eppendorf

New Brunswick™ Excella® E-24 Shaker

Operating manual

M1352-0051-A/022014

Table of contents

1 Operating instructions

1.1 Using this manual

- Carefully read this operating manual before using the device for the first time.
- Also observe the operating manual enclosed with the accessories.
- The operating manual should be considered as part of the product and stored in a location that is easily accessible.
- When passing the device on to third parties, be sure to include this operating manual.
- If this manual is lost, please request another one. The current version can be found on our website http://www.eppendorf.com.

1.2 Danger symbols and danger levels

1.2.1 Hazard symbols

 **Hazard point**	 **Material damage**
 **Electric shock**	

1.2.2 Degrees of danger

The following degree levels are used in safety messages throughout this manual. Acquaint yourself with each item and the potential risk if you disregard the safety message.

DANGER	*Will* lead to severe injuries or death.
WARNING	*May* lead to severe injuries or death.
CAUTION	May lead to light to moderate injuries.
NOTICE	May lead to material damage.

1.3 Symbols used

Example		Meaning
	▸	You are requested to perform an action.
	1. 2.	Perform these actions in the sequence described.
	•	List.
		References useful information.

1.4 Abbreviations used

kWh
Kilowatt hours

PI
Proportional/Integral

PPE
Personal Protective Equipment

RMA
Return Material Authorization

rpm
Revolutions Per Minute

UEL
Upper Explosion Limit

VA
Volt Amps

VAC
Voltage in Alternating Current

2 Product description

2.1 Main illustration

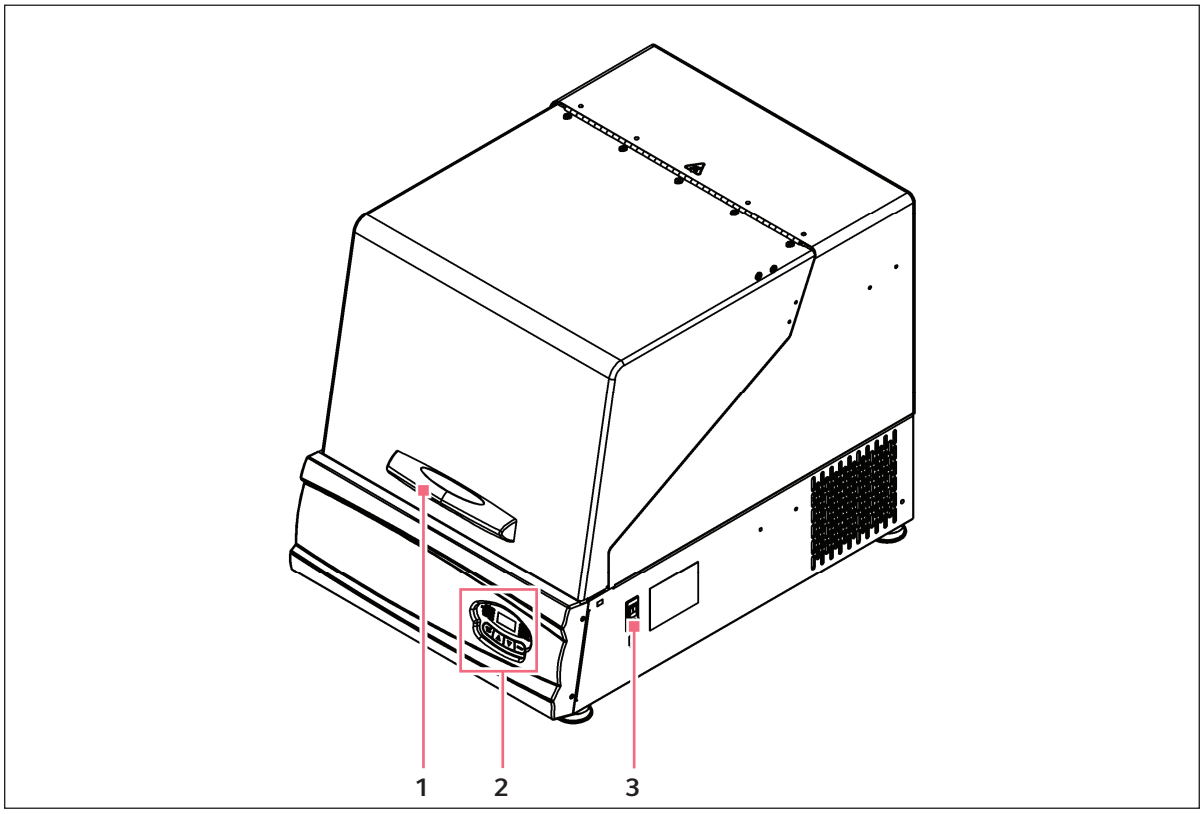

Fig. 2-1: New Brunswick™ Excella® E-24 incubator shaker

1 Lid handle

2 User interface

3 On/off switch

2.2 Inspection of boxes

After you have received your order, inspect the boxes carefully for any damage that may have occurred during shipping. Report any damage to the carrier and to your local Eppendorf distributor immediately.

2.3 Features

The Excella E-24 Benchtop Incubator Shakers uses a unicentric counter-balanced drive mechanism. It provides horizontal plane rotary motion in a 1.91 cm (¾ in) diameter circular orbit. A Proportional/Integral (PI) microprocessor controls the speed and temperature over the entire range.

The E-24 operates from 7 °C above ambient to 60 °C. This range depends on relative humidity and other ambient factors. Ambient temperature is measured one meter from the front of the unit.

Erlenmeyer flasks, 2.8-liter Fernbach flasks, and a wide variety of tubes and plates can be accommodated using New Brunswick shaker accessories.

A wide variety of platforms can be used with the Excella E-24:

- Universal platforms are the most flexible, providing hole patterns for flask clamps, test tube racks and other accessories.
- Dedicated platforms are supplied with flask clamps attached; they are designed solely and expressly for this purpose.
- Test tube racks, microplate holders, and test tube rack holders are also available (a universal platform is needed for all test tube racks and holders).

For further information on these accessories (see *Accessories on p. 35)*.

2.3.1 Operating modes

The E-24 may be operated in the following modes:

- **Continuously:** at a set speed and temperature, until user intervention.
- **In a timed mode:** run at a set speed, time and temperature for a period of up to 99.9 hours, after which the incubator shaker automatically shuts off, while the temperature is maintained at its setpoint.

2.3.2 Visible/audible user alarms

The E-24 is equipped with visual and audible alarms for the following conditions:

- The end of a timed run
- Deviations from speed setpoint (5 minutes after lid is closed)
- Deviations from temperature setpoint (5 minutes after lid is closed)
- Power failure
- Lid open

2.3.3 Data logging

RS-232 connection provided for data logging.

2.3.4 Setpoint retention

All setpoints and operating status are retained in non-volatile memory.

2.3.5 Automatic restart

Automatic restart after power is restored, indicated by flashing display.

2.3.6 Drive interrupt

Drive interrupt shuts off power to the incubator shaker when the lid opens. Acceleration/deceleration circuit prevents sudden starts and stops, minimizing both splashing and mechanical damage.

3 Safety

3.1 Intended use

The New Brunswick Excella E-24 is half incubator and half biological shaker, combining the best features of New Brunswick incubators and shakers into one versatile instrument. It provides gentle shaking and accurate control of temperature, enabling growth of hybridomas, insect cultures, mammalian and stem cells as well as both aerobic and anaerobic bacteria and yeast.

The New Brunswick Excella E-24 was designed for controlled incubation and shaking of biological samples. Do not use any heat-generating device inside the chamber.

CAUTION! Lack of safety due to incorrect accessories or spare parts
Accessories and spare parts that are not recommended by Eppendorf compromise the safety, function and precision of the device. Eppendorf cannot be held liable or accept any liability for damage resulting from the use of non-recommended accessories and spare parts.

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

3.2 Information on product liability

In the following cases, the designated protection of the device may be compromised.

The liability for the function of the device passes to the operator if:
- The device is not used in accordance with this operating manual.
- The device is used outside of the range of application described in the succeding chapters.
- The device is used with accessories or consumables that were not approved by Eppendorf.
- Service or maintenance is completed on the device by people who are not authorized by Eppendorf.
- The owner has made unauthorized modifications to the device.

3.3 Warnings for intended use

Before using the incubator shaker, read the operating manual and observe the following general safety instructions.

3.3.1 Personal injury and damage to device

WARNING! Health risk due to poisonous, radioactive or aggressive chemicals

- Observe the national regulations for handling these substances as well as the material safety data sheets and manufacturer's application notes.
- Wear personal protective equipment (PPE).

WARNING! Burns due to hot metal on the device and hot pistons

- Only touch the device and pistons when wearing protective gloves.

WARNING! Risk of crushing fingers with lid

- Do not reach between the lid and device, or into the lid locking mechanism, when opening and closing the device.
- Always fully open the lid so it cannot fall and close.

CAUTION! Risk to health due to lifting heavy loads

- Only lift the device with another person or using a suitable aid.
- Make sure to use a transport aid for transportation over long distances.

NOTICE! Damage due to overheating

- Do not place the device close to sources of heat (e.g., radiator, drying cabinet).
- Do not expose the device to direct sunlight.
- Ensure there is adequate distance to the wall and adjacent devices, on all sides of the device, in order to guarantee unobstructed air circulation.

4 Installation

4.1 Selecting the location

NOTICE! Damage due to overheating

- Do not place the device close to sources of heat (e.g., radiator, drying cabinet).
- Do not expose the device to direct sunlight.
- Ensure there is adequate distance to the wall and adjacent devices, on all sides of the device, in order to guarantee unobstructed air circulation.

Select the location according to the following criteria:
- Suitable mains power connection according to the ID plate
- Stable, even and resonance-free base
- Well ventilated area and no direct sunlight to prevent additional temperature increases
- Ambient conditions of 10 °C to 35 °C, 20 % to 80 % non condensing
- Able to accommodate 200 lb

4.2 Unpacking the device

Keep the packing material and transport securing device for later transport or storage.

