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Eppendorf ThermoMixer[®] C

Operating manual

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1 Operating instructions









1.1 Using this manual

- ▶ Read this operating manual completely before using the device for the first time. Also observe the instructions for use of the accessories.
- ▶ This operating manual is part of the product. Thus, it must always be easily accessible.
- ▶ Enclose this operating manual when transferring the device to third parties.
- ▶ You will find the current version of the operating manual for all available languages on our webpage under www.eppendorf.com.

1.2 Danger symbols and danger levels

The safety instructions of this operating manual indicate the following danger symbols and danger levels:

1.2.1 Danger symbols

| | | | |
|---|-----------------------|---|------------------------|
|  | Biohazard |  | Explosion |
|  | Electric shock |  | Hot surface |
|  | Hazard point |  | Risk of fire |
|  | Crushing |  | Material damage |

1.2.2 Danger levels

| | |
|----------------|--|
| DANGER | <i>Will lead to severe injuries or death.</i> |
| WARNING | <i>May lead to severe injuries or death.</i> |
| CAUTION | <i>May lead to light to moderate injuries.</i> |
| NOTICE | <i>May lead to material damage.</i> |

1.3 Symbols used

| Depiction | Meaning |
|-------------|-----------------------------------|
| 1. 2. | Actions in the specified order |
| ▶ | Actions without a specified order |
| • | List |
| <i>Text</i> | Display text or software text |
| i | Additional information |

1.4 Abbreviations used

PCR

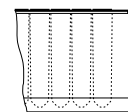
Polymerase chain reaction

rpm

Revolutions per minute – in rpm

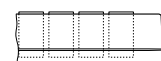
1.5 Glossary

Deepwell plate Plate with 48, 96 or 384 wells with a larger volume than microplates. Suitable for the preparation, mixing, centrifuging, transporting and storing of solid and liquid samples.



Lid Lid for the thermoblock. Ensures uniform temperature control and protects samples from unwanted exposure to light.

Microplate Plate with 24, 48, 96 or 384 wells for the preparation, mixing, centrifuging, transporting and storing of solid and liquid samples.



PCR plate Plate with 96 or 384 wells for PCR applications.

ThermoTop Heated cover for the thermoblock. Prevents the formation of condensation on the inner wall or the lid of the tube thanks to the *condens.protect* technology.

Well Concave vessel of a microplate, PCR plate or deepwell plate.

2 Product description

2.1 Main illustration

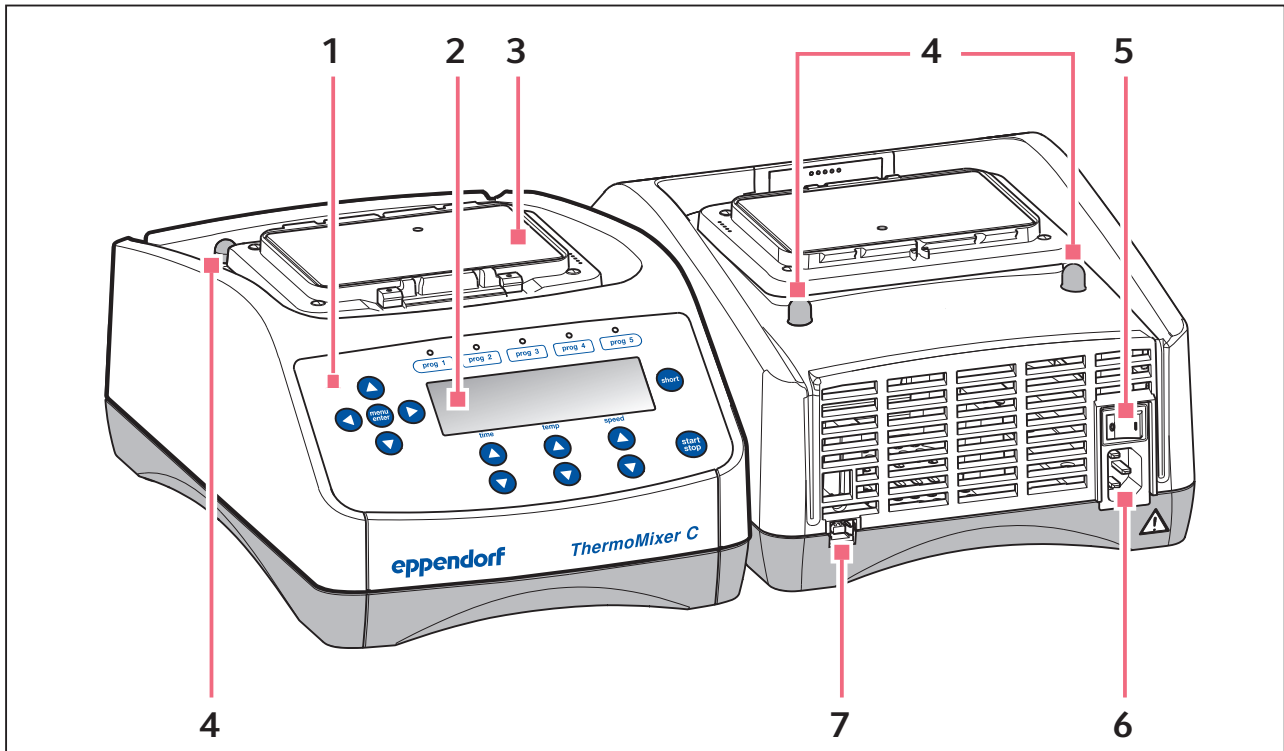


Fig. 2-1: ThermoMixer C

- | | |
|-------------------------|--|
| 1 Operating controls | 5 Power switch |
| 2 Display | 6 Power connection socket |
| 3 Heating/cooling plate | 7 USB interface (for Eppendorf Service only) |
| 4 Centering pins | |

2.2 Delivery package

| Quantity | Order no. (International) | Order no. (North America) | Description |
|----------|---------------------------|---------------------------|--|
| 1 | 5382 000.015 | 5382000023 | ThermoMixer C basic device without thermoblock |
| 1 | – | – | Mains/power cord |
| 1 | 5382 900.016 | | Operating Manual ThermoMixer C |
| 1 | 5382 900.024 | | Short Instructions ThermoMixer C |



- ▶ Check the delivery for completeness.
- ▶ Check all parts for damage in transit.
- ▶ To safely transport and store the device, keep the transport box and packing material.

Product description

Eppendorf ThermoMixer® C
English (EN)

2.3 Features

You can use the ThermoMixer C for performing two basic applications of the sample preparation in one convenient workstep: the simultaneous mixing and tempering of the sample material.

The thermoblocks can be exchanged quickly and easily, without the use of tools. The thermoblocks allow the use of lab tubes in the microliter and milliliter ranges:

- Tubes (e.g., Eppendorf Safe-Lock Tubes with volumes of 0.2 mL to 5.0 mL)
- Conical tubes with volumes of 15 mL and 50 mL
- Microplates and deepwell plates with any kind of bottom shape
- PCR plates (e.g., Eppendorf twin.tec PCR Plate 96, Eppendorf twin.tec PCR Plate 384)
- Tubes with a diameter of 11 mm to 11.9 mm
- Cryotubes

Temperature control

- Peltier cooling allows samples to be cooled to 15 °C below ambient temperature.
- The temperature range can be set from 1 °C to 100 °C.

Mix

- Depending on the utilized thermoblock, you can select mixing frequencies between 300 rpm and 3 000 rpm.
- Anti-spill technology prevents lid wetting and cross contamination.
- The controlled and efficient mixing movement of the ^{2D}Mix-Control technology provides for a fast and complete mixing even of minimum volumes.
- Short Mix: Short, uncomplicated mixing of sample material. The mixing process is performed at the selected speed as long as you press the **short** key.
- Interval Mix: Continuous switching between mixing phases and pauses. The mixing frequency and the duration are freely selectable.
- **Interrupt time counting:** If you want to add reagents or exchange tubes while mixing, you can interrupt time counting and the mixing process.

Multi-level mixing/temperature control

- In addition to a normal mixing/temperature control run, you can freely define programs with up to four successive levels ("steps"). The program levels automatically run one after the other.
- A total of 20 program slots is available.
- Program keys: The 5 most common mixing and temperature control parameters are already stored as programs and can be selected directly with the program keys. The programs can be overwritten.

Lid and ThermoTop

- The Lid ensures uniform temperature control and protects samples from unwanted exposure to light.
- The ThermoTop prevents the formation of condensation on the inner wall or the lid of the tube thanks to the *condens.protect* technology.

3 Safety

3.1 Intended use

The ThermoMixer C is intended for use in a molecular biology laboratory.

The ThermoMixer C is designed for the temperature control and mixing of liquids in closed tubes and closed plates for the preparation and processing of samples.

The ThermoMixer C is exclusively intended for use indoors. All country-specific safety requirements for operating electrical equipment in the laboratory must be observed.

Only use Eppendorf accessories or accessories recommended by Eppendorf.

3.2 User profile

The device and accessories may only be operated by trained and skilled personnel.

Before using the device, read the operating manual carefully and familiarize yourself with the device's mode of operation.

3.3 Information on product liability

In the following cases, the designated protection of the device may be compromised. Liability for any resulting property damage or personal injury is then transferred to the operator:

- The device is not used in accordance with the operating manual.
- The device is used outside of its intended use.
- The device is used with accessories or consumables which are not recommended by Eppendorf.
- The device is maintained or repaired by people not authorized by Eppendorf.
- The user makes unauthorized changes to the device.

3.4 Warnings for intended use

Read the operating instructions and observe the following general safety information before using the ThermoMixer C.



DANGER! Risk of explosion.

- ▶ Do not operate the device in areas where work is completed with explosive substances.
- ▶ Do not use this device to process any explosive or highly reactive substances.
- ▶ Do not use this device for processing any substances which could generate an explosive atmosphere.



DANGER! Electric shock as a result of penetration of liquid.

- ▶ Switch off the device and disconnect the power plug before starting cleaning or disinfection work.
 - ▶ Do not allow any liquids to penetrate the inside of the housing.
 - ▶ Use closed tubes and closed plates.
 - ▶ Do not spray clean/spray disinfect the housing.
 - ▶ Only plug the device back in if it is completely dry, both inside and outside.
-



WARNING! Electric shock due to damage to device or mains cable.

- ▶ Only switch on the device if the device and mains cable are undamaged.
- ▶ Only use devices that have been properly installed or repaired.
- ▶ In case of danger, disconnect the device from the mains supply by pulling the power plug from the device or the mains socket or, by using the isolating device intended for this purpose (e.g., emergency stop switch in the laboratory).



WARNING! Lethal voltages inside the device.

Touching parts which are under high voltage may cause an electric shock. An electric shock injures the heart and causes respiratory paralysis.

- ▶ Ensure that the housing is closed and undamaged.
- ▶ Do not remove the housing.
- ▶ Ensure that no liquid can penetrate into the device.

Only authorized service staff may open the device.



WARNING! Risk from incorrect supply voltage

- ▶ Only connect the device to voltage sources which correspond to the electrical requirements on the name plate.
- ▶ Only use sockets with a protective earth (PE) conductor and suitable power cable.



WARNING! Risk of burns from hot surfaces.

The thermoblock and the heating/cooling plate can be very hot after heating and cause burns.

- ▶ Allow the thermoblock and heating/cooling plate to cool down completely before removing the thermoblock.



WARNING! Personal injury or material damage due to chemically or mechanically damaged thermoblocks.

- ▶ Do not use thermoblocks that show signs of corrosion or mechanical damage.
- ▶ Regularly check the condition of the thermoblocks.



WARNING! Damage to health due to infectious liquids and pathogenic germs.

- ▶ When handling infectious liquids and pathogenic germs, observe the national regulations, the biological security level of your laboratory, the material safety data sheets, and the manufacturer's application notes.
- ▶ Wear personal protective equipment.
- ▶ For comprehensive regulations about handling germs or biological material of risk group II or higher, please refer to the "Laboratory Biosafety Manual" (source: World Health Organization, Laboratory Biosafety Manual, in its respectively current valid version).



WARNING! Risk of fire.

- ▶ Do not use this device to process any highly flammable liquids.



WARNING! Damage to health due to contaminated device and accessories.

- ▶ Decontaminate the device and the accessories before storage and shipping.



WARNING! Risk of injury due to incorrect consumables.

- Poorly fitting tubes or plates can become detached from the thermoblock.
- Glass tubes can smash.
- ▶ Only use the thermoblocks with the consumables designed for them.
- ▶ Never use tubes made of glass or other fragile material.



WARNING! Contamination due to opening seals of consumables.

In the following cases, the seals of tubes can spring open. Sample material can escape.

- high vapor pressure of the content
- improperly sealed cover
- damaged sealing lip
- improperly fastened foil
- ▶ Always check that consumables have been sealed tightly before use.



WARNING! Injury from sample material being thrown out.

Sample material can be thrown out of open, improperly sealed or unstable tubes and plates.

- ▶ Only mix in closed tubes and closed plates.
- ▶ Observe the nationally prescribed safety environment when working with hazardous, toxic and pathogenic samples. Pay particular attention to personal protective equipment (gloves, clothing, goggles etc.), extraction, and the safety class of the lab.



CAUTION! Poor safety due to incorrect accessories and spare parts.

The use of accessories and spare parts other than those recommended by Eppendorf may impair the safety, functioning and precision of the device. Eppendorf cannot be held liable or accept any liability for damage resulting from the use of incorrect or non-recommended accessories and spare parts, or from the improper use of such equipment.

- ▶ Only use accessories and original spare parts recommended by Eppendorf.



CAUTION! Crush hazard due to moving parts.

- ▶ Do not replace any consumables during the mixing process.
- ▶ Do not remove the thermoblock during the mixing process.
- ▶ Put on the ThermoTop or Lid prior to the mixing process.
- ▶ Do not remove the ThermoTop or Lid during the mixing process.



NOTICE! Caution! Strong vibration.

When mixing at high speeds, items located near the device may be moved by the vibrations of the work surface and, e.g., fall off the work table.

- ▶ Do not place easily movable items near the device or secure them adequately.



NOTICE! Damage to the display due to mechanical pressure.

- ▶ Do not apply mechanical pressure to the display.



NOTICE! Damage from overheating.

- ▶ Do not install the device near to any heat sources (e.g., heating, drying cabinet).
- ▶ Do not expose the device to direct sunlight.
- ▶ Ensure unobstructed air circulation. Keep free a clearance of at least 10 cm (3.9 in) around all ventilation grilles.



NOTICE! Damage to electronic components due to condensation.

Condensate can form in the device after it has been moved from a cool environment to a warmer environment.

- ▶ After installing the device, wait at least for 3 h. Only then connect the device to the mains.



NOTICE! Damage from the use of aggressive chemicals.

- ▶ Do not use any aggressive chemicals on the device or its accessories, such as strong and weak bases, strong acids, acetone, formaldehyde, halogenated hydrocarbons or phenol.
- ▶ If the device has been contaminated by aggressive chemicals, immediately clean it by means of a mild cleaning agent.

3.5 Danger symbols on the device

| Representation | Meaning | Location |
|----------------|----------------------------------|---|
| | Risk of burns from hot surfaces. | Upper device side On the thermoblock |
| | ▶ Observe the operating manual. | Rear of the device |

4 Installation

4.1 Selecting the location

Select the device location according to the following criteria:

- Mains/power connection in accordance with the name plate
- Minimum distance to other devices and walls: 10 cm (3.9 in)
- Resonance free table with horizontal even work surface
- The design of table is suitable for operating the device.
- The design of table is suitable for operating the device.
- Surrounding area must be well ventilated.
- The location must be protected against direct sunlight.



The mains/power switch and cutting unit of the mains/power line must be easily accessible during operation (e.g., residual current circuit breaker).

4.2 Installing the instrument



WARNING! Risk from incorrect supply voltage

- ▶ Only connect the device to voltage sources which correspond to the electrical requirements on the name plate.
 - ▶ Only use sockets with a protective earth (PE) conductor and suitable power cable.
-

1. Place the ThermoMixer C on a suitable work surface.
Position the device in such a way that the ventilation slots of the device are not obstructed.
2. Connect the power cable to the power connection socket of the device and the power supply.

5 Operation

5.1 Overview of operating controls

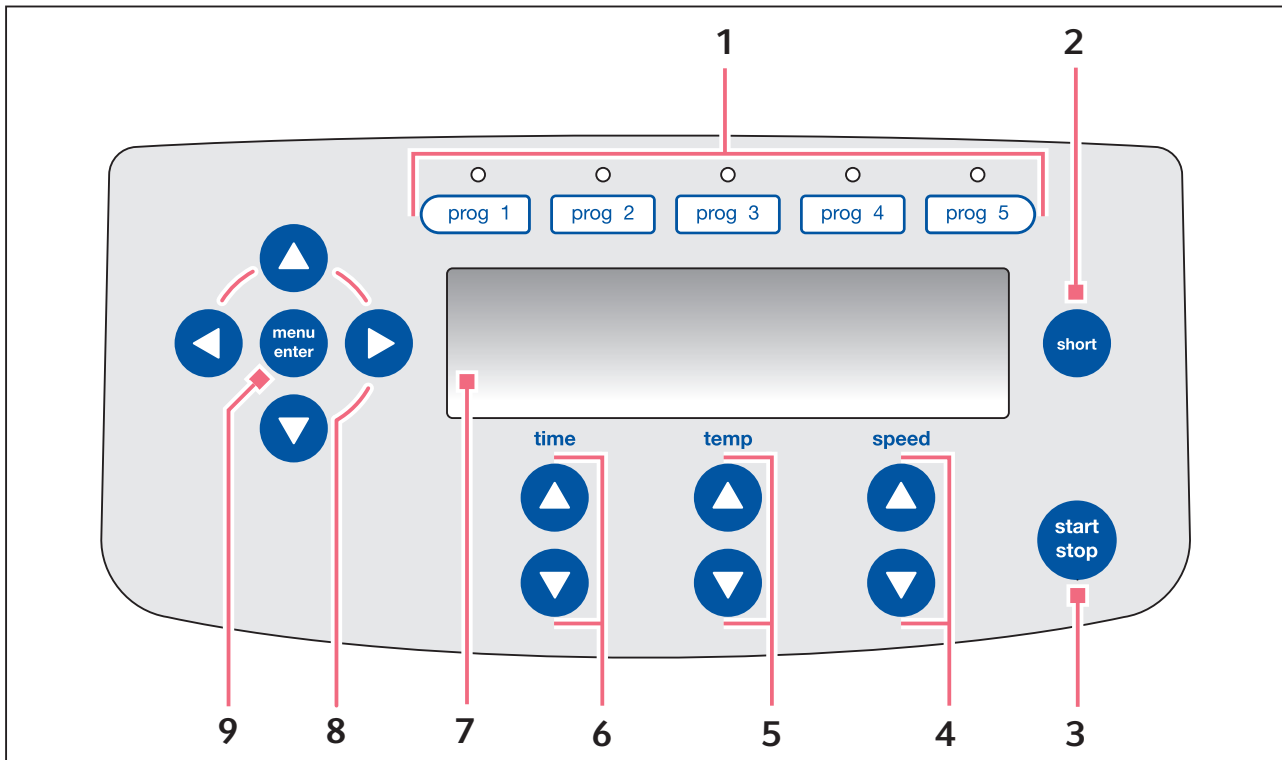


Fig. 5-1: Operating controls ThermoMixer C

- | | |
|---|--|
| <p>1 Program keys with control LEDs Press the program key: Load program Keep the program key pressed for 2 s: Save current parameters</p> | <p>5 Arrow keys temp Set temperature Keep the arrow key pressed: Quick setting As soon as the target temperature is modified, the device begins to perform temperature control.</p> |
| <p>2 short key Short Mix runs while the short key is being pressed (see p. 27).</p> | <p>6 Arrow keys time Setting the mixing time Keep the arrow key pressed: Quick setting</p> |
| <p>3 start/stop key Press the start/stop key: Start or stop mixing/temperature control Press and hold the start/stop key for 2 s: Pause (interrupt mixing process and time counting)</p> | <p>7 Display</p> |
| <p>4 Arrow keys speed Setting the mixing frequency Keep the arrow key pressed: Quick setting</p> | <p>8 Menu arrow keys Navigating the menu: Load or edit programs, set key lock, set the time mode, edit the settings.</p> |
| <p>9 menu/enter key Open the menu. Confirm your selection</p> | |

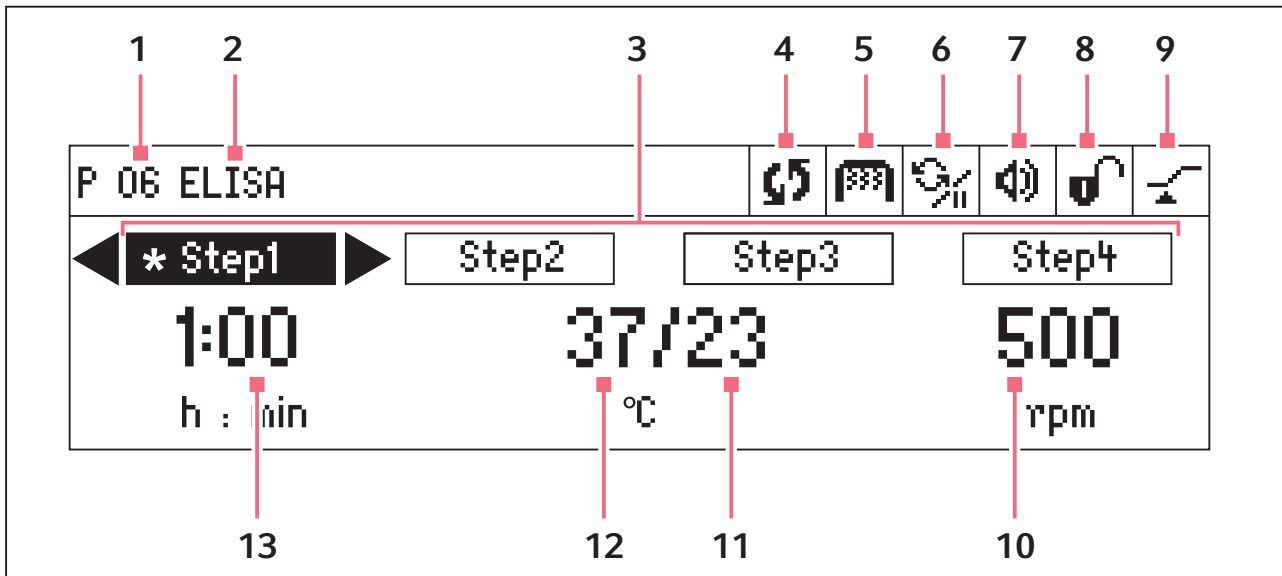












Fig. 5-2: Display ThermoMixer C

- | | |
|--|--|
| <p>1 Program number</p> <p>2 Program name</p> <p>3 Program levels (step 1 to step 4) *: current step</p> <p>4 Device status Device is performing mixing/temperature control. Mixing process interrupted, temperature control to be continued.</p> <p>5 ThermoTop ThermoTop has been attached. To prevent the formation of condensate, the device heats up the ThermoTop, before the temperature of the thermoblock is controlled.</p> <p>6 Interval Mix Interval Mix has been activated for the current step.</p> <p>7 Speaker Speaker switched on. Speaker switched off.</p> | <p>8 Key lock Key lock activated: parameters cannot be changed. No key lock.</p> <p>9 Time mode <i>Time Control</i> Time counting begins immediately. <i>Temp Control</i> Time counting begins when the set temperature has been reached.</p> <p>10 Mixing frequency</p> <p>11 Actual temperature When the actual temperature flashes on the display, the device is not in temperature control mode operation.</p> <p>12 Set temperature When the set temperature has been reached, only one value is displayed.</p> <p>13 Mixing time</p> |
|--|--|

5.2 Setting the language

The device is delivered with *English* as the default language. To set another language, proceed as follows:

| | | |
|----|--|--|
| 1. | | Switch on the device with the power switch at the rear of the device. |
| 2. |  | To open the menu, press the menu/enter key. |
| 3. |  | Select the <i>Settings</i> menu item with the menu arrow keys. |
| 4. |  | To confirm your selection, press the menu/enter key. |
| 5. |  | Select the <i>Language</i> menu item with the menu arrow keys. Confirm with the menu/enter key. |
| 6. |      | Select the language with the menu arrow keys and press the menu/enter key. A tick appears in front of the selected language. |
| 7. |  | To exit the menu, press the left menu arrow key several times. |

5.3 Installing the thermoblock



WARNING! Personal injury or material damage due to chemically or mechanically damaged thermoblocks.

- ▶ Do not use thermoblocks that show signs of corrosion or mechanical damage.
- ▶ Regularly check the condition of the thermoblocks.



WARNING! Contamination due to opening seals of consumables.

In the following cases, the seals of tubes can spring open. Sample material can escape.

- high vapor pressure of the content
 - improperly sealed cover
 - damaged sealing lip
 - improperly fastened foil
- ▶ Always check that consumables have been sealed tightly before use.

Operation

Eppendorf ThermoMixer® C
English (EN)

When you attach the thermoblock, the device automatically recognizes the mounted thermoblock. The mixing frequency is automatically limited to the maximum value for the thermoblock being used.

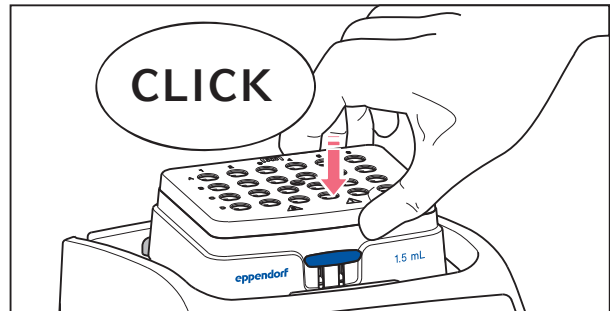
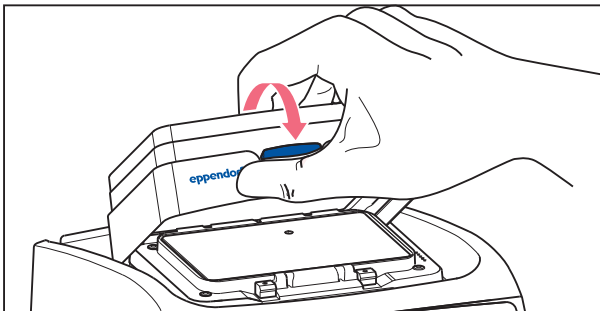
Only the following thermoblocks can be used with the ThermoMixer C. Exchangeable thermoblocks for the Thermomixer comfort/Thermomixer R are not compatible.

| Thermoblock | Tubes/Plates | Maximum mixing frequency | Accessories |
|---------------------------|--|--------------------------|--------------------|
| SmartBlock <i>0.5 mL</i> | Tube volume 0.5 mL | 2 000 rpm | ThermoTop or Lid** |
| SmartBlock <i>1.5 mL</i> | Tube volume 1.5 mL | 2 000 rpm | ThermoTop or Lid** |
| SmartBlock <i>2.0 mL</i> | Tube volume 2.0 mL | 2 000 rpm | ThermoTop or Lid** |
| SmartBlock <i>5.0 mL</i> | Tube volume 5.0 mL | 1 000 rpm | – |
| SmartBlock <i>12 mm</i> | Tubes with a diameter of 11 mm to 11.9 mm | 2 000 rpm | – |
| SmartBlock <i>cryo</i> | Cryotubes | 2 000 rpm | – |
| SmartBlock <i>15 mL</i> | Conical tubes volume 15 mL | 1 000 rpm | – |
| SmartBlock <i>50 mL</i> | Conical tubes volume 50 mL | 1 000 rpm | – |
| SmartBlock <i>plates</i> | Microplates with various bottom contours | 3 000 rpm* | ThermoTop or Lid** |
| | Deepwell plates with various bottom contours up to 80 °C | 2 000 rpm | |
| | Deepwell plates with various bottom contours from 80 °C | 1000 rpm | |
| SmartBlock <i>PCR 96</i> | 96-well PCR plates 0.2 mL PCR tubes | 2 000 rpm | ThermoTop or Lid** |
| SmartBlock <i>PCR 384</i> | 384-well PCR plates | 3 000 rpm | ThermoTop or Lid** |

* The height sensor of the SmartBlock *plates* automatically differentiates between deepwell plates and microplates.

** If you are using the Lid, select a mixing frequency of max. 2 000 rpm.

5.3.1 Attaching the thermoblock



1. First only attach the rear edge of the thermoblock. The writing must face to the front.
2. Push the front edge of the thermoblock down.
 - The thermoblock audibly engages.
 - The display shows the name of the thermoblock.

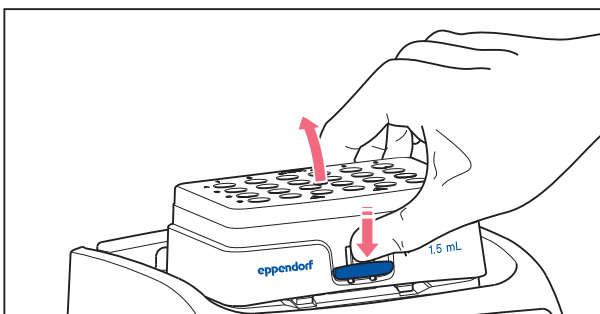
5.3.2 Removing the thermoblock



WARNING! Risk of burns from hot surfaces.

The thermoblock and the heating/cooling plate can be very hot after heating and cause burns.

- ▶ Allow the thermoblock and heating/cooling plate to cool down completely before removing the thermoblock.



1. To unlock the thermoblock, press the lever at the front of the thermoblock down.
2. Lift the front edge so that the thermoblock is tilted backwards.
3. Remove the thermoblock upwards.

5.4 Inserting tubes and plates

**WARNING! Risk of injury due to incorrect consumables.**

- Poorly fitting tubes or plates can become detached from the thermoblock.
 - Glass tubes can smash.
 - ▶ Only use the thermoblocks with the consumables designed for them.
 - ▶ Never use tubes made of glass or other fragile material.
-

**NOTICE! Damage to plates due to too high temperatures.**

Polystyrene microplates melt at temperatures above 70 °C.

Polypropylene deepwell plates deform at temperatures above 80 °C. Deformed plates can become detached from the thermoblock.

- ▶ Only heat microplates up to 70 °C.
 - ▶ If you are heating deepwell plates above 80 °C, do not exceed the mixing frequency of 1000 rpm.
-

**NOTICE! Material change of consumables due to extreme temperatures.**

Extreme temperatures (e.g., during refrigeration or autoclaving) affect consumables material. The mechanical strength, dimensions and shape of the consumable will change.

- ▶ Use consumables that are suitable for the selected temperature range or selected procedure.
-



The height sensor of the SmartBlock *plates* automatically differentiates between deepwell plates and microplates.

- ▶ When inserting microplates, make sure that the height sensor is not covered.
 - ▶ Take care that the height sensor does not get contaminated.
- ▶ Place the suitable thermoblock on the device (see *Attaching the thermoblock on p. 21*).

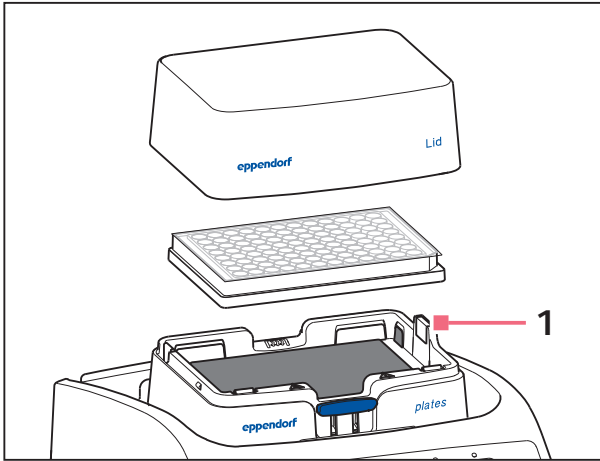
Inserting the plate

- ▶ Insert the plate with the back edge first. Then press it down at the front.

Inserting tubes

- ▶ Insert the tubes completely into the bores of the thermoblock.

SmartBlock plates, SmartBlock PCR 96 or SmartBlock PCR 384:



1 Height sensor

- ▶ To ensure uniform temperature control, place the lid on the thermoblock.

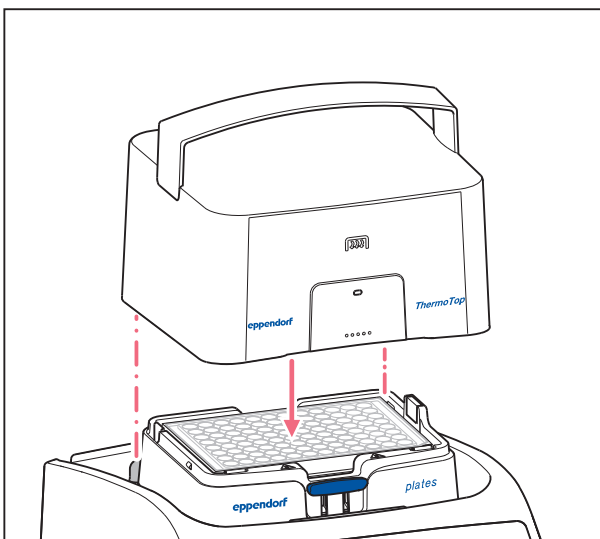
5.5 Installing the ThermoTop

The ThermoTop is compatible with thermoblocks which feature the *condens.protect* symbol:

The *condens.protect* technology available with ThermoTop prevents the formation of condensation on the inner wall or the lid of the tube.

Prerequisites

- A compatible thermoblock has been attached.
- Tubes or plates have been inserted.



- ▶ Place the ThermoTop on the device vertically from above. The centering pins behind the heating/cooling plate fit into the recesses of the ThermoTop.
- The ThermoTop is correctly positioned if the seal is fully flush with the upper part of the device.
- The blue LED of the ThermoTop lights.
- The symbol appears in the display.

**Functioning principle of the ThermoTop**

- In order to prevent the formation of any condensate in a reliable manner, the device first heats the ThermoTop until it reaches the set temperature. The tempering of the thermoblock occurs with a delay.
- The temperature sensor of the thermoblock reacts to the temperature of samples: after inserting samples into a pre-heated thermoblock, the displayed actual temperature may fall temporarily.
- While the device is tempering, the blue LED of the ThermoTop is flashing.

5.6 Temperature control

**NOTICE! Damage to electronic components due to condensation.**

Condensate can form in the device after it has been moved from a cool environment to a warmer environment.

- ▶ After installing the device, wait at least for 3 h. Only then connect the device to the mains.

The ThermoMixer C can be used for temperature control in a range of 15 °C below the ambient temperature to 100 °C.



- When the actual temperature flashes on the display, the device is not in temperature control mode operation.
- As soon as the set temperature is changed with the **temp** arrow keys, the device begins to perform temperature control.
- When the set temperature has been reached, the display only shows one value.


5.6.1 Temperature control with time setting

Prerequisites

The time mode is set to *Time Control*  (see p. 27)

1. To switch off the mixing function, use the **speed** arrow keys to select the 0 rpm setting (▼ below 300 rpm or ▲ above 3 000 rpm).



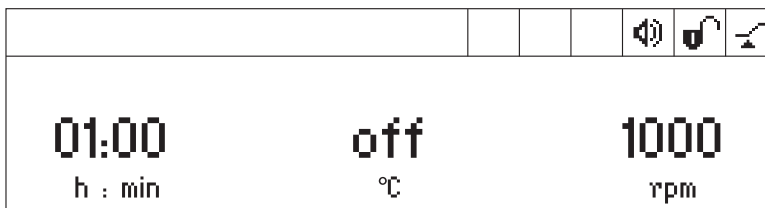
2. Using the **time** arrow keys set the temperature control duration.
3. Using the **temp** arrow keys set the temperature.
4. To start time counting, press the **start/stop** key.
 - The  symbol flashes on the display.
 - The temperature control duration is counted down.
 - The display shows the remaining temperature control duration and the actual temperature/set temperature.
 - A signal sounds after the temperature control duration has elapsed.

