



MiniSpin[®] / MiniSpin[®] plus

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Contents

MiniSpin / MiniSpin plus

Instruction Manual 17

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Mikrocentrifuge MiniSpin / MiniSpin plus

Abb. 1 / Fig. 1



START/STOP

SHORT-SPIN

OPEN

1 Netzschalter und -stecker

2 Rotormutter

3 Rotor

4 ▼▲ RPM/RZB

5 ▼▲ Zeit

1 Mains switch and plug

2 Rotor nut

3 Rotor

4 ▼▲ rpm/rcf

5 ▼▲ Time



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1 Introduction

MiniSpin and **MiniSpin plus** are compact, easy-to-operate tabletop centrifuges, which are ideal for use as "personal centrifuges".

Twelve Eppendorf micro test tubes can be centrifuged simultaneously in a 45° fixed-angle rotor F-45-12-11 using the following performance data:

	Relative centrifugal force rcf	Rotational speed rpm	Max. centrifuging radius (cm)
MiniSpin®	12,100	13,400	6
MiniSpin® plus	14,000	14,500	6

The rotor F-55-16-5-PCR is a fixed-angle rotor for centrifuging 16 PCR tubes (0.2 ml) or two 5 or 8-strips 0.2 ml PCR tubes with the following performance data:

	Relative centrifugal force rcf	Rotational speed rpm	Max. centrifuging radius (cm)
MiniSpin®	9,840	13,400	4.9
MiniSpin® plus	11,520	14,500	4.9

Before starting up MiniSpin or MiniSpin plus for the first time, please read the rest of this operating manual. The latest version of the manual and the safety instructions in your language can be found on the Internet at www.eppendorf.com.



This sign is found on your centrifuge and on several pages in the operating manual. Texts labeled with this sign contain safety notes. Read these safety precautions before using the centrifuge for the first time.

1.1 Intended use

The **MiniSpin / MiniSpin plus** is intended exclusively for indoor use and for separating aqueous solutions and suspensions of various densities in approved test tubes.

This device may only be operated by trained specialist staff.

1 Introduction

1.2 Delivery package

1 MiniSpin or MiniSpin plus

- 1 Rotor F-45-12-11
- 1 Stainless steel rotor lid
- 1 Rotor nut
- 1 Mains cable
- 1 Operating manual

1.3 Installing the device



Place the centrifuge onto a level, horizontal surface. Make sure that the ventilation slits are not blocked! In accordance with the safety regulations of IEC 1010-2-020 (equivalent to EN 61010-2-020), a safety distance of 30 cm should be observed around the centrifuge during operation. No objects which could cause additional damage in the event of a centrifuge crash should be positioned in this space.

Before plugging in the centrifuge, compare your power supply with the electrical requirements listed on the identification plate on the underside of the device.

The mains switch is located at the rear of the device. The centrifuge is ready to operate when the display becomes visible. Place the rotor onto the rotor axle and tighten using the rotor nut.

Before starting up the centrifuge for the first time, make sure that the rotor nut is securely fastened.

2 Safety precautions and applicational limitations



The rotor and the rotor lid must always be securely fastened.

If the centrifuge makes unusual noises when started, the rotor or rotor lid is not fastened correctly. Switch the device off **immediately** by pressing "STOP".

The stainless steel rotor lid may only be used in the MiniSpin® / MiniSpin® plus and MiniSpin® SPACE centrifuges for the recommended application areas.

The rotors must only be loaded symmetrically.

Do not use centrifuges that have not been correctly installed or repaired.

Repairs must only be performed by an Eppendorf authorized service technician. Only use original rotors and spare parts recommended by Eppendorf.

MiniSpin / MiniSpin plus may be used for the specified applications only. They must not be operated in a hazardous or flammable environment and must not be used to centrifuge explosive or highly reactive substances.

When handling toxic or radioactive liquids or pathogenic bacteria from Risk Group II (see World Health Organisation: "Laboratory Biosafety Manual"), observe the safety regulations of the country in question.

If such liquids are spilled in the rotor or rotor chamber, the centrifuge must be cleaned carefully and properly.

Before using cleaning or decontamination methods other than those stipulated by the manufacturer, contact the manufacturer to ensure that the intended method will not damage the centrifuge.

Prior to centrifugation, the tubes should in any case be visually inspected for material damage. Damaged tubes may not be centrifuged. This is because broken tubes can, in addition to sample loss, result in further damage to the centrifuge and accessories.

Close the test tube lids before centrifuging. Open lids can be ripped off during centrifuging and damage the centrifuge.

A liquid density of 1.2 g/ml must not be exceeded at the maximum rotational speed.

