Frontier™ 5000 Series

Multi Pro Centrifuges

FC5714, FC5718, FC5718R, FC5720R, FC5816, FC5816R, FC5830R, FC5916, FC5916R, FC5917RF

Instruction Manual

Change History

#	Date	Version	Descriptions
1	25.08.2025	G	Updated product pictures and data

TABLE OF CONTENTS

1 INTRODUCTION

Thank you for choosing this OHAUS product.

All symbols indicate safety instructions and points to potentially dangerous situations. Please read the manual completely before using the Frontier™ Multi Centrifuges to avoid incorrect operation.

1.1 Brief Product Family Description

Frontier™ Multi Pro Centrifuges are designed to meet the diverse needs of laboratory applications like microbiology, molecular biology, biochemistry, research and others. This family includes refrigerated and non-refrigerated models, offering high g-forces up to 65,394 x g and covers sample capacity from 0.2ml to 1000ml. Thanks to excellent performance and safety features like imbalance detection and automatic imbalance switch-off, our Multi Pro Centrifuges ensure reliable operation and protect both the instrument and the user. The refrigerated centrifuges are intended for commercial, industrial, or institutional use as defined in the safety standards for refrigeration systems according to ANSI/ASHRAE 15.

1.2 Intended Use

These centrifuges are general purpose devices and were designed for the separation of liquid materials or mixtures with different densities. They are to be used only for this purpose.

These centrifuges are intended exclusively for use in closed rooms under supervision and for operation by trained specialist personnel!

Only the rotors and other accessories specified in the instructions for use may be used. Any other use or use beyond this is considered improper use. We are not liable for any resulting damage. The contents of the operating instructions must be observed.

1.3 Safety Sings and Warnings

Safety notes are marked with signal words and warning symbols. These show safety issues and warnings. Ignoring the safety notes may lead to personal injury, damage to the instrument, malfunctions, and false results.

The degree of danger is a part of a safety note and distinguishes the possible results of non-observance from each other.

Warning Symbols

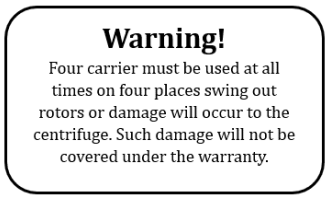
DANGER	Will lead to severe injuries or death if not avoided.
WARNING	For a hazardous situation with medium risk, possibly resulting in severe injuries or death if not avoided.
CAUTION	For a hazardous situation with low risk, resulting in damage to the device or the property or in loss of data, or minor or medium injuries if not avoided.
ATTENTION	For important information about the product. May lead to equipment damage if not avoided.
NOTE	For useful information about the product.

Warning and information signs on the surface of centrifuge

General hazard

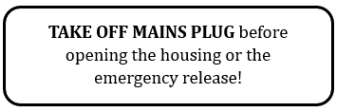
Electric shock hazard

Biohazard

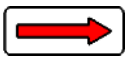


All buckets must be used at all times on all places of the swing out rotors or damage will occur to the centrifuge. Such damage will not be covered under the product warranty.

Attention! Check the fastening of the rotor nut before each run.

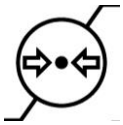


Take off mains plug before opening the housing or the emergency release.

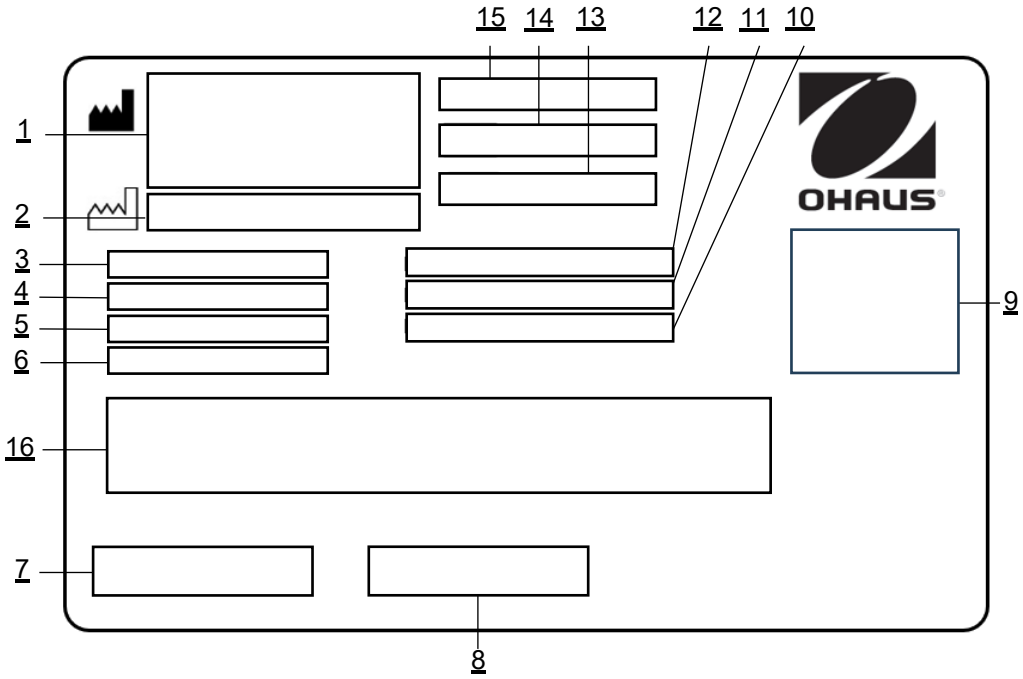


Direction of rotation – clockwise rotation for the rotor drive

1.4 Marking on the packaging

	Keep the packaging dry. The box must be kept out of the rain and away from moisture.
	This way up. Indication of upright position of the transport package.
	Indication that the package contains fragile good.
	Temperature limitation. The packaging must be transported and stored within the specified range of -25 °C to +60 °C.
	Humidity limitation. The packaging must be transported and stored within the specified range of 10% to 75%.
	Pressure limitation. The packaging must be transported and stored within the specified range of 30 kPa to 106 kPa.

1.5 Product Label



1	Legal Manufacturer	**9**	Model-specific marks and symbols
2	Date of Production	**10**	Max. permissible Density
3	Rated Voltage	**11**	Max. kinetic Energy
4	Rated Current	**12**	Max. Speed
5	Frequency	**13**	Serial Number
6	Rated Power	**14**	Product Number
7	Country of Manufacture	**15**	Product Name
8	CE mark	**16**	Coolant Information (only refrigerated models)

1.6 Safety Precautions

1.6.1 Rotors and Accessories

Only OHAUS original rotors and accessories shall be used. Any other use or intended use is considered improper. OHAUS is not liable for damage resulting from improper use.

1.6.2 Measures For Your Protection

WARNING!

Never work in an environment subject to explosion hazards! The housing of the instrument is not gas tight. (Explosion hazard due to spark formation, corrosion caused by the ingress of gases)

WARNING!

When using chemicals and solvents, comply with the instructions of the producer and the general lab safety rules.

WARNING!

The centrifuge is not sealed. Use suitable protection measures when using the centrifuge for infectious and pathogenic samples. Follow appropriate safety precautions when handling these samples.

1.6.3 Exclude The Following Environmental Influences

- Powerful vibrations
- Direct sunlight
- Atmospheric humidity greater than 80%
- Corrosive gases present
- Temperatures below 5 °C and above 35 °C
- Powerful electric or magnetic fields

WARNING!

Electrical shock hazards exist within the housing. The housing should only be opened by authorized and qualified personnel. Remove all power connections to the unit before opening.

1.6.4 Measures Of Operational Safety

- Do not unscrew the two halves of the housing.
- Dry off any liquid spills immediately! The instrument is not watertight.
- Verify that the equipment’s input voltage range and plug type are compatible with the local power supply.
- Only connect the power cord to a properly grounded power receptacle.
- Only use a power cord with a rating that exceeds the specifications on the equipment label.
- Do not position the equipment such that it is difficult to disconnect the power cord from the power receptacle.
- Make sure that the power cord does not pose a potential obstacle or tripping hazard.
- The equipment is for indoor use only. Use the equipment only in dry locations.
- Use only approved accessories.
- Operate the equipment only under ambient conditions specified in these instructions.
- Disconnect the equipment from the power supply when cleaning.
- Do not operate the equipment in hazardous or unstable environments.
- Service should only be performed by authorized personnel.

1.6.5 Danger and Precautions

CAUTION!

This device may only be operated by a trained professional. Carefully, read the operating manual and be familiar with the functions of the device.

To protect people and the environment, the following precautions must be taken:

- During centrifugation, the presences of people and the setting up of hazardous materials are prohibited within 30 cm around the centrifuge according to the regulations of EN 61010-2-020.
- All centrifuges are not explosion-proof and must therefore not be operated in explosion-endangered areas or locations. Centrifugation of flammable, explosive, radioactive, or such substances, which chemically react with high energy, is strictly prohibited. The final decision on the risks associated with the use of such substances is the responsibility of the user of the centrifuge.
- Never spin toxic or pathogenic material without adequate safety precautions, i.e. centrifugation of buckets / tubes with missing or defective hermetic sealing is strictly prohibited. The user is obliged to perform appropriate disinfection procedures in case dangerous substances have contaminated the centrifuge and or its accessories.When centrifuging infectious substances, always pay attention to the general laboratory precautions. If necessary, contact your safety officer!
- It is prohibited to run the centrifuge with rotors other than listed for this unit.
- Under no circumstances open the lid of the centrifuge while the rotor is still running or rotating with a speed of >2m/s.

1.6.6 Abbreviations Used In This Instruction Manual

Symbol/Abbreviations	Unit	Description
RPM	[min^{-1}]rpm	revolutions per minute
RCF	[x g]	relative centrifugal force
PCR		Polymerase chain reaction
PP	-	Polypropylene
PC	-	Polycarbonate
accel	-	acceleration
decel	-	deceleration
prog	-	program

2 INSTALLATION

2.1 Delivery Package

- Centrifuge
- Power cable
- Warranty Card
- Rotor Key
- Download Guide

Please note: The centrifuge and the accessories are non-sterile.

2.2 Unpacking the Centrifuge

Carefully remove your centrifuge and each of its components from the package. The included components vary depending on the centrifuge model. Save the packaging to ensure safe storage and transport. With the help of the download guide and the included QR-code, you can download the user manual in different languages. The download guide must always be kept with the centrifuge.

Rotor(s) / Accessories will be packed separately.

WARNING!

Lifting Hazard. Single person lift could cause injury. Use a mechanical lifting device or team lifting procedures when lifting or moving the equipment. Always lift the centrifuge on both sides.

ATTENTION!

Do not lift the centrifuge from under the lid or by the front panel! See correct lifting in the **Figure 1.**

Figure 1

2.2.1 Unpacking of FC5917RF and FC5916RF Short

Model FC5917RF/FC5917RF Short are supplied in a carton on a wooden pallet.

- Remove the strap retainer and open the carton.
- Remove the metal bars, which are fixed onto the pallet and fix them to the front edge of the pallet so that they can be used as a ramp (see Figure 2). Use the same screws and pay attention to secure screw connection.
- Take the provided open-ended spanner to move the centrifuge feet up until it is on its rollers (see also Figure 2).
- Move the centrifuge carefully from the pallet, preferably with several people. Move the centrifuge on its intended location.

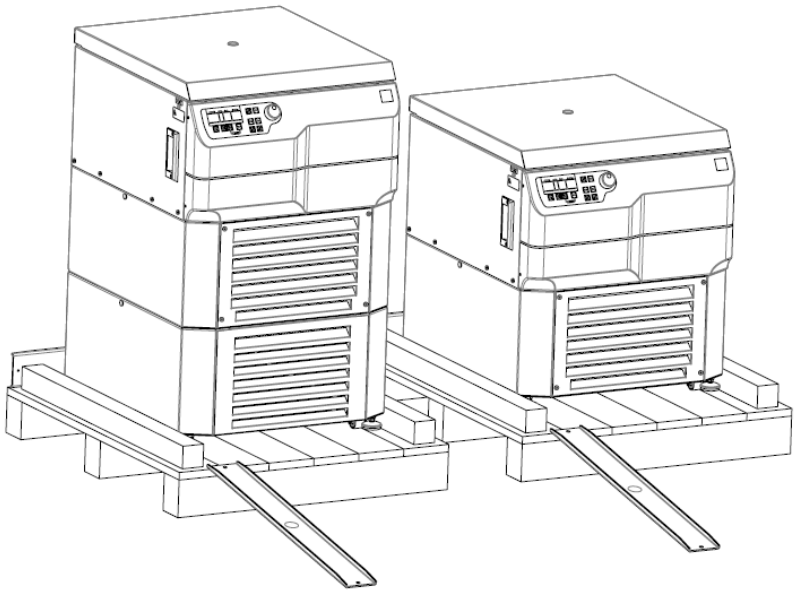


Figure 2

2.3 Space Requirements

ATTANTION!

Avoid excessive vibrations, heat sources, air current, or rapid temperature changes.

- When choosing a location for the refrigerated models, consider the minimum room volume provided in table 9.1.3 and 9.1.5.
- The centrifuge should be installed on an even, solid and level surface, if possible, on a laboratory cabinet, table, or some other solid vibration free surface.
- During centrifugation, the centrifuge must be placed in a way, that there is a minimum space of 30 cm on each side of the unit according to the standards EN 61010-2-020.
- Do not place the centrifuge next to a window or a heater, where it could be exposed to excessive heat, as the performance of the unit is based on an ambient temperature of 23°C.

2.4 Installation

Follow these steps:

- Only FC5917RF and FC5917RF Short: Move the centrifuge on its intended location. Unscrew the lock nut (1) with an open-ended spanner AF M16 (see **Figure 3**). Turn the appliance feet (2) down with an open-ended spanner AF M13 until they are firmly on the floor surface. Now the centrifuge has to be leveled horizontally, using the four appliance feet. Therefore, mount the associated rotor on the motor shaft and place a spirit level on it. After leveling the appliance feet, tighten the lock nut. The rollers should not touch the ground anymore.

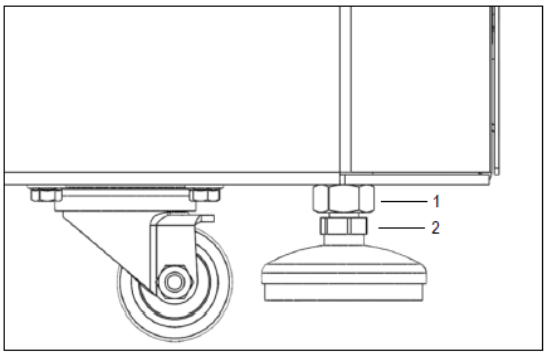


Figure 3

- Check whether the power supply corresponds with the one specified on the manufacturer's rating label, which is located on the rear panel.
- For FC5714, FC5718, FC5816 the power line should be protected by a 10 A rating circuit breaker (type K).
- For FC5718R, FC5816R, FC5916, FC5916R the power line should be protected by a 16 A rating circuit breaker (type K).
- For FC5917RF, FC5917RF Short the power connection for the centrifuge requires a separate one-site protection 15 A, 16 A or 20 A (Type K).
- In case of emergency, there must be an emergency switch off installed outside the room in order to disconnect the power supply from the unit.
- Connect the centrifuge to a grounded power receptacle.
- Connect the centrifuge with the mains (the socket for the power cord must be easy to reach for disconnection).
- Turn the instrument on using the mains power switch.
- Open the lid by using the Door Open button.
- Remove the transport securing device of the motor.

2.5 Safety Precautions During Operation

- Do not operate the centrifuge in case it is not installed correctly.
- Do not lean on the centrifuge during operation.
- Do not stay within the 30 cm clearance envelope longer than necessary for operational reasons.
- Do not place any potentially hazardous materials within the 30 cm clearance envelope.
- Do not operate the centrifuge when disassembled (e.g. without housing).
- Do not run the centrifuge when mechanical or electrical components have been tampered with.
- Do not use accessories such as rotors and buckets, which are not exclusively approved by OHAUS Corporation, except commercially available centrifuge tubes made of glass or plastic.
- Do not spin extremely corrosive substances, as they may damage or weaken the materials.
- Do not operate the centrifuge with rotors or buckets, which show any signs of corrosion or mechanical damage.
- The manufacturer is responsible for safety and reliability of the centrifuge, only if:
    1. The unit is operated in accordance with this instruction manual.
    2. Modifications, repairs, or other adjustments are performed by OHAUS authorized personnel, and theelectrical installation complies with the relevant electrical code.

2.6 Warranty

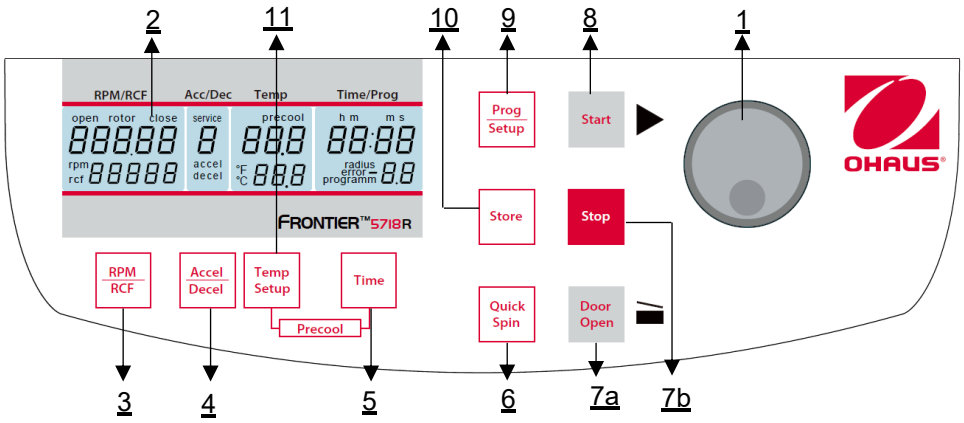
The centrifuge has been subjected to thorough testing and quality control. In the unlikely case of any manufacturing faults occurring, the centrifuge and rotors are covered by warranty. The warranty depends on the region and is valid from date of delivery. This warranty becomes invalid in any case of mishandling, damage and/or negligence and further in any case of usage of inappropriate spare parts and / or accessories or unauthorized modification of the unit.

Technical modification rights are reserved, by the manufacturer, in regard to technical improvement!

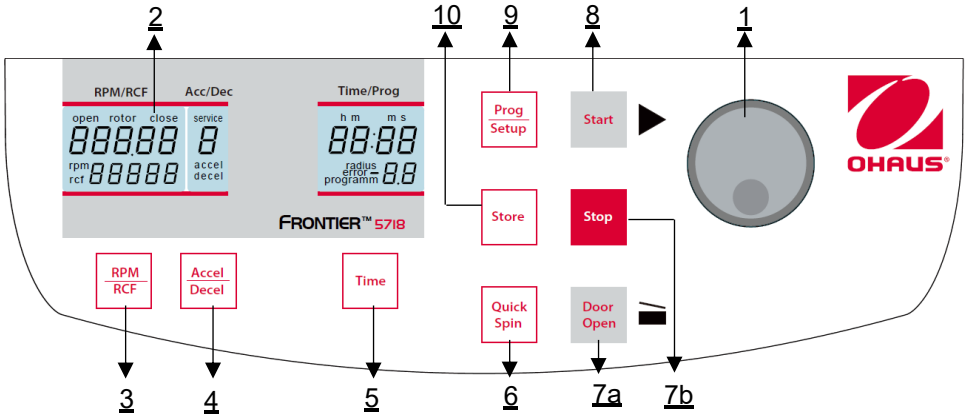
3 OPERATION

3.1 Operating and Display Elements

FC5718R, FC5816R, FC5916R, FC5917RF, FC5917RF Short, FC5830R, FC5720R



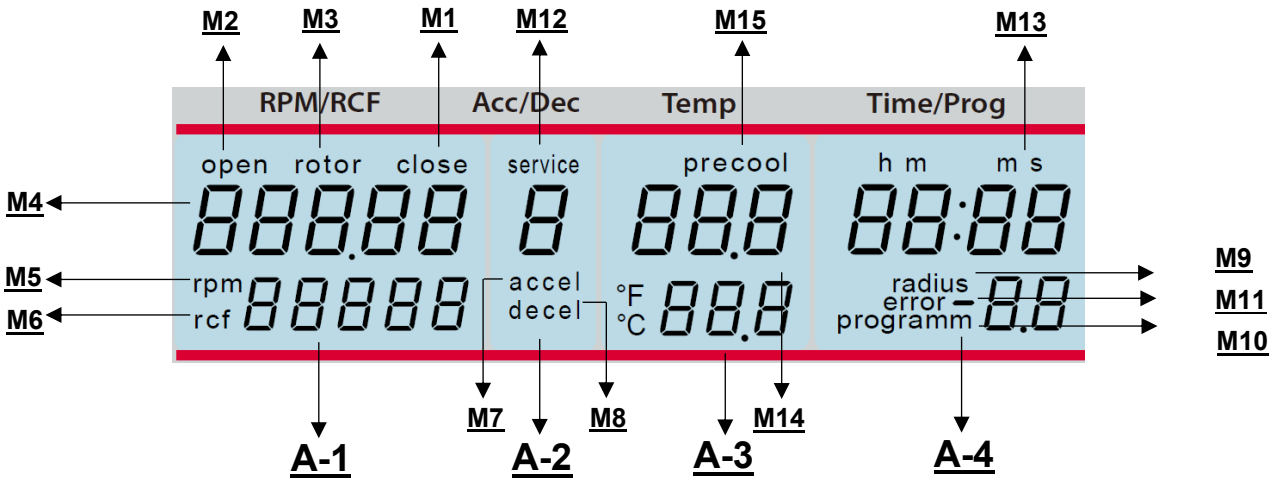
FC5714, FC5718, FC5816, FC5916



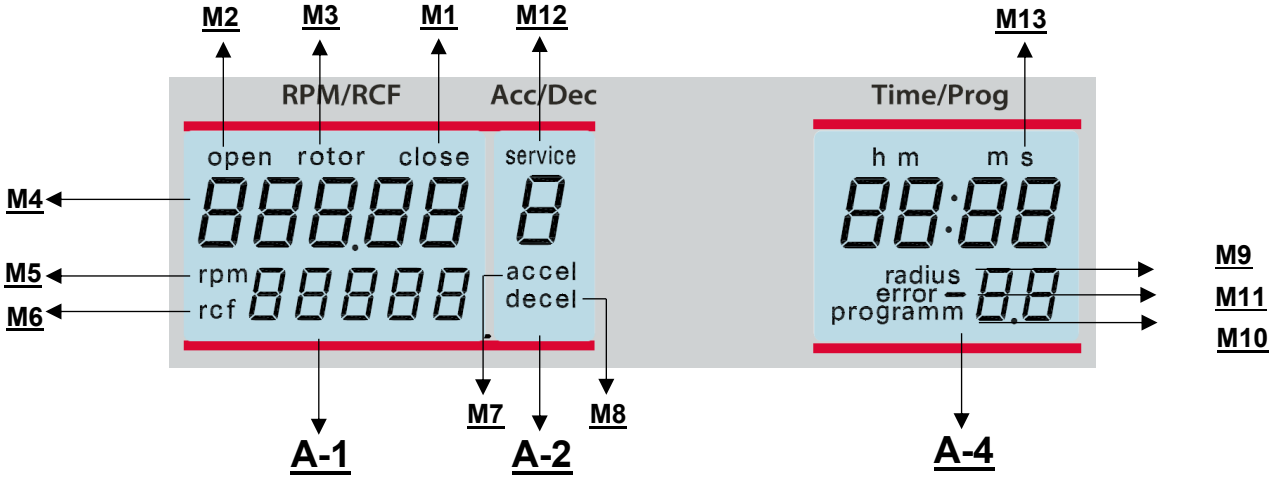
1	Adjusting knob	Run Parameters
2	LCD	Control Panel Display
3	RPM/RCF	Speed/ g-Force
4	Acc/Dec	Acceleration / Deceleration Intensity
5	Time	Centrifugation Time
6	Quick Spin	Short Running
7a	Door Open	Lid Release
7b	Stop	Stop Centrifuge
8	Start	Start Centrifugation
9	Prog/Setup	Retrieving Stored Programs
10	Store	Program Store
11	Temp Setup	Temperature Setup (FC5513R and FC5515R)

3.2 LCD Display

Refrigerated models



Non-refrigerated models



Display Fields:

A1	Display Field – “RPM/RCF”
A2	Display Field – “Acc/Dec”
A3	Display Field – “Time/Prog”
A4	Display Field – “Temp”

Messages on the Display Fields:

M1 “close”

M2 “open”

M3 “rotor”

M4 Rotor-No.

M5 “rpm”

M6 “rcf”

M7 “accel”

M8 “decel”

M9 “radius”

M10 “program”

M11 “error”

M12 “service”

M13 h:m:s

M14 temperature

M15 “precool”

3.3 Rotors

3.3.1 Overview

Rotor ID	Order No.	Description	Compatible									
			FC5714	FC5718	FC5718R	FC5720R	FC5816	FC5816R	FC5830R	FC5916	FC5916R	FC5917RF
10	83041010	Rotor Angle 12x5ml FA ID	●	●	●							
11	83041011	Rotor Swing out 4x200ml ID	●	●	●	●						
12	83041512	Rotor Swing out 4x1000ml ID										●
18	30372718	Rotor Angle 44x1.5/2.0ml ID V1		●	●	●	●	●		●	●	
20	30314820	Rotor Swing out 4x290ml ID					●	●	●			
21	30314821	Rotor Angle 6x250ml FB ID					●	●	●	●	●	●
22	30314822	Rotor Swing out 4x145ml ID	●	●	●	●						
23	30314823	Rotor Swing out 4x100ml ID	●	●	●							
24	30314824	Rotor Swing out 2x3MTP w/ bucket ID	●	●	●	●	●	●	●	●	●	
25	30314825	Rotor Angle 6x85ml RB ID Hi		●	●	●						
26	30314826	Rotor Angle 6x85ml RB ID		●	●	●	●	●	●	●	●	
27	30314827	Rotor Angle 4x85ml RB ID Hi		●	●	●	●	●	●	●	●	●
28	30314828	Rotor Swing out 4×250ml ID					●	●				
29	30314829	Rotor Angle 10x50ml FA ID		●	●	●	●	●	●	●	●	●
30	30314830	Rotor Angle 6x50ml RB/FA ID	●	●	●	●						
31	30314831	Rotor Angle 6x50ml RB ID Hi		●	●	●	●	●	●	●	●	
32	30314832	Rotor Angle 30x15ml RB/FA ID	●	●	●	●	●	●	●			
33	30314833	Rotor Angle 20x10ml RB ID Hi		●	●	●	●	●	●	●	●	
34	30314834	Rotor Angle 12x15ml RB/FA ID	●	●	●	●						
36	30314836	Rotor Angle 30x1.5/2.0ml ID	●	●	●	●			●	●	●	
38	83041238	Rotor Angle 24x1.5/2.0ml ID BIOSEALS V1	●	●	●	●	●	●		●	●	
39	30314839	Rotor Angle 12x1.5/2.0ml ID		●	●				●			
41	30314841	Rotor Angle 4x8-Place PCR Stripes ID		●	●	●				●	●	
61	30304361	Rotor Angle 24x1.5/2.0ml ID BIOSEALS				●						
85	30553085	Rotor Swing out 4x750ml ID								●	●	●
86	30553086	Rotor Angle 4x500ml ID								●	●	●

3.3.2 Installation Of Rotors

Clean the drive shaft with a clean, grease-free piece of cloth **(see Figure 4).** Place the rotor onto the motor shaft, hold the rotor with one hand and tighten the fixing nut clockwise with provided rotor key **(see Figure 5).**

The centrifuge will detect the installed rotor automatically after closing the centrifuge lid.

Figure 4

Figure 5

ATTENTION!

Check that the fixing nut is properly installed before each run **(see Figure 5).**

Do not operate the centrifuge with rotors or buckets which show any signs of corrosion or mechanical damage.

Do not operate with extremely corrosive substances, which could damage the rotor, buckets, and materials.

In case of any questions, please contact the manufacturer!

3.3.3 Loading Angle Rotors

Rotors must be loaded symmetrically and with equal weight **(see Figure 7).** The adapter may only be loaded with the appropriate vessels. The weight differences between the filled vessels should be kept as low as possible. Therefore, we recommend weighing them with a balance. This reduces the wear of the drive and the acoustic operating noise.

The maximum load per hole is stated on each rotor.

Figure 6 – WRONG

Figure 7 – CORRECT

ATTENTION!

For safety reason, all places on certain rotors must be occupied with equal weight during centrifugation **(see Figure 9).**

Figure 8 - WRONG

Figure 9 - CORRECT

Regardless of the centrifuge model, this applies to the following angle rotors:

30553086 (4 x 500 ml)
30314821 (6 x 250 ml)
30314825 (6 x 85 ml)
30314826 (6 x 85 ml)
30314827 (4 x 85 ml)

3.3.4 Loading Swing Out Rotors

Loading of the buckets / Racks must be made in accordance to the **Figure 11**.

It is permissible to operate a 4-place rotor with only 2 loaded buckets, but the loaded buckets must be positioned opposite to each other. Make sure that the unloaded buckets are also placed into the rotor **(see Figure 11)**.

Generally swing out rotors may not be taken into operation until all buckets or racks are put into the rotor.

The bolts at the rotor must be greased regularly with the provided lubricant 30314586. The sample tubes have to be filled evenly by eye and put into the drillings or tube racks. The weight difference of the loaded buckets should not exceed approx.1.0 g.

ATTENTION!

Swing out rotors may be taken in operation only if all locations are filled in with either four buckets or four carriers – do not mix buckets and carriers together!!

ATTENTION!

Do not operate the centrifuge with rotors or buckets which show any signs of corrosion or mechanical damage.

Do not operate with extremely corrosive substances, which could damage the rotor and buckets. In case of any questions, please contact the manufacturer!

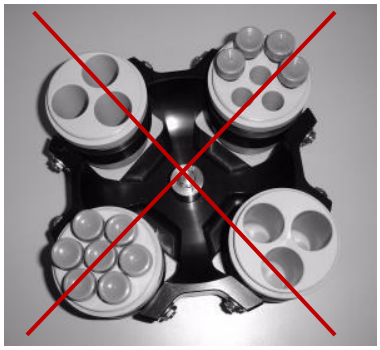


Figure 10 - WRONG

Figure 11 - CORRECT

3.3.5 Loading and Overloading of The Rotors

All approved rotors are listed with their maximum speed and maximum filling weight in **"Table 1: Permissible net weight"** (See APPENDIX).

The maximum load permitted for a rotor, which is determined by the manufacturer, as well as the maximum speed allowed for this rotor (see label on rotor), must not be exceeded. The liquids the rotors are loaded with should have a maximum homogeneous density of 1.2 g/ml or less when the rotor is running at maximum speed.

In order to spin liquids with a higher density, the speed has to be reduced according to the following formula:

Reduced speed $n_{red} = \sqrt{\frac{1,2}{higher\ density}}$ x max. speed (n_{max}) of the rotor

Example:

$n_{red} = \sqrt{\frac{1,2}{1,7}}$ x 4.000 = 3.360 rpm

To determine the relative centrifugal force (RCF/g-force) for a specific adapter, you can calculate using the attached formula:

$RCF = 1.117862*10^{-5}*n^2*r_{max}$

n: revolutions per minute (RPM)

rmax: max centrifuging radius in cm by using the bottom of tubes

In case of any questions, please contact the manufacturer!

3.3.6 Removing The Rotor

Untighten the rotor fixing nut completely counterclockwise and lift the rotor vertically out of the centrifuge**.**

3.4 Power switch

The power switch is located at the front. At the models FC5917RF and FC5917RF Short it´s located at the right side of the housing **(see Figure 12)**.

Figure 12 – Power Switch

3.4.1 Power connection

The power connection of the products is located always at the rear side if the housing.

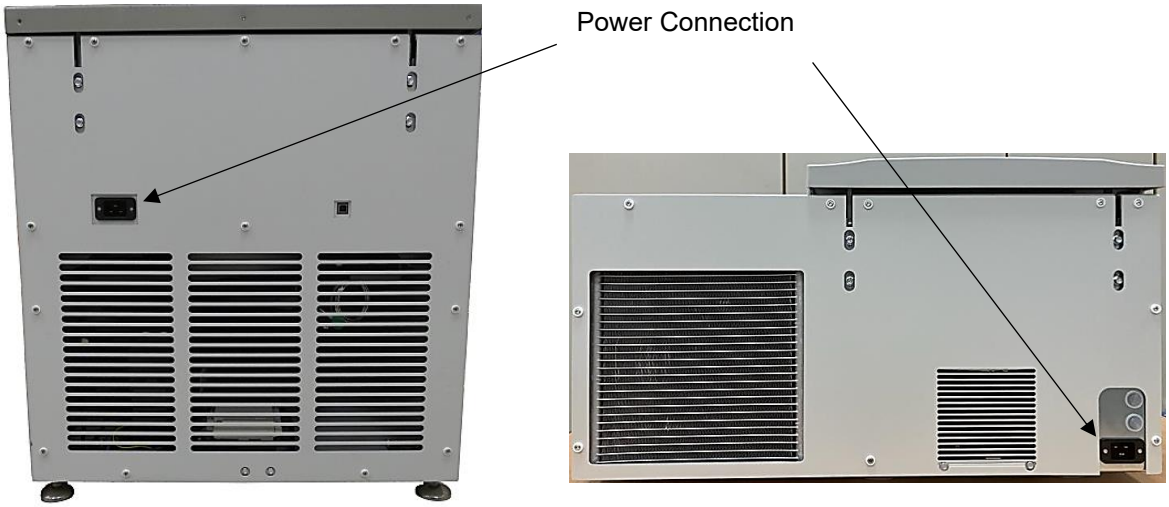


Figure 13 – Power Connection

3.5 Lid Control

3.5.1 Lid Open

After the run, when the lid of the centrifuge remains closed, the word **"close"** (M1) will continued to appear in the display **"RPM | RCF"** (A-1). At the same time the actual rotor ID, e.g. "**nr 80**", is shown in the display (M4). If there is no rotor in the centrifuge installed, the word **"rotor"** (M3) flashes and additionally the word **"no"** (M4) appears. As soon as the lid is released by pressing the key **"Door Open"** (7a), the word **"open"** (M2) appears. Now you can open the lid of the centrifuge. Please refer to **Figure 14** below for reference.

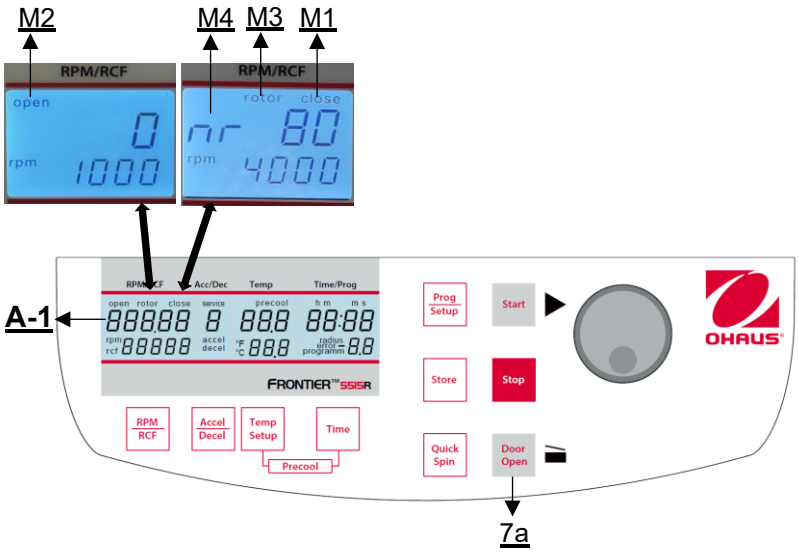


Figure 14

3.5.2 Lid lock

The lid should only be pushed down slightly. When the lid is locked, the word **"open"** (M2) is no longer displayed. As a sign that the centrifuge is ready for starting, in the display **"RPM | RCF"** (A-1) the word **"close"** (M1) appears. Simultaneously the word **"rotor"** (M3) is displayed, as well as the rotor ID, which is set in the centrifuge system, e.g. **"nr 80"** (M4).

Please refer to **Figure 14** for reference.

ATTENTION

Don't grip your fingers between lid and device or locking mechanism when closing the lid!

Before closing the lid please check if the rotor is tighten.

3.6 Preselection

3.6.1 Preselection of Speed / RCF-value

The pre-selection is activated through the key **"RPM | RCF"** (3) **(refer to Figure 15).** By pressing the key once the word **"rpm"** (M5) flashes. By pressing the key twice, the pre-selection of the centrifugal forces can be selected. Then the flashing word **"rcf"** (M6) appears. You can set the desired values with the adjusting knob (1). In the display (A-1) the regulated value is shown permanently, before, during and after the run.

As long as no rotor is inserted, the speed is adjustable between 200 rpm and maximum revolution of the centrifuge. If there is a rotor in the centrifuge the speed can only be pre-selected until the maximum permissible revolution of that rotor. It is the same with the pre-selection of the RCF-value. The setting range is between the minimum and maximum relative centrifugal force of the rotor.

See **"Table 2: max. speed and RCF-values for permissible rotor"** (APPENDIX). All important values are listed there.