5.7 Mixing

- i** You can select the mixing frequency between 300 rpm and 3 000 rpm. The mixing frequency can be adjusted in steps of 50 rpm.

5.7.1 Mixing without temperature control

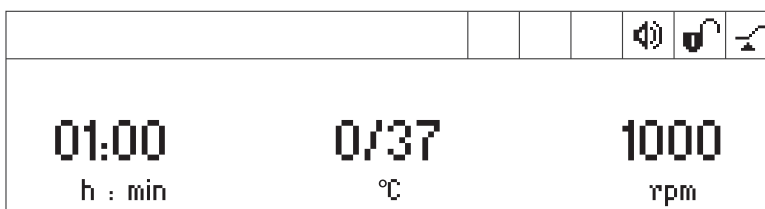
1. In order to switch off the temperature control, use the **temp** arrow keys for selecting the *off* setting (▼ below 1 °C or ▲ above 100 °C).



2. Set the mixing time by means of the **time** arrow keys.
3. Set the mixing frequency by means of the **speed** arrow keys.
4. In order to start the mixing process, press the **start/stop** key.
 - The **S** symbol flashes on the display.
 - The mixing time is counted down.
 - The display shows the remaining mixing time, the actual temperature/set temperature and the mixing frequency.
5. After the set mixing time has elapsed, the device stops automatically.
 - A signal tone sounds.
 - The display shows the last used parameters.

5.7.2 Mixing and tempering

1. Set the mixing time with the **time** arrow keys.
2. Set the temperature with the **temp** arrow keys.
The device immediately starts to perform the temperature control.
3. Set the mixing frequency with the **speed** arrow keys.



4. In order to start the mixing process, press the **start/stop** key.
 - The **S** symbol flashes on the display.
 - The mixing time is counted down.
 - The display shows the remaining mixing time, the actual temperature/set temperature and the mixing frequency.

5. After the set mixing time has elapsed, the device stops automatically.

- A signal tone sounds.
- The display shows the last used parameters.
- Temperature control is continued.

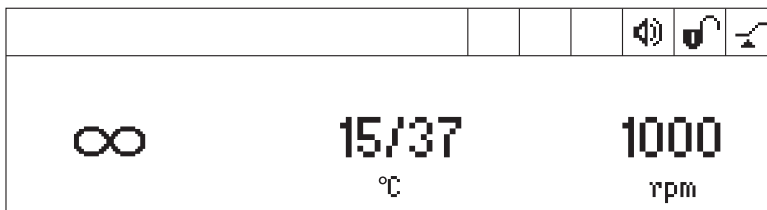
5.7.3 Mixing/temperature control with continuous run




Icing of the thermoblock

Ice may form on the thermoblock if samples are tempered at low temperatures for a long time.

1. In order to mix without any time limits, use the **time** arrow keys to select the ∞ setting (▼ below 15 s or ▲ above 99:30 h).
2. Set the temperature with the **temp** arrow keys.
The device immediately starts to perform the temperature control.
3. Set the mixing frequency with the **speed** arrow keys.



4. In order to start the mixing process, press the **start/stop** key.

- The  symbol flashes on the display.
- The display alternately shows the mixing time and the ∞ symbol, the actual temperature/set temperature and the mixing frequency.
- The mixing time is counted up.

5. In order to end the mixing process, press the **start/stop** key.

- A signal sounds.
- The display shows the last used parameters.
- Temperature control is continued.

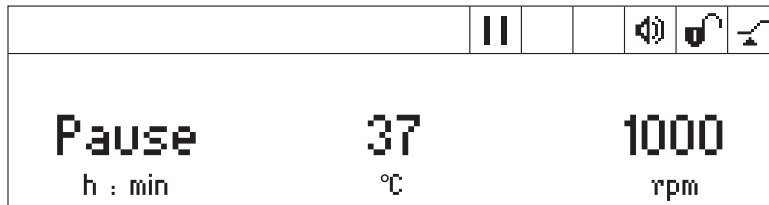


A mixing time of more than 99:30 h is possible. After 99:30 h has passed, the display only will show the ∞ symbol.

5.7.4 Interrupting the mixing process

If you want to add reagents or exchange tubes while mixing, you can interrupt the mixing process. The temperature control continues to run during the pause.

1. In order to interrupt the mixing process, keep the **start/stop** key pressed for 2 s.



- The display shows *Pause*.
- The mixing process is interrupted.
- Time counting is stopped.
- Temperature control is continued.

2. In order to continue the mixing process, press the **start/stop** key.

5.7.5 Short Mix

Use the Short Mix function for mixing for a short while without temperature control.

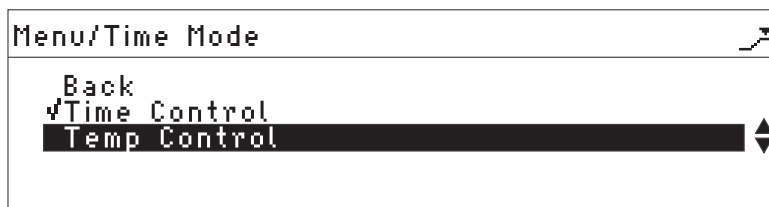
1. Set the mixing frequency by means of the **speed** arrow keys.
2. Keep the **short** key pressed.
The mixing process continues as long as the **short** key will be pressed.
3. In order to end Short Mix, release the **short** key.

5.7.6 Mixing/tempering with *Time Control* or *Temp Control*

You can specify when time counting should begin:

- Time counting and mixing process begin immediately: *Time Control*
- Time counting and mixing process begin when the set temperature has been reached: *Temp Control*

1. Under *Menu*, select the *Time Mode* menu item.




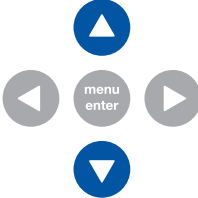

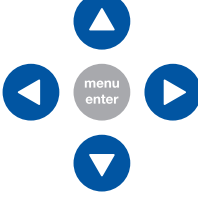

2. Use the menu arrow keys to select *Time Control* or *Temp Control*.
A tick indicates the selected setting.

3. To exit the menu, press the left menu arrow key twice.

5.8 Menu







5.8.1 Navigating in the menu

The menu has 3 levels. To change settings, proceed as follows:

| | | |
|----|---|--|
| 1. |  | To open the menu, press the menu/enter key. |
| 2. |  | Select the menu item with the menu arrow keys. |
| 3. |  | To confirm your selection, press the menu/enter key. |
| 4. |  | Change the settings with the menu arrow keys. |
| 5. |  | To confirm the changed setting, press the menu/enter key A tick appears in front of the setting. |
| 6. | | To exit the menu level, select the <i>Back</i> menu item and press the menu/enter key. |

5.8.2 Menu structure

| Menu items and options | Description | Symbol on the display |
|--|--|-----------------------|
| Programs <ul style="list-style-type: none"> • Load saved program • Create program • Edit program | List with 20 program spaces <ul style="list-style-type: none"> • Select a program key (prog 1 to prog 5) or • Select the program from the program list: <i>Menu > Programs > Load</i> • Start the program with the start/stop key • Save the set parameters (mixing time, temperature and mixing frequency) on a free program space. • You can save up to 4 sets of parameters as automatically consecutive program levels ("steps"). • Overwrite saved program or save it to a new program space. | |

| Menu items and options | Description | Symbol on the display |
|--|--|--|
| <ul style="list-style-type: none"> Delete program | <ul style="list-style-type: none"> Delete the saved program. Programs 1 to 5 cannot be deleted. You can edit and overwrite the programs. | |
| Key lock <ul style="list-style-type: none"> Key lock on Key lock off | <ul style="list-style-type: none"> Parameters cannot be changed. Parameters can be changed. |   |
| Time mode <ul style="list-style-type: none"> Time Control Temp Control | <ul style="list-style-type: none"> Time counting and mixing process begin immediately. Time counting and mixing process only begin when the set temperature has been reached. |   |
| Settings <ul style="list-style-type: none"> Signal tones <ul style="list-style-type: none"> Volume Repetitions Language Contrast Service | <ul style="list-style-type: none"> The signal tone for error messages is always output at medium volume level regardless of the speaker settings. Set the volume of the speaker: <i>20 %, 40 %, 60 %, 80 %, 100 %</i> Switching the speaker off: <i>0 %</i> Set repetitions of the signal tone. <i>1 x, 5 x, 10 x, 30 x, Unlimited</i> Set the language: <i>English, German, French, Italian, Spanish</i> Set the contrast: <i>0 %, 25 %, 50 %, 75 %, 100 %</i> Set the service interval: <i>After 500 operating hours</i> <i>After 1000 operating hours</i> <i>After 2000 operating hours</i> <i>No notification</i> |   |

Go to next higher menu level: *Back*

Exit menu item without saving: *Cancel*

Save set value: *Save*

 The program keys as well as the *Programs* and *Time Mode* menu items are locked while time counting is active.

5.9 Programs

A program consists of up to four program levels ("steps"). The program levels automatically run one after the other. You can save separate settings for each program level:

- Mixing time/temperature control duration
- Mixing frequency
- Temperature
- Program levels with pause interval (Interval Mix) .
- Program levels with restricted ramp rates.

The program ends automatically.



The ThermoMixer C has 20 program slots.

At the end of this operating manual there is a printed form of a program table. The program data can be noted there.

5.9.1 Creating a program

1. In order to open the menu, keep the **menu/enter** key pressed.
2. Use the menu arrow keys to select the *Programs* menu item. Confirm with the **menu/enter** key.
3. Use the menu arrow keys to select an empty program space. Confirm with the **menu/enter** key.

| | | |
|------------------|----------|-------------|
| P 06 | | |
| Cancel | ◀ Save ▶ | Options |
| 01:00 h : min | 37 °C | 1000 rpm |

5.9.1.1 Creating a single-level program

1. Set the mixing time, temperature, and mixing frequency with the **time**, **temp** and **speed** arrow keys.
2. Use the menu arrow keys to select *Save*. Confirm with the **menu/enter** key.

Entering the program name

| | | |
|--------|---|--|
| P 06 | | |
| Cancel | ◀ Save ▶ | |
| ◀ | A B C D E F G H I J K L M N O P Q R S T U V W X Y Z 1 2 3 4 5 6 7 8 9 0 _ ← | |

3. Select letters or numbers with the menu arrow keys and confirm with the **menu/enter** key.

The program name can have a maximum of 15 characters.

In order to delete individual characters, select ← and press the **menu/enter** key.

4. In order to save the program with the program name, use the menu arrow keys to select *Save*.
5. Select the program space with the menu arrow keys. Confirm with the **menu/enter** key.

5.9.1.2 Creating a multi-level program

1. Select an empty program space in the *Menu > Programs* menu item.

Defining step 1

2. Set the mixing time, temperature, and mixing frequency for the first program step with the **time**, **temp** and **speed** arrow keys.

Adding step 2

3. Select *Options*. Confirm with the **menu/enter** key.

| | |
|---------------|---|
| P 06 /Options | |
| Back | ◀ |
| Add step | ▶ |
| Delete step | |
| Interval Mix | |
| Ramp rates | |

4. Select *Add step*. Confirm with the **menu/enter** key.


| | | | |
|--------|---------|-------------|-----------|
| P 06 | | | |
| Cancel | Save | ◀ Options ▶ | |
| Step 1 | 01h:00m | 37 °C | 1000 rpm |
| Step 2 | 10m:00s | 56 °C | 500 rpm ▲ |

The set parameters have been adopted in step 1.

5. Set the parameters for the second program level.
 - In order to save the program with 2 program levels, select *Save*.
 - In order to program a third and a fourth program level, respectively select *Options > Add step*.

i In order to delete a step from a program, select *Options > Delete step*.


5.9.2 Interval Mix: Creating a program level with pause interval

By using the Interval Mix function, you can determine the mixing process to be interrupted by one or several pauses **within one program level** . Interval Mix can only be specified in programs. For program levels with Interval Mix, the  symbol will appear in the display

1. Select an empty program space under *Menu > Programs* .
2. Set the mixing time, temperature, and mixing frequency with the **time**, **temp** and **speed** arrow keys.
Select the mixing time so that it covers the entire duration, including mixing processes and pauses.
3. Select *Options*. Confirm with the **menu/enter** key.
4. Select *Interval Mix*. Confirm with the **menu/enter** key.

| | | |
|----------------------------|-------------|--|
| P 06 /Options/Interval Mix | | |
| Cancel | ◀ Save ▶ | |
| 10m:00s | Mixing time |  |
| 01m:00s | Pause | ◀▶ |

5. Set the mixing time (before the pause) in the *Mixing time* row using the **time** arrow keys.
6. Set the pause duration in the *Pause* row using the **time** arrow keys.
7. In order to save the program, select *Save* . Confirm with the **menu/enter** key.
The Interval Mix settings are now saved for the program level.

 To program a change between several mixing processes and pauses within a program level, select a correspondingly longer mixing time for the program level:

Change between mixing process and pause:

- Mixing time set for program level: 6:00 min
- Interval Mix: *Mixing time*: 1:00 min, *Pause*: 0:30 min

In the program level the device performs the setting 1 min mixing and 0:30 min pause 4 times.

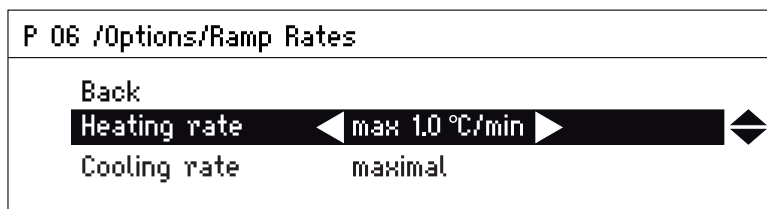
5.9.3 Restricting ramp rates

You can use the ThermoMixer C to choke the heating rate as well as the cooling rate. Restricted ramp rates can only be specified for programs.

Tab. 5-1: Heating rates and cooling rates

| | | | | |
|---------------------|-----------------|-----------------|-----------------|-----------------|
| <i>Heating rate</i> | max. 3.0 °C/min | max. 2.0 °C/min | max. 1.0 °C/min | max. 0.1 °C/min |
| <i>Cooling rate</i> | max. 1.0 °C/min | max. 0.5 °C/min | max. 0.1 °C/min | |

1. Select an empty program space under *Menu > Programs*.
2. Set the mixing time, temperature, and mixing frequency with the **time**, **temp** and **speed** arrow keys.
3. Select *Options*. Confirm with the **menu/enter** key.
4. Select *Ramp rates*. Confirm with the **menu/enter** key.



5. Use the menu arrow keys to select and change *Heating rate* or *Cooling rate*.
6. In order to leave the *Ramp rates* menu, select the *Back* menu item. Confirm with the **menu/enter** key.

i When you start a program that runs with restricted heating or cooling rates, a message is displayed: *The program's ramp rates are restricted.*

5.9.4 Quick save with program keys

To quickly save a single-level program, you can use the program keys.

1. Set the mixing time, temperature, and mixing frequency with the **time**, **temp** and **speed** arrow keys.
2. Keep one of the program keys **prog 1** to **prog 5** pressed for 2 seconds.
 - A signal tone sounds.
 - The LED above the program key lights blue.
 - The parameters of the program are saved.

i

- If you want to assign a program name, save the program in the menu: *Menu > Programs*.
- If you want to save a program with multiple levels under the program numbers 1 to 5, select the program space under *Menu > Programs*.

5.9.5 Loading a saved program

5.9.5.1 Loading program **prog 1** to **prog 5**

On supply, the **prog 1** to **prog 5** program keys are assigned as follows:






| | Program name | Temperature | Mixing time/ temperature control duration | Mixing frequency |
|-------------------|----------------|-------------|---|---------------------|
| prog 1 key | Cooling | 8°C | ∞ | 0 rpm |
| prog 2 key | Ligation | 16°C | 16:00 h | 0 rpm |
| prog 3 key | Restr. Digest | 37°C | 1:00 h | 1 000 rpm |
| prog 4 key | Prot. K Digest | 56°C | 10:00 min | 1 000 rpm |
| prog 5 key | Denaturation | 95°C | 30:00 min | 0 rpm |

- In order to call up a program on the program spaces 1 to 5, press one of the program keys **prog 1** to **prog 5**.
 - The LED above the program key lights blue.
 - The display shows the parameters of the program.
- In order to start the program, press the **start/stop** key.

5.9.5.2 Loading a program from the program list

- In order to load a program from the program list, select the program under *Menu > Programs*. Confirm with the **menu/enter** key.
- Use the menu arrow keys to select the *Load* menu item. Confirm with the **menu/enter** key.
 - The display shows the parameters of the program.
 - Programs with several program levels:

The display shows the parameters of the first program level. To display the parameters of the other program levels, use the ◀ or ▶ menu arrow keys to select the corresponding step.
- In order to start the program, press the **start/stop** key.

| | | | |
|---------|------------|---|--------|
| P 06 RT | |      | |
| *Step 1 | ◀ Step 2 ▶ | Step 3 | Step 4 |
| 01:00 | 30/42 | 800 | |
| h : min | °C | rpm | |

The asterisk marks the active program level Step 1. The display shows the parameters of Step 2.

5.9.6 Editing programs

There are two ways to change a saved program:

- Changing the program via the *Edit* menu item in the program list
- Changing the program during operation

5.9.6.1 Changing the program via the *Edit* menu item in the program list

1. In order to change the parameters of a program, select the program under *Menu > Programs*. Confirm with the **menu/enter** key.
2. Use the menu arrow keys to select the *Edit* menu item. Confirm with the **menu/enter** key.
The display shows the saved parameters.

You can change all parameters and save them (see *Creating a program on p. 30*).

5.9.6.2 Changing the program during operation

1. Load the program with the program keys or from the program list.
 2. Change the parameters.
For programs with program levels: Use the ◀ or ▶ menu arrow keys to select a step, change the parameters of the step.
 3. Start the program.
- After completion of the program, a message appears stating that the program has been changed. You can confirm or discard the changes.

5.9.7 Deleting programs



Programs 1 to 5 cannot be deleted. You can change and overwrite the program name and all parameters of these programs.

