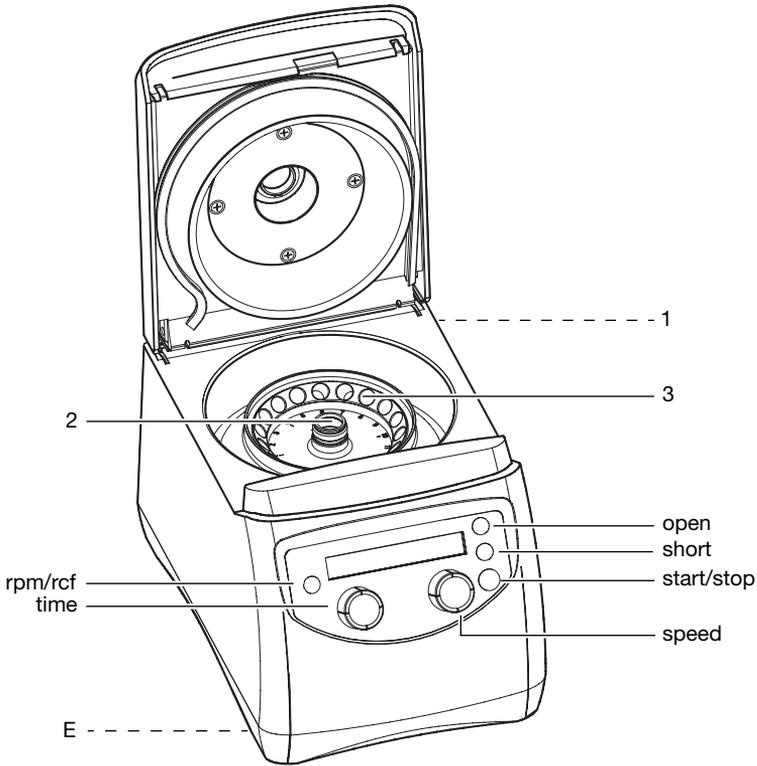




## Centrifuge 5418

**eppendorf**

Figure 1 / Abbildung 1



**rpm/rcf**

rpm/rcf button

rpm/rcf-Taste



**time**

Time knob

Zeitwahl-Drehknopf



**speed**

Speed selector knob

Geschwindigkeits-Drehknopf



**open**

Lid release button

Deckelentriegelungs-Taste



**short**

Short run button

Kurzzeitlauf-Taste



**start/stop**

Start/stop button

Start/Stop-Taste

**1** Power switch and plug

Netzschalter und -stecker

**2** Rotor nut

Rotormutter

**3** Rotor

Rotor

**E** Emergency lid release

Notentriegelung



No part of this publication may be reproduced without the prior permission of the copyright owner.

Copyright© 2005 Eppendorf AG, Hamburg

## Table of contents

<b>1</b>	<b>Introduction .....</b>	<b>24</b>
1.1	Delivery package .....	24
1.2	Installing the device .....	24
<b>2</b>	<b>Safety precautions and applicational limitations.....</b>	<b>26</b>
<b>3</b>	<b>Operation .....</b>	<b>29</b>
3.1	Functional and operator control elements.....	29
3.2	Fitting and removing the rotor .....	29
3.3	Loading the rotor .....	29
3.4	Rotor .....	29
3.5	Centrifugation with timer setting.....	30
3.6	Adjusting centrifuging parameters during centrifugation .....	30
3.7	Short spin centrifugation .....	30
3.8	Continuous operation .....	30
3.9	rcf display and calculation .....	32
3.10	Standby mode .....	32
3.11	Opening the centrifuge in case of power failure.....	32
3.12	Fuses .....	32
<b>4</b>	<b>Maintenance and cleaning .....</b>	<b>33</b>
4.1	Device.....	33
4.2	Rotor.....	33
4.3	Glass breakage.....	34
4.4	Returning devices.....	34
<b>5</b>	<b>Troubleshooting.....</b>	<b>35</b>
<b>6</b>	<b>Technical data.....</b>	<b>37</b>
<b>7</b>	<b>Ordering information .....</b>	<b>38</b>

# 1 Introduction

The Centrifuge 5418 is a non-refrigerated bench-top centrifuge for use by trained professionals in research, routine and training laboratory work in the biosciences, medicine, clinical diagnostics, industry and the chemistry field. Up to 18 micro test tubes with a filling volume of 0.2 to 2.0 ml can be centrifuged simultaneously in the fixed-angle rotor.

**Before using the centrifuge 5418 for the first time, please read the manual. The latest version of the manual and the safety instructions in your language can be found on the Internet at [www.eppendorf.com](http://www.eppendorf.com).**



You will see this symbol on your centrifuge and at a number of points throughout this manual. The texts it highlights are relevant to safety. Use the centrifuge only after having read the safety notices.

