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Mikrocentrifuge MiniSpin / MiniSpin plus

Abb. 1 / Fig. 1

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
# Contents

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MiniSpin and MiniSpin plus are bench-top "personal centrifuges" designed for workstations in training and research laboratories in the fields of bioscience, medicine and chemistry.

With a space-saving design and excellent operating comfort, MiniSpin is the ideal made-to-measure workstation.

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

<table>
<thead>
<tr>
<th></th>
<th>Relative centrifugal force rcf</th>
<th>Rotational speed rpm</th>
<th>Max. centrifuging radius (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MiniSpin</td>
<td>12,100</td>
<td>13,400</td>
<td>6</td>
</tr>
<tr>
<td>MiniSpin plus</td>
<td>14,000</td>
<td>14,500</td>
<td>6</td>
</tr>
</tbody>
</table>

Before starting up MiniSpin or MiniSpin plus for the first time, please read the rest of this operating manual.

⚠️ 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 Delivery package

1 MiniSpin or MiniSpin plus
1 Rotor
1 Stainless steel rotor lid
1 Rotor nut
1 Mains cable
1 Operating manual

1.2 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 (round washer containing the instructions "Festziehen → Fasten well →").

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

⚠️ After the run has finished, the centrifuge lid opens automatically. Microcentrifuge tubes with a nominal volume of up to 2.0 ml are loaded into the 12 bores. They are loaded opposite each other in pairs (e.g. position 1 and 17) or symmetrically in sets of three (e.g. position 1, 5 and 9). Opposing tubes should be filled equally. To prevent any losses caused by friction and to minimize noise levels, **MiniSpin / MiniSpin plus** may not be operated without the rotor lid being fastened.

The specifications for the permitted weight per bore (4 g) apply to adapter + tube + content of tube.

3.3 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).
3 Operation

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.

3.4 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.

3.5 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.

2nd START/STOP  To end continuous operation.

3.6 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:

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

n: rotational speed in 1/min

\( r_{max} = 6 \text{ cm} \) : 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  Operation

3.7 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!
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, please ensure that these devices are fully decontaminated so that they do not present a health risk to our service staff.

For more information, see www.eppendorf.com.
## 5 Troubleshooting

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<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
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<td>No display.</td>
<td>No main power connection.</td>
<td>Plug in mains cable on both sides.</td>
</tr>
<tr>
<td></td>
<td>Power failure.</td>
<td>Check the mains fuse of the lab.</td>
</tr>
<tr>
<td>Lid cannot be opened.</td>
<td>Power failure.</td>
<td>Emergency lid release (see Sec. 3.7).</td>
</tr>
<tr>
<td></td>
<td>Rotor is still spinning.</td>
<td>Wait for the rotor to come to a standstill.</td>
</tr>
<tr>
<td>Centrifuge shakes</td>
<td>Rotor not loaded symmetrically.</td>
<td>Stop centrifuge run and load centrifuge symmetrically.</td>
</tr>
<tr>
<td>during acceleration.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;LID&quot;</td>
<td>Lid not closed correctly.</td>
<td>Press lid closed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Error with lid closing mechanism; contact Service.</td>
</tr>
<tr>
<td>&quot;INT&quot;</td>
<td>Power failure during run.</td>
<td>Check the mains plug.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Re-start the centrifuge using Start/Stop</td>
</tr>
<tr>
<td>&quot;Err 5&quot;</td>
<td>Rotor loaded incorrectly or</td>
<td>Check loading of rotor.</td>
</tr>
<tr>
<td></td>
<td>defective lid latch.</td>
<td></td>
</tr>
<tr>
<td>&quot;Err 9&quot; to &quot;Err 14&quot;</td>
<td>Electronics error.</td>
<td>Switch off centrifuge and then switch on again.</td>
</tr>
<tr>
<td>&quot;Err 60&quot; to &quot;Err 68&quot;</td>
<td>Drive error.</td>
<td>Allow centrifuge to cool down, then re-start.</td>
</tr>
</tbody>
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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: 2 – 40 °C

Max. relative humidity: 75 %, no condensing moisture

Degree of pollution: 2

Overvoltage category: ΙΙ

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
for MiniSpin plus (black) 5452 720.008

Rotor F-45-12-11
for MiniSpin (anodized) 5452 725.000

Lid for rotor F-45-12-11,
stainless steel with rotor nut 5452 700.805

Rotor nut for stainless steel lid 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.
EG-Konformitätserklärung
EC Conformity Declaration


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

Produkttyp, Product type:
Laborzentrifuge / Laboratory Centrifuge

Einschlägige EG-Richtlinien/Normen, Relevant EC directives/standards:
73/23/EWG, EN 61010-1, EN 61010-2-20
89/336/EWG, EN 55011/B, EN 61000-6-1, EN 61000-3-2, EN 61000-3-3
98/37/EG, EN 292-2, EN 292-2/A1

98/79/EG, EN 61326

Vorstand, Board of Management:
19.08.2003

Hamburg, Date:

Projektmanagement, Project Management: