desired mixing frequency.

Press  to start.

## 12 Ordering Information

### ***Thermomixer***

22670000

### ***1.5 ml Safe-Lock Microcentrifuge Tubes***

with patented lid latch, graduation scale  
and writing areas on lid and side

Minimum ordering quantity: 500

colorless

22363204

yellow

22363301

red

22363280

blue

22363247

green

22363263

mixed (assortment of above colors)

22363328

amber (light protection)

22363221

### ***IsoTherm System***

22510053

(Starter set for 1.5 ml / 2.0 ml micro test tubes)

insulating box, cooling block for 0 °C,

cooling block for -21 °C, rack plus lid

### ***Important note:***

Please use the original accessories recommended by Eppendorf. Failure to do so can affect the performance and safety of the device.

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