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Eppendorf ThermoMixer® F0.5/F1.5/F2.0/FP

Operating manual

5386 900.002-01/122013

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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 precautions in these instructions have 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	*Will* lead to severe injuries or death.
WARNING	*Can* lead to severe injuries or death.
CAUTION	May lead to light to moderate injuries.
NOTICE	May lead to material damage.

1.3 Symbols used

Depiction	Meaning
1. 2.	Actions in the specified order
▶	Actions without a specified order
•	List
Text	Display text or software text
	Additional information

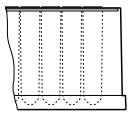
1.4 Abbreviations used

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

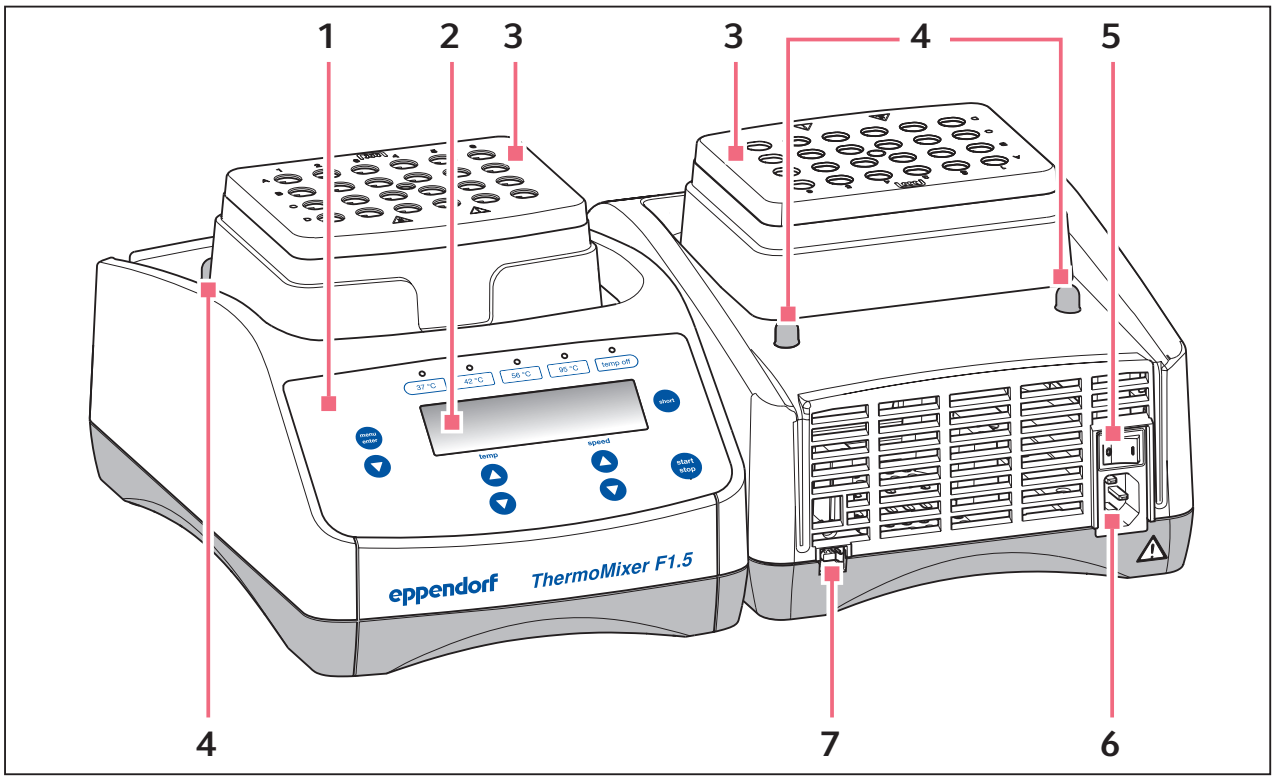


Fig. 2-1: ThermoMixer F1.5 (ThermoMixer F0.5 and ThermoMixer F2.0 are similar)