1. In order to delete a program from the program spaces 6 to 20, select the program under *Menu > Programs*. Confirm with the **menu/enter** key.
2. Use the menu arrow keys to select the *Delete* menu item. Confirm with the **menu/enter** key.
The display shows the message *Confirm delete*. In order to confirm, press the **menu/enter** key.

6 Troubleshooting

If you cannot remedy an error with the recommended measures, please contact your local Eppendorf partner. The contact address can be found online at: www.eppendorf.com.

6.1 General errors

| Problem | Cause | Solution |
|--|--|--|
| Display remains dark. | <ul style="list-style-type: none"> No mains connection. | <ul style="list-style-type: none"> ▶ Check the mains connection and the power supply. ▶ Switch the device on. |
| Set temperature is not reached. | Set temperature is more than 15 °C below ambient temperature. | <ul style="list-style-type: none"> ▶ Set up the device in a cooler environment. |
| ThermoTop LED does not light. | <ul style="list-style-type: none"> No thermoblock has been attached The thermoblock is not compatible with ThermoTop. | <ul style="list-style-type: none"> ▶ Use a compatible thermoblock with a condens.protect symbol:  |
| | <ul style="list-style-type: none"> The interface between the device and the ThermoTop is dirty. | <ul style="list-style-type: none"> ▶ Remove any dirt from the front of the ThermoTop. ▶ Remove any dirt from the top of the device, especially from the viewing window beside the heating/cooling plate. |
| ThermoTop does not fit on the device. | <ul style="list-style-type: none"> The thermoblock is not compatible with ThermoTop. The lid is attached to the thermoblock. | <ul style="list-style-type: none"> ▶ Use a compatible thermoblock with a condens.protect symbol:  ▶ If using the ThermoTop, do not use the lid. |
| The device does not mix nor control the temperature. | Various causes are possible. | <ul style="list-style-type: none"> ▶ Contact your local Eppendorf partner. |

6.2 Error messages

| Problem | Cause | Solution |
|--|---|--|
| <i>Thermoblock not recognized</i> | <ul style="list-style-type: none"> • Thermoblock is not compatible with the device. • The thermoblock is not attached properly. | <ul style="list-style-type: none"> ▶ Use a compatible thermoblock. ▶ Remove the thermoblock and then reattach it. |
| | <ul style="list-style-type: none"> • The interface between the device and the thermoblock is dirty. | <ul style="list-style-type: none"> ▶ Remove any dirt from the underside of the thermoblock. ▶ Remove any dirt from the top of the device, especially from the viewing window beside the heating/cooling plate. |
| Error message preceded by a number code. | <ul style="list-style-type: none"> • Various causes are possible. | <ol style="list-style-type: none"> 1. Switch off device and wait 10 seconds. 2. Switch on device. <p>If the error message appears again, contact your local Eppendorf partner.</p> |

7 Maintenance

7.1 Setting service intervals

The ThermoMixer C offers the option of activating a reminder that the device needs to be serviced. To set a service interval, proceed as follows:

1. Under *Menu > Settings >* select the *Service* menu item. Confirm with the **menu/enter** key.
2. Select a service interval with the menu arrow keys (after 500, 1 000 or 2 000 operating hours).

To switch off the notification, select *No notification*.

When the specified operating hours have been reached, a message appears. Contact your local Eppendorf partner. The contact addresses can be found online at www.eppendorf.com/worldwide.

7.2 Cleaning

Clean the housing of the ThermoMixer C and the thermoblocks regularly.



DANGER! Electric shock as a result of penetration of liquid.

- ▶ Switch off the device and disconnect the power plug before starting cleaning or disinfection work.
- ▶ Do not allow any liquids to penetrate the inside of the housing.
- ▶ Use closed tubes and closed plates.
- ▶ Do not spray clean/spray disinfect the housing.
- ▶ Only plug the device back in if it is completely dry, both inside and outside.



NOTICE! Damage from the use of aggressive chemicals.

- ▶ Do not use any aggressive chemicals on the device or its accessories, such as strong and weak bases, strong acids, acetone, formaldehyde, halogenated hydrocarbons or phenol.
- ▶ If the device has been contaminated by aggressive chemicals, immediately clean it by means of a mild cleaning agent.



NOTICE! Corrosion from aggressive cleaning agents and disinfectants.

- ▶ Do not use corrosive cleaning agents, aggressive solvents or abrasive polishes.
 - ▶ Do not use lab cleaners with sodium hypochlorite.
-

Auxiliary equipment

- Lint-free cloth
- Mild, soap-based lab cleaner
- Dist. water

Cleaning the ThermoMixer C

1. Switch off the ThermoMixer C and disconnect it from the power supply.
2. Allow the device to cool down.
3. Clean all of the outer parts of the ThermoMixer C with a mild soap solution and a lint-free cloth.
4. Wipe off the soap solution with dist. water.
5. Dry all cleaned parts.

7.2.1 Cleaning the thermoblock

Auxiliary equipment

- Lint-free cloth
- Mild, soap-based lab cleaner
- Dist. water

Clean the thermoblock immediately if sample fluid enters the bore holes or comes into contact with the surfaces.

1. Clean with a mild soap solution.
2. Wipe off the soap solution with dist. water.
3. Dry the cleaned thermoblock.

7.3 Disinfection/Decontamination

**DANGER! Electric shock as a result of penetration of liquid.**

- ▶ Switch off the device and disconnect the power plug before starting cleaning or disinfection work.
 - ▶ Do not allow any liquids to penetrate the inside of the housing.
 - ▶ Use closed tubes and closed plates.
 - ▶ Do not spray clean/spray disinfect the housing.
 - ▶ Only plug the device back in if it is completely dry, both inside and outside.
-

Auxiliary equipment

- Lint-free cloth
 - Disinfectant.
1. Switch the ThermoMixer C off and isolate from the power supply.
 2. Allow the device to cool down.
 3. Clean the device (see *Cleaning on p. 38*).
 4. Select a disinfection method which complies with the legal requirements and regulations applicable to your range of application.
 5. Wipe the surfaces with the lint-free cloth and disinfectant.

7.4 Decontamination before shipment

If you are shipping the device to the authorized Technical Service for repairs or to your authorized dealer for disposal please note the following:

**WARNING! Risk to health from contaminated device**

1. Follow the instructions in the decontamination certificate. You find it as a PDF file on our website (www.eppendorf.com/decontamination).
 2. Decontaminate all the parts you would like to dispatch.
 3. Include the fully completed decontamination certificate in the package.
-

7.5 Verification of temperature control

To verify the temperature accuracy of the thermoblock, use the Eppendorf Temperature Verification System – Single Channel. In combination with the temperature sensor for the ThermoMixer C the exact temperature in the thermoblock can be measured.

Details on the verification process with the Eppendorf Temperature Verification System – Single Channel can be found in the corresponding operating manual.

8 Transport, storage and disposal

8.1 Transport



CAUTION! Risk of injury when lifting and carrying heavy loads

The device is heavy. Lifting and carrying the device can lead to back injuries.

- ▶ Only lift and transport the device with a sufficient number of helpers.
- ▶ Use a transport aid for transporting the device.

- ▶ Use the original packaging for transport.

| | Air temperature | Relative humidity | Atmospheric pressure |
|-------------------|------------------------|--------------------------|-----------------------------|
| General transport | -25 °C – 60 °C | 10 % – 75 % | 30 kPa – 106 kPa |
| Air freight | -40 °C – 55 °C | 10 % – 75 % | 30 kPa – 106 kPa |

8.2 Storage

| | Air temperature | Relative humidity | Atmospheric pressure |
|-----------------------------|------------------------|--------------------------|-----------------------------|
| In transport packaging | -25 °C – 55 °C | 10 % – 95 % | 70 kPa – 106 kPa |
| Without transport packaging | -5 °C – 45 °C | 10 % – 95 % | 70 kPa – 106 kPa |

8.3 Disposal

In case the product is to be disposed of, the relevant legal regulations are to be observed.

Information on the disposal of electrical and electronic devices in the European Community:

Within the European Community, the disposal of electrical devices is regulated by national regulations based on EU Directive 2002/96/EC pertaining to waste electrical and electronic equipment (WEEE).

According to these regulations, any devices supplied after August 13, 2005, in the business-to-business sphere, to which this product is assigned, may no longer be disposed of in municipal or domestic waste. To document this, they have been marked with the following identification:



Because disposal regulations may differ from one country to another within the EU, please contact your supplier if necessary.

Technical dataEppendorf ThermoMixer® C
English (EN)**9 Technical data****9.1 Power supply**

| | |
|----------------------|--|
| Power connection | 100 V – 130 V \pm 10 %, 50 Hz – 60 Hz 220 V – 240 V \pm 10 %, 50 Hz – 60 Hz |
| Power consumption | Maximum 200 W |
| Overvoltage category | II |
| Degree of pollution | 2 |
| Protection class | I |

9.2 Weight/dimensions

| | | |
|------------|---------------------------------|---------------------------------|
| Dimensions | Width: | 20.6 cm (8.1 in) |
| | Depth: | 30.4 cm (12.0 in) |
| | Height: | ThermoMixer C: 13.6 cm (5.4 in) |
| Weight | ThermoMixer C: 6.3 kg (13.9 lb) | |

9.3 Ambient conditions

| | |
|----------------------|------------------------------|
| Ambience | Only for use indoors. |
| Ambient temperature | 5 °C – 40 °C |
| Relative humidity | 10 % – 90 %, non-condensing. |
| Atmospheric pressure | 79.5 kPa – 106 kPa |

9.4 Application parameters

9.4.1 Temperature control

| | | |
|---|---|---|
| Temperature control range | Minimum: 15 °C ±2 °C below ambient temperature Maximum: 100 °C Temperature setting 1 °C – 100 °C, adjustable in steps of 1 °C | |
| Temperature accuracy | Set temperature 20 °C – 45 °C | Set temperature < 20 °C or > 45 °C |
| SmartBlock 1.5 mL | ±0.5 °C | ±1.0 °C |
| You can find information on the temperature accuracy of other SmartBlocks on the website www.eppendorf.com . | | |
| Temperature homogeneity | In the range of 20 °C – 45 °C max. ±0.5 °C for all positions of the thermoblock | |
| Heating rate* | 6.0 °C/min The change of temperature in filled tubes is slower. | |
| Cooling rate* | if the set temperature is above ambient temperature 2.5 °C/min | if the set temperature is between ambient temperature and 15 °C below ambient temperature 0.5 °C/min – 0.8 °C/min |

*Heating rate and cooling rate can be throttled (see *Restricting ramp rates on p. 33*).

Technical dataEppendorf ThermoMixer® C
English (EN)

9.4.2 Mix

| Thermoblock | Mixing frequency |
|--|------------------------------------|
| | can be set in increments of 50 rpm |
| SmartBlock <i>0.5 mL</i> | 300 rpm – 2 000 rpm |
| SmartBlock <i>1.5 mL</i> | 300 rpm – 2 000 rpm |
| SmartBlock <i>2.0 mL</i> | 300 rpm – 2 000 rpm |
| SmartBlock <i>5.0 mL</i> | 300 rpm – 1 000 rpm |
| SmartBlock <i>12 mm</i> | 300 rpm – 2 000 rpm |
| SmartBlock <i>cryo</i> | 300 rpm – 2 000 rpm |
| SmartBlock <i>15 mL</i> | 300 rpm – 1 000 rpm |
| SmartBlock <i>50 mL</i> | 300 rpm – 1 000 rpm |
| SmartBlock <i>plates</i> | 300 rpm – 3 000 rpm |
| with deepwell plates and temperature control up to 80 °C | 300 rpm – 2 000 rpm |
| with deepwell plates and temperature control from 80 °C | 300 rpm – 1000 rpm |
| SmartBlock <i>PCR 96</i> | 300 rpm – 2 000 rpm |
| SmartBlock <i>PCR 384</i> | 300 rpm – 3 000 rpm |

9.4.3 Time setting

| | |
|------------|---|
| Cycle time | 15 s – 99:30 h, unlimited <ul style="list-style-type: none"> • In the range of 15 s – 20 min adjustable in steps of 15 s • In the range of 20 min – 1:00 h adjustable in steps of 1 min • In the range of 1:00 h – 10:00 h adjustable in steps of 5 min • In the range of 10:00 h – 99:30 h adjustable in steps of 30 min |
|------------|---|

9.5 Interface

| | |
|---------------|-----------------------------|
| USB interface | For Eppendorf service only. |
|---------------|-----------------------------|

10 Ordering information



CAUTION! Poor safety due to incorrect accessories and spare parts.

The use of accessories and spare parts other than those recommended by Eppendorf may impair the safety, functioning and precision of the device. Eppendorf cannot be held liable or accept any liability for damage resulting from the use of incorrect or non-recommended accessories and spare parts, or from the improper use of such equipment.

- ▶ Only use accessories and original spare parts recommended by Eppendorf.

10.1 Device and accessories

| Order no. (International) | Order no. (North America) | Description |
|------------------------------|------------------------------|---|
| 5382 000.015 – | – 5382000023 | ThermoMixer C basic device without thermoblock 220 V – 240 V 100 V – 130 V |
| 5308 000.003 | 5308000003 | ThermoTop with condens.protect technology |
| 5363 000.233 | 5363000233 | Lid for ThermoMixer F0.5/F1.5/F2.0/FP for SmartBlocks 0.5 mL, 1.5 mL, 2.0 mL, plates, PCR 96, PCR 384 |
| 5361 000.031 | 5361000031 | SmartBlock 0.5 mL Thermoblock for 24 tubes 0.5 mL |
| 5360 000.038 | 5360000038 | SmartBlock 1.5 mL Thermoblock for 24 tubes 1.5 mL |
| 5362 000.035 | 5362000035 | SmartBlock 2.0 mL Thermoblock for 24 tubes 2.0 mL |
| 5309 000.007 | 5309000007 | SmartBlock 5.0 mL Thermoblock for 8 tubes 5.0 mL |
| 5366 000.021 | 5366000021 | SmartBlock 15 mL Thermoblock for 8 conical tubes 15 mL |
| 5365 000.028 | 5365000028 | SmartBlock 50 mL Thermoblock for 4 conical tubes 50 mL |
| 5364 000.024 | 5364000024 | SmartBlock 12 mm Thermoblock for 24 tubes diameter 11 mm – 11.9 mm, height 34 mm – 76 mm |

| Order no. (International) | Order no. (North America) | Description |
|------------------------------|------------------------------|--|
| 5367 000.025 | 5367000025 | SmartBlock cryo Thermoblock for 24 Cryo tubes 1.5 mL – 2 mL, diameter max. 12,5 mm, all base shapes |
| 5363 000.039 | 5363000039 | SmartBlock plates Thermoblock for microplates and deepwell plates incl. Lid |
| 5306 000.006 | 5306000006 | SmartBlock PCR 96 Thermoblock for PCR plates 96 incl. Lid |
| 5307 000.000 | 5307000000 | SmartBlock PCR 384 Thermoblock for PCR plates 384 incl. Lid |

10.2 Tubes and plates

| Order no. (International) | Order no. (North America) | Description |
|------------------------------|------------------------------|--|
| 0030 121.023 | 022363611 | Eppendorf Safe-Lock Tube 0.5 mL 500 pieces clear |
| 0030 120.086 | - | Eppendorf Safe-Lock Tube 1.5 mL 1,000 pieces clear |
| 0030 120.094 | - | Eppendorf Safe-Lock Tube 2.0 mL 1,000 pieces clear |
| 0030 124.502 | 951010057 | PCR Tubes 0,5 mL 500 pieces colorless, thin-walled, with hinged lid |
| 0030 124.332 0030 124.200 | 951010006 - | PCR Tubes 0,2 mL 1,000 pieces PCR clean, colorless clear |
| 0030 124.340 | 951010014 | PCR Tube Strips 0,2 mL, five-tube strip pack of 125 (= 625 tubes) colorless |

| Order no. (International) | Order no. (North America) | Description |
|------------------------------|------------------------------|---|
| 0030 124.359 | 951010022 | PCR Tube Strips 0,2 mL 10 × 12 strips colorless |
| 0030 128.648 | 951020401 | twin.tec PCR Plate 96, skirted low profile, wells colorless, 25 pieces clear |
| 0030 128.575 | 951020303 | twin.tec PCR Plate 96, semi-skirted Wells colorless, 25 pieces standard profile, clear |
| 0030 521.102 | 951031003 | Eppendorf Deepwell Plate 384/200 µL 40 plates, wells clear, white border color PCR Clean |
| 0030 501.101 | 951031801 | Eppendorf Deepwell Plate 96/500 µL 40 plates, wells clear, white border color PCR Clean |
| 0030 501.209 | 951032603 | Eppendorf Deepwell Plate 96/1000 µL 20 plates, wells clear, white border color PCR Clean |
| 0030 501.306 | 951033405 | Eppendorf Deepwell Plate 96/2000 µL 20 plates, wells clear, white border color PCR Clean |

All plates are available with different border colors (red, yellow, green and blue) and purity qualities, in large packs as well as with barcoding on request. You can find further information in our catalog or on our website www.eppendorf.com.

10.3 Temperature Verification System

| Order no. (International) | Order no. (North America) | Description |
|------------------------------|------------------------------|--|
| 0056 000.003 | 0056000003 | Temperature Verification System USB – Single channel For Mastercycler nexus, Mastercycler pro und Mastercycler ep, ThermoMixer, ThermoStat |
| 0056 002.006 | 0056002006 | Temperature sensor for Temperature Verification System USB – Single channel 384 Well |

11 Program data form

| program | time | temp | speed |
|----------------|-------------|-------------|--------------|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
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| 10 | | | |
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Declaration of Conformity

The product named below fulfills the requirements of directives and standards listed. In the case of unauthorized modifications to the product or an unintended use this declaration becomes invalid.

Product name:

Eppendorf ThermoMixer® C
including accessories

Product type:

Thermomixer for test tubes and plates

Relevant directives / standards:

2006/95/EC: EN 61010-1, EN 61010-2-051,
UL 61010-1, CAN/CSA C22.2 No. 61010-1

2004/108/EC: EN 55011, EN 61326-1

2011/65/EU



Management Board



Portfolio Management

Date: December 06, 2013

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