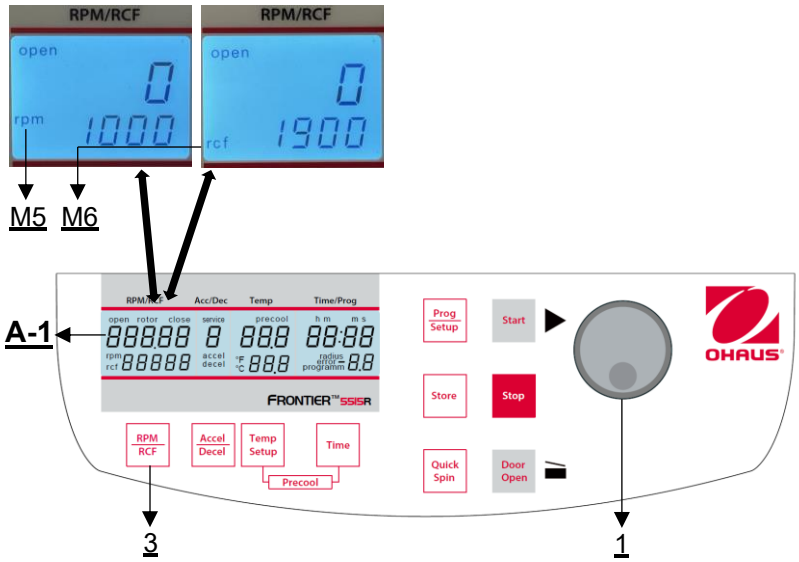


Figure 15

ATTENTION

Please also check the maximum permissible revolutions of your test tubes with the manufacturer.

3.6.2 Preselection of running time

The running time can be pre-selected in three different ranges from 10 seconds up to 99 hours 59 minutes.

- Range from: 10 seconds up to 59 minutes 50 seconds in steps of 10 seconds
- Range from: 1 hour up to 99 hours 59 minutes in steps of 1 minute.
- Range: Continuous run **"cont",** which can be interrupted by the key **"Stop"**(7b).

The running time can be pre-selected with the lid open or closed.

To activate the setting of the running time, press the key **"Time"** (5).

In the display **"Time/Prog"** (A-4) flashes the indication **"m : s"** or **"h : m"**, depending on the previous setting.

To set the desired value, use the adjusting knob (1). After exceeding 59 min 50 sec the indication changes automatically into **"h : m"**. After exceeding 99 hours 59 min the word **"cont"** appears in the display **"Time/Prog"** (A-3). That continuous run can only be interrupted by pressing the key **"Stop"**(7b). The time countdown starts as soon as the set speed is reached.

The display always shows the remaining running time **(see Figure 16).**

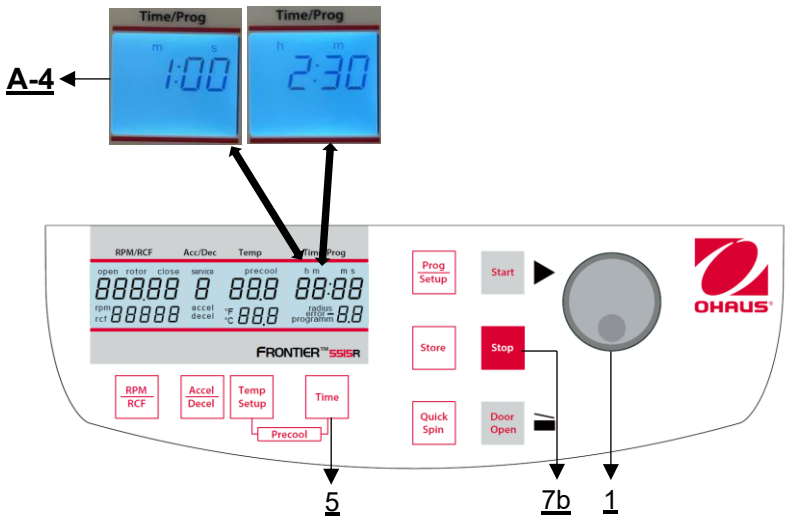


Figure 16

3.6.3 Preselection of acceleration and brake intensity (deceleration)

This function is activated through the key **"Accel/Decel"** (4) **(see Figure 17).**

By pressing the key once the word **"accel"** (M7) flashes in the display **"Acc/Dec"** (A-2). The desired acceleration can be pre-selected by the adjusting knob (1). The value 0 is equivalent to the lowest and the value 9 to the highest acceleration.

By pressing the key **"Accel/Decel"** (4) twice, the display **"Acc/Dec"** (A-2) indicates the word **"decel"**(M8). Now the desired brake intensity can be pre-selected by the Adjusting knob (1). The value 9 is equivalent to the shortest and the value 0 to longest possible brake time. A value of 0 corresponds to a free run-out without an active brake.

See **"Table 3: acceleration and deceleration times"** (APPENDIX). In this table the acceleration and deceleration times for the acceleration and deceleration stages 0 to 9 for permissible rotors are shown.

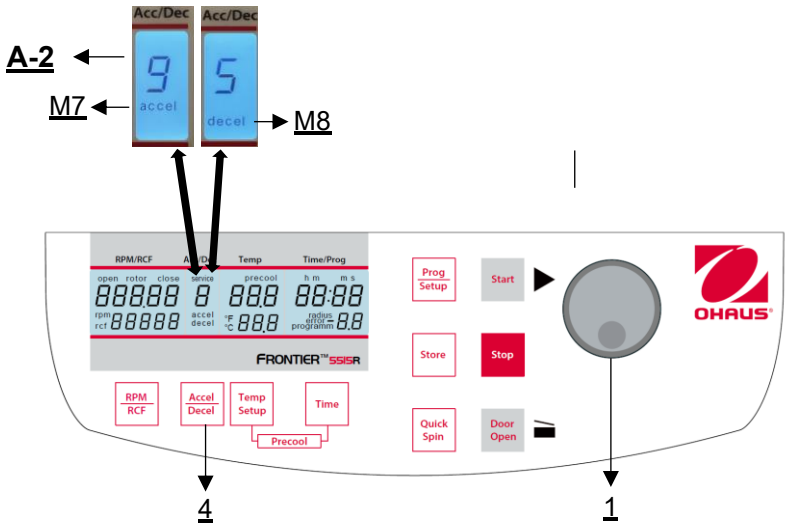


Figure 17

Only FC5917RF and FC5917RF Short

If the **"Accel/Decel"** (4) key is pressed three times, the word **"decel"** (M8) flashes in the **"Acc/Dec"** (A-2) display field. Now the desired braking curve can be preselected with the adjusting knob (1) **(see Figure 18)**. The code letter "L" stands for a linear braking curve. This means that the rotor is braked evenly during the entire braking phase. The braking curve with the code letter "A" allows a smooth braking. Its braking rate (rpm/s) is dynamically adjusted, which means that sensitive samples are only slightly swirled during the braking phase. This leads to a better separation result.

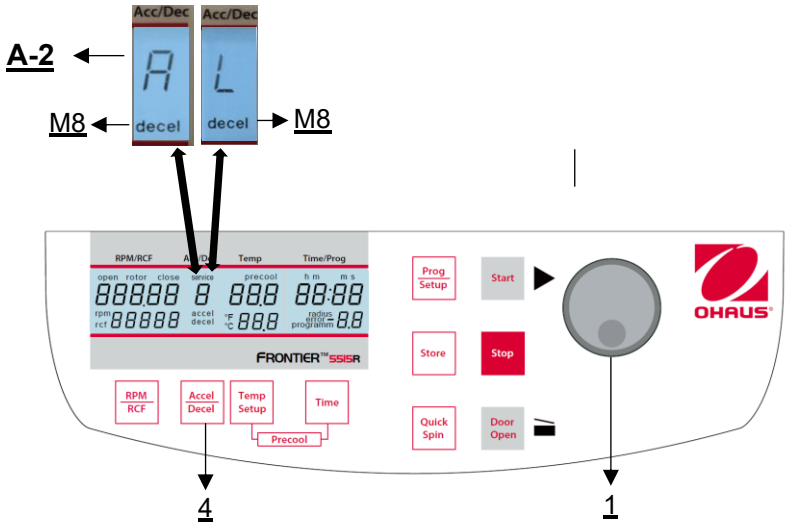


Figure 18

3.6.4 Preselection of temperature (Only Refrigerated Models)

This function is activated by the key **"Temp/Setup"** (11). After pressing this key in the display **"Temp"** (A-3) the indication **"°C "** flashes. By the adjusting knob (1) the desired test temperature can be pre-selected in steps of 1°C in a range from -20°C up to +40°C.

The value is indicated permanently in the display **(Figure 19)** - before, during and after the run. Please notice the respective lowest temperatures of the rotors at maximum speed!

See **"Table 4: Lowest temperature at max. speed"** (APPENDIX).

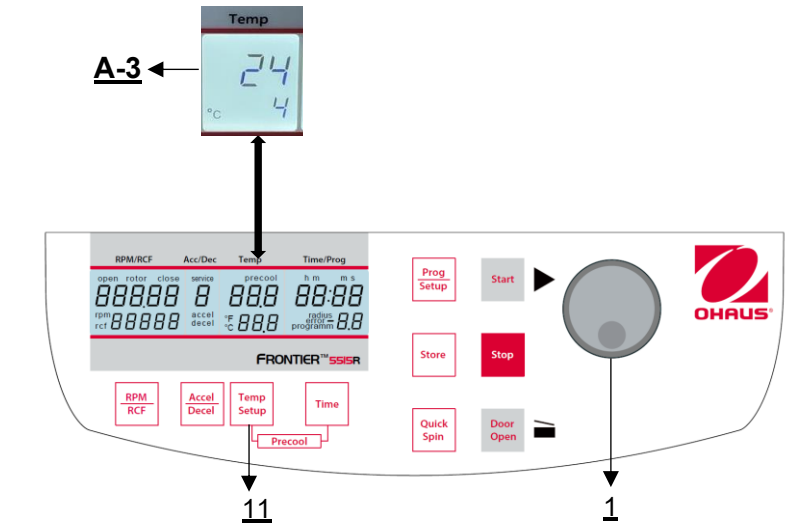


Figure 19

3.6.5 Pre-cooling (Only Refrigerated Models)

If the samples are temperature-sensitive it is useful to pre-cool the centrifuge, the rotor and eventually the buckets to the required working temperature. Therefore, insert the desired rotor and pre-set the respective temperature. By simultaneous pressing the keys **"Temp/Setup"** (11) and **"Time"** (5) you can start the run **(Figure 20)**. While running, the unit chooses automatically a rotational speed that is equivalent to 30 or 50 % of the permitted rotational speed of the respective rotor (depending on the rotor). After the pre-set temperature is reached you can leave the pre-cooling run with the key **"Stop"**(7b)

Depending on the inserted rotor the pre-cooling goes between approx. 10 and 20 min.

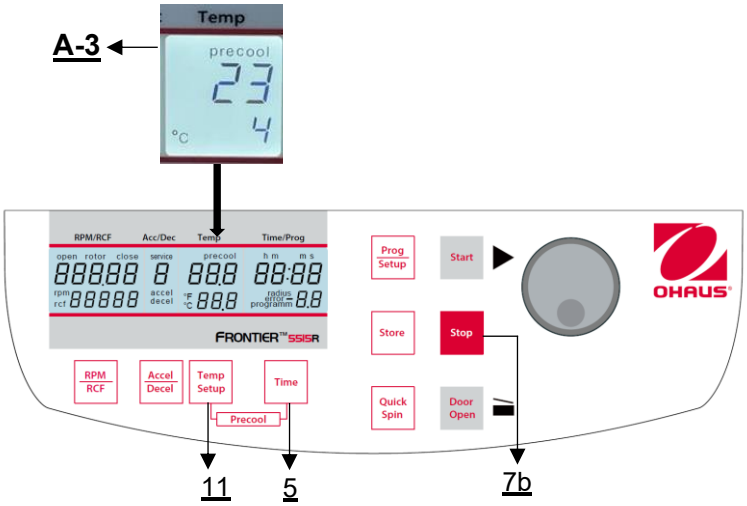


Figure 20

3.7 Radius correction

If you use adapters or reducers, it could change the centrifugal radius of the respective rotor. In that case you can correct the radius manually. Please proceed as follows:

First, close the centrifuge lid, then press the key **"Time"** (5) and the key **"Prog/Setup"** (9) at the same time and hold them **(see Figure 21).**

In the display **"Time/Prog"** (A-4) the word **"radius"** (M9) appears. By the adjusting knob (1) you can preselect the respective radius correction, see "**Table 6: Radius correction**" (APPENDIX) in steps of 0.1 cm. As soon as you have set a radius correction the word **"radius"** (M9) appears. This word will be visible until you put the radius correction back to 0 again.

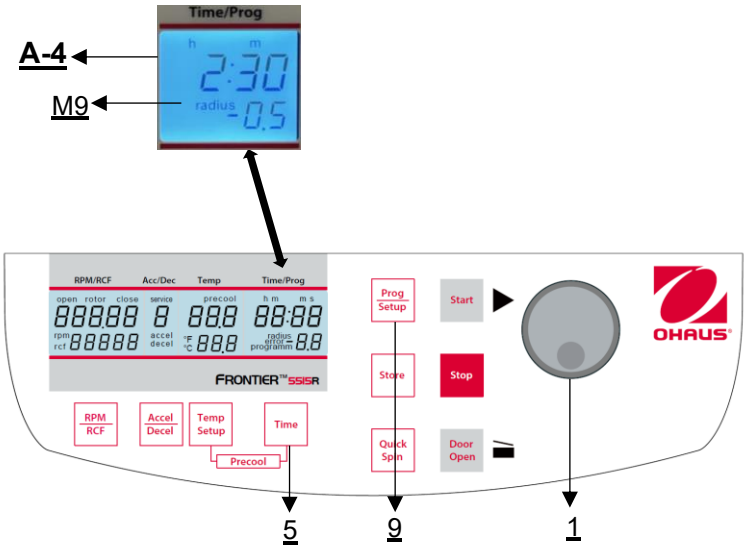


Figure 21

3.8 Program

3.8.1 Program storage

You can store up to 99 runs with all relevant parameters, including the used rotors. You can use any free program number and call it up again.

Put the needed rotor into the centrifuge. By pressing the key **"Prog/Setup"** (9) in the display **"Time/Prog"** (A-4) the word **"program--"** (M10) appears. By the adjusting knob (1) you can chose the desired program number.

If a program number is already occupied, in the display **"RPM | RCF"** (A-1), the words **"rotor"** (M3) and **"xx"** (M4) will appear – the **"xx"** stands for the rotor ID. In case of free program numbers, 0 appears instead of rotor ID **(see Figure 22).**

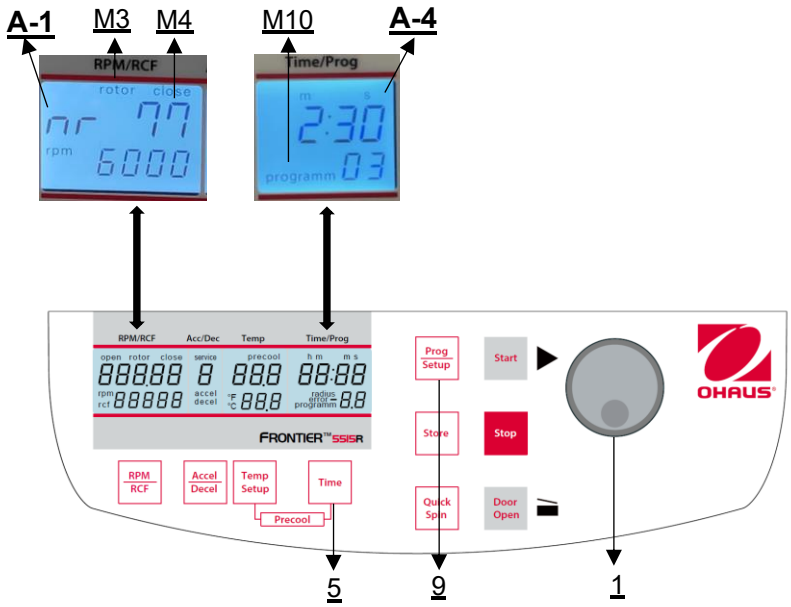


Figure 22

Close the lid of the centrifuge. Now proceed as described previously to set all important run parameters. If the lid isn't closed when storing the program, in the display **"RPM/RCF"** (A-1), the words **"FirSt"** and **"CLOSE Lid"** **(see Figure 23)** flashes alternately. If you want to start the run without storing the program, in the display **"RPM/RCF"** (A-1), the words **"First"** and **"PrESS StoreE"** **(see Figure 24)** flashes alternately.

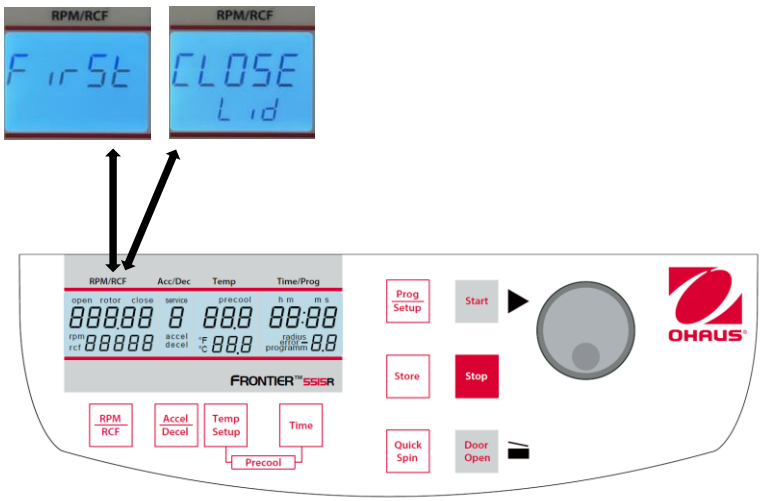


Figure 23

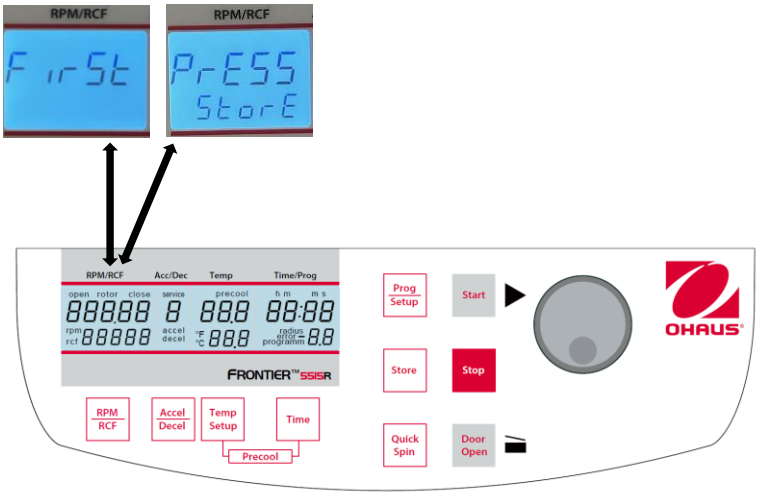


Figure 24

For adaption of data press the key **"Store"** (10) for approx. 1 second. If the program is stored correctly, the word **"StorE"** appears in the display **"RPM/RCF"** (A-1).