1. Remove the packing material.
2. Remove the transport securing device.
3. Use the details included in the scope of delivery to check that the delivery is complete.
4. Check all parts for damage in transit. Contact Eppendorf Service if parts are missing or transport damage is present.

4.3 Utility requirements

The following utility requirements are needed for operation:

Utility	Requirement
Electricity	• 230 V, 60 Hz, 1500 VA maximum

In all cases, voltage variations must not exceed ±10 %.

4.4 Installation of platform

A platform must be installed prior to use.

The shaker is shipped with 4 Allen head platform screws (circled in red, (see Fig. 4-1 on p. 14)) installed in the 4 bearing housing uprights. The screws must be removed before a platform can be installed.

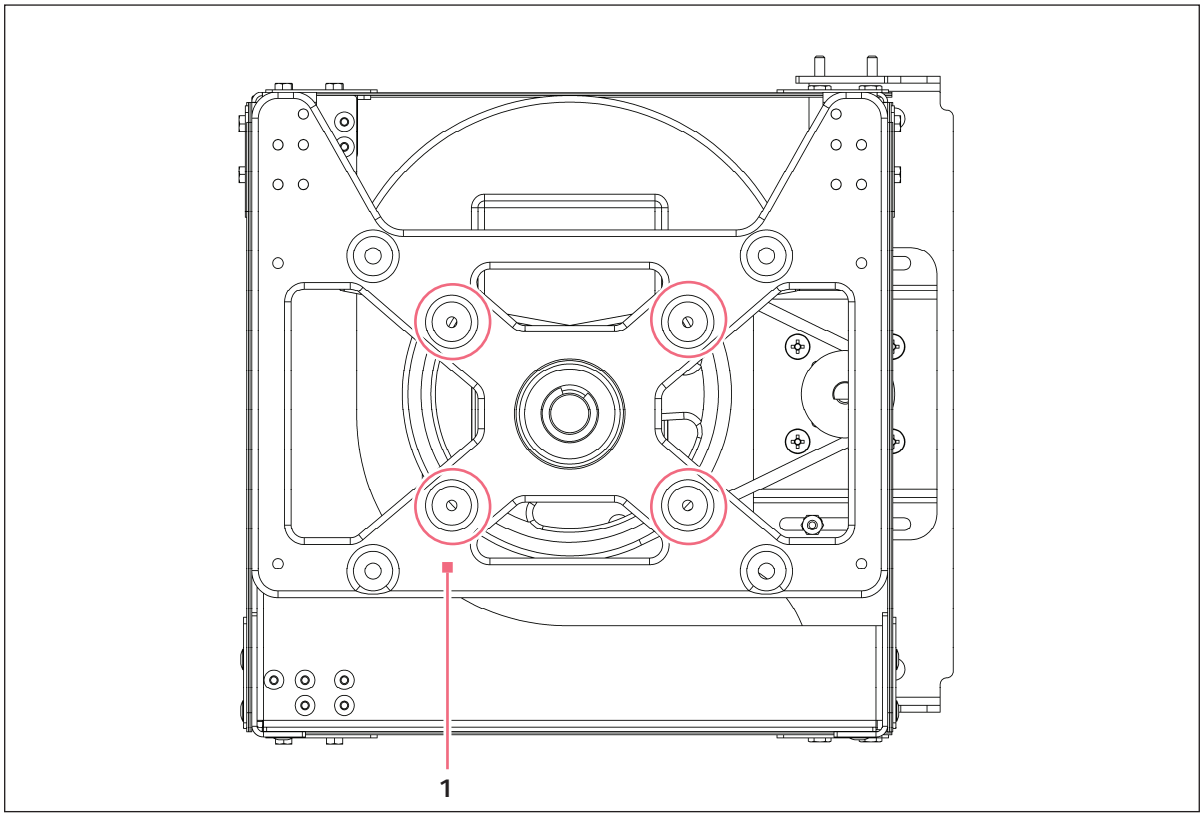

Fig. 4-1: Platform screw locations

1 Subplatform

1. Remove the 2 small plastic straps that secure the bearing housing in place for shipping.
2. Using the 7/32 in hex key provided, remove the 4 Allen head platform screws (circled in red, (see Fig. 4-1 on p. 14)) from the subplatform.

   Save the screws for later use.
3. Place the selected platform on the subplatform. Align the mounting holes of the platform with the platform screw locations in the subplatform.
4. Insert the 4 Allen head platform screws removed in step 2. Tighten them with the 7/32 in hex key to secure the platform.

4.5 Flask clamp installation

Flask clamps purchased for use with the platform require installation. Clamps are installed by securing the base of the clamp to the platform with the correct type and number of screws. All clamps are shipped complete with hardware.

The Excella E-24 platform requires 10-24 × 5/16 in Phillips-head screws (which are supplied) to fasten flask clamps.

Clamps for 2.8 L and 2 L flasks are shipped with an additional girdle to keep the flasks in place. The girdle is an assembly of springs and sections of rubber tubing. One girdle is already in place on the clamp, the other is packed separately.

To install these double girdle clamps:

1. Place the clamp on the platform, aligning its mounting holes with holes on the platform.
2. Secure the clamp in place using the flat Phillips head screws provided (#S2116-3051, 10-24 x 5/16 in).

   3 different types of screws are shipped with the clamps. To identify the proper screws (see Fig. 4-2 on p. 15).
3. The first girdle is delivered in place. Insert an empty flask into the clamp.
4. Make sure the sections of tubing are located between the clamp legs, and roll the first girdle down the legs of the clamp as far as it can go.

   The tubing sections will rest against the platform. The springs will be under the clamp base.
5. Place the second girdle around the upper portion of clamp body.
6. Make sure that the spring sections of the second girdle rest against the clamp legs, and that the rubber sections sit against the flask (in between the clamp legs (see Fig. 4-3 on p. 16)).

Fig. 4-2: Clamp fastener

One-liter and larger flask clamps are fastened with 5 screws.

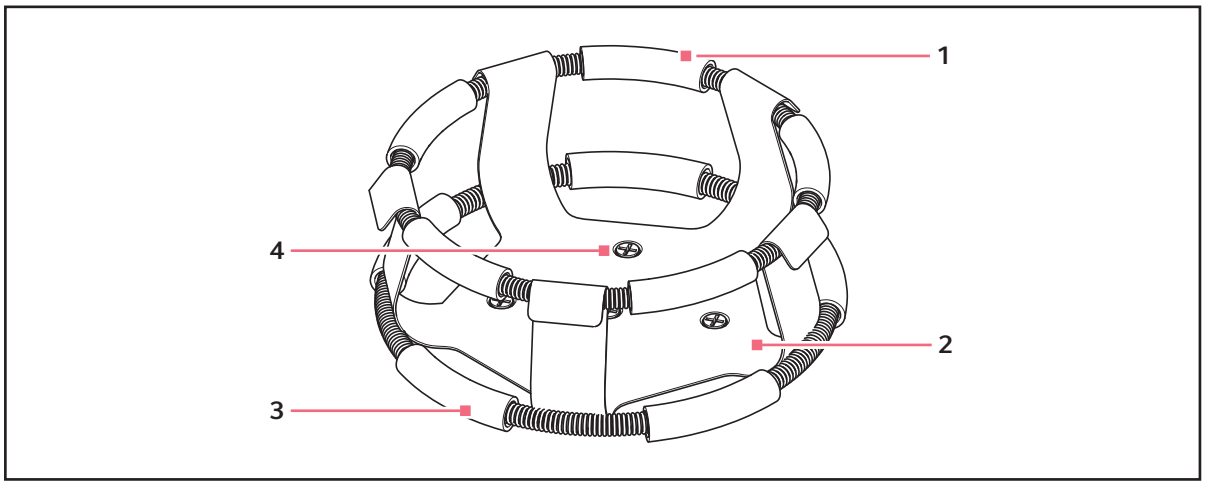

Fig. 4-3: Double girdle clamp installation

1 Upper girdle with girdle tubes

2 Clamp body (legs and base)

3 Lower girdle with girdle tubes

4 Clamp mounting holes
Quantity: 5

The upper girdle secures the flask within the clamp, and the bottom girdle keeps the flask from spinning.

4.6 Electrical connections

NOTICE! Risk of material damage

- An earthed/grounded electrical outlet is necessary for the safe operation of this instrument.

CAUTION! Risk of electrical hazard

- Before making electrical connections, be sure to check the following list.

1. If you have not already done so, check that the voltage and frequency of your incubator shaker are compatible with your mains/electric supply.
2. Remove the caution label from the rear of the unit.
3. Set the on/off switch to the off position.

ONLY THEN:

4. Plug the mains/power cord into an earthed/grounded electrical outlet.

5 Operation

5.1 Start/stop

The shaker will not incubate if the lid is open.

To initially start the shaker:

1. Turn the on/off switch to the on position.
   During start-up, the LED display will indicate the model of your shaker.
2. Press the START/STOP key on the keypad to start or stop operation of the platform.
   When the shaker begins to operate, the LED display will track the speed as it accelerates to the last setpoint entered.

5.2 Continuous (untimed) run

1. Press SELECT until the RPM indicator is illuminated.
2. If the display indicates that the shaker is OFF, press the START/STOP key.
3. Press either the ▲ or ▼ key to enter SET mode.
   The SET indicator will illuminate.
4. Set the speed by using the ▲ or ▼ key until the desired setpoint is displayed.

Holding the ▲ or ▼ key for more than 0.5 seconds causes the speed setpoint to change. Should this occur, resetting will be necessary.

The setpoint may be changed during a run without stopping the shaker by following Steps 2 – 4 above. During speed changes, a visual alarm (flashing RPM indicator) will flash, and an audible alarm will sound until the speed returns to within 5 rpm of the setpoint.

5.3 Check setpoint

1. Press SELECT until the desired indicator is illuminated.
2. Briefly press either the ▲ or ▼ key to enter the SET mode and display the current setpoint.

Holding the ▲ or ▼ key for more than 0.5 seconds causes the speed setpoint to change. Should this occur, resetting will be necessary.