## 1.1 Delivery package

1 centrifuge 5418  
1 rotor FA-45-18-11 incl. rotor lid  
1 power cable  
1 manual  
1 rotor key  
1 Captain Eppi rotor key holder  
1 set of fuses

## 1.2 Installing the device



- To disconnect the power supply of the centrifuge from the power supply in the event of a fault, an emergency switch must be provided away from the centrifuge, preferably outside the room in which the centrifuge is located or next to the exit from this room.
- Remove the transport safety device and keep it together with the centrifuge packaging for possible use if the device is subsequently moved.
- Place the centrifuge on a solid, flat, non-resonant lab bench. Check beforehand whether the lab bench is specified for the weight of the centrifuge.
- The surrounding area must be well-ventilated and protected against direct sunlight. To ensure that ventilation of the device is not impaired, a minimum fundamental clearance of at least 30 cm to the side and at least 15 cm to the back wall must be maintained.
- During centrifugation, according to the recommendations set out in EN 61010-2-020, a safety clearance of 30 cm must be maintained around the centrifuge within which there are no objects which may be destroyed and so cause further damage.
- Please ascertain that the power supply and the power frequency are compatible with the information given on the device ID plate.

# 1 Introduction

- Now connect the centrifuge to the power supply and switch it on at the power switch (on the rear side, see inside cover page). The centrifuge is now ready for operation and the display is active.
- **Before starting for the first time, check whether the rotor and the rotor lid are tightened in accordance with specification.** To tighten the rotor, place the rotor key supplied on the rotor nut and turn it clockwise until the rotor nut is firmly tightened up. The rotor lid is then tightened up.

## 2 Safety precautions and applicational limitations



For your personal safety, please be sure to comply with the following regulations unconditionally.

- The centrifuge 5418 must only be used for the specified applications (see “Introduction”). It must not be operated in explosive atmospheres. Explosive, radioactive or highly reactive substances must not be centrifuged.
- When being moved from the cool room to a normal lab environment, the centrifuge must either run for half an hour in the cool room first to warm up, or it must warm up for at least 3 hours in the lab before being connected to the power supply system, in order to prevent damage from condensation.
- The centrifuge must not be moved or knocked while in operation.
- Centrifuges which have not been properly installed or repaired may not be operated. Repairs may only be carried out by Service personnel authorized by Eppendorf. Use only original Eppendorf spare parts and rotors.
- When handling toxic liquids or pathogenic microorganisms of risk group II (see World Health Organization: Laboratory Biosafety Manual) comply with the relevant national regulations. Bioseals are a component of biosafety systems which are not capable, in isolation, of ensuring that people and the environment are protected when pathogenic microorganisms are being handled. When working with pathogenic microorganisms of a higher risk group, more than one aerosol-tight bioseal must be provided for. If the named liquids are spilled in the rotor or rotor chamber, the centrifuge must be thoroughly and professionally cleaned. Before using any cleaning or decontamination method other than that set out in Section 4, “Maintenance and cleaning”, please consult Eppendorf to ensure the intended method will not damage the device.
- **The rotor and rotor lid must always be secured in accordance with specification. The centrifuge may only be operated with the rotor and rotor lid firmly tightened. To do this, before centrifugation, place the rotor key supplied for tightening up the rotor on the rotor nut and turn it clockwise until the rotor nut is firmly tightened up.** The rotor lid with the red rotor lid bolt must then be screwed right up to the stop to ensure that it is correctly tightened up. Once the rotor lid has been screwed up to the stop, the top edge of the replaceable lid seal is just below the outer edge of the rotor (see illustration in Section 3.4 “Rotor”). This is the only way to ensure safe centrifugation and reliable protection from aerosols (see Section 3.4 “Rotor” with regard to exceptions for Rotor FA-45-18-11 for centrifuging micro test tubes with closed tube lids). If unusual noises occur when the centrifuge starts, the rotor or the rotor lid are not properly secure. In this case, stop centrifugation immediately using **start/stop**.
- The rotor may only be loaded symmetrically. Opposing vessels should be of the same type and be filled equally. On the rotor you will find information about maximum load (adapter, tube and contents) per bore - this limit may not be exceeded. The maximum permitted loading imbalance is 3.75 g. This corresponds to maximum load (adapter, tube and contents) of one bore of rotor FA-45-18-11. The centrifuge and the rotor may be damaged by prohibited imbalanced loading.
- Rotors showing clear signs of corrosion or mechanical damage must not be used. Check the accessories regularly.