If all program numbers are occupied, you can take an old number that is not necessary anymore and just put in the new parameters.

3.8.2 Recall of stored programs

To recall stored programs, press the key **"Prog/Setup"** (9) **(see Figure 25)** while the lid is already closed. Inside the display **"Time/Prog"** (A-4), **"program--"** (M10) appears. The desired program number can be pre-selected with the adjusting knob (1).

In the respective displays the stored values for that program will appear.

If the wrong rotor is set for the pre-selected program, in the display **"RPM | RCF"** (A-1), the word **"rotor"** (M3) flashes. At the same time the word **"FALSE"** and the stored rotor ID **"xx"** (M4) will be flashing by turns.

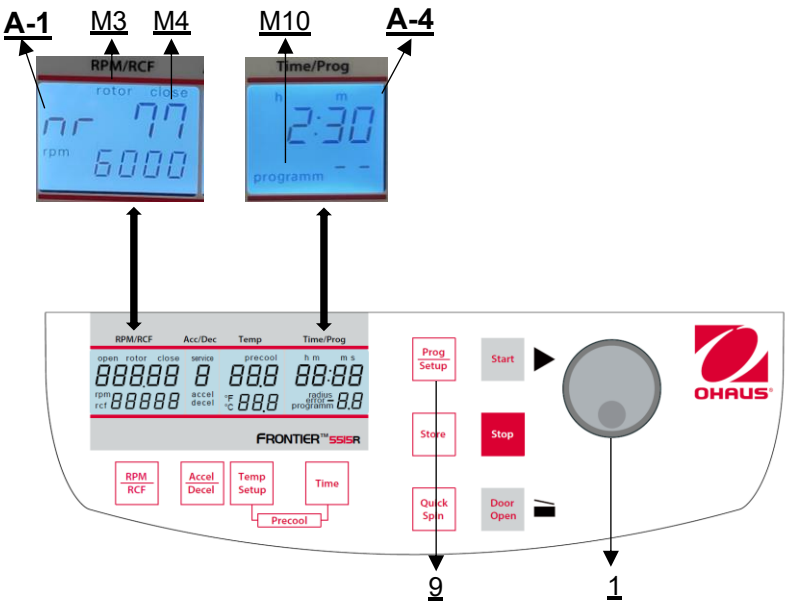


Figure 25

3.8.3 Leaving program mode

To leave the program mode just press the key **"Prog/Setup"** (9) **(see Figure 25).** Then inside the display **"Time/Prog" (A-1)** the word **"programm"** (M10) appears. Set the display to **"programm--"** (M10) with the adjusting knob (1).

3.9 Starting and Stopping the Centrifuge

3.9.1 Starting the centrifuge

You can start the centrifuge either with the **"Start"** key (8) or the **"Quick Spin"** key (6) **(see Figure 26)**. By the **"Start"** key (8) you can start stored runs or runs with manually pre-selected parameters. When the respective pre-selected running time has ended the centrifuge will stop automatically. By the **"Quick Spin"** key (6) you can start runs, which will last just a few seconds.

By pressing the **"Quick Spin"** key (6) the centrifuge accelerates up to the pre-selected revolution.In the display **"Time/Prog"** (A-4) the passed running time is indicated from the date of pressing the **"Quick Spin"** key (6). By releasing the **"Quick Spin"** key (6) the centrifuge stops, and the running time is indicated until the opening of the lid.

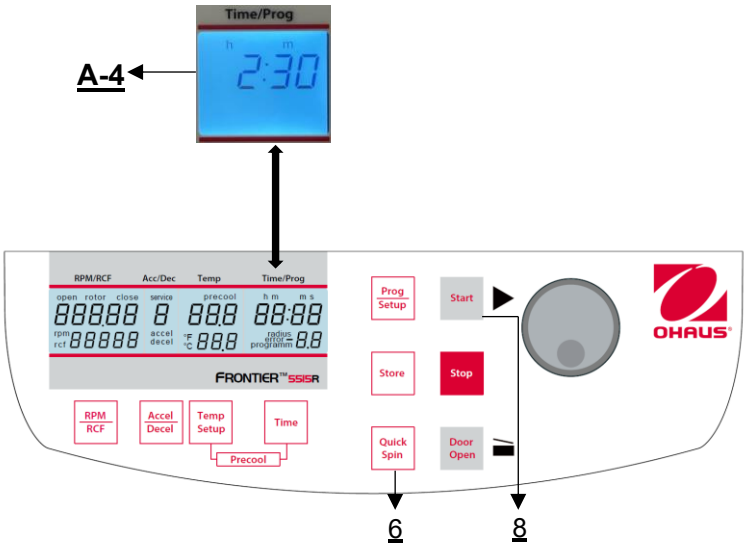


Figure 26

3.9.2 Stopping the centrifuge

By the **"Stop"** (7b) key **(see Figure 27)** you can interrupt the run at any time. After pressing the key, the centrifuge decelerates with the respective pre-selected intensity down to stand still.

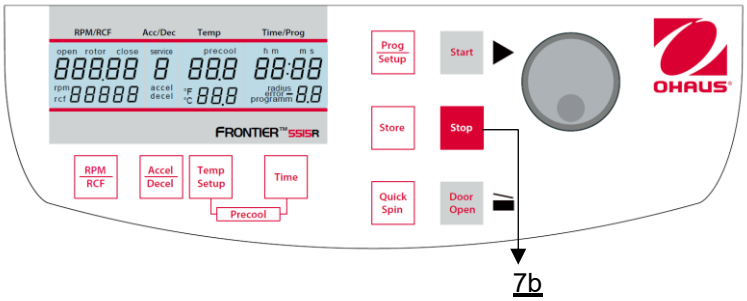


Figure 27

3.10 Imbalance Detection

In case of the rotor not being equally loaded, the drive will turn off during acceleration. The rotor decelerates to stand still.

When in the display **"Time/Prog"** (A-4) the word **"error"** (M11) together with the number **"01"** appear, the weight difference of the samples is too large. Distribute the weight evenly **(see picture 28).**

Load the rotor as described in chapter 3.3.3 and 3.3.4.

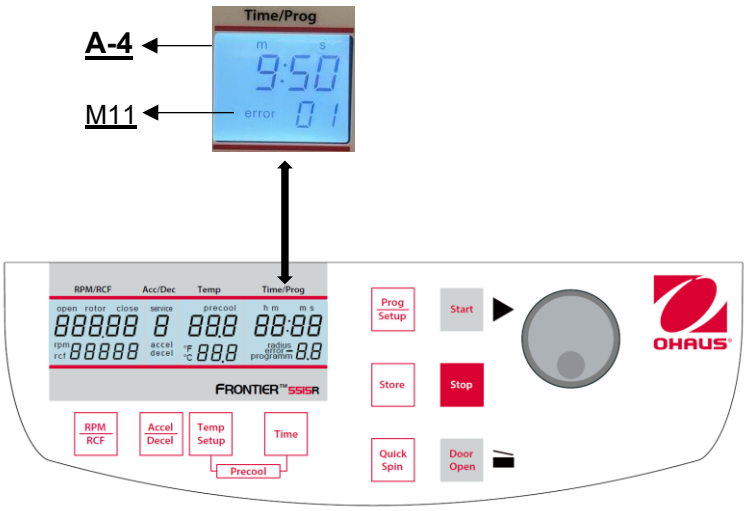


Figure 28

4 SETTING

4.1 Basic Adjustments

4.1.1 Access to mode “Operating Data”

When using the centrifuge, the following parameters can be set:

- Temperature indication in °C or °F (only Refrigerated Models)
- Acoustic signal turn on/off
- Keyboard sound turn on/off
- Volume pre-selection of sound signal
- Song selection of sound signal **"end of run"**

The following operating data can be retrieved in this menu:

- Number of starts
- Operating hours of centrifuge
- Operating hours of motor
- Software version centrifuge
- Frequency converter software
- Error list
- Function of the imbalance sensor
- Operation of keyboard
- Hardware version

Open the centrifuge lid and shut off the main switch. Now switch on again the main switch. For approximately 3 seconds the model name will be shown in the display as well as the current software version. Press during this time the keys **"Time"** (5) and **"Door Open"** (7a) simultaneously. As a result, a display test is executed for approx. 3 seconds. All indicators will appear at the same time **(see Figure 29).**

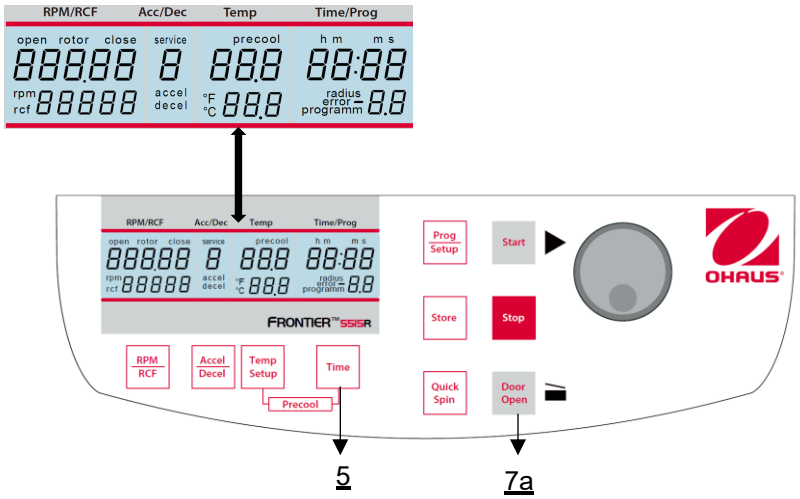


Figure 29

ATTENTION

All changed settings must be confirmed by the key **"Start"**(8) or **"Store"** (10). The word **"Store"** appears in the display **"RPM | RCF"** (A-1) – Only then the pre-selections are valid **(see Figure 30).** After you have stored the settings, you can change to normal program mode again by switching off the centrifuge for a short while.

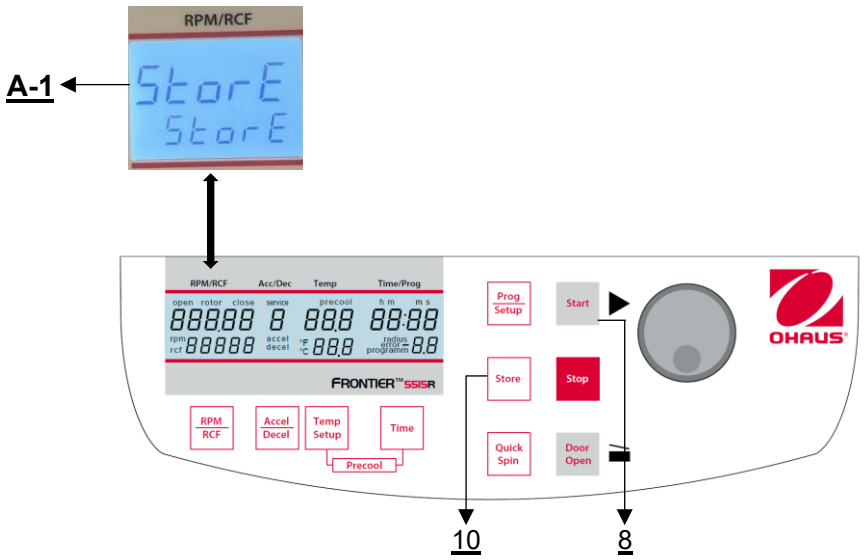


Figure 30

4.1.2 Temperature indication in °C or °F (only Refrigerated Models)

Proceed as described under point 4.1.1 to enter this program mode and then press the key **"Accel/Decel"** (4). In the display **"Acc/Dec"** (A-2) the word **"Service"** (M12) flashes. Now select the letter **"C"** with the adjusting knob (1). As a result, the words "CELSI/temp" appear in the display **"RPM | RCF"** (A-1). If you press the key **"RPM | RCF"** (3), the word **"°C"** flashes and you can change the display into Fahrenheit **"°F"** with the adjusting knob (1) **(see Figure 31).**

After you have stored the settings (see 4.1.1) you can change back to the normal program mode again by switching off the centrifuge for a short while.

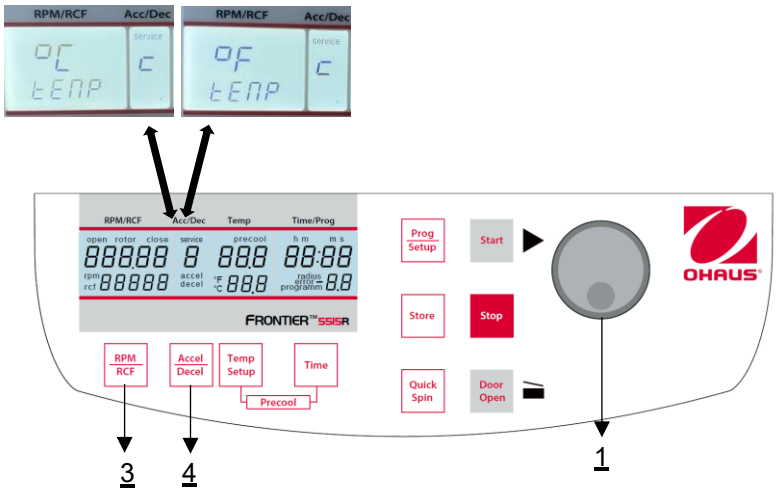


Figure 31

4.1.3 Acoustic signal turn on /off

Proceed as described under point 4.1.1 to enter this program mode and then press the key **"Accel/Decel"** (4). In the display **"Acc/Dec"** (A-2) the word **"Service"** (M12) flashes. Now select the letter **"L"** with the adjusting knob (1). As a result, the words "On Sound" appear in the display **"RPM | RCF"** (A-1). If you press the key **"RPM | RCF"** (3), the word **"On"** flashes and you can switch off the sound with the adjusting knob (1) **(see Figure 31).**

After you have stored the settings (see 4.1.1) you can change back to the normal program mode again by switching off the centrifuge for a short while.

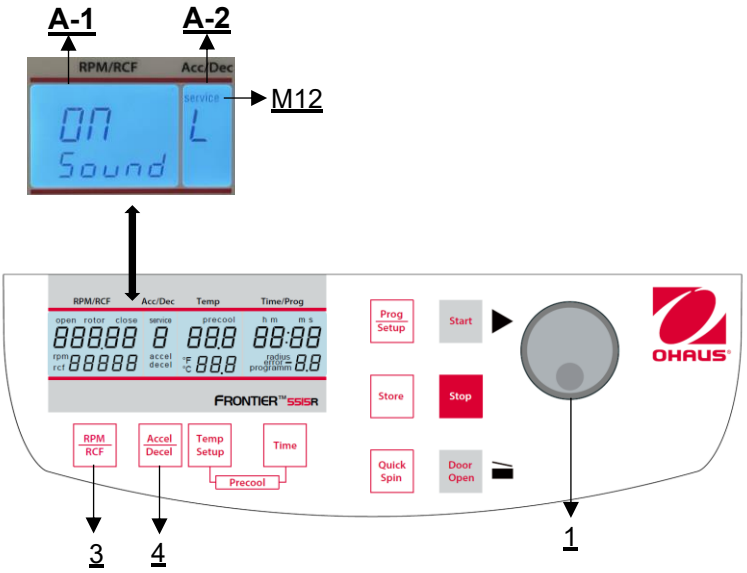


Figure 31

4.1.4 Volume pre-selection sound signal

Proceed as described under point 4.1.1 to enter this program mode and then press the key **"Accel/Decel"** (4). In the display **"Acc/Dec"** (A-2) the word **"Service"** (M12) flashes. Now select the letter **"U"** with the adjusting knob (1). As a result, the words "Vol=9/Sound" appear in the display **"RPM | RCF"** (A-1). After pressing the key **"RPM | RCF"** (3), you can adjust the desired volume between 0 (low) and 9 (loud) with the adjusting knob (1) **(see Figure 32)**.

After you have stored the settings (see 4.1.1) you can change back to the normal program mode again by switching off the centrifuge for a short while.

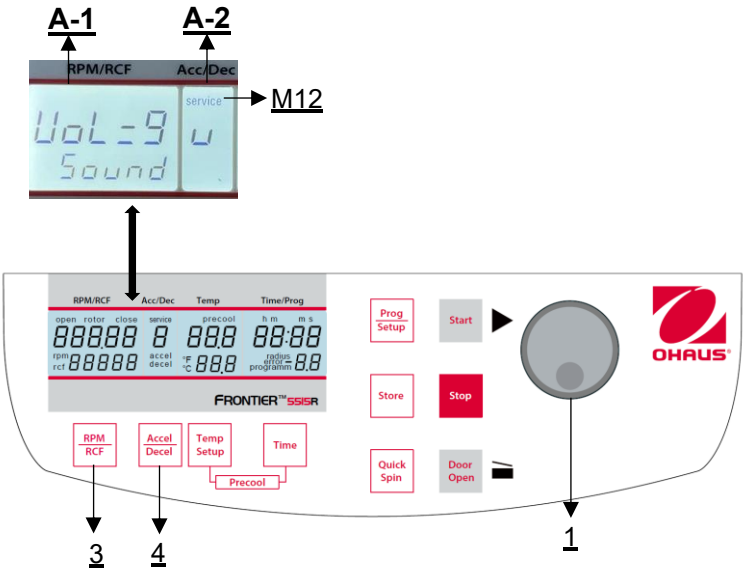


Figure 32

4.1.5 Song selection for sound signal – end of run

Proceed as described under point 4.1.1 to enter this program mode and then press the key **"Accel/Decel"** (4). In the display **"Acc/Dec"** (A-2) the word **"Service"** (M12) flashes. Now select the letter **"G"** with the adjusting knob (1). As a result, the words "SonGo/Sound" appear in the display **"RPM | RCF"** (A-1). After pressing the key **"RPM | RCF"** (3), you can select a song with the adjusting knob (1) **(see Figure 33)**.

After you have stored the settings (see 4.1.1) you can change back to the normal program mode again by switching off the centrifuge for a short while.