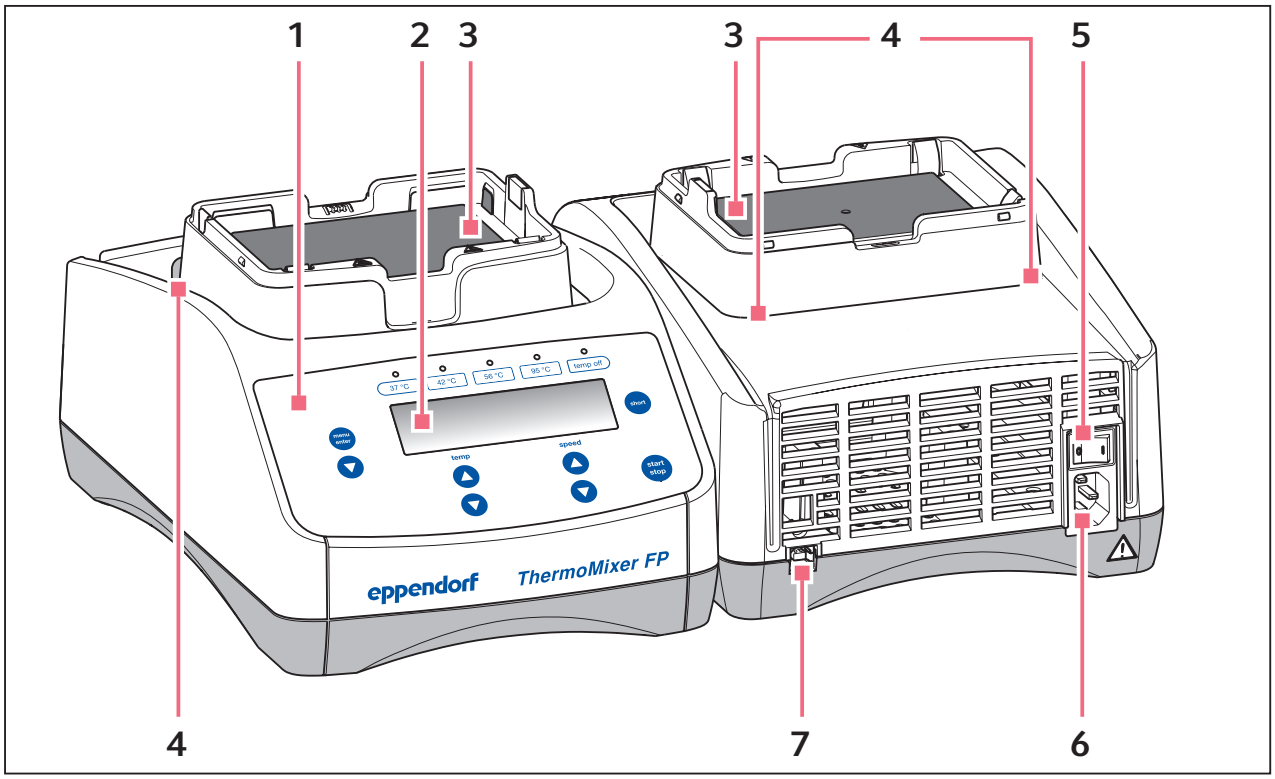


Fig. 2-2: ThermoMixer FP

1 **Operating controls**
2 **Display**
3 **Thermoblock**
4 **Centering pins**
5 **Mains/power switch**
6 **Mains/power cord socket**
7 **USB interface (for Eppendorf Service only)**

2.2 Delivery package

2.2.1 Eppendorf ThermoMixer F0.5, Eppendorf ThermoMixer F1.5, Eppendorf ThermoMixer F2.0

Quantity	Order no. (International)	Order no. (North America)	Description
1	5386 000.010	5386000028	**ThermoMixer F0.5** with thermoblock for 24 0.5 mL tubes
or 1	5384 000.012	5384000020	**ThermoMixer F1.5** with thermoblock for 24 1.5 mL tubes
or 1	5387 000.013	5387000021	**ThermoMixer F2.0** with thermoblock for 24 2.0 mL tubes
1	–	–	**Mains/power cord**
1	5384 900.013		**Operating Manual ThermoMixer F0.5/F1.5/F2.0/FP**
1	5384 900.021		**Short Instructions ThermoMixer F0.5/F1.5/F2.0/FP**
1	–	–	**Certificate of Quality**

2.2.2 Eppendorf ThermoMixer FP

Quantity	Order no. (International)	Order no. (North America)	Description
1	5385 000.016	5385000024	**ThermoMixer FP** with thermoblock for microplates and Deepwell plates
1	–	–	**Mains/power cord**
1	5363 000.233	5363000233	**Lid** for ThermoMixer F0.5/F1.5/F2.0/FP
1	5384 900.013		**Operating Manual ThermoMixer F0.5/F1.5/F2.0/FP**
1	5384 900.021		**Short Instructions ThermoMixer F0.5/F1.5/F2.0/FP**
1	–	–	**Certificate of Quality**

- ▸ 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.

2.3 Features

You can use the Eppendorf ThermoMixer F0.5/F1.5/F2.0/FP for performing two basic applications of the sample preparation in one convenient workstep: the simultaneous mixing and tempering of the sample material.

- Eppendorf ThermoMixer F0.5: for 24 0.5 mL micro test tubes (e.g., Eppendorf Safe-Lock Tubes)
- Eppendorf ThermoMixer F1.5: for 24 1.5 mL micro test tubes (e.g., Eppendorf Safe-Lock Tubes)
- Eppendorf ThermoMixer F2.0: for 24 2.0 mL micro test tubes (e.g., Eppendorf Safe-Lock Tubes)
- Eppendorf ThermoMixer FP: all current plate formats (e.g. Eppendorf Microplates or Eppendorf Deepwell Plates).

Temperature control

- Temperatures from 4 °C above ambient temperature until 100 °C are met exactly and constantly.
- The temperatures 37 °C, 42 °C, 56 °C, 95 °C can be selected directly.

Mix

- Anti-spill technology prevents lid wetting and cross contamination.
- Eppendorf ThermoMixer F1.5, Eppendorf ThermoMixer F2.0: You can select mixing frequencies between 300 rpm and 1 500 rpm.
- Eppendorf ThermoMixer F0.5, Eppendorf ThermoMixer FP: You can select mixing frequencies between 300 rpm and 2 000 rpm.
- 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.

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 Eppendorf ThermoMixer F0.5/F1.5/F2.0/FP is intended for use in a molecular biology laboratory.

The Eppendorf ThermoMixer F0.5/F1.5/F2.0/FP is designed for the temperature control and mixing of liquids in closed tubes and closed plates for the preparation and processing of samples.

The Eppendorf ThermoMixer F0.5/F1.5/F2.0/FP 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 Eppendorf ThermoMixer F0.5/F1.5/F2.0/FP.

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.

- Ensure that the housing is always closed and undamaged so that no parts inside the device can be contacted by accident.
- Do not remove the housing of the device.
- Do not allow any liquids to penetrate the inside of the housing.
- Do not allow the device to be opened by anyone except service personnel who have been specifically authorized by Eppendorf.

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 can be very hot after heating and cause burns.

- Avoid direct contact with a heated thermoblock.

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 full instructions regarding the handling of germs or biological material of risk group II or higher, please refer to the "Laboratory Biosafety Manual" (Source: World Health Organization, current edition of the Laboratory Biosafety Manual).

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.
▶ 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
	▸ Observe the operating manual.	Rear of the device
	Caution! Risk of injury from moving parts. ▸ Observe the operating manual.	On the thermoblock

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 Eppendorf ThermoMixer F0.5/F1.5/F2.0/FP 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

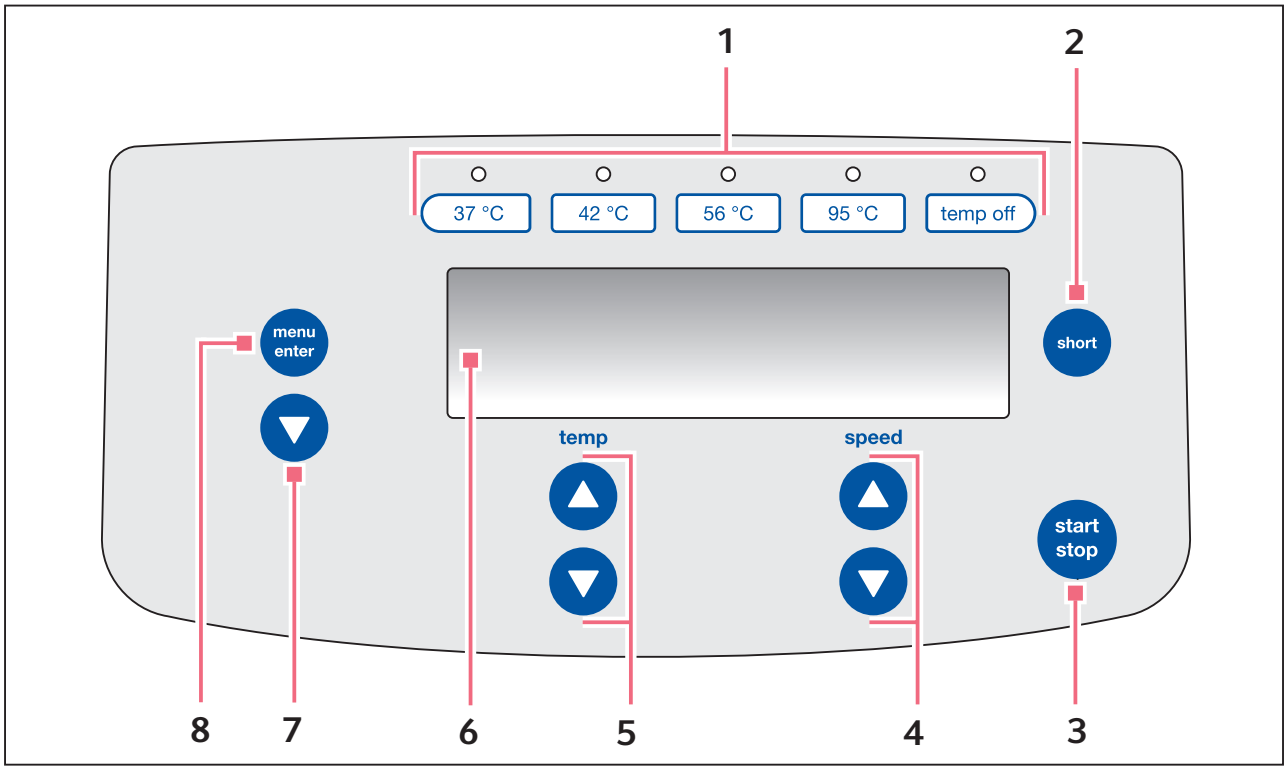


Fig. 5-1: Operating controls

1 **Temperature keys with control LEDs**
Select a temperature or switch off temperature control

2 **short key**
Short Mix runs as long as the Taste **short** key is being pressed (see p. 21).

3 **start/stop key**
Start or stop mixing/temperature control

4 **Arrow keys speed**
Setting the mixing frequency
Keep the arrow key pressed: Quick setting

5 **Arrow keys temp**
Setting the temperature
Keep the arrow key pressed: Quick setting
As soon as the target temperature is modified, the device begins to perform temperature control.

6 **Display**

7 **Menu arrow key**
Navigate the menu: Set the time mode or the volume

8 **menu/enter key**
Open menu
Confirm your selection

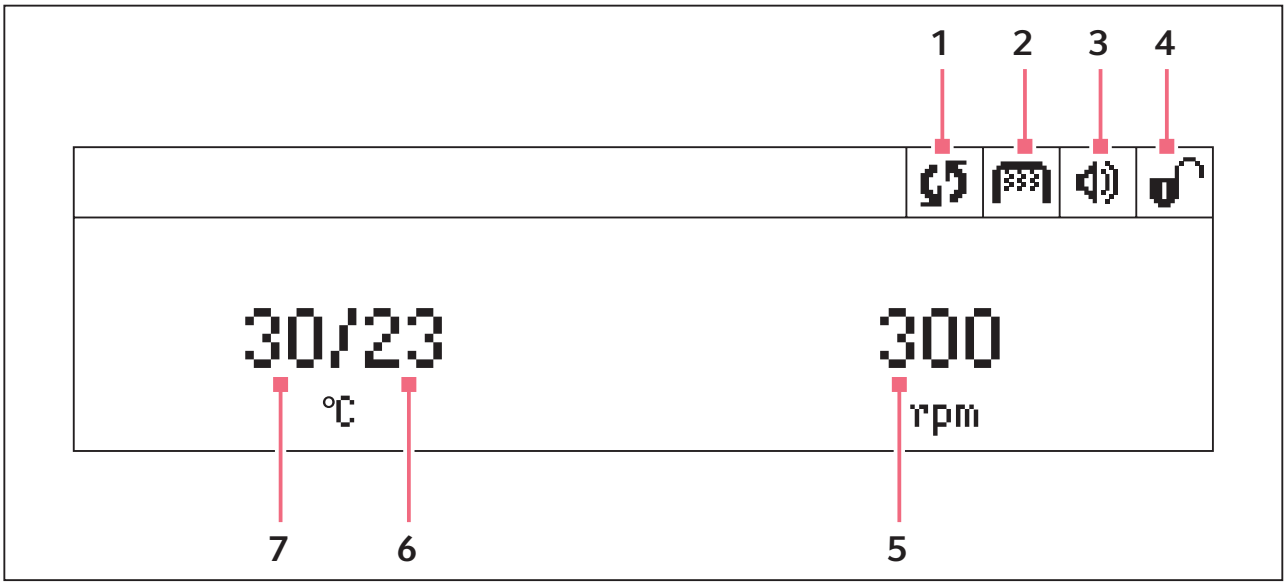


Fig. 5-2: Display Eppendorf ThermoMixer F0.5/F1.5/F2.0/FP

1 **Device status**
Device is performing mixing/ temperature control.

2 **ThermoTop**
ThermoTop has been attached.
To prevent condensation, the device heats up the ThermoTop, before controlling the temperature of the thermoblock.

3 **Speaker**
Speaker switched on.
Speaker switched off.

4 **Key lock**
Key lock activated: Parameters cannot be changed.
No key lock.

5 **Mixing frequency**

6 **Actual temperature**
When the actual temperature flashes on the display, the device is not in temperature control mode operation.

7 **Set temperature**
When the set temperature has been reached, only one value is displayed.

5.2 Inserting tubes and plates

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 Eppendorf ThermoMixer FP 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.

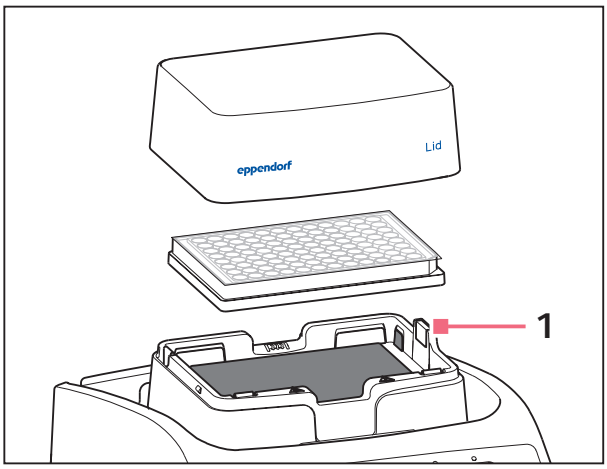
Inserting the plate

- 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.

Only Eppendorf ThermoMixer FP:



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

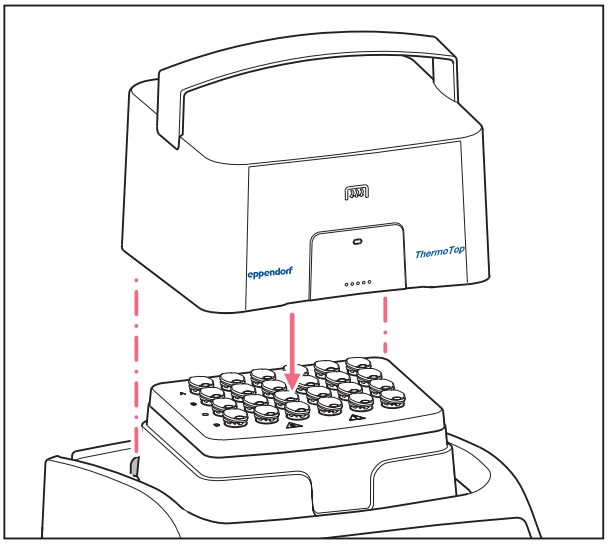
1 Height sensor

5.3 Installing the ThermoTop

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

Prerequisites

- Tubes or plates have been inserted.



- ▶ Place the ThermoTop on the device vertically from above. The centering pins behind the heating 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.

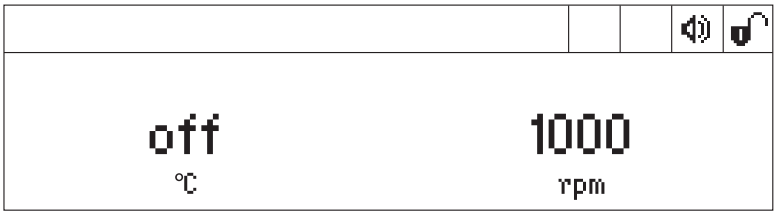
5.4 Mixing

The mixing frequency can be adjusted in steps of 50 rpm.

- Eppendorf ThermoMixer F0.5: 300 rpm – 2 000 rpm
- Eppendorf ThermoMixer F1.5: 300 rpm – 1 500 rpm
- Eppendorf ThermoMixer F2.0: 300 rpm – 1 500 rpm
- Eppendorf ThermoMixer FP: 300 rpm – 2 000 rpm

5.4.1 Mixing without temperature control

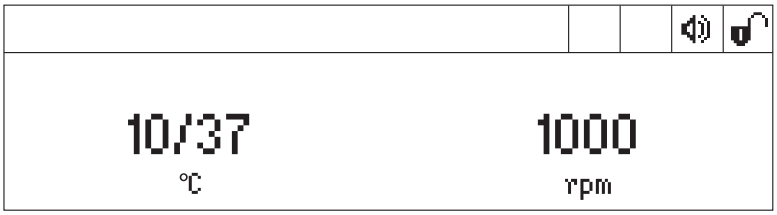
1. In order to switch off the temperature control, press the **temp off** key.



2. Set the mixing frequency with the **speed** arrow keys.
3. In order to start the mixing process, press the **start/stop** key.
   - The symbol flashes on the display.
4. In order to end the mixing process, press the **start/stop** key.
   - The display shows the last used parameters.

5.4.2 Mixing and tempering

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



3. In order to start the mixing process, press the **start/stop** key.
   - The symbol flashes on the display.
   - The display shows the actual temperature/set temperature and the mixing frequency.
4. In order to end the mixing process, press the **start/stop** key.
   - The display shows the last used parameters.
   - Temperature control is continued.

5.4.3 Short Mix

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

1. Set the mixing frequency with 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.

5.5 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.

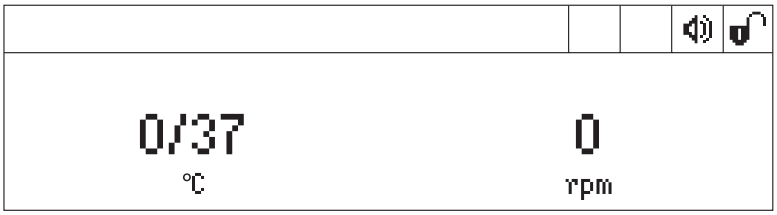
- ▶ After installing the device, wait at least for 3 h. Only then connect the device to the mains.

The Eppendorf ThermoMixer F0.5/F1.5/F2.0/FP can be used for temperature control in a range of 4 °C above 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.

5.5.1 Temperature control without mixing process

1. To switch off the mixing function, use the **speed** arrow keys to select the 0 rpm setting (▼ below 300 rpm or ▲ above 1 500 rpm or 2 000 rpm).



2. Using the **temp** arrow keys set the temperature.
   - The device immediately starts to perform temperature control.
   - When the set temperature is not changed, the actual temperature flashes on the display and the device does not perform temperature control.
3. To manually start the temperature control procedure, press the **start/stop** key.
   - The ↻ symbol flashes on the display.
   - The display shows the actual temperature/set temperature.

5.6 Menu

5.6.1 Navigate the menu

To change settings, proceed as follows:

1.		In order to open the menu, keep the **menu/enter** key pressed.
2.		Select the menu item with the menu arrow key.
3.		To confirm your selection, press the **menu/enter** key.
4.		Change the settings with the menu arrow key.
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 *Back* in the menu and press the **menu/enter** key.	

5.6.2 Menu structure

Menu items and options	**Description**	**Symbol on the display**
Key lock (*Key lock*)		
• *Key lock on*	• Parameters cannot be changed.	
• *Key lock off*	• Parameters can be changed.	
Volume (*Volume*)	The signal tone for error messages is always output at medium volume level regardless of the speaker settings.	
	• Set the volume of the speaker: *Volume 1*, *Volume 2*, *Volume 3*	
	• Switching the speaker off: *Volume off*	
Contrast (*Contrast*)	• Set the contrast: *0 %*, *25 %*, *50 %*, *75 %*, *100 %*	
Service (*Service*)	• Set the service interval: *After 500 operating hours* *After 1000 operating hours* *After 2000 operating hours* *No notification*	

Back: Go to next higher menu level.

5.7 Loading saved parameters

The **37 °C** to **95 °C** keys can be used to quickly select a temperature for a temperature control procedure for an unlimited period of time. Use the **temp off** key to switch off temperature control.

	Temperature	**Mixing frequency**
Key **37 °C**	37 °C	*off*
Key **42 °C**	42 °C	*off*
Key **56 °C**	56 °C	*off*
Key **95 °C**	95 °C	*off*
Key **temp off**	*off*	*off*

- To call a saved temperature, press a direct selection key (**37 °C** to **95 °C**).
  - The LED above the key lights blue.
  - The display shows saved parameters.
- To start temperature control, press the **start/stop** key.
- To perform temperature control and mixing at the same time, also set the mixing frequency using the **speed** arrow keys.

To exit the displayed parameters, set different values for the temperature or mixing frequency.

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

Symptom/ message	Cause	Remedy
Display remains dark.	• No mains connection.	▶ Check the mains connection and the power supply. ▶ Switch the device on.
Set temperature is not reached.	Set temperature is less than 4 °C above ambient temperature.	▶ Set up the device in a cooler environment.
ThermoTop LED does not light.	• The interface between the device and the ThermoTop is dirty.	▶ Remove any dirt from the front of the ThermoTop. ▶ Remove any dirt from the top of the device, especially from the viewing window in front of the thermoblock.
ThermoTop does not fit on the device.	The lid is attached to the thermoblock.	▶ If using the ThermoTop, do not use the lid.
The device does not mix nor control the temperature.	Various causes are possible.	▶ Contact your local Eppendorf partner.

6.2 Error messages

Symptom/ message	Cause	Remedy
Error message preceded by a number code.	• Various causes are possible.	1. Switch off device and wait 10 seconds. 2. Switch on device. If the error message appears again, contact your local Eppendorf partner.

7 Maintenance

7.1 Setting service intervals

The Eppendorf ThermoMixer F0.5/F1.5/F2.0/FP 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 Eppendorf ThermoMixer F0.5/F1.5/F2.0/FP 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 Eppendorf ThermoMixer F0.5/F1.5/F2.0/FP

1. Switch off the Eppendorf ThermoMixer F0.5/F1.5/F2.0/FP and disconnect it from the power supply.
2. Clean all of the outer parts of the Eppendorf ThermoMixer F0.5/F1.5/F2.0/FP with a mild soap solution and a lint-free cloth.
3. Wipe off the soap solution with dist. water.
4. Dry all cleaned parts.

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 Eppendorf ThermoMixer F0.5/F1.5/F2.0/FP off and isolate from the power supply.
2. Allow the device to cool down.
3. Clean the device (see *Cleaning on p. 25)*.
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. Observe the notes on 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 Eppendorf ThermoMixer F0.5/F1.5/F2.0/FP 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 due to lifting and carrying heavy loads
The device is heavy. Lifting and carrying the device can lead to back injuries.

- Transport and lift the device with an adequate number of helpers only.
- Use a transport aid to transport 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.

In Germany, this is mandatory from March 23, 2006. From this date, the manufacturer has to offer a suitable method of return for all devices supplied after August 13, 2005. For all devices supplied before August 13, 2005, the last user is responsible for the correct disposal.

9 Technical data

9.1 Power supply

Power connection	100 V – 130 V ±10 %, 50 Hz – 60 Hz 220 V – 240 V ±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 F0.5: 16.3 cm (6.4 in) ThermoMixer F1.5: 17.0 cm (6.7 in) ThermoMixer F2.0: 17.0 cm (6.7 in) ThermoMixer FP: 16.4 cm (6.5 in)
Weight		ThermoMixer F0.5: 6.2 kg (13.7 lb) ThermoMixer F1.5: 6.3 kg (13.9 lb) ThermoMixer F2.0: 6.3 kg (13.9 lb) ThermoMixer FP: 6.1 kg (13.4 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: 4 °C above 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
Eppendorf ThermoMixer F0.5	±0.5 °C	±0.5 °C
Eppendorf ThermoMixer F1.5	±0.5 °C	±0.5 °C
Eppendorf ThermoMixer F2.0	±0.5 °C	±0.5 °C
Eppendorf ThermoMixer FP	±1.0 °C	±4.0 °C
Temperature homogeneity in relation to all positions of the thermoblock	Set temperature 20 °C – 45 °C	Set temperature < 20 °C or > 45 °C
Eppendorf ThermoMixer F0.5/F1.5/F2.0/FP	±0.5 °C	±1.5 °C
Heating rate	Eppendorf ThermoMixer F0.5: 15 °C/min Eppendorf ThermoMixer F1.5: 11 °C/min Eppendorf ThermoMixer F2.0: 13 °C/min Eppendorf ThermoMixer FP: 18 °C/min The change of temperature in filled tubes is slower.	

9.4.2 Mix

Mixing frequency can be set in increments of 50 rpm	
Eppendorf ThermoMixer F0.5	300 rpm – 2 000 rpm
Eppendorf ThermoMixer F1.5	300 rpm – 1 500 rpm
Eppendorf ThermoMixer F2.0	300 rpm – 1 500 rpm
Eppendorf ThermoMixer FP	300 rpm – 2 000 rpm

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
5386 000.010 –	– 5386000028	**ThermoMixer F0.5** with thermoblock for 24 0.5 mL tubes 220 V – 240 V 100 V – 130 V
5384 000.012 –	– 5384000020	**ThermoMixer F1.5** with thermoblock for 24 1.5 mL tubes 220 V – 240 V 100 V – 130 V
5387 000.013 –	– 5387000021	**ThermoMixer F2.0** with thermoblock for 24 2.0 mL tubes 220 V – 240 V 100 V – 130 V
5385 000.016 –	– 5385000024	**ThermoMixer FP** with thermoblock for microplates and Deepwell plates 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

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 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

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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® F1.5, Eppendorf ThermoMixer® FP

Eppendorf ThermoMixer® F0.5, Eppendorf ThermoMixer® F2.0

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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