## 2 Safety precautions and applicational limitations

- Rotors are high-grade components which have to withstand extreme stresses and strains. Aluminum rotors are surface-treated to provide them with a high level of protection from corrosion by the most common laboratory chemicals, though this protection is not unlimited. Avoid damage from the use of aggressive chemicals such as strong and weak alkalis, strong acids, solutions of mercury, copper and other heavy metal ions, chlorinated hydrocarbons, concentrated salt solutions and phenol. If the rotor is contaminated by aggressive substances, clean it immediately with a neutral agent (e.g. Extran<sup>®</sup> neutral, RBS<sup>®</sup> neutral or Teepol<sup>®</sup> 610 S). This applies to the rotor bores in particular.  
Protect the rotors from mechanical damage. Even minor scratches or cracks can result in serious internal material damage.
- The material being centrifuged may not exceed a density of 1.2 g/ml at maximum speed.
- If the rotor is run for a lengthy period or more often with short centrifugation runs, the sample tubes will become hot.
- Keep within the load limits specified for the tubes by the tube manufacturer. Tubes may only be centrifuged at the preselected g-force (rcf) if they are approved for this application by the manufacturer.
- Before centrifugation, all the tubes should be subjected to a visual inspection for material damage. Damaged tubes must not be centrifuged, as if tubes break, there may be further damage to the centrifuge and its accessories in addition to loss of the sample.
- **Tube lids must be sealed down tight before centrifuging.** The lids of tubes which are not sealed may rip off during centrifugation and damage the rotor lid and the centrifuge.
- When using organic solvents (e.g. phenol, chloroform), the durability of plastic tubes may be impaired with the result that tubes may break during centrifugation.
- When closing the centrifuge lid, do not place your fingers between the lid and the centrifuge, otherwise they may be trapped.

### The ATEX Guideline (94/9/EC) explained

The present design of Eppendorf Centrifuges and the environment within the gadgets means that they are not suitable for use in any potentially explosive atmospheres. They must therefore 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 could perform a potentially explosive atmosphere, is not permitted. The final decision on risk in this context has to be determined by the user of the Centrifuge.

## 2 Safety precautions and applicational limitations

### 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. 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.

## 3 Operation

### 3.1 Functional and operator control elements

See the frontal view (Fig. 1) on the first inside cover page of this manual.

<b>rpm/rcf</b>	rpm/rcf button	see Section 3.9
<b>time</b>	Time knob	see Sections 3.5, 3.6 and 3.8
<b>speed</b>	Speed selector knob	see Sections 3.5 and 3.6
<b>open</b>	Lid release button	see Section 3.5
<b>short</b>	Short run button	see Section 3.7
<b>start/stop</b>	Start/stop button	see Section 3.5
<b>1</b>	Power switch and plug	see Section 3.5
<b>2</b>	Rotor nut	see Section 3.2
<b>3</b>	Rotor	see Sections 3.2 - 3.4
<b>E</b>	Emergency lid release	see Section 3.11

### 3.2 Fitting and removing the rotor



Fit the rotor onto the motor shaft and tighten the rotor nut firmly by turning it clockwise using the appropriate rotor key provided. Before each start, check that the rotor is firmly tightened.

To release the rotor, turn the rotor nut anticlockwise using the rotor key.

Under no circumstances centrifuge with a rotor which already has obvious traces of corrosion or mechanical damage (see Section 2 “Safety precautions and applicational limitations”).

### 3.3 Loading the rotor



The rotor may only be loaded symmetrically. The adapters must be loaded only with the specified tubes. 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.

The maximum permitted loading imbalance is 3.75 g. This corresponds to maximum load (adapter, tube and contents) of one bore of the rotor FA-45-18-11. The centrifuge and the rotor may be damaged by prohibited imbalanced loading.

The maximum load per bore is indicated on the rotor.

### 3.4 Rotor

A maximum of 18 micro test tubes 1.5/2.0 ml each can be centrifuged in the rotor **FA-45-18-11**. With the appropriate adapters, it is also possible to load it with 0.2 ml PCR tubes, 0.4 ml micro test tubes, 0.5 ml micro test tubes and 0.6 ml Microtainers®. It is also possible to load the rotor with 18 Spin Columns. The maximum speed of the rotor is 14,000 rpm and maximum g-force (rcf) is 16,873 x g.

## 3 Operation



The maximum load (adapter, tube and contents) per bore is 3.75 g for this rotor.

When loading the rotor, make sure that the micro test tubes are inserted in the rotor bores opposite one another in pairs. To ensure that the rotor is symmetrically loaded, opposing tubes must contain the same filling volume.

The fixed-angle rotor can be operated both with and without a rotor lid.

Without a rotor lid, the rotor is not aerosol-tight and is noisier. Particular attention should be paid to the fact that tube lids are closed in accordance with specification before centrifugation.

Aerosol-tight centrifugation can only be carried out with the rotor lid in place. **Spin Columns must always be centrifuged with the rotor lid.** Use of the rotor lid is also always recommended for the other tubes.

When centrifuging Rotor FA-45-18-11 with a rotor lid, the red rotor lid bolt must be screwed right up to the stop to ensure that it is correctly tightened up. Once the rotor lid has been screwed up to the stop, the top edge of the replaceable lid seal is just below the outer edge of the rotor (see illustration). This is the only way to ensure safe centrifugation and reliable protection from aerosols.



Figure 2: rotor lid in position correctly

### 3.5 Centrifugation with timer setting

Switch on the centrifuge with the power switch if necessary and open the lid using the **open** button. The specified values of the last run are displayed. Load the rotor symmetrically, fit the rotor lid and close the centrifuge lid.

**time** adjusts the run time up to 10 min. in 0.5 min. increments, then in 1 min. increments up to 09:59 h.

**speed** adjusts the speed in increments of 100 rpm or the g-force (rcf) in increments of 100 x g.

**start/stop** starts centrifugation. The symbol  flashes while the rotor is running.

During centrifugation, the remaining run time is displayed in minutes. The last minute is counted down in seconds. In addition, the speed of the rotor/relevant g-force (rcf) is displayed. The timer setting, speed and rpm/rcf display can be adjusted during centrifugation. The **open** and the **short** buttons are blocked during centrifugation.

## 3 Operation

**start/stop** if the button is pressed again, centrifugation is stopped before expiry of the set run time.

After expiry of the set run time, the centrifuge will otherwise stop automatically. During braking, the timer flashes and shows the spin time which has elapsed. When the rotor has come to a standstill, a signal tone is heard and the centrifuge lid opens automatically. The display then shows the symbol .

### 3.6 Adjusting centrifuging parameters during centrifugation

Timer setting and speed can be changed during centrifugation using the two knobs. If these parameters are adjusted, the display begins flashing. The new centrifuging parameters are accepted after a short time.

The time which has elapsed up to this point is offset against the new specified value. In order that centrifugation cannot be stopped by changing the timer setting, the shortest time which can be set is the time which has already elapsed plus 2 minutes. Parameters cannot be adjusted during the braking process.

### 3.7 Short spin centrifugation

Switch on the centrifuge with the power switch if necessary and open the lid using the **open** button. The specified values of the last run are displayed. Load the rotor symmetrically, fit the rotor lid and close the centrifuge lid.

**short** starts a short spin run at maximum speed/g-force. The **short** button must be kept depressed throughout the entire short run. The symbol  flashes while the rotor is running. Time is counted upwards in seconds. Centrifugation is stopped by releasing the **short** button during the braking process, centrifugation can be re-started twice by pressing the **short** button again.

The timer flashes and shows the spin time which has elapsed during braking. When the rotor has come to a standstill, the centrifuge lid opens automatically. The display then shows the symbol . During a short run, all other buttons and knobs are blocked.

### 3.8 Continuous operation

Switch on the centrifuge with the power switch if necessary and open the lid using the **open** button. The specified values of the last run are displayed. Load the rotor symmetrically, fit the rotor lid and close the centrifuge lid.

**time** the continuous function is set using the **time** selection knob to above 09:59 h or below 30 sec. The timer shows "oo" to indicate continuous running. Time is counted upwards in minutes.

**speed** adjusts the speed in increments of 100 rpm or the g-force (rcf) in increments of 100 x g.

**start/stop** starts centrifugation. The symbol  flashes while the rotor is running.

**start/stop** if the button is pressed again, centrifugation will stop.

During braking, the timer flashes and shows the spin time which has elapsed. When the rotor has come to a standstill, a signal tone is heard and the centrifuge lid opens automatically. The display then shows the symbol  briefly.

## 3 Operation

### 3.9 rcf display and calculation

**rpm/rcf** Pressing the button toggles the display from rpm (1/min) to rcf and vice versa.

Please note that the g-force (rcf) shown when toggling the display is standardized to 1.5/2.0 ml micro test tubes. At 14,000 rpm you can achieve the following maximum g-force (rcf) in rotor FA-45-18-11 with the various adapters:

Adapter	Max. centrifugal radius $r_{\max}$ [cm]	Max. g-force (rcf)
None	7.7	16,873
0.2 ml	5.6	12,271
0.4 ml	7.7	16,873
0.5 ml	6.6	14,462
0.6 ml	7.7	16,873

To calculate the g-force (rcf) for a specific adapter you can apply the following formula according to DIN 58 970:

$$\text{rcf} = 1.118 \cdot 10^{-5} \cdot n^2 \cdot r_{\max}$$

n: speed in rpm

$r_{\max}$ : max. centrifugal radius in cm

Example: The 0.2 ml adapter has a maximum radius of 5.6 cm. At 5,000 rpm, a maximum g-force (rcf) of 1,565 x g is achieved.

### 3.10 Standby mode

If the centrifuge has not been used for 15 min., it switches to standby mode. The “EP” logo then appears in the display. When a button or knob is used or the centrifuge lid is closed, the centrifuge is reactivated and ready for operation.

### 3.11 Opening the centrifuge in case of power failure



If the lid release does not function following a power failure, the emergency lid release can be operated by hand.

Remove the power plug and wait for the rotor to come to a standstill. This may take as long as 5 minutes. Look through the window in the lid of the centrifuge to check whether the rotor has come to a standstill. Emergency lid release on underside of device by pull cord: behind the front left foot there is a small white plastic cap in the base plate (see letter “E” in Figure 1, first inside cover page). Remove the cap and draw the cord out straight downward.

Later, ensure that the cord is pushed completely back into the housing before the lid is closed. Then push the plastic cap back into the base plate.

### 3.12 Fuses

The fuse box is located under the power plug. To replace the fuses, unplug the power plug and pull the fuse box out towards the rear. The two fuses can then be replaced (see Ordering information).

## 4 Maintenance and cleaning

### 4.1 Device

The outer surfaces of the centrifuge and the rotor chamber should be cleaned regularly with a neutral agent (e.g. Extran<sup>®</sup> neutral, RBS<sup>®</sup> neutral or Teepol<sup>®</sup> 610 S). This is for hygiene purposes and to prevent adhering impurities causing corrosion.

If material hazardous to health or aggressive material contaminate the device, the owner is responsible for appropriate cleaning and decontamination.

Before cleaning, unplug the power plug with the lid open, unscrew the rotor using the rotor key supplied and clean it separately. Use only neutral agents for cleaning (e.g. Extran<sup>®</sup> neutral, RBS<sup>®</sup> neutral, Teepol<sup>®</sup> 610 S). Bacillo<sup>®</sup> AF, Meliseptol<sup>®</sup> und Perform<sup>®</sup> are recommended for cleaning and disinfecting the outer surface of the centrifuge and the rotor chamber. Do not allow any liquid to get into the gap at the motor shaft outlet. For this reason, the rotor chamber should be cleaned only with a damp cloth.

The outer surface of the centrifuge and the rotor chamber have been tested for resistance to the cleaning agents and disinfectants mentioned. However, this does not guarantee that the device is disinfected following application of one of the methods mentioned. You should also consult your laboratory safety officer with regard to a suitable method of cleaning and disinfecting. However, before any cleaning or disinfecting method other than that recommended by the manufacturer is used, please check with Eppendorf that the intended method will not damage the device or its accessories. In order to ensure long-term, reliable work with your centrifuge, please note that aggressive chemicals may damage the rotor and the chamber. Check your device once a month for corrosion and damage.

The rubber seals in the rotor chamber should be rinsed off thoroughly with water and lubricated with glycerin or talc after every clean to prevent them becoming brittle.

### 4.2 Rotor

The rotor needs cleaning regularly to prevent residues of the material being centrifuged from changing its properties. Check the rotor for residues and corrosion at least once a month. This applies to the rotor bores in particular. Please look after your rotor regularly; this will protect it and increase its service life.

For thorough cleaning, the rotor is unscrewed using the rotor key supplied and cleaned using a neutral agent (e.g. Extran<sup>®</sup> neutral, RBS<sup>®</sup> neutral, Teepol<sup>®</sup> 610 S). Bacillo<sup>®</sup> AF, Meliseptol<sup>®</sup> und Perform<sup>®</sup> are recommended for cleaning and disinfecting the rotor and the rotor bores. The rotor bores are also brushed out with a bottle brush. The rotor and bores are then rinsed out thoroughly and placed on a cloth with the bores facing downwards to dry. The rotor is then put back in and the rotor nut tightened up.

The rotor has been tested for resistance to the cleaning agents and disinfectants mentioned. However, this does not guarantee that the device is disinfected following application of one of the methods mentioned. You should also consult your laboratory safety officer with regard to a suitable method of cleaning and disinfecting. However, before any cleaning or disinfecting method other than that recommended by the manufacturer is used, please check with Eppendorf that the intended method will not damage the rotor or its accessories. In order to ensure long-term, reliable work with your centrifuge, please note that aggressive chemicals may damage the rotor.

## 4 Maintenance and cleaning

The rotor, the rotor lid and all the adapters can be autoclaved (121 °C, 20 min.). The two sealing rings of the aerosol-tight rotor lid should be replaced after no more than 10 autoclaving operations.

The two sealing rings on the lid thread and in the lid groove of the rotor lid should be replaced when worn. Regular care of the sealing rings is required to protect the rotor. Check that the seals are undamaged before use.

The aerosol-tight rotor may not be stored with the lid done up tightly!

### 4.3 Glass breakage

When centrifuging glass tubes, be aware that as speed/rcf increases, so does the risk of glass breaking. Please observe manufacturers' information about maximum loading of centrifuge tubes.

In case of glass breakage, carefully remove all splinters and all ground glass from the rotor, the adapters and the rotor chamber. You may need to replace adapters in order to prevent further damage.

Otherwise fine glass splinters will scratch the surface of the rotor, reducing its resistance to chemicals. Air vortices will result in very fine black abraded metal in the rotor chamber; in addition to damaging the rotor chamber, rotor and adapters, this material will also cause samples to become contaminated.

Check the rotor bores regularly for residues or damage.

### 4.4 Returning devices

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.eppendorf.com](http://www.eppendorf.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 guide

If the suggested rectification measures repeatedly fail, contact Eppendorf.

Error / Display	Cause	Remedy
No display	No power	Check power connection
	Power failure	Check power fuses of device and laboratory
Lid cannot be opened	Power failure	See above, activate emergency lid release
	Rotor still running	Wait for rotor to stop
Centrifuge will not start	Lid not closed	Press lid shut
Centrifuge shakes when starting up	Rotor unevenly loaded	Stop centrifuge and load evenly
Centrifuge brakes during a short run although the <b>short</b> button is still depressed	Button was released briefly more than 2x (drive protection function)	Do not release button during a short run
LID ERROR	Lid cannot be locked	Close lid again and start
	Lid cannot be unlocked	Switch device off and back on, press the <b>open</b> button, if error recurs: switch off device, activate emergency lid release, if error recurs => Service
	Lid cannot be unlocked during a run	Wait for centrifuge to come to a standstill, repeat run, if error recurs => Service
INT	Power interruption during a run	Check power plug
NO RPM	Error in speed measuring system	Leave device switched on until the error message disappears (10 s or 6 min.), repeat run, if error recurs => Service
Err 6	Drive error	Repeat run, if error recurs => Service
Err 7	Overspeed or major control deviation	Check rotor properly tightened, repeat run

## 5 Troubleshooting guide

<b>Error / Display</b>	<b>Cause</b>	<b>Remedy</b>
Err 8	Rotor loose, drive error	Tighten up rotor, repeat run, if error recurs => Service
Err 11	Power interruption during a run	Check power plug, repeat run
Err 9, 10, 12 - 17	Electronics error	Repeat run, if error recurs => Service

## 6 Technical data

Mains power connection:	230 V / 50 – 60 Hz 120 V / 50 - 60 Hz 100 V / 50 - 60 Hz
Power output	170 W
Speed	100 to 14,000 rpm
Max. relative centrifugal force (rcf)	16,873 x g
Max. load	18 x 2.0 ml micro test tubes
Max. kinetic energy	2550 Nm
Permissible density of material to be centrifuged	1.2 g/ml
Ambient temperature	2 - 40 °C
Rel. humidity	10 - 75 %
Setup height	max. 2000 m above NSL
Dimensions	Width: 208 mm Depth: 300 mm Height: 210 mm
Weight excluding rotor:	7.7 kg
Startup time (230 V)	15 s
Deceleration time (230 V)	15 s
Startup time (120 V)	15 s
Deceleration time (120 V)	15 s
Startup time (100 V)	18 s
Deceleration time (100 V)	15 s
Fuses	2.5 AT (230 V) 5.0 AT (120 V / 100 V)
Noise level	< 57 dB (A)
Overvoltage category	II
Degree of contamination:	2

Technical specifications subject to change!

## 7 Ordering information

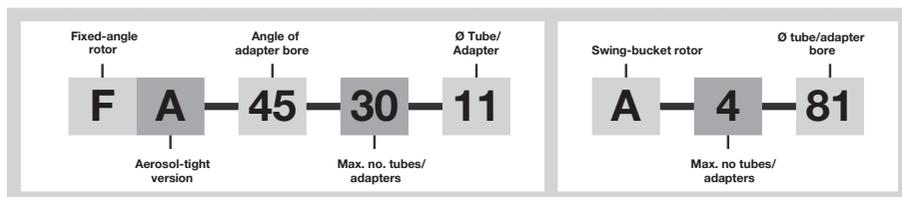
7

Ordering information

	Order no. international	Order no. North America
<b>Centrifuge 5418</b> with rotor FA-45-18-11 incl. rotor lid 230 V / 50 - 60 Hz	5418 000.017	022620321
<b>Centrifuge 5418</b> with rotor FA-45-18-11 incl. rotor lid 120 V / 50 - 60 Hz	5418 000.025	022620304
<b>Fixed-angle rotor and rotor lid</b>  Fixed-angle rotor FA-45-18-11 with rotor lid, aluminum, aerosol-tight, angle 45°, 18 places, max. diameter 11 mm, designed for 1.5/2.0 ml micro test tubes	5418 702.003	022652001
Spare lid (aluminum) for rotor FA-45-18-11, aerosol-tight	5418 703.000	022652028
Spare seal for rotor lid FA-45-18-11, per 2 x 5 pcs.	5418 705.002	022652044
<b>Accessories</b>		
Adapter for 0.2 ml PCR tubes, for FA-45-18-11, per 6 pcs.	5425 715.005	022636260
Adapter for 0.4 ml micro test tubes, for FA-45-18-11, per 6 pcs.	5425 717.008	022636243
Adapter for 0.5 ml micro test tubes and 0.6 ml Microtainers®, for FA-45-18-11, per 6 pcs.	5425 716.001	022636227
Rotor key	5416 301.001	022634305
Captain Eppi, rotor key holder, 1 pc	5703 350.102	022639609
Set of fuses      2 x 2.5 AT (230 V)	5425 351.003	022668188
2 x 5.0 AT (120 V / 100 V)	5425 353.006	022668226

### 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.:



## 7 Ordering information

### Important

Use only the original accessories we recommend. The functioning and safety of centrifuges may be impaired if you use spares or disposables other than those we recommend! Any warranty and liability for losses thus caused shall be excluded.

Bacillo <sup>®</sup> AF	Registered trade mark of Bode Chemie GmbH & Co., Hamburg, Germany
Extran <sup>®</sup> neutral	Registered trade mark of Merck KgaA, Darmstadt, Germany
Meliseptol <sup>®</sup>	Registered trade mark of B. Braun Melsungen AG, Melsungen, Germany
Microtainer <sup>®</sup>	Registered trade mark of Becton Dickinson, Franklin Lakes, USA
Perform <sup>®</sup>	Registered trade mark of Schülke & Mayr GmbH, Norderstedt, Germany
RBS <sup>®</sup> neutral	Registered trade mark of Carl Roth GmbH + Co. KG, Karlsruhe, Germany
Teepol <sup>®</sup> 610 S	Registered trade mark of Sigma-Aldrich Corp., St. Louis, USA

# 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 5418

einschließlich Zubehör / including accessories

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, EN 61326

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

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

Vorstand, Board of Management:

15.06.2005

Hamburg, Date:

Projektmanagement, Project Management:

**ependorf**



Eppendorf AG · Barkhausenweg 1 · 22339 Hamburg · Germany

# Certificate of Compliance

Certificate Number 090905 - E215059  
Report Reference E215059, June 17th, 2005  
Issue Date 2005 September 9

Page 1 of 2



**Underwriters  
Laboratories Inc.®**

*Issued to:* **EPPENDORF A G**  
**BARKHAUSENWEG 1**  
**22339 HAMBURG GERMANY**

*This is to certify that  
representative samples of* **Centrifuge**  
**Model 5418**

*Have been investigated by Underwriters Laboratories Inc.® in  
accordance with the Standard(s) indicated on this Certificate.*

*Standard(s) for Safety:* See Addendum for Standards

*Additional Information:* ELECTRICAL RATING:  
Voltage: 120 V ac  
Frequency: 50-60 Hz  
Current: 2.6 A  
Power: 170 W

Only those products bearing the UL Listing Mark for the US and Canada should be considered as being covered by UL's Listing and Follow-Up Service meeting the appropriate requirements for US and Canada.

The UL Listing Mark for the US and Canada generally includes: the UL in a circle symbol with "C" and "US" identifiers;  the word "LISTED"; a control number (may be alphanumeric) assigned by UL; and the product category name (product identifier) as indicated in the appropriate UL Directory.

**Look for the UL Listing Mark on the product**

Issued by: *Walter Hofmair*  
**Walter Hofmair, Senior Project Engineer**

Reviewed by: *Manfred Müller*  
**Manfred Müller, Senior Project Engineer**

UL International Germany GmbH

UL International Germany GmbH

Any information and documentation provided to you involving UL Mark services are provided on behalf of Underwriters Laboratories Inc.  
For questions in Germany, you may call +49 0 6102 369 0.

# Certificate of Compliance

Certificate Number 090905 - E215059  
Report Reference E215059, June 17th, 2005  
Issue Date 2005 September 9

Page 2 of 2



This is to verify that representative samples of the product as specified on this certificate were tested according to the current UL, cUL requirements.

## Standards:

UL 61010A-1 - Electrical Equipment for Laboratory Use; Part 1: General Requirements;  
UL 61010A-2-020 -Electrical Equipment for Laboratory Use; Part 2: Particular Requirements for Laboratory Centrifuges;  
CSA C22.2 No. 1010.1-92 - Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use; Part 1: General Requirements;  
**CSA C22.2 No. 1010.2.020-92, CSA C22.2 No. 1010.2.020A-97 - Part 2: Particular Requirements for Laboratory Centrifuges**  
**UL 61010-1 Electrical Equipment for Measurement, Control, and Laboratory Use; Part 1: General Requirements**  
**CSA22.2 No. 61010-1 - Electrical Equipment for Measurement, Control, and Laboratory Equipment - Part 1: General Requirements**

Issued by:

Walter Hofmair, Senior Project Engineer

UL International Germany GmbH

Any information and documentation provided to you involving UL Mark services are provided on behalf of Underwriters Laboratories Inc. UL International Germany GmbH

Reviewed by:

Manfred Müller, Senior Project Engineer

UL International Germany GmbH

# Eppendorf Offices

## ASEAN

Eppendorf AG  
Regional Office in Malaysia  
Tel. +60 3 8023 2769  
Fax +60 3 8023 3720  
E-Mail: [eppendorf@eppendorf.com.my](mailto:eppendorf@eppendorf.com.my)  
Internet: [www.eppendorf.com.my](http://www.eppendorf.com.my)

## AUSTRALIA / NEW ZEALAND

Eppendorf South Pacific Pty. Ltd.  
Tel. +61 2 9889 5000  
Fax +61 2 9889 5111  
E-mail: [Info@eppendorf.com.au](mailto:Info@eppendorf.com.au)  
Internet: [www.eppendorf.com.au](http://www.eppendorf.com.au)

## AUSTRIA

Eppendorf AG  
c/o Schott Austria  
Tel. +43 1 29017560  
Fax +43 1 290175620  
E-Mail: [gilch.p@eppendorf.de](mailto:gilch.p@eppendorf.de)  
Internet: [www.eppendorf.com](http://www.eppendorf.com)

## Brazil

Eppendorf do Brasil Ltda.  
Tel. +55 11 30 95 93 44  
Fax +55 11 30 95 93 40  
E-Mail: [eppendorf@eppendorf.com.br](mailto:eppendorf@eppendorf.com.br)  
Internet: [www.eppendorf.com.br](http://www.eppendorf.com.br)

## CANADA

Brinkmann Instruments, Ltd.  
Tel. +1 905 826 5525  
Fax +1 905 826 5424  
E-Mail: [canada@brinkmann.com](mailto:canada@brinkmann.com)  
Internet: [www.brinkmann.com](http://www.brinkmann.com)

## CHINA

Eppendorf AG  
Tel. +86 21 68760880  
Fax +86 21 50815371  
E-Mail: [market.info@eppendorf.cn](mailto:market.info@eppendorf.cn)  
Internet: [www.eppendorf.cn](http://www.eppendorf.cn)

## FRANCE

EPPENDORF FRANCE S.A.R.L.  
Tel. +33 1 30 15 67 40  
Fax +33 1 30 15 67 45  
E-Mail: [eppendorf@eppendorf.fr](mailto:eppendorf@eppendorf.fr)  
Internet: [www.eppendorf.fr](http://www.eppendorf.fr)

## GERMANY

Eppendorf Vertrieb  
Deutschland GmbH  
Tel. +49 02232 418-0  
Fax +49 02232 418-155  
E-Mail: [vertrieb@eppendorf.de](mailto:vertrieb@eppendorf.de)  
Internet: [www.eppendorf.de](http://www.eppendorf.de)

## INDIA

Eppendorf India Limited  
Tel. +91 44 52111314  
Fax +91 44 52187405  
E-Mail: [info@eppendorf.co.in](mailto:info@eppendorf.co.in)  
Internet: [www.eppendorf.co.in](http://www.eppendorf.co.in)

## ITALY

Eppendorf s.r.l.  
Tel. +390 2 55 404 1  
Fax +390 2 58 013 438  
E-Mail: [eppendorf@eppendorf.it](mailto:eppendorf@eppendorf.it)  
Internet: [www.eppendorf.it](http://www.eppendorf.it)

## JAPAN

Eppendorf Japan Co. Ltd.  
Tel. +81 3 5825 2363  
Fax +81 3 5825 2365  
E-Mail: [info@eppendorf.jp](mailto:info@eppendorf.jp)  
Internet: [www.eppendorf.jp](http://www.eppendorf.jp)

## NORDIC

Eppendorf Nordic Aps  
Tel. +45 70 22 2970  
Fax +45 45 76 7370  
E-Mail: [nordic@eppendorf.dk](mailto:nordic@eppendorf.dk)  
Internet: [www.eppendorf.dk](http://www.eppendorf.dk)

## SPAIN

Eppendorf Ibérica S.L.  
Tel. +34 91 651 76 94  
Fax +34 91 651 81 44  
E-Mail: [iberica@eppendorf.de](mailto:iberica@eppendorf.de)  
Internet: [www.eppendorf.es](http://www.eppendorf.es)

## SWITZERLAND

Vaudaux-Eppendorf AG  
Tel. +41 61 482 1414  
Fax +41 61 482 1419  
E-Mail: [vaudaux@vaudaux.ch](mailto:vaudaux@vaudaux.ch)  
Internet: [www.eppendorf.com](http://www.eppendorf.com)

## UNITED KINGDOM

Eppendorf UK Limited  
Tel. +44 1223 200 440  
Fax +44 1223 200 441  
E-Mail: [sales@eppendorf.co.uk](mailto:sales@eppendorf.co.uk)  
Internet: [www.eppendorf.co.uk](http://www.eppendorf.co.uk)

## USA

Eppendorf North America  
Tel. +1 516 334 7500  
Fax +1 516 334 7506  
E-Mail: [info@eppendorf.com](mailto:info@eppendorf.com)  
Internet: [www.eppendorfna.com](http://www.eppendorfna.com)

## OTHER COUNTRIES

see:  
[www.eppendorf.com/worldwide](http://www.eppendorf.com/worldwide)

# eppendorf

*In touch with life*

**Your local distributor: [www.eppendorf.com/worldwide](http://www.eppendorf.com/worldwide)**

Eppendorf AG · 22331 Hamburg · Germany · Tel. +49 40 5 38 01-0 · Fax +49 40 5 38 01-556  
E-Mail: [eppendorf@eppendorf.com](mailto:eppendorf@eppendorf.com)

Eppendorf North America, Inc. · One Cantiague Road, P.O. Box 1019 · Westbury, N.Y. 11590-0207 USA  
Tel. +1 516 3 34 75 00 · Free phone +1 800 6 45 30 50 · Fax +1 516 3 34 75 06 · E-Mail: [info@eppendorf.com](mailto:info@eppendorf.com)

## **Application Support**

Europe, International: Tel. +49 180 3 66 67 89 · E-Mail: [support@eppendorf.com](mailto:support@eppendorf.com)  
North America: Tel. +1 800 6 45 30 50 ext. 2258 · E-Mail: [support\\_NA@eppendorf.com](mailto:support_NA@eppendorf.com)  
Asia, Pacific: Tel. +60 3 80 23 27 69 · E-Mail: [support\\_Asia@eppendorf.com](mailto:support_Asia@eppendorf.com)