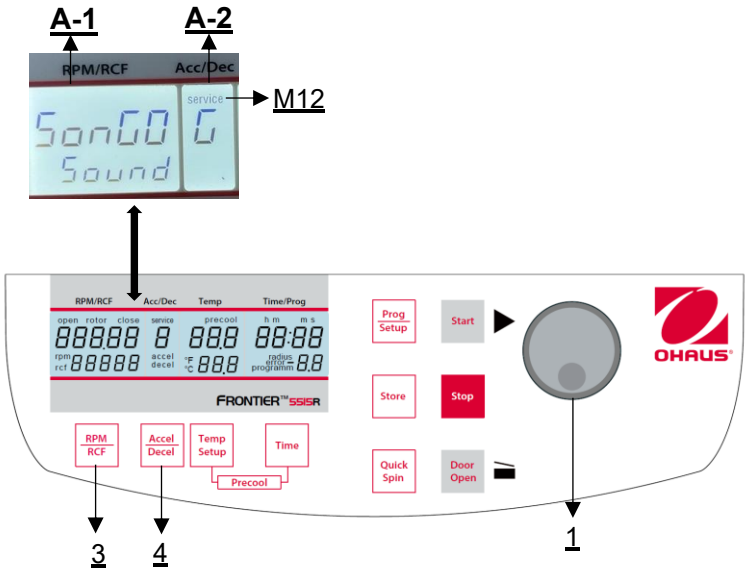


Figure 33

4.1.6 Keyboard sound turn on /off

Proceed as described under point 4.1.1 to enter this program mode and then press the key **"Accel/Decel"** (4). In the display **"Acc/Dec"** (A-2) the word **"Service"** (M12) flashes. Now select the letter **"b"**. with the adjusting knob (1). As a result, in the display **"RPM | RCF"** (A-1), the word **"ON/BEEP "** appears. After pressing the key **"RPM | RCF"** (3), you can turn the keyboard sound (On) or (Off) with the adjusting knob (1) **(see figure 34).**

After you have stored the settings (see 4.1.1) you can change back to the normal program mode again by switchoff the centrifuge for a short while.

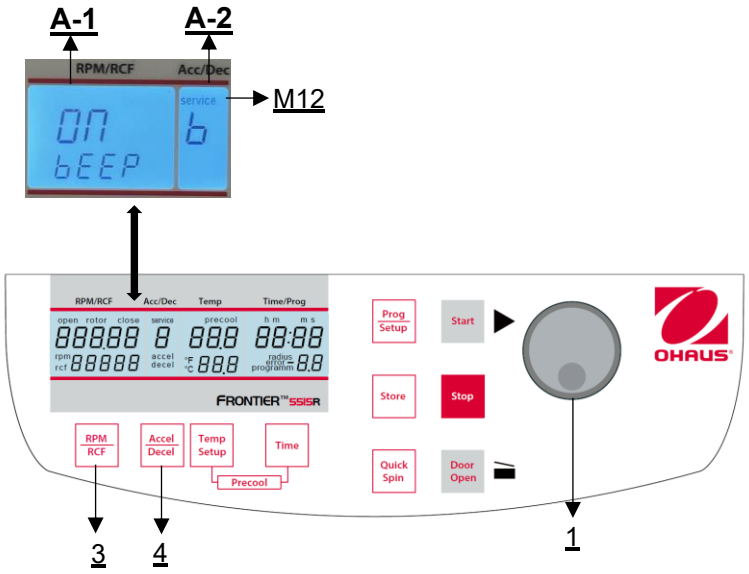


Figure 34

4.1.7 Call up operating data

In the mode **"Basic Adjustments"** you can call up the operating data of the centrifuge. Please proceed as described under point 4.1.1 to enter this program mode. Press the key **"Accel/Decel"** (4). In the display **"Acc/Dec"** (A-2) the word "Service" (M12) flashes.

With the adjusting knob (1) the different information can be accessed:

A = previous starts of the centrifuge

H = previous operating hours

h = running time of the motor

S = software version

r = frequency converter software

E = list of previous error messages

F = Function of the Imbalance Sensor

P = Operation of keyboard

d = Hardware Version

The list of the last 99 error messages can be looked over by pressing the key **"RPM | RCF"** (3) and scroll through it by the adjusting knob (1). The respective error codes appear in the display "**RPM | RCF**" (A-1). Please refer to **"Table 5: error messages"** (see APPENDIX).

To change back to normal program mode again, switch off the centrifuge for a short period.

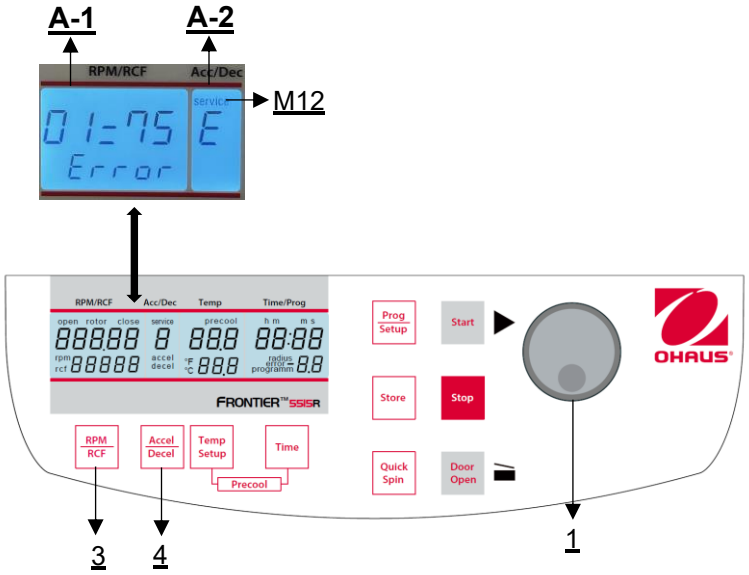


Figure 35

5 MAINTENANCE

5.1 Maintenance and cleaning

5.1.1 General Care

Maintenance of the centrifuge by the end user is confined to keeping the rotor, the rotor chamber, and the rotor accessories clean as well as to regularly lubricating the rotor insert bolts of a swing out rotor (if available).

Suitable lubricant can be order under this order number: 30314586. Own lubricants containing molycote and graphite are not allowed.

Please pay special attention to anodized aluminum parts (if available). Breakage of rotors can be caused even by slight damage.In case of rotors, buckets or tube racks getting in touch with corrosive substances the concerned spots have to be cleaned carefully.

Corrosive substances are for instance: alkalis, alkaline soap solutions, alkaline amines, concentrated acids, solutions containing heavy metals, water-free chlorinated solvents, and saline solutions. e.g. salt water, phenol, halogenated hydrocarbons.

Maintenance and repairs may only be performed by persons authorized by the manufacturer to avoid the risk of possible ignition in refrigerated models due to incorrect parts or improper maintenance. The refrigerated models must have an annual leaks inspection.

5.1.2 Cleaning – centrifuges, rotors, accessories

- Turn the device off and disconnect it from the power supply before you begin any cleaning or disinfecting. Do pour liquids into the housing interior.
- Do not spray disinfectant on the device.
- Thorough cleaning not only has its purpose in hygiene but also in avoiding corrosion due to pollution.
- In order to avoid damaging anodized parts such as rotors, reduction plates etc., only pH-neutral detergents with a pH-value of 6-8 may be used for cleaning. Alkaline cleaning agents (pH-value > 8) must not be used. After cleaning, please ensure all parts are dried thoroughly, either by hand or in a hot-air cabinet (max. temperature + 50°C).
- It is necessary to coat anodized aluminum parts with anti-corrosion oil regularly in order to increase their life- spans and reduce corrosion predisposition.
- Due to humidity or not hermetically sealed samples, condensate may be formed. The condensate has to be removed from the rotor chamber with a soft cloth regularly.

NOTE!

The maintenance procedure must be repeated every 10 to 15 runs, or at least once a week.

- Connect the unit to the power supply, after the equipment is completely dry.
- Do not carry out disinfection with UV-, beta- and gamma-rays or other high energy radiation.

5.1.3 Centrifuge cleaning and disinfection

- Open the lid before you turn off the unit. Disconnect it from the power supply.
- Remove the rotor screw or nut by turning counterclockwise.
- Remove the rotor.
- For cleaning and disinfection of the unit and the rotor chamber use the above-mentioned cleaner.
- Clean all accessible areas of the device and its accessories, including the power cord with a damp cloth.
- Wash the rubber seals and rotor chamber thoroughly with water.
- Rub the dry rubber seals with glycerol or talc to prevent these to becoming brittle. Other components of the unit, e.g. motor shaft and rotor cone must not be greased.
- Dry the motor shaft with a soft, dry, and lint-free cloth.
- Control the unit and accessories for damage.

5.1.4 Cleaning and disinfection of the rotors

- Clean and disinfect the rotors and adapters with the cleaner, previously mentioned above.
- Use a bottle brush to clean and disinfect the rotor bores.
- Rinse the rotor and adapter, with clear water. Particularly, the drillings of the angle rotors.
- When drying the rotor and adapter, set on a towel. Place the angle rotor, with bores down, to dry.
- Dry the rotor cone with a soft, dry, and lint-free cloth, check for damage. Do not grease the rotor cone.
- Put the dry rotor back on the motor shaft.
- Fix the rotor by turning the rotor screw or nut clockwise.

5.1.5 Disinfection of rotors

In case of infectious material spilling into the rotor, it must be disinfected directly after the run.

Autoclaving

The recommended time for autoclaving: 15-20 min at 121°C (2,15 bar)

ATTENTION!

The sterilization time of 20 min. must not be exceeded. Repeated sterilization will cause reduction of the mechanical resistance of the plastic material.

Before autoclaving the PP-rotor and adapter must be thoroughly cleaned to avoid the burning in of dirty residues. You can disregard the consequences of some chemical residues to plastic materials at ambient temperatures. But at the high temperatures during autoclaving those residues may corrode and destroy the plastic. The objects must be thoroughly rinsed with distilled water after the cleaning but before the autoclaving. Residues of any cleaning liquids may cause fissures, whitening and stains.

Gas sterilization

Adapters, bottles, and rotors may be gas sterilized with Ethylenoxyd. Make sure to air out the items after the sterilization and before using them again.

ATTENTION!

Because the temperature may rise during the sterilization, rotors, adapters, and bottles must not be closed and must be totally unscrewed

Chemical sterilization

Bottles, adapters, and rotors may be treated with the usual liquid disinfectants.

ATTENTION!

Before applying any other cleaning or decontamination method than recommended by the manufacturer, contact the manufacturer to ensure that it will not damage the unit or the rotor.

5.1.6 Glass breakage

With high g-values, the rate of glass tube breakage increases. Glass splinters have to be removed immediately from rotor, buckets, adapters, and the rotor chamber itself. Fine glass splinters will scratch and therefore damage the protective surface coating of a rotor. If glass splinters remain in the rotor chamber, fine metal dust will build up due to air circulation. This very fine, black metal dust will significantly pollute the rotor chamber, the rotor, the buckets, and the samples.

If necessary, replace the adapters, tubes, and accessories to avoid further damage. Check the rotor bores regularly for residues and damage.

ATTENTION!

Please check the relevant specifications of the tube’s centrifuges with the manufacturer.

5.2 Service life of rotors, buckets, accessories

Rotors and rotor lids made of metal have a maximum operating time service life of 7 years from first use. Transparent rotor lids and caps made of PC or PP, as well as rotors, tube racks, and adapters of PP, have a maximum operating time service life of up to 3 years from first use. The condition for the operating time is proper use, damage-free condition, recommended care, and no sign of corrosion or cracks.

- Before each run, please check if the accessories are damaged. Replace any and all damaged accessories.
- Rotors, rotor lids, buckets, adapters or caps, which are showing any signs of corrosion or mechanical damage, are not longer functional.
- Do not use any accessories which are past their operating life.
- Be aware when inserting buckets and rotors, ensure that they do not become scratched.
- Protect the equipment from damage.

6 TROUBLESHOOTING

6.1 Error messages: Cause / Solution

The error messages are listed to help localize possible errors faster.

The diagnosing referred to in this chapter may not always be the case, as they are only theoretically occurring errors and solutions.

6.2 Survey of possible failures and their solutions

6.2.1 Lid release during power failure (Emergency Lid Release)

In case of power failure or malfunction, the lid of the centrifuge can be opened manually in order to retrieve your samples.

Please proceed as follows for models **FC5718, FC5718R, FC5816, FC5816R, FC5916, FC5916R, FC5917RF, FC5917RF Short, FC5720R and FC5830R:**

- Switch off the centrifuge, unplug the power cord and wait until the rotor stands still. This may take several minutes.
- At the left side of the centrifuge housing there is a plastic stopper. Remove this stopper and behind it there is a hexagon nut.
- Take the included rotor key, put it into the opening and lock rotor key with the hexagon nut **(see Figure 36)**.
- Now turn the rotor key according to the instructions at the label, which is positioned under the opening for emergency lid release. Don´t tighten the nut! Now you can open the centrifuge lid.

ATTENTION:

a) Just turn to the limit, don´t tighten the nut

b) Now open the lid of the centrifuge

c) Switch on the centrifuge again, to resume work

Figure 36

Please proceed as follows for model **FC5714:**

- Switch off the centrifuge, unplug the power cord and wait until the rotor stands still. This may take several minutes.
- At the right side of the centrifuge housing there is a plastic stopper. Remove this stopper, which is connected to the lid lock with a red string **(see Figure 37)**.
- Pull the string to open the centrifuge lid.

Figure 37

6.2.2 Description of the error message system

The error message **"error"** (M11) is shown in the **"Time/Prog"** (A-4) display **(see Figure 38).** Detailed information about possible error messages is in: **"Table 5: error messages"** See APPENDIX.

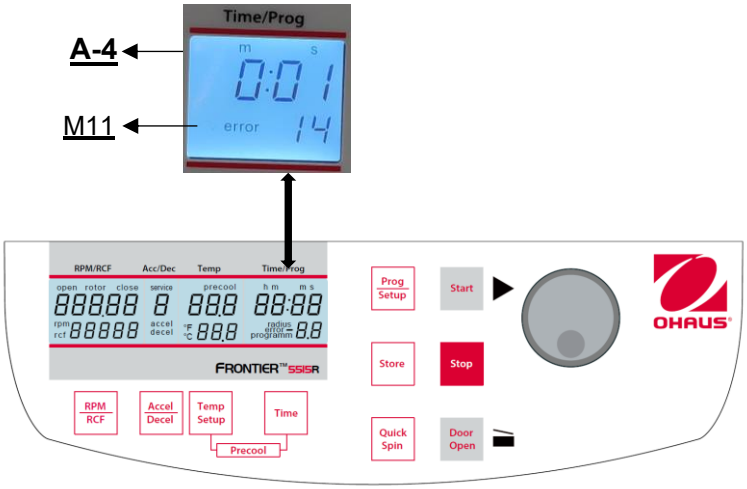


Figure 38

6.2.3 Procedure while error 14

If Error 14 occurs, there is a problem with the speed sensor. The centrifuge lid is closed for undefined period of time and in the "**RPM | RCF"** (A-1) display shows the lettering "**USEr GuidE**" **(see Figure 39).**

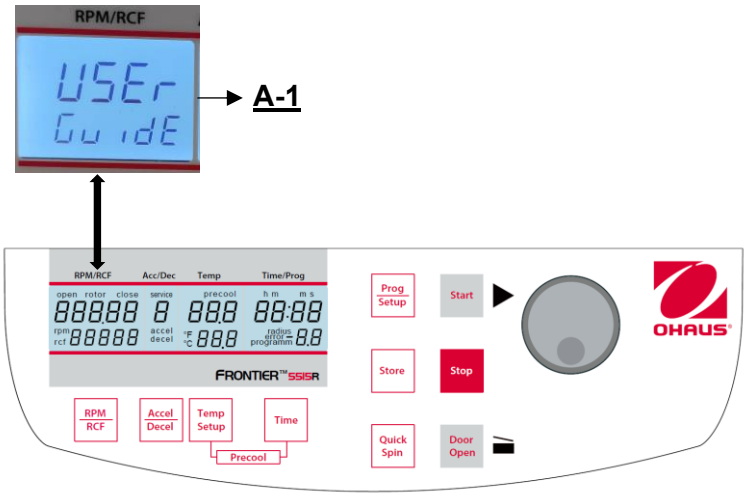


Figure 39

To reopen the centrifuge lid, switch off the device and wait until the rotor has come to a **standstill**. Take from **"Table 3: acceleration and deceleration times"** the maximum deceleration time of the respective rotor. Level 0 corresponds to unbreaked rundown, which occurs at error 14. If the centrifuge lid is opened before standstill of the rotor, a following error can occur.

Once the rotor has come to a standstill, open the centrifuge lid with the emergency release. Proceed as described in chapter 6.2.1. After opening the centrifuge lid, switch on the device again. Error 14 and the lettering "USEr GuidE" should be eliminated.

6.2.4 Procedure for error 90 and 91 only models FC5720R, FC5830R, FC5917RF and FC5917RF Short – Max life cycles of installed rotor is reached (soon)

Error 90 indicates that the maximum life cycles of the installed rotor will be reached soon, and the rotor should be replaced in time. This message occurs for the first time when 500 cycles of the affected rotor remain. In the display "**RPM | RCF"** (A-1), the message "**500 LEFt**" is shown **(see Figure 40).**

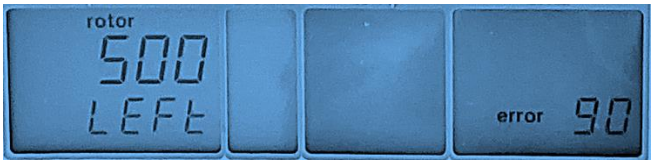


Figure 40

This error can be acknowledged using the key **"Stop"**(7b) and from now on it occurs every 50 cycle for the affected rotor. If the maximum permitted cycles of a rotor are reached, error 91 occurs. The rotor can´t be operated anymore and must be replaced. The **"Table 7: Table of the service life of rotors"** shows the max. life cycles of every rotor.

7 RECEIPT OF CENTRIFUGES TO REPAIR

ATTENTION!

Health risk from contaminated equipment, rotors, and accessories.

In case of returning the Centrifuge for repair, please take note of the following:

- The centrifuge **must** be decontaminated and cleaned before the shipment for the protection of persons, environment, and material.
- Decontamination certificate at goods return delivery (See APPENDIX). We reserve the right to not accept contaminated centrifuges.
- Further on all costs occurred for the cleaning and disinfection of the units will go to the debit of the customer’s account.

8 TRANSPORT and STORAGE

8.1 Transport

- Before transporting, take out the rotor.
- Only transport the unit in the original packaging.
- Install the transport protection material to secure the motor shaft, when transporting over longer distances.

	Air temperature	Rel. humidity	Air pressure
General transportation	-25 to 60 °C	10 to 75 %	30 to 106 kPa

8.2 Storage

During storage of the centrifuge the following environmental conditions must be observed:

	Air temperature	Rel. humidity	Air pressure
In transportation packaging	-25 to 60 °C	10 to 75 %	30 to 106 kPa

9 TECHNICAL DATA

9.1 Specifications

9.1.1 Centrifuge FC5714

Model	**FC5714, 230 V**	**FC5714, 120 V**
Speed Range	200 rpm -14000 rpm;10 rpm/set	
Maximum RCF	18624 x g;10 x g/set	
Maximum Capacity (Rotor)	4 x 200 ml	
Temperature range (N/A)	Air cool	
Running Time	10 sec to 99 hr 59 min 59 sec or continuous	
Noise level (depending on the rotor)	⩽ 63 ± 2 dB(A)	
Allowable density at maximum speed	1.2 g/ml	
Allowable kinetic energy	5595 Nm	
Mains power connection AC	230 V~ 50/60 Hz	120 V~ 50/60 Hz
Voltage fluctuation	± 10 %	± 10 %
Current consumption	1.3 A	2.4 A
Power consumption	240 W	300 W
Dimensions (W × D × H)	355 x 492 x 330 mm 14 x 19.4 x 13 in	
Net Weight (without rotor)	30 kg 66 lb	
Shipping Dimensions (W × D × H)	490 x 590 x 540 mm 19.3 x 23.2 x 21.6 in	
Shipping Weight	32.5 kg 72 lb	
Environment	For indoor use only	
Altitude	Use up to an altitude of 2000 m	
Ambient temperature	5°C up to 35 °C	
Max. relative humidity	Max. relative humidity 80 % for temperatures up to 31°C, decreasing linearly to 50 % relative humidity up to 35°C.	
Overvoltage category (IEC 60364-4-443)	II	
Degree of contamination	2	
Class of protection	I	
Not suitable for use in hazardous environments.		
EMC	EN/IEC 61326-1 Class B emissions, Basic immunity FCC Class B emissions	

9.1.2 Centrifuge FC5718

Model	FC5718, 230 V	FC5718, 120 V
Speed Range	200 rpm -18000 rpm;10 rpm/set	
Maximum RCF	23542 x g;10 x g/set	
Maximum Capacity (Rotor)	4 x 200 ml	
Temperature range (N/A)	Air cool	
Running Time	10 sec to 99 hr 59 min 59 sec or continuous	
Noise level (depending on the rotor)	⩽ 60 ± 2 dB(A)	
Allowable density at maximum speed	1.2 g/ml	
Allowable kinetic energy	16672 Nm	
Mains power connection AC	230 V~ 50/60 Hz	120 V~ 50/60 Hz
Voltage fluctuation	± 10 %	± 10 %
Current consumption	2.0 A	4.0 A
Power consumption	455 W	475 W
Dimensions (W × D × H)	400 x 498 x 352 mm 15.7 x 19.6 x 13.9 in	
Net Weight (without rotor)	43 kg 95 lb	
Shipping Dimensions (W × D × H)	490 x 590 x 540 mm 19.3 x 23.2 x 21.6 in	
Shipping Weight (without rotor)	53 kg 117 lb	
Environment	For indoor use only	
Altitude	Use up to an altitude of 2000 m	
Ambient temperature	5°C up to 35 °C	
Max. relative humidity	Max. relative humidity 80 % for temperatures up to 31°C, decreasing linearly to 50 % relative humidity up to 35°C.	
Overvoltage category (IEC 60364-4-443)	II	
Degree of contamination	2	
Class of protection	I	
Not suitable for use in hazardous environments.		
EMC	EN/IEC 61326-1 Class B emissions, Basic immunity FCC Class B emissions	

9.1.3 Centrifuge FC5718R

Model	FC5718R, 230 V	FC5718R, 120 V
Speed Range	200 rpm -18000 rpm;10 rpm/set	
Maximum RCF	23542 x g;10 x g/set	
Maximum Capacity (Rotor)	4 x 200 ml	
Temperature range	-20° to 40°C, 1°C/set	
Running Time	10 sec to 99 hr 59 min 59 sec or continuous	
Noise level (depending on the rotor)	⩽ 60 ± 2 dB(A)	
Allowable density at maximum speed	1.2 g/ml	
Allowable kinetic energy	25111 Nm	
Mains power connection AC	230 V~ 50/60 Hz	120 V~ 50/60 Hz
Voltage fluctuation	± 10 %	± 10 %
Current consumption	3.0 A	6.0 A
Power consumption	660 W	660 W
Dimensions (W × D × H)	400 x 730 x 360 mm 15.7 x 28.7 x 14.2 in	
Net Weight (without rotor)	60 kg 132 lb	
Shipping Dimensions (W × D × H)	640 x 820 x 470 mm 25.2 x 32.3 x 18.5 in	
Shipping Weight (without rotor)	77 kg 170 lb	
Environment	For indoor use only	
Altitude	Use up to an altitude of 2000 m	
Ambient temperature	5°C up to 35 °C	
Max. relative humidity	Max. relative humidity 80 % for temperatures up to 31°C, decreasing linearly to 50 % relative humidity up to 35°C.	
Overvoltage category (IEC 60364-4-443)	II	
Degree of contamination	2	
Class of protection	I	
Not suitable for use in hazardous environments.		
EMC	EN/IEC 61326-1 Class B emissions, Basic immunity FCC Class B emissions	

9.1.4 Centrifuge FC5816

Model	FC5816, 230 V	FC5816, 120 V
Speed Range	200 rpm -15000 rpm;10 rpm/set	
Maximum RCF	21379 x g;10 x g/set	
Maximum Capacity (Rotor)	6 x 250 ml	
Temperature range (N/A)	Air cool	
Running Time	10 sec to 99 hr 59 min 59 sec or continuous	
Noise level (depending on the rotor)	⩽ 61 ± 2 dB(A)	
Allowable density at maximum speed	1.2 g/ml	
Allowable kinetic energy	34363 Nm	
Mains power connection AC	230 V~ 50/60 Hz	120 V~ 50/60 Hz
Voltage fluctuation	± 10 %	± 10 %
Current consumption	2.4 A	4.2 A
Power consumption	530 W	520 W
Dimensions (W × D × H)	438 x 537 x 354 mm 17.2 x 21.1 x 13.9 in	
Net Weight (without rotor)	52 kg 115 lb	
Shipping Dimensions (W × D × H)	590 x 700 x 410 mm 23.2 x 27.6 x 16.1 in	
Shipping Weight (without rotor)	77 kg 170 lb	
Environment	For indoor use only	
Altitude	Use up to an altitude of 2000 m	
Ambient temperature	5°C up to 35 °C	
Max. relative humidity	Max. relative humidity 80 % for temperatures up to 31°C, decreasing linearly to 50 % relative humidity up to 35°C.	
Overvoltage category (IEC 60364-4-443)	II	
Degree of contamination	2	
Class of protection	I	
Not suitable for use in hazardous environments.		
EMC	EN/IEC 61326-1 Class B emissions, Basic immunity FCC Class B emissions	

9.1.5 Centrifuge FC5816R

Model	FC5816R, 230 V	FC5816R, 120 V
Speed Range	200 rpm -16000 rpm;10 rpm/set	
Maximum RCF	24325 x g;10 x g/set	
Maximum Capacity (Rotor)	6 x 250 ml	
Temperature range	-20° to 40°C, 1°C/set	
Running Time	10 sec to 99 hr 59 min 59 sec or continuous	
Noise level (depending on the rotor)	⩽ 63 ± 2 dB(A)	
Allowable density at maximum speed	1.2 g/ml	
Allowable kinetic energy	34363 Nm	
Mains power connection AC	230 V~ 50/60 Hz	120 V~ 50/60 Hz
Voltage fluctuation	± 10 %	± 10 %
Current consumption	3.7 A	7.8 A
Power consumption	785 W	850 W
Dimensions (W × D × H)	721 x 537 x 354 mm 28.4 x 21.1 x 13.9 in	
Net Weight (without rotor)	77 kg 170 lb	
Shipping Dimensions (W × D × H)	820 x 650 x 460 mm 32.3 x 25.6 x 18.1 in	
Shipping Weight (without rotor)	87 kg 192 lb	
Environment	For indoor use only	
Altitude	Use up to an altitude of 2000 m	
Ambient temperature	5°C up to 35 °C	
Max. relative humidity	Max. relative humidity 80 % for temperatures up to 31°C, decreasing linearly to 50 % relative humidity up to 35°C.	
Overvoltage category (IEC 60364-4-443)	II	
Degree of contamination	2	
Class of protection	I	
Not suitable for use in hazardous environments.		
EMC	EN/IEC 61326-1 Class B emissions, Basic immunity FCC Class B emissions	

9.1.6 Centrifuge FC5916

Model	FC5916, 230 V	FC5916, 120 V
Speed Range	200 rpm -16000 rpm;10 rpm/set	
Maximum RCF	24325 x g;10 x g/set	
Maximum Capacity (Rotor)	4 x 750 ml	
Temperature range (N/A)	Air cool	
Running Time	10 sec to 99 hr 59 min 59 sec or continuous	
Noise level (depending on the rotor)	⩽ 63 ± 2 dB(A)	
Allowable density at maximum speed	1.2 g/ml	
Allowable kinetic energy	60629 Nm	
Mains power connection AC	230 V~ 50/60 Hz	120 V~ 50/60 Hz
Voltage fluctuation	± 10 %	± 10 %
Current consumption	2.8 A	5.6 A
Power consumption	640 W	680 W
Dimensions (W × D × H)	544 x 651 x 371 mm 21.4 x 25.6 x 14.6 in	
Net Weight (without rotor)	85 kg 187 lb	
Shipping Dimensions (W × D × H)	780 x 670 x 590 mm 30.7 x 26.4 x 23.2 in	
Shipping Weight (without rotor)	98 kg 216 lb	
Environment	For indoor use only	
Altitude	Use up to an altitude of 2000 m	
Ambient temperature	5°C up to 35 °C	
Max. relative humidity	Max. relative humidity 80 % for temperatures up to 31°C, decreasing linearly to 50 % relative humidity up to 35°C.	
Overvoltage category (IEC 60364-4-443)	II	
Degree of contamination	2	
Class of protection	I	
Not suitable for use in hazardous environments.		
EMC	EN/IEC 61326-1 Class B emissions, Basic immunity FCC Class B emissions	

9.1.7 Centrifuge FC5916R

Model	FC5916R, 230 V	FC5916R, 120 V
Speed Range	200 rpm -16000 rpm;10 rpm/set	
Maximum RCF	26331 x g;10 x g/set	
Maximum Capacity (Rotor)	4 x 750 ml	
Temperature range	-20° to 40°C, 1°C/set	
Running Time	10 sec to 99 hr 59 min 59 sec or continuous	
Noise level (depending on the rotor)	⩽ 63 ± 2 dB(A)	
Allowable density at maximum speed	1.2 g/ml	
Allowable kinetic energy	54458 Nm	
Mains power connection AC	230 V~ 50/60 Hz	120 V~ 50/60 Hz
Voltage fluctuation	± 10 %	± 10 %
Current consumption	7.2 A	20 A
Power consumption	1630 W	1750 W
Dimensions (W × D × H)	728 x 667 x 370 mm 28.7 x 26.3 x 14.6 in	
Net Weight (without rotor)	118 kg 260 lb	
Shipping Dimensions (W × D × H)	900 x 750 x 560 mm 35.4 x 29.5 x 22.0 in	
Shipping Weight (without rotor)	137 kg 302 lb	
Environment	For indoor use only	
Altitude	Use up to an altitude of 2000 m	
Ambient temperature	5°C up to 35 °C	
Max. relative humidity	Max. relative humidity 80 % for temperatures up to 31°C, decreasing linearly to 50 % relative humidity up to 35°C.	
Overvoltage category (IEC 60364-4-443)	II	
Degree of contamination	2	
Class of protection	I	
Not suitable for use in hazardous environments.		
EMC	EN/IEC 61326-1 Class B emissions, Basic immunity FCC Class B emissions	

9.1.8 Centrifuge FC5720R

Model	FC5720R, 230 V	FC5720R, 120 V
Speed Range	200 rpm -20000 rpm;10 rpm/set	
Maximum RCF	38007 x g;10 x g/set	
Maximum Capacity (Rotor)	4 x 200 ml	
Temperature range	-20° to 40°C, 1°C/set	
Running Time	10 sec to 99 hr 59 min 59 sec or continuous	
Noise level (depending on the rotor)	⩽ 60 ± 2 dB(A)	
Allowable density at maximum speed	1.2 g/ml	
Allowable kinetic energy	24367 Nm	
Mains power connection AC	230 V~ 50/60 Hz	120 V~ 50/60 Hz
Voltage fluctuation	± 10 %	± 10 %
Current consumption	5.9 A	10.5 A
Power consumption	1200 W	1100 W
Dimensions (W × D × H)	407 x 712 x 361 mm 16.0 x 28.0 x 14.2 in	
Net Weight (without rotor)	61 kg 157 lb	
Shipping Dimensions (W × D × H)	640 x 820 x 470 mm 25.2 x 32.3 x 18.5 in	
Shipping Weight (without rotor)	83 kg 183 lb	
Environment	For indoor use only	
Altitude	Use up to an altitude of 2000 m	
Ambient temperature	5°C up to 35 °C	
Max. relative humidity	Max. relative humidity 80 % for temperatures up to 31°C, decreasing linearly to 50 % relative humidity up to 35°C.	
Overvoltage category (IEC 60364-4-443)	II	
Degree of contamination	2	
Class of protection	I	
Not suitable for use in hazardous environments.		
EMC	EN/IEC 61326-1 Class B emissions, Basic immunity FCC Class B emissions	

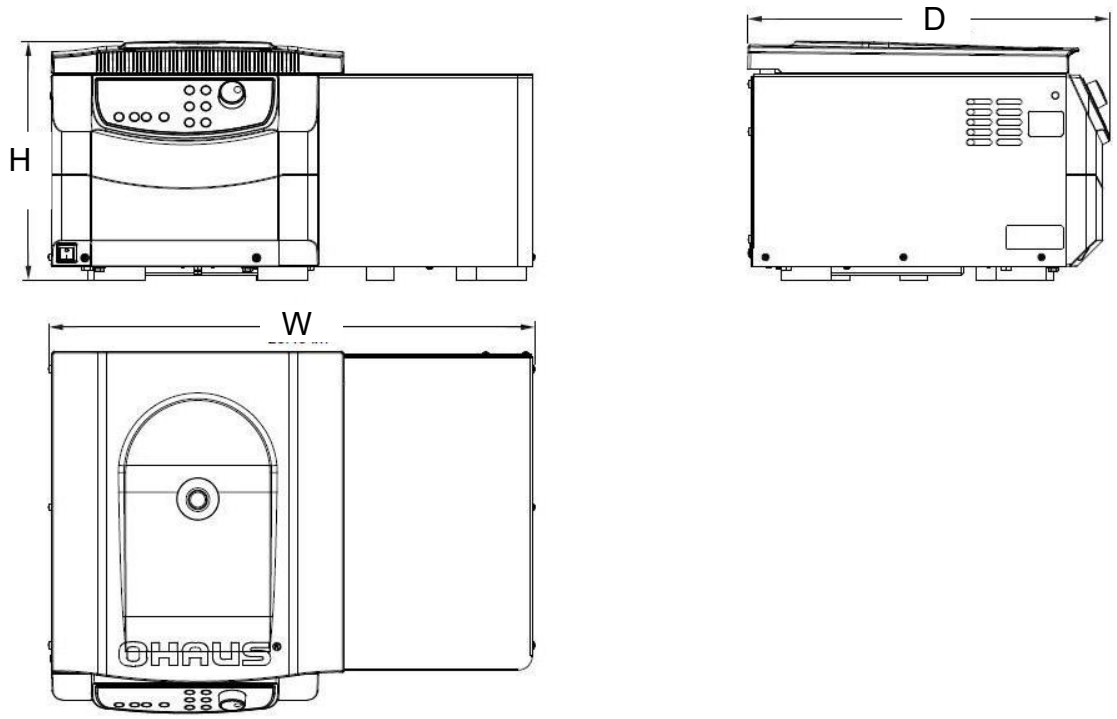
9.1.9 Centrifuge FC5830R

Model	FC5830R, 230 V	FC5830R, 120 V
Speed Range	200 rpm - 30000 rpm;10 rpm/set	
Maximum RCF	65395 x g;10 x g/set	
Maximum Capacity (Rotor)	6 x 250 ml	
Temperature range	-20° to 40°C, 1°C/set	
Running Time	10 sec to 99 hr 59 min 59 sec or continuous	
Noise level (depending on the rotor)	⩽ 60 ± 2 dB(A)	
Allowable density at maximum speed	1.2 g/ml	
Allowable kinetic energy	30241 Nm	
Mains power connection AC	230 V~ 50/60 Hz	120 V~ 50/60 Hz
Voltage fluctuation	± 10 %	± 10 %
Current consumption	7.2 A	15.8 A
Power consumption	1600 W	1800 W
Dimensions (W × D × H)	721 x 516 x 412 mm 28.4 x 20.3 x 16.2 in	
Net Weight (without rotor)	91 kg 201 lb	
Shipping Dimensions (W × D × H)	820 x 650 x 460 mm 32.3 x 25.6 x 18.1 in	
Shipping Weight (without rotor)	101 kg 223 lb	
Environment	For indoor use only	
Altitude	Use up to an altitude of 2000 m	
Ambient temperature	5°C up to 35 °C	
Max. relative humidity	Max. relative humidity 80 % for temperatures up to 31°C, decreasing linearly to 50 % relative humidity up to 35°C.	
Overvoltage category (IEC 60364-4-443)	II	
Degree of contamination	2	
Class of protection	I	
Not suitable for use in hazardous environments.		
EMC	EN/IEC 61326-1 Class B emissions, Basic immunity FCC Class B emissions	

9.1.10 Centrifuge FC5917RF

Model	FC5917RF, 230 V	FC5917RF Short, 230 V
Speed Range	200 rpm – 16010 rpm;10 rpm/set	
Maximum RCF	26361 x g;10 x g/set	
Maximum Capacity (Rotor)	6 x 1000 ml	
Temperature range	-20° to 40°C, 1°C/set	
Running Time	10 sec to 99 hr 59 min 59 sec or continuous	
Noise level (depending on the rotor)	⩽ 63 ± 2 dB(A)	
Allowable density at maximum speed	1.2 g/ml	
Allowable kinetic energy	70412 Nm	
Mains power connection AC	230 V~ 50/60 Hz	
Voltage fluctuation	± 10 %	
Current consumption	13 A	
Power consumption	2300 W	
Dimensions (W × D × H)	620 x 690 x 980 mm 24.4 x 27.2 x 38.6 in	620 x 690 x 700 mm 24.4 x 27.2 x 27.6 in
Net Weight (without rotor)	190 kg 419 lb	157 kg 346 lb
Shipping Dimensions (W × D × H)	930 x 780 x 1260 mm 36.6 x 30.7 x 49.6 in	930 x 780 x 930 mm 36.6 x 30.7 x 36.6 in
Shipping Weight (without rotor)	225 kg 496 lb	183 kg 403 lb
Environment	For indoor use only	
Altitude	Use up to an altitude of 2000 m	
Ambient temperature	5°C up to 35 °C	
Max. relative humidity	Max. relative humidity 80 % for temperatures up to 31°C, decreasing linearly to 50 % relative humidity up to 35°C.	
Overvoltage category (IEC 60364-4-443)	II	
Degree of contamination	2	
Class of protection	I	
Not suitable for use in hazardous environments.		
EMC	EN/IEC 61326-1 Class B emissions, Basic immunity FCC Class B emissions	

9.2 Drawings and dimension



Model	W (mm / in.)	D (mm / in.)	H (mm / in.)
FC5714	355 / 14.0	492 / 19.4	330 / 13.0
FC5718	400 / 15.7	498 / 19.6	352 / 13.9
FC5718R	400 / 15.7	730 / 28.7	360 / 14.2
FC5720R	407 / 16.0	712 / 28.0	361 / 14.2
FC5816	438 / 17.2	537 / 21.1	354 / 13.9
FC5816R	721 / 28.4	537 / 21.1	354 / 13.9
FC5830R	721 / 28.4	516 / 20.3	412 / 16.2
FC5916	544 / 21.4	651 / 25.6	371 / 14.6
FC5916R	728 / 28.7	667 / 26.3	370 / 14.6
FC5917RF	620 / 24.4	690 / 27.2	980 / 38.6
FC5917RF Short	620 / 24.4	690 / 27.2	700 x 27.6

10 COMPLIANCE

Compliance to the following standards is indicated by the corresponding mark on the product.

CE	The EU Declaration of Conformity is available online at www.ohaus.com/ce.

	**Disposal** In conformance with the European Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of in domestic waste. This also applies to countries outside the EU, per their specific requirements. Please dispose of this product in accordance with local regulations at thecollecting point specified for electrical and electronic equipment. If you have any questions, please contact the responsible authority or thedistributor from which you purchased this device. Should this device be passed on to other parties (for private or professional use),the content of this regulation must also be related. For disposal instructions in Europe, refer to www.ohaus.com/weee.Thank you for your contribution to environmental protection.

FCC Supplier Declaration of Conformity

Unintentional Radiator per 47CFR Part B

Trade Name: OHAUS CORPORATION
Model: FC5706P, FC5707

FCC Compliance Statement:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user'sauthority to operate the equipment.

11 APPENDIX

11.1 Table 1: Permissible net weight

Rotor ID	Order No.	Description	Permissible weight
10	83041010	Rotor Angle 12x5ml FA ID	12 x 9,5 g
11	83041011	Rotor Swing out 4x200ml ID	4 x 560 g
12	83041512	Rotor Swing out 4x1000ml ID	See below
18	30372718	Rotor Angle 44x1.5/2.0ml ID V1	44 x 3,4 g
20	30314820	Rotor Swing out 4x290ml ID	4 x 355 g
21	30314821	Rotor Angle 6x250ml FB ID	4 x 533 g
22	30314822	Rotor Swing out 4x145ml ID	4 x 340 g
23	30314823	Rotor Swing out 4x100ml ID	4 x 465 g
24	30314824	Rotor Swing out 2x3MTP w/ bucket ID	2 x 310 g
25	30314825	Rotor Angle 6x85ml RB ID Hi	6 x 140 g
26	30314826	Rotor Angle 6x85ml RB ID	6 x 140 g
27	30314827	Rotor Angle 4x85ml RB ID Hi	4 x 140 g
28	30314828	Rotor Swing out 4×250ml ID	4 x 557 g
29	30314829	Rotor Angle 10x50ml FA ID	10 x 76 g
30	30314830	Rotor Angle 6x50ml RB/FA ID	6 x 72 g
31	30314831	Rotor Angle 6x50ml RB ID Hi	6 x 94 g
32	30314832	Rotor Angle 30x15ml RB/FA ID	30 x 32 g
33	30314833	Rotor Angle 20x10ml RB ID Hi	20 x 18 g
34	30314834	Rotor Angle 12x15ml RB/FA ID	12 x 25 g
36	30314836	Rotor Angle 30x1.5/2.0ml ID	30 x 3,4 g
38	83041238	Rotor Angle 24x1.5/2.0ml ID BIOSEALS V1	24 x 3,4 g
39	30314839	Rotor Angle 12x1.5/2.0ml ID	12 x 3,4 g
41	30314841	Rotor Angle 4x8-Place PCR Stripes ID	4 x 3,5 g
61	30304361	Rotor Angle 24x1.5/2.0ml ID BIOSEALS	24 x 3,4 g
85	30553085	Rotor Swing out 4x750ml ID	4 x 995 g
86	30553086	Rotor Angle 4x500ml ID	4 x 708 g

Permissible weight for rotor 83041512 and buckets

WARNING: Please note that there is a need to adjust permissible weight depends on the rpm level.

Order No.	Description	Permissible weight	RPM level
83041513	Bucket 1x1000ml w/o Cap 2/pk	4 x 1390 g	3,700 rpm
		4 x 460 g	4,600 rpm
83041518	Bucket 1x500ml or 7xMTP w/o Lid 2/pk	4 x 1060 g	3,725 rpm
		4 x 500 g	4,200 rpm

11.2 Table 2: Max. speed and RCF-values for permissible rotors

Rotor ID	Order No.	Description	Used in model	Max Speed	Max RCF
10	83041010	Rotor Angle 12x5ml FA ID	FC5714	14,000 rpm	18,624 x g
			FC5718	14,000 rpm	18,624 x g
			FC5718R	15,000 rpm	21,379 x g
11	83041011	Rotor Swing out 4x200ml ID	FC5714	4,500 rpm	3,350 x g
			FC5718	5,000 rpm	4,136 x g
			FC5718R	5,000 rpm	4,136 x g
			FC5720R	5,000 rpm	4,136 x g
12	83041512	Rotor Swing out 4x1000ml ID	FC5917RF	4,600 rpm	5,204 x g
18	30372718	Rotor Angle 44x1.5/2.0ml ID V1	FC5718	15,000 rpm	21,379 x g
			FC5718R	15,000 rpm	21,379 x g
			FC5720R	15,000 rpm	21,379 x g
			FC5816	15,000 rpm	21,379 x g
			FC5816R	16,000 rpm	24,325 x g
			FC5916	16,000 rpm	24,325 x g
			FC5916R	16,000 rpm	24,325 x g
20	30314820	Rotor Swing out 4x290ml ID	FC5816	4,500 rpm	3,780 x g
			FC5816R	4,500 rpm	3,780 x g
			FC5830R	4,000 rpm	2,987 x g
21	30314821	Rotor Angle 6x250ml FB ID	FC5816	8,000 rpm	10,016 x g
			FC5816R	8,000 rpm	10,016 x g
			FC5830R	10,000 rpm	15,650 x g
			FC5916	8,000 rpm	10,016 x g
			FC5916R	8,000 rpm	10,016 x g
			FC5917RF	8,000 rpm	10,016 x g
22	30314822	Rotor Swing out 4x145ml ID	FC5714	4,500 rpm	3,350 x g
			FC5718	4,500 rpm	3,350 x g
			FC5718R	4,500 rpm	3,350 x g
			FC5720R	4,500 rpm	3,350 x g
23	30314823	Rotor Swing out 4x100ml ID	FC5714	4,000 rpm	2,611 x g
			FC5718	5,000 rpm	4,080 x g
			FC5718R	5,000 rpm	4,080 x g
24	30314824	Rotor Swing out 2x3MTP w/ bucket ID	FC5714	4,500 rpm	2,716 x g
			FC5718	4,500 rpm	2,716 x g
			FC5718R	4,500 rpm	2,716x g
			FC5720R	4,500 rpm	2,716 x g
			FC5816	4,500 rpm	2,716 x g
			FC5816R	4,500 rpm	2,716 x g
			FC5830R	4,500 rpm	2,716 x g
			FC5916	4,500 rpm	2,716 x g
			FC5916R	4,500 rpm	2,716 x g
25	30314825	Rotor Angle 6x85ml RB ID Hi	FC5718	11,000 rpm	13,932 x g
			FC5718R	13,500 rpm	20,984 x g
			FC5720R	13,500 rpm	20,984 x g

Rotor ID	Order No.	Description	Used in Model	Max Speed	Max RCF
26	30314826	Rotor Angle 6x85ml RB ID	FC5718	9,000 rpm	10,413 x g
			FC5718R	9,000 rpm	10,413 x g
			FC5720R	13,000 rpm	21,726 x g
			FC5816	11,000 rpm	15,555 x g
			FC5816R	13,000 rpm	21,726 x g
			FC5830R	13,000 rpm	21,726 x g
			FC5916	11,000 rpm	15,555 x g
			FC5916R	13,000 rpm	21,726 x g
27	30314827	Rotor Angle 4x85ml RB ID Hi	FC5718	12,000 rpm	14,809 x g
			FC5718R	12,000 rpm	14,809 x g
			FC5720R	15,000 rpm	23,140 x g
			FC5816	12,000 rpm	14,809 x g
			FC5816R	12,000 rpm	14,809 x g
			FC5830R	20,000 rpm	41,137 x g
			FC5916	15,000 rpm	23,140 x g
			FC5916R	16,000 rpm	26,328 x g
			FC5917RF	16,010 rpm	26,361 x g
28	30314828	Rotor Swing out 4×250ml ID	FC5816	4,500 rpm	3,735 x g
			FC5816R	4,500 rpm	3,735 x g
29	30314829	Rotor Angle 10x50ml FA ID	FC5718	7,500 rpm	8,174 x g
			FC5718R	7,500 rpm	8,174 x g
			FC5720R	9,000 rpm	11,771 x g
			FC5816	9,000 rpm	11,771 x g
			FC5816R	10,500 rpm	16,022 x g
			FC5830R	10,500 rpm	16,022 x g
			FC5916	10,000 rpm	14,532 x g
			FC5916R	10,500 rpm	16,022 x g
			FC5917RF	10,500 rpm	16,022 x g
30	30314830	Rotor Angle 6x50ml RB/FA ID	FC5714	6,000 rpm	4,427 x g
			FC5718	6,000 rpm	4,427 x g
			FC5718R	6,000 rpm	4,427 x g
			FC5720R	6,000 rpm	4,427 x g
31	30314831	Rotor Angle 6x50ml RB ID Hi	FC5718	12,000 rpm	13,522 x g
			FC5718R	12,000 rpm	13,522 x g
			FC5720R	16,000 rpm	24,039 x g
			FC5816	13,000 rpm	15,869 x g
			FC5816R	13,000 rpm	15,869 x g
			FC5830R	21,000 rpm	41,410 x g
			FC5916	13,000 rpm	15,869 x g
			FC5916R	13,000 rpm	15,869 x g
32	30314832	Rotor Angle 30x15ml RB/FA ID	FC5714	4,500 rpm	2,830 x g
			FC5718	4,500 rpm	2,830 x g
			FC5718R	4,500 rpm	2,830 x g
			FC5720R	4,500 rpm	2,830 x g
			FC5816	4,500 rpm	2,830 x g
			FC5816R	4,500 rpm	2,830 x g
			FC5830R	4,500 rpm	2,830 x g

Rotor ID	Order No.	Description	Model	Max Speed	Max RCF
33	30314833	Rotor Angle 20x10ml RB ID Hi	FC5718	12,000 rpm	15,775 x g
			FC5718R	12,000 rpm	15,775 x g
			FC5720R	14,000 rpm	21,472 x g
			FC5816	12,000 rpm	15,775 x g
			FC5816R	12,000 rpm	15,775 x g
			FC5830R	16,000 rpm	28,045 x g
			FC5916	12,000 rpm	15,775 x g
			FC5916R	12,000 rpm	15,775 x g
34	30314834	Rotor Angle 12x15ml RB/FA ID	FC5714	6,000 rpm	4,427 x g
			FC5718	6,000 rpm	4,427 x g
			FC5718R	6,000 rpm	4,427 x g
			FC5720R	6,000 rpm	4,427 x g
36	30314836	Rotor Angle 30x1.5/2.0ml ID	FC5714	12,000 rpm	15,131 x g
			FC5718	13,000 rpm	17,758 x g
			FC5718R	14,000 rpm	20,595 x g
			FC5720R	17,000 rpm	30,368 x g
			FC5830R	20,000 rpm	42,032 x g
			FC5916	15,000 rpm	23,643 x g
			FC5916R	15,000 rpm	23,643 x g
38	83041238	Rotor Angle 24x1.5/2.0ml ID BIOSEALS V1	FC5714	14,000 rpm	18,624 x g
			FC5718	15,000 rpm	21,379 x g
			FC5718R	15,000 rpm	21,379 x g
			FC5720R	16,000 rpm	24,325 x g
			FC5816	15,000 rpm	21,379 x g
			FC5816R	16,000 rpm	24,325 x g
			FC5916	16,000 rpm	24,325 x g
			FC5916R	16,000 rpm	24,325 x g
39	30314839	Rotor Angle 12x1.5/2.0ml ID	FC5718	18,000 rpm	23,643 x g
			FC5718R	18,000 rpm	23,643 x g
			FC5830R	30,000 rpm	65,395 x g
41	30314841	Rotor Angle 4x8-Place PCR Stripes ID	FC5718	15,000 rpm	15,343 x g
			FC5718R	15,000 rpm	15,343 x g
			FC5720R	15,000 rpm	15,343 x g
			FC5916	15,000 rpm	15,343 x g
			FC5916R	15,000 rpm	15,343 x g
61	30304361	Rotor Angle 24x1.5/2.0ml ID BIOSEALS	FC5720R	20,000 rpm	38,007 x g
85	30553085	Rotor Swing out 4x750ml ID	FC5916	4,000 rpm	3,452 x g
			FC5916R	4,500 rpm	4,369 x g
			FC5917RF	4,500 rpm	4,369 x g
86	30553086	Rotor Angle 4x500ml ID	FC5916	8,000 rpm	10,374 x g
			FC5916R	8,000 rpm	10,374 x g
			FC5917RF	8,000 rpm	10,374 x g

11.3 Table 3: Acceleration and deceleration times

			Acceleration* Time in sec		Deceleration Time * Time in sec, L Curve		Deceleration Time * Time in sec, A Curve	
ID	**Order No.**	**Model**	**level 0**	**level 9**	**level 0**	**level 9**	**level 0**	**level 9**
10	83041010	FC5714	238	27	206	22	-	-
		FC5718	206	24	436	20	-	-
		FC5718R	220	26	420	21	-	-
11	83041011	FC5714	97	17	256	14	-	-
		FC5718	104	23	322	13	-	-
		FC5718R	102	21	387	12	-	-
		FC5720R	104	15	373	12	-	-
12	83041512 with 83041513 Bucket	FC5917RF	328	84	1067	50	1225	242
	83041512 with 83041518 Bucket	FC5917RF	302	84	1178	53	1180	243
18	30372718	FC5718	256	33	446	21	-	-
		FC5718R	256	31	441	21	-	-
		FC5720R	222	25	447	23	-	-
		FC5816	256	28	328	24	-	-
		FC5816R	275	33	536	26	-	-
		FC5916	236	25	324	25	-	-
		FC5916R	235	25	500	25	-	-
20	30314820	FC5816	309	34	458	36	-	-
		FC5816R	309	34	458	36	-	-
		FC5830R	160	18	383	22	-	-
21	30314821	FC5816	664	130	2906	92	-	-
		FC5816R	664	130	2906	83	-	-
		FC5830R	709	148	2010	132	-	-
		FC5916	573	66	1903	84	-	-
		FC5916R	573	66	1903	84	-	-
		FC5917RF	407	53	1667	82	1464	280
22	30314822	FC5714	110	13	158	18	-	-
		FC5718	91	14	243	13	-	-
		FC5718R	93	12	226	12	-	-
		FC5720R	93	12	328	11	-	-
23	30314823	FC5714	110	14	170	17	-	-
		FC5718	100	15	150	15	-	-
		FC5718R	155	22	518	16	-	-
24	30314824	FC5714	220	24	339	24	-	-
		FC5718	150	23	473	17	-	-
		FC5718R	155	22	518	16	-	-
		FC5720R	158	18	644	18	-	-
		FC5816	452	43	616	38	-	-
		FC5816R	432	43	616	38	-	-
		FC5830R	180	20	530	23	-	-
		FC5916	249	27	488	23	-	-
		FC5916R	249	27	488	23	-	-
25	30314825	FC5718	399	65	988	38	-	-
		FC5718R	495	98	1.068	47	-	-

		FC5720R	495	61	1407	46	-	-
		FC5916	463	48	1654	46	-	-
		FC5916R	549	69	1307	67	-	-
26	30314826	FC5718	417	61	1.446	35	-	-
		FC5718R	412	62	1.310	34	-	-
		FC5720R	515	62	1869	51	-	-
		FC5816	697	85	2313	70	-	-
		FC5816R	825	118	1630	76	-	-
		FC5830R	500	60	1374	67	-	-
		FC5916	463	48	1654	46	-	-
		FC5916R	549	69	1307	67	-	-
27	30314827	FC5718	307	69	1.131	35	-	-
		FC5718R	307	68	1.102	34	-	-
		FC5720R	511	58	1460	51	-	-
		FC5816	506	60	1745	49	-	-
		FC5816R	506	60	1745	44	-	-
		FC5830R	508	115	1046	124	-	-
		FC5916	448	50	1251	45	-	-
		FC5916R	448	50	1251	45	-	-
		FC5917RF	480	61	1220	47	865	234
28	30314828	FC5816	34	311	36	387	-	-
		FC5816R	307	34	487	35	-	-
29	30314829	FC5718	381	72	1.435	36	-	-
		FC5718R	374	59	1.698	35	-	-
		FC5720R	458	65	2006	68	-	-
		FC5816	753	115	2395	72	-	-
		FC5816R	753	115	2395	65	-	-
		FC5830R	740	86	1801	107	-	-
		FC5916	480	60	1747	68	-	-
		FC5916R	480	60	1747	68	-	-
		FC5917RF	441	53	1411	71	1426	267
30	30314830	FC5714	102	14	304	11	-	-
		FC5718	110	17	416	11	-	-
		FC5718R	102	15	486	11	-	-
		FC5720R	119	13	522	17	-	-
31	30314831	FC5718	358	44	772	26	-	-
		FC5718R	358	44	772	26	-	-
		FC5720R	412	50	1087	37	-	-
		FC5816	446	48	1323	49	-	-
		FC5816R	446	48	1323	42	-	-
		FC5830R	760	85	870	78	-	-
		FC5916	264	28	921	32	-	-
		FC5916R	264	28	921	32	-	-
32	30314832	FC5714	155	18	369	18	-	-
		FC5718	113	17	572	9	-	-
		FC5718R	114	17	632	11	-	-
		FC5720R	115	15	777	15	-	-
		FC5816	149	25	985	20	-	-
		FC5816R	149	25	985	19	-	-