5.4 Timed functions

The shaker may be programmed to automatically stop after a preset time period of 0.1 to 99.9 hours. There must be power to the shaker in order to set the timer, although a timed run can be initiated while the shaker is either stopped or operating.

5.4.1 Setting the timer

To set the timer:

1. Press the SELECT key until the HRS indicator is illuminated.
2. Press either the ▲ or ▼ key to enter the SET mode and set the desired run time, between 0.1 and 99.9 hours.

   If the shaker is stopped, (see *If the shaker is stopped: on p. 18)*. If the shaker is already running continue to Step 3.
3. Press the START/STOP key.

   The shaker will stop and the display will read OFF.
4. Press the START/STOP key again.

   The TIME indicator will light and the shaker will start the timed run.

To cancel the timer without stopping the shaker:

- Repeat steps 1 and 2.
- Immediately press the START/STOP key.

The TIME indicator will stop flashing and the display will read OFF.

5.4.2 If the shaker is stopped:

1. Follow steps 1 and 2, (see *Setting the timer on p. 18)*
2. Press the START/STOP key. The shaker will start in untimed mode.
3. Press the START/STOP key again. The shaker will stop and the display will read OFF.
4. Press the START/STOP key a third time; the TIME indicator will light and the shaker will start the timed run.

To disable the visual alarm (flashing TIME indicator):

- Press the SELECT key and change to any other function

5.5 Alarm functions

In addition to visual alarm, the Excella E-24 has an audible alarm that is activated at predetermined times. It can be deactivated by using the MUTE function (see *Deactivating on p. 19)*.

5.5.1 Deactivating

1. Press the SELECT key until the MUTE indicator illuminates.
2. Press the ▲ or ▼ key to display ON, then press the SELECT key.

5.5.2 Reactivating

To reactivate the audible alarm:

1. Press the SELECT key until the MUTE indicator illuminates.
2. Press the ▲ or ▼ key to display OFF, then press the SELECT key.

5.6 Temperature setpoint

Press the SELECT key until the function °C indicator illuminates. The temperature can be set from 5 °C above ambient temperature to 60 °C (non-refrigerated units) or from 7 °C to 60 °C (refrigerated units). Increasing or decreasing the setpoint is accomplished with the ▲ or ▼ key.

During operation, if the temperature of the chamber is more than 1.0 °C higher or lower than the temperature setpoint, an alarm is triggered. This alarm consists of a flashing °C indicator and audible beep. The alarm will automatically deactivate as the incubator shaker achieves the set temperature.

5.7 Temperature offset calibration

The temperature probe and the temperature controller are calibrated together at the factory. The temperature probe measures the temperature of the air at the probe's location, near the heat exchanger return vent. The controller uses the probe input to adjust air temperature, up or down, to match the temperature setpoint.

Depending on various conditions within the chamber (flask placement and size, heat produced by growing organisms, heat losses due to liquid evaporation from flasks, etc.), the display temperature may differ from temperatures within the flasks themselves.

If you wish to have the temperature display (indicated temperature) match the temperature at a given point or match the average of a series of points within the chamber (actual Temperature), proceed as follows:

1. Let the unit equilibrate at or near the desired temperature. Record the indicated temperature.
2. Record the actual temperature.
3. Calculate the temperature correction value.
   Actual Temperature – Indicated Temperature = Temperature Correction Value
4. Press the SELECT key until the function °C indicator illuminates.
5. Simultaneously press the ▲ or ▼ keys. The display will indicate CAL.
6. Using the ▲ and ▼ keys, enter the Temperature Correction Value calculated in Step 3.
7. Simultaneously press the ▲ and ▼ to save the Temperature Correction Value to memory.

The °C light will pulse rapidly to indicate it is not operating in the factory default mode.

5.8 Factory Calibration

To return to the factory calibration:

1. Press the SELECT key until the function °C indicator illuminates.
2. Simultaneously press the ▲ and ▼ keys. The display will indicate CAL.
3. Using the ▲ or ▼ key, set the Temperature Correction Value to zero.
4. Simultaneously press the ▲ and ▼ keys. The rapid pulsing of the °C indicator will stop.

5.9 Speed calibration

To calibrate the shaking speed:

1. Set the shaker to a speed that can easily be measured. If you are using a strobe, minimum speed should be 250 rpm.
2. Compare the reading on the display to the measured reading.

5.9.1 Calibration adjustments

If an adjustment is needed:

1. Press the SELECT key until the RPM indicator light illuminates.
2. Press the ▲ and ▼ keys simultaneously. The display will indicate CAL.
3. Press either the ▲ or ▼ keys to change the displayed value to match the measured speed.
4. Press the ▲ and ▼ keys simultaneously to save the adjustment.
5. Turn the shaker off using the on/off switch, then turn it back on.

5.10 Power failure

In the event of a power failure, the Excella E-24 is equipped with an automatic restart function.

If the shaker was in operation prior to the power interruption, when power is restored the shaker will begin to operate at its last entered setpoint. The LED display will flash and the audible alarm will sound, indicating that a power failure has occurred. Press any key to stop the flashing in the display and the audible alarm.

6 Operating controls and function

6.1 Control panel

The control panel consists of the status indicators, LED display, function indicators, and the user interface keys.

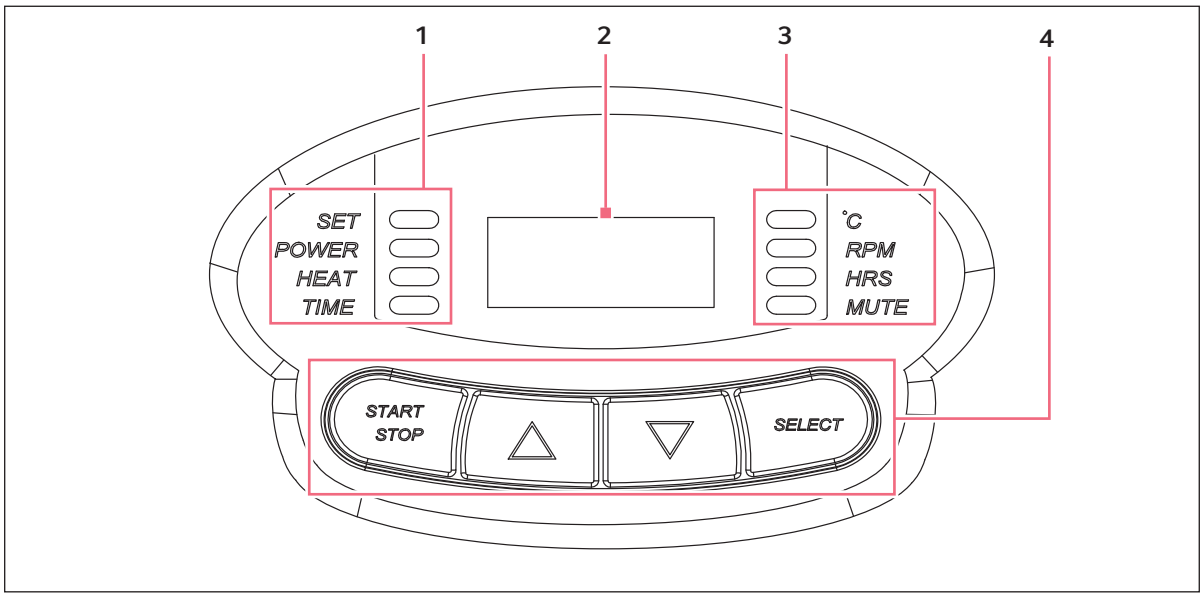

Fig. 6-1: Control panel

1 Status indicators

2 LED display

3 Function indicators

4 User interface keys

6.1.1 User interface keys

Key	Description
START/STOP	• Starts and stops the shaker • Starts and stops the timer when a timed run is desired.
SELECT	• Used to change the displayed parameter
▲ or ▼	• Used to adjust the setpoint of a displayed parameter up or down • They also allow the user to enter the SET mode for setpoint changes

6.1.2 Status indicators

4 status indicator lights are located to the left of the LED display.

Indicator	Meaning	Description
SET	Shaker is in SET mode	• Setpoints are displayed and can be altered • Activated by pressing the SELECT key or the ▲ (up) or ▼ (down) keys
POWER	Power failure	• Illuminates and blinks during power up or if power is interrupted during a run • Press the SELECT key and change to another function to turn off this indicator
HEAT	Heater is on	• Illuminate to indicate that the heater is on
TIME	Timer is in operation	• Shaker can be programmed to run for a preset time from 0.1 to 99.9 hours • Can be disengaged without stopping an ongoing run

6.1.3 LED display

The digital display on the control panel is a three-digit LED display. During normal operation, the display will indicate:

- Shaker status (On/Off)
- Shaking speed
- Chamber temperature
- Setpoints
- Hours remaining (in a timed run)
- Lid open (*LID*)

6.1.4 Function indicators

4 function indicator lights are located to the right of the LED DISPLAY. They indicate the current parameter(s) being displayed.

Indicator	Meaning	Description
°C	Interior chamber temperature	• When in SET mode, can be set between 7 °C and 60 °C using the ▲ or ▼ keys • Indexes at 0.1 °C increments unless the ▲ or ▼ key is pressed for 4 seconds, after which it indexes more rapidly
RPM	Revolutions per minute	• When in SET mode, use the ▲ or ▼ key to change the speed • Indexes at 1 RPM increments unless the ▲ or ▼ key is pressed for 4 seconds, after which it indexes more rapidly
HRS	Time remaining in a timed run	• Can be set from 0.1 to 99.9 hours using the ▲ or ▼ keys • Indexes at 0.1 hour increments unless the ▲ or ▼ key is pressed for 4 seconds, after which it indexes more rapidly
MUTE	Audible alarm mute	• Controlled by the SELECT key • When activated, the audible alarm is muted, and remains so until is is reactivated • If MUTE is ctivated when the shaker is turned off, it will remain active when the unit is powered on • Press the SELECT key until the MUTE indicator illuminates; press the ▲ or ▼ key to display ON or OFF as desired, then press SELECT.

7 Troubleshooting

Symptoms	Possible causes	Solutions
Shaker does not run	• Power cord is not plugged in and/or power switch is off	▸ Plug in power cord to working electrical outlet ▸ Turn on the power switch
	• Lid is open, *Lid* is indicated on the display	▸ Open and reclose the lid firmly
	• Recently replaced fuse may not be seated properly	▸ Reinstall the fuse carefully
	• On/off switch is not working • Defective main board • Defective display controller board • Jammed shaking mechanism • Defective motor • Drive belt out of alignment or worn	▸ Call for service
Shaker runs slowly and/or no speed indication	• Incorrect speed calibration	▸ Recalibrate shaking speed (see *Speed calibration on p. 20)*
	• Defective main board • Defective motor • Drive belt out of alignment or worn	▸ Call for service
Shaker does not run at set speed	• Shaker is overloaded and/or you are using baffled flasks	▸ Remove some contents and balance load
	• Defective motor • Drive belt is out of alignment or worn	▸ Call for service
Operating noise	• Load out of balance	▸ Unload all contents and reload
	• Loose component(s) in platform, subplatform and/or drive assembly	▸ Call for service
Incubator does not reach set temperature	• Heater fuse blown	▸ Replace (see *Fuse replacement on p. 29)*
	• Ambient temperature too high or too low	▸ Cool or heat the room as needed
	• Compressor over-pressure switch activated • Defective heater	▸ Call for service
	• Incorrect temperature indication	▸ (see Tab. on p. 28)

Symptoms	Possible causes	Solutions
Incorrect temperature indication	• Defective RTD assembly • Defective main board	▸ Call for service

8 Maintenance

8.1 Routine maintenance

No routine maintenance schedule is required for the E-24.

Clean the incubator shaker occasionally using a cloth with conventional household (non-abrasive) cleaner.

To ensure proper air flow in and around the incubator shaker, vacuum or sweep the area around the incubator shaker to remove dust and other debris.

8.2 Opening the service compartment

WARNING!

- Before opening the service compartment, always turn off the shaker and disconnect the power cord from the power supply.

The service compartment contains the shaker's electronic and temperature control components. Normally, this compartment should be accessed by authorized service technicians only. You may, from time to time, need to remove the access panel in order to replace fuses.

8.2.1 Fuse replacement

WARNING!

- When replacing fuses, always turn off the shaker and disconnect the power cord from the power supply.

The user can replace one fuse on the E-24, located behind the front bezel panel (on the PC board). To access the fuse:

1. Turn the power off and unplug the shaker.
2. Open the front cover.
3. Remove the 4 fastners that hold the front panel in place.
   Set them aside for the reuse.
4. The fuse is located on the PC board located on the right side of the base weldment.
5. Access the fuse by using a coin or a blade screwdriver to turn and release the spring-loaded cap.
6. Replace it with a new one of the same type and rating.

Fuse holder number	Function	Type	Rating
F1	Heater	Slo Blo 8 A	8.0 A

8.3 Cleaning

NOTICE! Risk of equipment damage
Use of abrasive or corrosive compounds may damage the incubator shaker.

- Do not use abrasive or corrosive compounds to clean the incubator shaker.

1. Routinely clean the exterior of the incubator shaker by wiping it over with a soft cloth, moistened with soapy water.
2. Rinse the soap from the cloth in clean water, and wipe the exterior surfaces again.

If Biohazard decontamination is necessary, (see *Disinfection/decontamination on p. 30)*.

8.4 Disinfection/decontamination

WARNING! Risk of potential harm to personnel

- It is the responsibility of the user to carry out appropriate decontamination procedures if hazardous material is spilled on or inside the equipment. Before using any cleaning or decontamination method other than those suggested by the manufacturer, users contact Eppendorf to ensure that the proposed method would not damage the equipment.

CAUTION! Risk of potential harm to personnel

- As a routine precaution, wear protective gloves.
- Be sure to adequately ventilate the work area as you disinfect, to avoid the formation of potentially explosive alcohol vapors.

Commercially available household bleach solutions, when diluted at a 1:10 ratio, are effective in routine decontamination of the incubator shaker. The method for decontaminating a spill depends upon the nature of the spill.

1. Switch the shaker off and unplug it from the mains/power supply.
2. Spills involving fresh cultures or samples known to have low concentrations of biomass should be flooded with decontamination solution and soaked for 5 minutes before cleanup.
3. Spills involving samples with high concentrations of biomass, or involving organic matter, or occurring in areas warmer than room ambient temperature, should be exposed to decontamination solution for at least one hour before cleanup.

9 Transport, storage and disposal

9.1 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 2012/19/EU 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.

10 Technical data

10.1 Weight/dimensions

10.1.1 Device dimensions

Width (External)	56 cm (22 in)
Height (External)	61 cm (24 in)
Height (with lid open)	101.9 cm (40 in)
Depth (External)	76 cm (30 in)
Weight	60 kg (133 lb)

10.1.2 Platform dimensions

Width	46 cm (18 in)
Depth	46 cm (18 in)

10.1.3 Chamber dimensions

Width	51.7 cm (20 3/8 in)
Height	34.4 cm (13 9/16 in)
Depth	53.3 cm (21 in)

10.1.4 Required space/footprint

Width	68.6 cm (27 in)
Height	106.7 cm (42 in)
Depth	83.8 cm (33 in)

10.2 Application parameters

10.2.1 Speed

	50 rpm – 400 rpm
Control accuracy	±1 rpm

Use of baffled flasks will significantly reduce maximum speed for any incubator shaker. We may be able to improve this maximum speed by using an alternative motor pulley. Contact your Eppendorf representative for more information.

10.2.2 Capacity

Heater	Long-life, low-watt density resistance-type heater with high temperature thermostat

10.2.3 Temperature

Range	+7 °C above ambient temperature to 60 °C
Accuracy	±0.1 °C at 37 °C
Ambient operating environment	10 to 35 °C, 20 to 80 % relative humidity, non-condensing

10.3 Power supply

E-24 main/power supply

230 V, 60 Hz	800 VA

11 Ordering information

11.1 Accessories

Universal platforms have multiple holes, enabling you to mount an assortment of flask clamps or other accessories on a single platform.

When only one size flask will be used on the shaker (i.e. 250 mL flasks), dedicated platforms come with flask clamps already mounted. Dedicated platforms generally will hold a greater number of flasks than the universal platform, but do not offer the versatility.

The capacities shown represent the maximum number of flasks in a given size that will fit on the platform in a balanced pattern.

	Dedicated platform	**Universal platform**
10 mL	-	109
25 mL	-	64
50 mL	64	45
125 mL	34	21
	M1194-9904	
250 mL	25	18
	M1194-9905	
500 mL	16	14
	M1194-9906	
1 L	9	8
	M1194-9907	
2 L	5	5
	M1194-9908	
2.8 L	4	4
	M1194-9932	
4 L	_	-
5 L	-	-
6 L	-	2
Large test tube rack	-	4
Medium test tube rack	-	5
Small test tube rack	-	5
Microplate rack (stack)	-	8
Microplate rack (1 layer)	-	2

Platforms	Part number
Universal platform	M1250-9902
Utility carrier with cushioned crossbars	M1194-9909
Utility tray with non-skid rubber surface	M1194-9910
Sticky pad platform	M1250-9903

Flask clamps	Part number
10 ml Erlenmeyer Flask	ACE-10S
25 ml Erlenmeyer Flask	M1190-9004
50 ml Erlenmeyer Flask	M1190-9000
125 ml Erlenmeyer Flask	M1190-9001
250 ml Erlenmeyer Flask	M1190-9002
500 ml Erlenmeyer Flask	M1190-9003
1 L Erlenmeyer Flask	ACE-1000S
2 L Erlenmeyer Flask	ACE-2000S
2.8 L Fernbach Flask	ACSB-2800S

Racks and trays		Part number	Platform capacity
Adjustable angle Test Tube Rack for tubes 8 – 11 mm diameter	80 tube capacity	M1289-0110	4
	60 tube capacity	M1289-0010	5
	48 tube capacity	M1289-0001	5
Adjustable angle Test Tube Rack for tubes 12 – 15 mm diameter	60 tube capacity	M1289-0200	4
	44 tube capacity	M1289-0020	5
	34 tube capacity	M1289-0002	5
Adjustable angle Test Tube Rack for tubes 15 – 18 mm diameter	42 tube capacity	M1289-0300	4
	31 tube capacity	M1289-0030	5
	24 tube capacity	M1289-0003	5
Adjustable angle Test Tube Rack for tubes 18 – 21 mm diameter	30 tube capacity	M1289-0400	4
	23 tube capacity	M1289-0040	5
	18 tube capacity	M1289-0004	5
Adjustable angle Test Tube Rack for tubes 22 – 26 mm diameter	22 tube capacity	M1289-0500	4
	16 tube capacity	M1289-0050	5
	13 tube capacity	M1289-0005	5

Racks and trays		Part number	Platform capacity
Adjustable angle Test Tube Rack for tubes 26 – 30 mm diameter	20 tube capacity	M1289-0600	4
	16 tube capacity	M1289-0060	5
	12 tube capacity	M1289-0006	5
Microplate holder rack (stacked)	3 deep well or 9 standard	M1289-0700	8
Microplate holder rack (single layer)	5 deep well or standard	TTR-221	2
Angled Test Tube Rack Holder* for user-supplied test tube racks that are 10 - 13 mm (4 – 5 in) wide and up to 38 mm (15 in) long	NA	TTR-210	2
Angled Test Tube Rack Spacer Bar* for use with TTR-210 to accommodate test tubes racks that are less than 13 mm (5 in) wide.	NA	TTR-215	NA

*Universal platform required

12 Declaration of conformity

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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:

Excella® E24 & Excella® E24R

including accessories

Product type:

Benchtop incubator shaker with optional refrigeration

Relevant directives / standards:

2006/95/EC: EN 61010-1, EN-61010-2-010

2004/108/EC: EN 61326-1

2011/65/EU

2012/19/EU

Management Board

Portfolio Management

Date: October 22, 2013

Your local distributor: www.eppendorf.com/contact
Eppendorf AG · 22331 Hamburg · Germany
eppendorf@eppendorf.com

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