When moving the centrifuge from a **cold room** to a normal lab, run the centrifuge for 30 minutes beforehand in the cold room so that it does not get covered in condensation. Alternatively, allow it to warm up in a lab for at least three hours, but **do not plug in the centrifuge** in order to prevent damage caused by condensation.

Rotors and rotor lids are high-grade components which are subject to extreme mechanical strain. Even slight scratches and tears can lead to serious internal material damage. Avoid damage caused by aggressive chemicals, including among others: Strong and weak alkali, strong acids, solutions with mercury, copper and other heavy metals, chlorinated hydrocarbons, concentrated saline solutions and phenol.

In the event of contamination caused by aggressive agents, the rotor must be cleaned immediately using a **neutral** cleaning liquid. This is particularly important for the bores for the tubes.

2 Safety precautions and applicational limitations

Rotors and rotor lids showing visible signs of corrosion or mechanical damage should not be used. Inspect the rotor lid regularly.

Be sure to close the tube lids tightly prior to centrifugation. Open tube lids can be torn off during centrifugation and damage the rotor lid or centrifuge.

Please ensure that the rotor is protected from corrosion and mechanical damage. Even slight scratches and cracks can cause severe inner damage to the rotor materials.

Do not use damaged rotors!

Do not move the centrifuge during the run.

After centrifugation, and particularly if the motor was blocked, the temperature of the motor block under the centrifuge may be so high as to be uncomfortably hot. For this reason, touch the centrifuge at the edges only.



Transfer

If the device is passed on to someone else, please include the instruction manual.

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

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

According to these regulations, any devices supplied after 13.08.05 in the business-to-business sphere, to which this product is assigned, may no longer be disposed of in municipal or domestic waste. They are marked with the following symbol to indicate this.



As disposal regulations within the EU may vary from country to country, please contact your supplier if necessary.

Declaration concerning the ATEX directive (94/9/EC)

The present design and ambient conditions inside Eppendorf centrifuges mean that they are not suitable for use in a potentially explosive atmosphere. The centrifuges must therefore only be used in a safe environment such as the open environment of a ventilated laboratory or a fully-extracted fume hood. The use of substances which may contribute to a potentially explosive atmosphere is not permitted. The final decision on the risks in connection with the use of such substances is the responsibility of the user of the centrifuge.

3 Operation

3.1 Control elements

See the front view of the device, found on the fold-out page at the front of this manual:

- **START/STOP**
- **SHORT-SPIN** - For reduced-time centrifugation
- **OPEN** - To open the lid
- **▼▲** - For setting the time and rotational speed
- Display for time and speed / rcf
- Rotor F-45-12-11 with 12 bores for microcentrifuge tubes
- Rotor lid with central locking button (not pictured)

Rear of centrifuge:

- Mains plug with mains switch.

Bottom of centrifuge:

- Identification plate with electrical specifications
- Opening in base for emergency lid release (Fig. 1, E).



Caution: Following centrifugation, the motor block may be hot.

3.2 Rotor insertion and removal



Fit the rotor onto the motor shaft, followed by the rotor nut. Tighten the rotor nut by turning it clockwise. Before each start, check that the rotor is firmly tightened. To release the rotor, turn the rotor nut counterclockwise.

3.3 Loading the rotors



Rotors must always be loaded symmetrically. Minimize differences in weight between the filled sample tubes - taring with a scale is recommended. This will reduce wear on the drive and cut running noise.

For rotor F-45-12-11 the permitted total weight (adapter + tube + contents) is 4 g per bore and for rotor F-55-16-5-PCR 3.5 g per 8-strip.

3 Operation

3.4 Centrifugation with a preset time

Turn on the mains switch. The nominal values of the last run appear in the display.

- OPEN** To open the lid.
Load the rotor **symmetrically**. Fasten the rotor lid and close the centrifuge lid.
- ▼▲** To change the run time / the rotational speed.
With **MiniSpin plus**, the time can be pre-selected between 15 seconds and 99 minutes, and with **MiniSpin** between 15 seconds and 30 minutes.
During centrifugation, the time is counted downwards, with the last minute counted down in seconds.
With **MiniSpin plus**, it is possible to switch from the centrifugation time display "15 sec" or "99 min" to the display "00" (for ∞) for continuous operation by pressing the ▼ or ▲ key again (With **MiniSpin**, time selection switches from 15 sec to 30 min or vice-versa).

1st START/STOP To start the run.

2nd START/STOP To end the run prematurely.

The time setting and the rotational speed may be changed **during the run**. The remaining run time appears in the display.

After the run the lid of the centrifuge opens automatically.

3.5 Short-spin centrifugation

SHORT-SPIN Short-spin centrifugation is possible for as long as this key is held down.
With **MiniSpin**, the maximum rpm is 13,400.

For **MiniSpin plus** only:

SHORT-SPIN When this key is pressed when the lid is **open**, the centrifuge switches to one of two operating statuses after 5 seconds:

1 – 14 t	When displayed, this signifies the following: short-spin speed as preset.
14 t	When displayed, this signifies the following: max. short-spin speed.

3.6 Continuous centrifugation (for MiniSpin plus only)

With **MiniSpin plus**, the display 00 (= ∞) for **continuous operation** can be selected by pressing the key again.

1st START/STOP To start the run. Time is counted upwards in minutes.
The rectangular symbol flashes for as long as the rotor is spinning.

2nd START/STOP To end continuous operation.

3 Operation

3.7 Switching to the rcf display (for MiniSpin plus only)

- ▼▲ When these keys are pressed simultaneously, the display switches from rpm to rcf (and vice-versa).
If this takes place during the run, the display switches back after 20 seconds.

In order to determine the RCF for the displayed rotational speed of the **MiniSpin**, you can calculate with the following formula in accordance with DIN 58 970:



$$\text{rcf} = 1,118 \cdot 10^{-5} \cdot n^2 \cdot r_{\text{max}}$$

n: rotational speed in 1/min

$r_{\text{max}} = 6 \text{ cm}$: max. centrifuging radius in cm

Example: Because the maximum centrifugation radius is 6 cm, a maximum RCF of 7,000 x g can be achieved at a rotational speed of 10,200.

3.8 Opening the centrifuge in the event of a power failure

-  Disconnect the centrifuge from the mains supply. Wait until the rotor has come to a standstill. (This may take up to four minutes!) Then lift up **MiniSpin**, insert a pen into the opening in the ground plate and move the disc in the direction of the arrow (see Fig. 1, E).
-  When lifting up the centrifuge, particularly after a device failure, please note that the motor on the underside of the centrifuge can become uncomfortably hot. Touch the device at the edges only!

4 Maintenance and cleaning



The rotor and the outside of **MiniSpin / MiniSpin plus** should be cleaned regularly with a moist cloth. Disconnect the centrifuge from the mains supply, remove the rotor and clean it separately. Only **neutral** agents may be used for cleaning purposes (e.g. Extran neutral, RBS neutral). For disinfection purposes, please use an alcohol-based disinfectant (70 % isopropanol/water mixture).

To ensure that the bores for the tubes are cleaned thoroughly, remove any residue using a bottle brush and hand-hot cleaning solution, afterwards rinse well. To dry the rotor, place it on a cloth with the bores facing downwards.

Please check the rotor and especially the rotor bores regularly for deposits or damage.

Then reinsert the rotor and tighten the rotor nut.

After cleaning, allow the rotor to accelerate once to the maximum speed.

Do not place the rotor into the cleaning solution!

If corrosive, toxic or radioactive liquids or pathogenic bacteria from Risk Group II (see World Health Organization: "Laboratory Biosafety Manual") are accidentally spilled in the rotor or rotor chamber, the centrifuge must be decontaminated thoroughly.

Please be sure to use only neutral media (e.g. Extran neutral, RBS neutral, Teepol 610 S, 70 % alcohol, meliseptol, sterillium) to clean and disinfect the stainless steel rotor lid. The stainless steel rotor lid is autoclavable (121 °C, 20 min). We don't advise continuous cleaning with a dishwasher.

Returning of the device

When returning centrifuges, ensure that these devices are fully decontaminated and do not present any kind of health risk to our service staff.

For further information and a blank of the decontamination confirmation, please visit www.ependorf.com. Do also consult your laboratory safety officer about a suitable decontamination method.

Please fill in the decontamination confirmation and enclose it with the device if it is to be returned to Eppendorf.

5 Troubleshooting

Error	Cause	Solution
No display.	No main power connection.	Plug in mains cable on both sides.
	Power failure.	Check the mains fuse of the lab.
Lid cannot be opened.	Power failure.	Emergency lid release (see Sec. 3.8).
	Rotor is still spinning.	Wait for the rotor to come to a standstill.
Centrifuge shakes during acceleration.	Rotor not loaded symmetrically.	Stop centrifuge run and load centrifuge symmetrically.
"LID"	Lid not closed correctly.	Press lid closed.
	Error with lid closing mechanism.	Contact Service.
"INT"	Power failure during run.	Check the mains plug. Restart the centrifuge using Start/ Stop
"Err 5"	Defective lid latch.	Allow device to stand switched on for at least 8 min.
"Err 8"	Rotor not properly secured.	Tighten rotor nut.
"Err 9" to "Err 14"	Electronics error.	Switch off centrifuge and then switch on again.
"Err 60" to "Err 68"	Drive error.	Allow centrifuge to cool down, then restart.

If the solutions suggested here prove to be unsuccessful, please contact Service.

6 Technical data

Power supply:	230 V / 50 – 60 Hz 120 V / 50 – 60 Hz see identification plate on bottom of centrifuge
Power requirement:	
MiniSpin plus	85 W
MiniSpin	70 W
Max. speed:	
MiniSpin plus	14,500 rpm
MiniSpin	13,400 rpm
Max. centrifugal force:	
MiniSpin plus	14,000 rcf
MiniSpin	12,100 rcf
Max. load:	12 x 2.0 ml Safe-Lock tubes
Max. kinetic energy:	
MiniSpin plus	852 Nm
MiniSpin	728 Nm
Max. permitted density of material to be centrifuged:	1.2 g/ml
Ambient temperature:	10 – 40 °C
Max. relative humidity:	75 %, no condensing moisture
Degree of pollution:	2
Overvoltage category:	II
Acceleration time to max. speed:	13 seconds
Braking time from max. speed;	12 seconds
Dimensions:	Height: 120 mm Depth: 240 mm Width: 225 mm
Weight:	3.7 kg (without rotor)
Fuses	
(not accessible from outside; to be changed by Service only):	230 V: 1.6 A, slow-acting 120 V: 3.16 A, slow-acting (UL-approved)

Technical specifications subject to change!

7 Ordering information

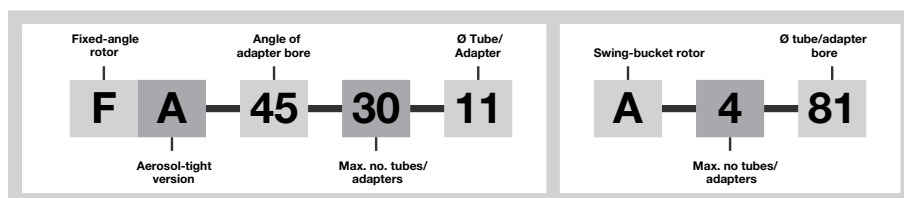
Centrifuge MiniSpin, 230 V / 50 – 60 Hz	5452 000.018
Centrifuge MiniSpin, 120 V / 50 – 50 Hz	5452 000.131
Centrifuge MiniSpin plus, 230 V / 50 – 60 Hz	5453 000.011
Centrifuge MiniSpin plus, 120 V / 50 – 50 Hz	5453 000.135
Adapter for 0.5 ml microcentrifuge tubes and 0.6 ml Microtainers®; set of 6	5425 716.001
Adapter for 0.4 ml tubes; set of 6	5425 717.008
Adapter for 0.2 ml PCR tubes; set of 6	5425 715.005
Accessories	
Rotor F-45-12-11 with rotor lid for MiniSpin plus	5452 720.008
Rotor F-45-12-11 with rotor lid for MiniSpin	5452 725.000
Lid for rotor F-45-12-11, stainless steel with rotor nut	5452 700.805
Rotor F-55-16-5-PCR with rotor lid	5452 727.007
Lid for rotor F-55-16-5-PCR with rotor nut	5452 730.008
Rotor nut	5452 729.000

Important:

Please use the original accessories recommended by Eppendorf. Using spare parts or disposables which we have not recommended can reduce the precision, accuracy and life of the centrifuges. We do not honor any warranty or accept any responsibility for damage resulting from such action.

Rotor code

All Eppendorf rotors are designated according to a simple, logical system which describes the technical specifications as a uniform series of numbers and letters e.g.:



EG-Konformitätserklärung EC Conformity Declaration

Das bezeichnete Produkt entspricht den einschlägigen grundlegenden Anforderungen der aufgeführten EG-Richtlinien und Normen. Bei einer nicht mit uns abgestimmten Änderung des Produktes oder einer nicht bestimmungsgemäßen Anwendung verliert diese Erklärung ihre Gültigkeit.

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

Produktbezeichnung, Product name:

Centrifuge MiniSpin[®], MiniSpin[®] plus, MiniSpin[®] plus SPACE

einschließlich Zubehör / including accessories

Produkttyp, Product type:

Laborzentrifuge / Laboratory Centrifuge

Einschlägige EG-Richtlinien/Normen, Relevant EC directives/standards:

2006/95/EG, EN 61010-1, EN 61010-2-20

2004/108/EG, EN 55011/B, EN 61000-6-1, EN 61000-3-2, EN 61000-3-3, EN 61326

98/37/EG, EN 292-2, EN 292-2/A1,

98/79/EG, EN 14971, EN 61010-2-101

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