11.4 Table 4: Lowest temperature at max. speed in refrigerated models

Rotor ID	Order No.	Description	Used in model	Max Speed	N-max
10	83041010	Rotor Angle 12x5ml FA ID	FC5718R	15,000 rpm	2°C
11	83041011	Rotor Swing out 4x200ml ID	FC5718R	5,000 rpm	6°C
			FC5720R	5,000 rpm	-8°C
12	83041512	Rotor Swing out 4x1000ml ID	FC5917RF	4,5000 rpm	7°C
18	30372718	Rotor Angle 44x1.5/2.0ml ID V1	FC5718R	15,000 rpm	3°C
			FC5720R	15,000 rpm	-6°C
			FC5816R	16,000 rpm	4°C
			FC5916R	16,000 rpm	-3°C
20	30314820	Rotor Swing out 4x290ml ID	FC5816R	4,500 rpm	1°C
			FC5830R	4,000 rpm	-20°C
21	30314821	Rotor Angle 6x250ml FB ID	FC5816R	8,000 rpm	6°C
			FC5830R	10,000 rpm	1°C
			FC5916R	8,000 rpm	-5°C
			FC5917RF	8,000 rpm	-3°C
22	30314822	Rotor Swing out 4x145ml ID	FC5718R	4,500 rpm	-2°C
			FC5720R	4,500 rpm	-13°C
23	30314823	Rotor Swing out 4x100ml ID	FC5718R	5,000 rpm	2°C
24	30314824	Rotor Swing out 2x3MTP w/ bucket ID	FC5718R	4,500 rpm	-5°C
			FC5720R	4,500 rpm	-14°C
			FC5816R	4,500 rpm	-3°C
			FC5830R	4,500 rpm	-15°C
			FC5916R	4,500 rpm	-15°C
25	30314825	Rotor Angle 6x85ml RB ID Hi	FC5718R	13,500 rpm	15°C
			FC5720R	13,500 rpm	4°C
26	30314826	Rotor Angle 6x85ml RB ID	FC5718R	9,000 rpm	1°C
			FC5720R	13,000 rpm	5°C
			FC5816R	13,000 rpm	15°C
			FC5830R	13,000 rpm	-10°C
			FC5916R	13,000 rpm	2°C
27	30314827	Rotor Angle 4x85ml RB ID Hi	FC5718R	12,000 rpm	3°C
			FC5720R	15,000 rpm	1°C
			FC5816R	12,000 rpm	5°C
			FC5830R	20,000 rpm	18°C
			FC5916R	16,000 rpm	4°C
			FC5917RF	16,010 rpm	-2°C
28	30314828	Rotor Swing out 4×250ml ID	FC5816R	4,500 rpm	2°C
29	30314829	Rotor Angle 10x50ml FA ID	FC5718R	7,500 rpm	0°C
			FC5720R	9,000 rpm	-6°C
			FC5816R	10,500 rpm	9°C
			FC5830R	10,500 rpm	-4°C
			FC5916R	10,500 rpm	0°C
			FC5917RF	10,500 rpm	1°C
30	30314830	Rotor Angle 6x50ml RB/FA ID	FC5718R	6,000 rpm	-6°C
			FC5720R	6,000 rpm	-18°C
			FC5816R	13,000 rpm	0°C
			FC5830R	21,000 rpm	10°C

11.5 Table 5: Error messages

Error-No.	Description
1	Imbalance arose
2	Imbalance sensor is defective
4	Imbalance switch has been activated for longer than 5 seconds
8	Transponder in the rotor is defective
11	Temperature sensor is defective
12	Chamber over temperature
14	Leap of speed is too big between two mesaurements
CLOSE lid	
33	Open lid while motor is running
34	Lid contact defective
38	Lid motor is blocked
40	Communication with frequency converter distrubed during start
41	Communication with frequency converter distrubed during stop
42	Short circuit in the frequency converter
43	Undervoltage frequency converter
44	Overvoltage frequency converter
45	Over temperature frequency converter
46	Over temperature motor
47	Over current frequency converter
48	Timeout between control unit and frequency converter
49	Other error frequency converter
55	Overspeed
70	Timeout between controler and RS232 interface
90	Max. life cycles of the installed rotor will soon be reached. Error appears for the first time when 500 cycles remain.
91	Max. life cycles of the installed rotor reached.
99	Rotor is not allowed in this centrifuge
FALSE	Inserted rotor does not exist in the programm
rotor no	Rotor is not detected

11.6 Table 6: Radius correction and adapter specifications

Rotor Order No.	Description	Adapter Order No.	Radius (cm)	Correction (cm)
83041010	Rotor Angle 12x5ml FA ID	None	8.5	0.0
		30130886	7.0	1.5
		30130887	7.3	1.2
		30130888	7.5	1.0
83041011	Rotor Swing out 4x200ml ID	83041012	14.8	0.0
		83041013	14.8	0.0
		83041005	-	-
		83041015	-	-
		83041016	14.8	0.0
		83041017	14.6	0.2
		83041018	14.6	0.2
		83041019	14.6	0.2
		83041020	14.6	0.2
		83041021	14.7	0.1
		83041022	14.6	0.2
		83041023	14.6	0.2
		83041024	14.6	0.2
		83041025	14.7	0.1
		83041026	14.8	0.0
		83041027	14.6	0.2
		83041028	14.6	0.2
		83041029	14.7	0.1
		83041030	14.7	0.1
		83041031	14.8	0.0
83041512	Rotor Swing out 4x1000ml ID	83041513	22.0	0.0
		30553122	-	-
		30553123	-	-
		30553125	21.5	0.5
		83041515	21.6	0.4
		30553126	21.8	0.2
		30553127	21.5	0.5
		30553131	21.9	0.1
		30553128	21.9	0.1
		30553129	21.9	0.1
		30553132	21.9	0.1
		30553135	21.9	0.1
		83041516	21.9	0.1
		30553136	21.1	0.9
		83041517	21.8	0.2
		30553140	21.7	0.3
		30553139	21.7	0.3
		30559377	21.6	0.4
		83041040	21.8	0.2
		83041518	20.1	1.9

Rotor Order No.	Description	Adapter Order No.	Radius (cm)	Correction (cm)
83041512	Rotor Swing out 4x1000ml ID	83041513	22.0	0.0
		83041519	-	-
		83041482	19.6	0.5*
		30553124	19.6	0.5*
		83041483	19.7	0.4*
		83041484	19.6	0.5*
		83041485	19.6	0.5*
		83041486	20.0	0.1*
		83041487	20.0	0.1*
		83041488	20.0	0.1*
		83041489	20.0	0.1*
		83041490	20.0	0.1*
		83041491	20.0	0.1*
30372718	Rotor Angle 44 x 1.5/2.0 ml ID V1	None	8.5	0.0
		30130885	8.3	0.2
		30130884	7.7	0.8
30314820	Rotor Swing out 4x290 ml ID	None	-	-
		30314901	-	-
		30314902	-	-
		83041037	16.7	0.0
		30314903	15.9	0.8
		30314904	16.1	0.6
		30314907	16.1	0.6
		30314905	16.3	0.4
		30314906	16.4	0.3
		30314908	16.3	0.4
		30314909	16.1	0.6
		30314910	16.1	0.6
		30314911	15.5	1.2
		83041032		
		30314912	16.3	0.4
		30314913	16.3	0.4
		30314914	16.1	0.6
		30314915	16.3	0.4
		30304367	16.3	0.4
		30314916	15.9	0.8
		30314917	15.9	0.8
		30304368	15.7	1.0

*This correction refers to rectangular bucket 83041518

Example:

22 cm – 1.9 cm – 0.5 cm = 19.6 cm

2.4 cm

Rotor Order No.	Description	Adapter Order No.	Radius (cm)	Correction (cm)
30314821	Rotor Angle 6x250 ml FB ID	None	14.1	0.0
		30559414	12.8	2.3
		30304373	12.0	2.1
		30304374	11.7	2.4
		30304372	12.5	1.6
		83041032		
		30304371	13.0	1.1
		30304370	13.3	0.8
		30304369	13.2	0.9
		30559412		
30314822	Rotor Swing out 4 x 145 ml ID	None	14.8	0.0
		83041035	13.9	0.9
		30314842	13.8	1.0
		30314843	14.0	0.8
		30314844	14.1	0.7
		30314845	14.1	0.7
		30314846	14.5	0.3
		30314847	14.2	0.6
		30314848	13.7	1.1
		30314849	14.3	0.5
		30314852	14.4	0.4
		30314850	14.8	0.0
		30314851	14.4	0.4
		30314858	14.3	0.5
		30314853	13.5	1.3
		30314856	11.5	3.3
		30314857	14.1	0.7
		30314855	13.9	0.9
		30314854	9.3	5.5
30314823	Rotor Swing out 4 x 100 ml ID	None	14.6	0.0
		30314860	14.2	0.4
		30314861	14.2	0.4
		30314862	-	-
		30314863	-	-
		30314864	13.7	0.9
		30314865	14.0	0.6
		30314866	14.0	0.6
		30314867	14.0	0.6
		30314868	14.2	0.4
		30314881	14.6	0.0
		30314869	13.9	0.7
		30314870	13.1	1.5
		83041032		
		30314871	14.0	0.6
		30314872	14.1	0.5
		30314873	14.1	0.5
		30314874	14.0	0.6
		30314875	14.0	0.6

Rotor Order No.	**Description**	Adapter Order No.	Radius (cm)	Correction (cm)
30314823	Rotor Swing out 4 x 100 ml ID	30314882	14.6	0.0
		30314878	14.0	0.6
		30314880	14.0	0.6
		30314876	14.0	0.6
		30314879	14.0	0.6
		30314877	14.0	0.6
30314824	Rotor Swing out 2 x 3 MTP w/ bucket ID	None	12.0	0.0
		30314890	-	-
		30314891	12.0	0.0
30314825	Rotor Angle 6 x 85 ml RB ID Hi	None	10.3	0.0
		30314895	10.0	0.3
		30314896	9.8	0.5
		83041033	9.6	0.7
		30314894	9.6	0.7
		83041032		
		30314899	9.5	0.8
		30314897	9.3	1.0
		30314898	10.3	0.0
		83041034	9.4	0.9
		30314893	9.6	0.7
30314826	Rotor Angle 6 x 85 ml RB ID	None	11.5	0.0
		30314895	10.9	0.6
		30314896	10.6	0.9
		30314894	10.4	1.1
		83041032	10.6	0.9
		30314899	10.4	1.1
		30314897	10.4	1.1
		30314898	11.1	0.4
		30314893	10.4	1.1
30314827	Rotor Angle 4 x 85 ml RB ID Hi	None	9.2	0.0
		30314895	8.9	0.3
		30314896	8.6	0.6
		30314894	8.4	0.8
		30314899	8.3	0.9
		30314897	8.3	0.9
		30314898	7.5	1.7
		30314893	8.5	0.7
30314828	Rotor Swing out 4×250ml ID	None	16.5	0.0
		83041039	15.6	0.9
		30304375	16.5	0.0
		83041032		
		30314583	16.5	0.0
		30314585	15.6	0.9
		30314584	15.9	0.9
		83041038	15.8	0.7

Rotor Order No.	Description	Adapter Order No.	Radius (cm)	Correction (cm)
30314829	Rotor Angle 10 x 50 ml FA ID	None	13.0	0.0
		83041032		
		30472300	12.7	0.3
		30472307	12.8	0.2
		30130889	12.2	0.8
		30130890	10.4	2.6
		30130886	8.9	4.1
30314830	Rotor Angle 6 x 50 ml RB/FA ID	None	11.0	0.0
		30130891	10.7	0.3
		83041032		
		30130892	10.3	0.7
		30130893	10.6	0.4
		30130894	10.6	0.4
		30130889	10.2	0.8
		30130890	8.3	2.7
		30130886	6.7	4.3
30314831	Rotor Angle 6 x 50 ml RB ID Hi	None	8.4	0.0
		30130891	8.2	0.2
		30130892	7.9	0.5
		30314892	7.7	0.7
		30130893	8.0	0.4
30314832	Rotor Angle 30 x 15 ml RB/FA ID	None	12.5	0.0
		30130889	12.2	0.3
		30130890	10.5	2.0
		30130886	9.0	3.5
30314834	Rotor Angle 12 x 15 ml RB/FA ID	None	11.0	0.0
		30130889	10.6	0.4
		30130890	9.1	1.9
		30130886	7.7	3.4
30314836	Rotor Angle 30 x 1.5/2.0 ml ID	None	9.4	0.0
		30130885	8.4	1.0
		30130884	9.1	0.3
83041238	Rotor Angle 24x1.5/2.0ml ID BIOSEALS V1	None	8.5	0.0
		30130885	8.3	0.2
		30130884	7.7	0.8
30314839	Rotor Angle 12 x 1.5/2.0 ml ID	None	6.5	0.0
		30314900	6.4	0.1
		30130885	5.6	0.9
		30130884	6.3	0.2
30642361	Rotor Angle 24 x 1.5/2.0 ml ID BIOSEALS	None	8.5	0.0
		30130885	8.3	0.2
		30130884	7.7	0.8

Rotor Order No.	Description	Adapter Order No.	Radius (cm)	Correction (cm)
30553085	Rotor Swing out 4 x 750 ml ID	None		
		30553104	-	-
		30553105	-	-
		30553117	-	-
		30553118	-	-
		30553119	-	-
		30602502	19.3	0.0
		30553122	-	-
		30553123	-	-
		30553124	18.8	0.5
		30553125	18.9	0.4
		30772866	19.3	0.0
		30553126	19.1	0.2
		30553127	19.1	0.2
		30553128	19.1	0.2
		30553129		
		30553130	19.1	0.2
		30553131	19.1	0.2
		30553132	19.1	0.2
		83041032		
		30553133	19.2	0.1
		30553134	19.0	0.3
		30553135	18.8	0.5
		30553136	18.9	0.4
		30553138	18.7	0.6
		30553139	18.8	0.5
		30553140	19.0	0.3
		30559377	18.9	0.4
		83041040	18.8	0.5
30553086	Rotor Angle 4 x 500 ml ID	None	14.5	0.0
		30559416	12.6	1.9
		30564850	13.7	0.8
		30559417	13.4	1.1
		30559419	12.4	2.1
		30559420	14.3	0.2
		30559421	14.3	0.2
		30559422	13.8	0.7

11.7 Table 7: Table of the service life of the rotors

FC5720R

Rotor ID	Order No.	Description	Cycles	Service life
11	83041011	Rotor Swing out 4x200ml ID	25,000	7 years
18	30372718	Rotor Angle 44x1.5/2.0ml ID V1	60,000	7 years
22	30314822	Rotor Swing out 4x145ml ID	25,000	7 years
24	30314824	Rotor Swing out 2x3MTP w/ bucket ID	25,000	7 years
25	30314825	Rotor Angle 6x85ml RB ID Hi	60,000	7 years
26	30314826	Rotor Angle 6x85ml RB ID	60,000	7 years
27	30314827	Rotor Angle 4x85ml RB ID Hi	30,000	7 years
29	30314829	Rotor Angle 10x50ml FA ID	30,000	7 years
30	30314830	Rotor Angle 6x50ml RB/FA ID	25,000	3 years
31	30314831	Rotor Angle 6x50ml RB ID Hi	30,000	7 years
32	30314832	Rotor Angle 30x15ml RB/FA ID	25,000	3 years
33	30314833	Rotor Angle 20x10ml RB ID Hi	60,000	7 years
34	30314834	Rotor Angle 12x15ml RB/FA ID	25,000	3 years
36	30314836	Rotor Angle 30x1.5/2.0ml ID	60,000	7 years
38	83041238	Rotor Angle 24x1.5/2.0ml ID BIOSEALS V1	60,000	7 years
41	30314841	Rotor Angle 4x8-Place PCR Stripes ID	25,000	3 years
61	30304361	Rotor Angle 24x1.5/2.0ml ID BIOSEALS	60,000	7 years

FC5830R

Rotor No. display	Order No.	Description	Cycles	Service life
20	30314820	Rotor Swing out 4x290ml ID	15,000	7 years
21	30314821	Rotor Angle 6x250ml FB ID	30,000	7 years
24	30314824	Rotor Swing out 2x3MTP w/ bucket ID	25,000	7 years
26	30314826	Rotor Angle 6x85ml RB ID	60,000	7 years
27	30314827	Rotor Angle 4x85ml RB ID Hi	30,000	7 years
29	30314829	Rotor Angle 10x50ml FA ID	30,000	7 years
31	30314831	Rotor Angle 6x50ml RB ID Hi	30,000	7 years
32	30314832	Rotor Angle 30x15ml RB/FA ID	25,000	3 years
33	30314833	Rotor Angle 20x10ml RB ID Hi	60,000	7 years
36	30314836	Rotor Angle 30x1.5/2.0ml ID	60,000	7 years
39	30314839	Rotor Angle 12x1.5/2.0ml ID	60,000	7 years

FC5917RF

Rotor No. display	Order No.	Description	Cycles	Service life
12	83041512	Rotor Swing out 4x1000ml ID	25,000	7 years
N/A	83041513	Bucket 1x1000ml w/o Cap 2/pk	32,000 / 3,700 rpm 25,000 / 4,600 rpm	7 years
		Bucket 1 x 500 ml or 7xMTP w/o Lid 2/pk	20,000	7 years
21	30314821	Rotor Angle 6x250ml FB ID	30,000	7 years
27	30314827	Rotor Angle 4x85ml RB ID Hi	30,000	7 years
29	30314829	Rotor Angle 10x50ml FA ID	30,000	7 years
85	30553085	Rotor Swing out 4x750ml ID	25,000	7 years
86	30553086	Rotor Angle 4x500ml ID	30,000	7 years

11.8 Redemption form / Decontamination certificate

Enclose this form with all returns of equipment and assemblies!

The completed declaration about the decontamination is a prerequisite for the assumption and further processing of the return. If no corresponding explanation is enclosed, we carry out decontamination with costs at your expense.

Surname:

First name:

Organization / company:

Street:

Zip code:

Telephone:

fax:

E-Mail:

Please fill out in block capitals!

Pos.	Crowd	Decontaminated object	Serial number	Description /Comment
1				
2				
3				
4				

Are the parts listed above in contact with the following substances?

1. Health endangering watery solutions, buffers, acids, alkalis ☐ Yes ☐ No
2. Potentially infectious agents ☐ Yes ☐ No
3. Organic reagents and solvent ☐ Yes ☐ No
4. Radioactive substances ☐ α ☐ β ☐ γ ☐ Yes ☐ No
5. Health endangering proteins ☐ Yes ☐ No
6. DNA ☐ Yes ☐ No
7. These substances have reached the equipment/assembly? ☐ Yes ☐ No
   Which one, if yes:

Description of the measures for the decontamination of the listed parts:

I confirm the proper decontamination:

Company/Department:

Place and Date:

Signature of responsible person: