

# LMC-3000, LMC-4200R Laboratory centrifuges



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## 1. About this edition of user instructions

1.1 The current edition of the user instructions applies to the following models:

<b>Model and name</b>	<b>Version</b>
<b>LMC-3000</b> , laboratory centrifuge	V.6AD, V.6AE
<b>LMC-4200R</b> , laboratory refrigerated centrifuge	V.6AD

1.2 Edition 6.03 – January of 2024.

## 2. Safety precautions

### 2.1 Symbols used in these instructions.



**Caution!** Make sure you have fully read and understood the present instructions before using the equipment. Please pay special attention to sections marked by this symbol.

### 2.2 Icons used on the unit and packaging

	CE marking, manufacturer affirms conformity with European health, safety, and environmental protection standards, see <b>11.1</b>
	WEEE directive marking, see <b>11.1</b>
	Set correct rotor before centrifugation, see <b>5.5.3</b>

### 2.3 General safety

- Use the device and accessories only for the purposes specified by the manufacturer in these instructions. Otherwise, the protection provided by the device may be impaired.
- Only use accessories (rotors, adapters, etc.) that are recommended or supplied by the manufacturer. Otherwise, the protection provided by the device may be impaired.
- Protect the device from shocks and falls.
- Do not use the device with visible mechanical damage.
- Store and transport the unit as described in section **Storage and transportation**.
- Use only original accessories (rotors, adapters, etc.) provided by the manufacturer and ordered specifically for this model.
- Before using any cleaning or decontamination methods except those recommended by the manufacturer, check with the manufacturer that the proposed method will not damage the equipment.
- Do not make modifications to the design of the unit.
- The compressor system of the **LMC-4200R** uses propane (R-290) as a refrigerant gas. Propane has low global warming potential as a greenhouse gas and is environmentally friendly. See section **Specifications**.

### 2.4 Electrical safety

- Connect only to electric circuit with voltage listed on the serial number label.
- Ensure that the switch and plug are easily accessible during use.
- Do not plug the unit into an ungrounded mains socket, and do not use an ungrounded extension lead.
- Disconnect the unit from electric circuit before moving. Switch the unit off and disconnect the power cord plug from mains socket to disconnect the unit from electric circuit.
- It is the user's responsibility to carry out appropriate decontamination if hazardous material is spilt on or penetrates into the equipment. If liquid penetrates into the unit, disconnect it from electric circuit and have it checked by a repair and maintenance technician.
- Do not operate the unit in premises where condensation can form. Operating conditions of the unit are defined in section **Specifications**.

## 2.5 During operation

- Do not centrifuge flammable or chemically active substances. If such liquids are spilled on the rotor or rotor chamber, the centrifuge must be cleaned with a moist cloth and a mild soap solution.
- According to EN 61010-2-20, people and hazardous materials must not be within a 300 mm area around the device during the centrifuge operation.
- Do not use rotors, adapters and accessories with visible signs of corrosion, wear or mechanical damage.
- Do not use the rotor without fixation screw (see figure 1 below). Fixation procedure is described in 4.4.



Figure 1. Rotor label sample

- Do not fill in the tubes after they have been inserted in the rotor.
  - Do not use tubes unsuitable for centrifugation.
  - Excessive g-force may cause vessels within the rotor chamber to fracture, risking damage to the rotor, accessories, and samples. Adhere to the vessel manufacturer's specifications for optimal centrifugation parameters, including load and speed.
  - Use rotors and adapters designed for dimensions of vessels used, see 7.2.1.
  - Use the correct type of rotor. Some rotors have limited maximum speed. Limits and selection processes are described in 5.5.3.
  - Do not leave the operating unit unattended.
  - Do not operate the unit in environments with aggressive or explosive chemical mixtures. Please contact manufacturer for possible operation of the unit in specific atmospheres.
  - Do not operate the unit if it is faulty or has been installed incorrectly.
  - Do not use outside laboratory rooms.
- ## 2.6 Biological safety
- According to EN 61010-2-20, a centrifuge without a lid gasket is not considered a biologically safe system and therefore cannot be used for centrifuging hazardous materials contaminated with toxic, radioactive or pathogenic microorganisms.
  - It is the user's responsibility to carry out appropriate decontamination if hazardous material is spilt on or penetrates into the equipment.

### 3. General information

LMC-3000 and LMC-4200R are modern desktop laboratory centrifuges designed for convenient sedimentation, centrifugation and collection of necessary samples. They provide operation with tubes, blood collection systems, gel cards, microtest and ELISA plates.

Our centrifuges are designed for safe work (metal protecting housing), easy maintenance and wide application range in medical, biochemical, chemical, industrial and other type of laboratories.

LMC-4200R Refrigerated Laboratory Centrifuge provides temperature control during centrifugation. Temperature control of the so-called "cold-shelf" is a gold standard for enzymologists, cell biologists, medical laboratory specialists and different discipline professionals because it ensures conditions necessary for reproducibility of sample preparation stage and reliable testing results connected with temperature sensitive components (metabolites, enzymes, hormonal factors, cytokines, chemical compounds etc.) and material itself (blood components, CSF and other thermolabile materials). Temperature control absence at this stage causes unpredictable results.

#### Features:

- User-friendly centrifugation parameter input and simultaneous display of the set and actual parameter values.
- Safe assay performance: metal protective housing and metal lid, automatic imbalance switch-off, lid lock during the centrifuge operation provide safe operation at all speeds.
- Rotor imbalance automatic diagnostics (emergency stop, imbalance indication).
- Low noise level (not more than 65 dBA).
- Wide choice of accessory rotors and adapters.
- Rotor mode selection.
- Different modes of acceleration and deceleration, including deceleration mode with switched off forced braking.
- Possibility to set the speed both in revolutions per minute and by relative centrifugal force.
- Temperature control (model **LMC-4200R**)

After non-stop centrifugation for 1.5 hours, temperature in the working chamber of the **LMC-3000** model can rise, but not by more than 15°C higher than ambient. In case of centrifugation of thermally sensitive samples, we recommend using **LMC-4200R** model, laboratory centrifuge with cooling function.

## 4. Getting started

- 4.1 **Unpacking.** Remove packing materials carefully and retain for them future shipment or storage of the unit. Examine the unit carefully for any damage incurred during transit. The warranty does not cover in-transit damage. Warranty covers only the units transported in the original package.



**Caution!** Due to the weight and size of the unit, its unpacking and installing must be carried out by two persons.

### 4.2 Package contents.

#### 4.2.1 Standard set:

- Laboratory centrifuge ..... 1 pce
- Spare fuse (inside the fuse holder) ..... 1 pce
- Power cable ..... 1 pce
- Wrench for rotor replacement (13 mm)..... 1 pce
- Emergency opening tool (for **LMC-4200R**)..... 1 pce
- Operating instructions, declaration of conformity.....1 copy

#### 4.2.2 Optional accessories. For information on optional accessories – rotors, adapters and holders, see **7.2.1**

### 4.3 Setup.

- Place the unit on the even, stable, and clean surface;
- Remove protective film from the display;
- Plug the power cord into the socket on the unit, and position it so that there is easy access to the power switch and the mains;
- According to EN 61010-2-20, clear a 30 cm safety zone around the centrifuge:
  - Zone must be free from hazardous and flammable materials during operation.
  - Personnel should vacate this zone after starting the centrifugation procedure.
  - This safe zone is also used by the centrifuge for ventilation.
- (**LMC-4200R**) Be sure to cork the drain hose (fig. 3/1) on the left side of the unit with a stopper to prevent the rising of chamber temperature.

### 4.4 Rotor replacement.

- Check the power cord for any signs of damage. Connect the power cord to a properly grounded mains socket. Set the power switch on the unit to position **I** (on). Press the **▲ Open** key (fig. 5/9 or 6/11) and lift the lid by hand.



**Caution!** Check the rotor and adapters for any signs of wear or corrosion and replace if necessary.

- Hold the rotor with one hand and, using the supplied wrench for rotor replacement (13 mm), turn the fixation screw (fig. 2/1) counter clockwise to release the rotor.
- Replace the rotor and secure the new rotor carefully by tightening the fixation screw.



**Caution!** Do not hold the rotor by rings or adapters mounting when mounting and fixing it. Hold the rotor as shown correctly on figure 2 (✓).



**Caution!** Since some plastic tubes and microtest plates can be damaged at higher speeds, maximum speed is limited for some rotors. Before centrifugation, select the type of installed rotor on the display, see **5.5.3**.

- If the unit will not be used, close the lid carefully and smoothly until a clicking sound is heard. Set the power switch on the side to position **O** (off). Disconnect the power cord from electric circuit.

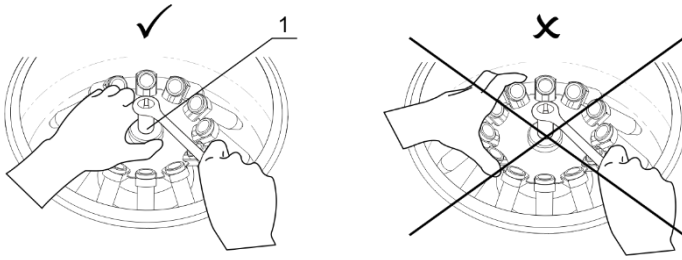


Figure 2. Rotor fixation

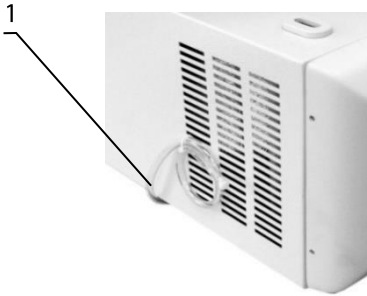


Figure 3. LMC-4200R, left side

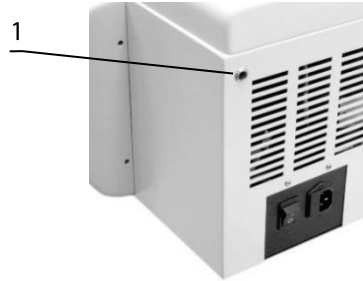


Figure 4. LMC4200R, right side

## 5. Operation

### 5.1 Requirements during operation.

- Avoid leaning on the centrifuge during operation.
- Centrifuge rotors must not be filled over the volume specified by the manufacturer.
- Do not fill in the tubes after they have been inserted in the rotor.
- Use rotors and adapters designed for dimensions of sample vessels, see **7.2.1**.
- Do not use tubes unsuitable for centrifugation.
- Adhere to the vessel manufacturer's specifications for optimal centrifugation parameters, including load and speed. Excessive g-force may cause vessels within the rotor chamber to fracture, risking damage to the rotor, accessories, and samples.
- Rotor must always be fixed securely. Stop the operation immediately by pressing and holding the **RUN/STOP** ►/■ key for more than 2 seconds if any unusual noise occurs during acceleration, which can be due to improper rotor fixation.

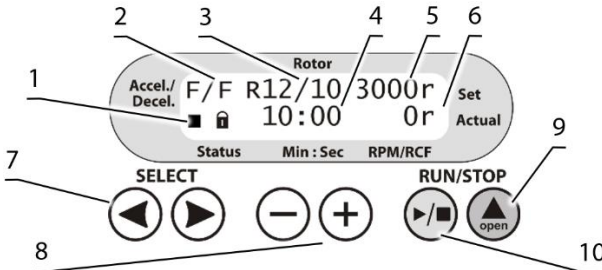


Figure 5. LMC-3000 control panel



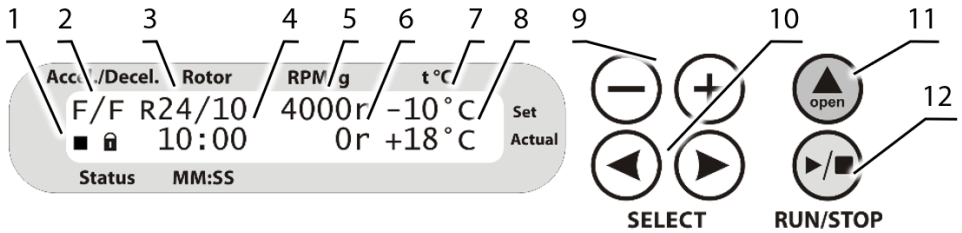


Figure 6. LMC-4200R control panel

- 5.2 Check the power cord for any signs of damage. Connect the power cord to a properly grounded mains socket. Set the power switch on the side to position I (on).



**Caution!** In model **LMC-4200R**, cooling system requires some time for start-up. After powering up, wait for about 4 minutes before centrifugation.

- 5.3 The centrifuge turns on. The following readouts appear on the display:

- Acceleration and deceleration modes (fig. 5/2 or 6/2);
- Rotor selection (fig. 5/1 or 6/1);
- Set rotor speed in RPM or RCF<sup>1</sup> (fig. 5/6 or 6/6);
- Set chamber temperature, in degrees Celsius (only **LMC-4200R**, fig. 6/7);
- Status icons of rotor, ■ stopped or ► running (fig. 5/1 or 6/1, first symbol);
- Status icons of lid, ▣ closed or ◻ open (fig. 5/1 or 6/1, second symbol);
- Set time of centrifugation, in minutes and seconds (fig. 5/4 or 6/4);
- Actual rotor speed, in RPM or RCF (fig. 5/6 or 6/6);
- Actual chamber temperature, in degrees Celsius (only **LMC-4200R**, fig. 6/8).

- 5.4 Press the ▲ **Open** key (fig. 5/9 or 6/11) and lift the lid by hand. Check the rotor and buckets for any signs of wear or corrosion and replace if necessary. Insert EVEN number of tubes/microtest plates in rotor one opposite another. The loading in the opposite tubes must be equal.



**Caution!** Always ensure that the fixation screw on the rotor is holding the rotor tight! See 4.4 and figure 2 for fixation procedure

- 5.5 **Setting parameters.** Use the **SELECT** ◀ and ▶ keys (fig. 5/7 or 6/10) to choose a parameter and the – and + keys (fig. 5/8 or 6/9) to modify it. Selected parameter will be blinking. Program automatically saves any changes made after no keys are pressed for 2 seconds.
- 5.5.1 Acceleration modes (fig. 5/2 or 6/2, first letter). Three modes of acceleration are available, slow (shortened to **S**), normal (**N**) and fast (**F**).
- 5.5.2 Deceleration modes (fig. 5/2 or 6/2, second letter). Four modes of deceleration are available, free brake (**0**), slow (**S**), normal (**N**) and fast (**F**).



**Note.** Acceleration and deceleration speed values can be found in the **Specifications** section. This information can also be found on the lid of the unit.

<sup>1</sup> Relative Centrifugal Force

5.5.3 Installed rotor (fig. 5/3 or 6/3). Select the rotor that is currently installed in the centrifuge. Combinations of rotors, adapters and their maximum allowed speed is listed below:

Rotor (adapter)	Code on display (fig. 5/3 or 6/3)	Maximum speed, RPM		Maximum RCF, g	
		LMC-3000	LMC-4200R	LMC-3000	LMC-4200R
R-6 or R-6P, any adapter	R6	3000	4200	1610	3160
R-12/15, any adapter	R12/15	3000	4200	1610	3160
R-24/10, any adapter	R24/10	N/A	4000	N/A	2860
R-12/10, any adapter except below	R12/10	3000	4200	1610	3160
R-12/10 with BN-13/75	BN1375	3000	4200	1360	2660
RMT-24	RMT24	N/A	4200	N/A	1835
R-2, any adapter	R2	2000		560	
R-24GC	R24GC	1500		280	


5.5.4 Rotation parameters (fig. 5/5 or 6/5). Rotor speed can be set in RPM and in RCF, denoted after numeric value by **r** and **g**, accordingly. Values convert after changing units. RCF depends on selected rotor or adapters, as shown in **5.5.3**.

5.5.5 Chamber temperature (fig. 6/7, only for **LMC-4200R**). Select the chamber temperature, step 1 °C. Cooling starts independently from centrifugation.







**Caution!** Chamber surface may become very cold. Avoid touching the surface.

5.5.6 Time setting (fig. 5/4 or 6/4). Select duration of centrifugation in minutes, step 1 minute.

5.6 Close the lid carefully and smoothly until a clicking sound is heard. Icon  appears on the display (fig. 5/1 or 6/1).







**Note.** If the  icon did not appear on the display, program does not start the centrifugation. Try to open and close the lid again.

5.7 Press the **RUN/STOP** /  key (fig. 5/10 or 6/12) to start centrifugation. Icon  (fig. 5/1 or 6/1) and actual speed (fig. 5/6 or 6/6) are shown in the lower line of the display. The timer (fig. 5/4 or 6/4) starts the countdown after set speed is achieved.






**Note.** If the rotor imbalance occurs causing vibration the centrifuge stops automatically (IMBALANCE indication appears on the display). In this case, open the lid after the rotor has stopped and remedy the cause of imbalance.

5.8 Centrifugation is stopped automatically after the set time elapses. A sound signal is emitted after full stop of the rotor. Press the **RUN/STOP** /  key to stop the signal.

5.9 If necessary, centrifugation can be stopped before the set time elapses. Press the **RUN/STOP** /  key. Rotor stops according to set deceleration mode.



**Note.** For emergency, to apply fast braking regardless of set deceleration mode, press and hold **RUN/STOP** /  key for more than 2 seconds.

5.10 Press the **▲ Open** key and open the lid by lifting it upwards with your hand. It is possible to unlock and open the lid only when the rotor is stopped. Display shows  icon.

5.11 (For **LMC-4200R**) Wipe clean the chamber from ice and condensation, see **8.2** for additional information.

5.12 At the end of operation, set the Power switch in position **O** (OFF) on the rear panel of the unit. Disconnect the power cord from the mains.



**Note.** The electrical lid lock allows opening the lid only when the unit is connected to the mains and is turned on. Do not force the lid to open when the unit is switched off!

### 5.13 Lid emergency opening.

5.13.1 Disconnect the power cord from the mains. Ensure that the rotor has stopped.

5.13.2 **LMC-3000.** Slide the unit to the front of the bench to access the emergency opening slot on the underside of the unit (located in the front side). Avoid tilting the unit as this may cause spilling of the materials from the containers inside the unit. Insert a small screwdriver (or similar tool with diameter up to 3 mm) into the emergency opening slot in front of the dot on the label “Open” at a depth of 10-15 mm. Move the lever to the arrow direction until a click is heard and open the unlocked lid.

5.13.3 **LMC-4200R.** Insert the emergency opening tool into the slot on the right side of the unit, above the power switch (fig. 4/1). Push until a click is heard and open the unlocked lid.

## 6. Specifications

6.1 Biosan is committed to a continuous program of improvement and reserves the right to alter design and specifications of the equipment without additional notice.

### 6.2 Centrifugation specifications

		<b>LMC-3000</b>	<b>LMC-4200R</b>
Speed setting range	In RPM	100 – 3000 RPM	100 – 4200 RPM
	In RCF <sup>1</sup>	10 – 1610 g	10 – 3160 g
Speed increment		100 RPM or 10 g	
Digital time setting		1 – 90 min	
Time setting increment		1 min	
Acceleration, in RPM/s	Slow mode	50	50
	Normal mode	75	75
	Fast mode	135	150
Deceleration, in RPM/s	Brakes off	30	30
	Slow mode	8	8
	Normal mode	45	50
	Fast mode	135	150



**Note.** For the **fast** acceleration/deceleration modes and the **brakes off** mode, values depend on the rotor load.

Temperature setting range	–	-10 °C ... +25 °C
Stable temperature maintenance range	–	25 °C below ambient ... +25 °C
Temperature setting resolution	–	1 °C
Coolant type and mass	–	Propane R-290, 70 g

## 6.3 General specifications

	<b>LMC-3000</b>	<b>LMC-4200R</b>
Rotor imbalance automatic diagnostics	Emergency stop, display indication "IMBALANCE"	
Rotation direction	Counterclockwise	
Display	LCD 2x16 symbols	LCD 2x24 symbols
Noise level	≤ 60 dBA	≤ 65 dBA
Chamber diameter	340 mm	360 mm
Dimensions	495x410x235 mm	635x580x335 mm
Power consumption	110 W ( <b>V.6AD</b> ); 120 W ( <b>V.6AE</b> )	990 W
Input voltage and frequency	230 V~, 50–60 Hz ( <b>V.6AD</b> ); 120 V~, 50–60 Hz ( <b>V.6AE</b> )	230 V~, 50–60 Hz
Voltage fluctuations	±10%	
Weight, accurate within ±10%	11.8 kg	56 kg

## 6.4 Workroom requirements

Workroom description	Indoors, cold rooms and closed laboratory rooms
Temperature range	+4 °C ... +40 °C
Humidity requirements	Maximum of 80% RH at 31 °C, decreasing linearly to 50% RH at 40 °C. Non-condensing atmosphere.
Operating height	Maximum 2000 m ASL
Overvoltage category	II
Pollution degree	2

# 7. Ordering information

## 7.1 Models and versions available

<b>Model</b>	<b>Version</b>	<b>Description</b>	<b>Catalogue number</b>
<b>LMC-3000</b>	V.6AD	230 V~, 50–60 Hz, <b>EU</b> plug (type E/F)	BS-010208-AAA
		230 V~, 50–60 Hz, <b>UK</b> plug (type G)	BS-010208-AAB
		230 V~, 50–60 Hz, <b>Australian</b> plug (type I)	BS-010208-AA3
	V.6AE	120 V~, 50–60 Hz, <b>US</b> plug (type B)	BS-010208-AAC
<b>LMC-4200R</b>	V.6AD	230 V~, 50–60 Hz, <b>EU</b> plug (type E/F)	BS-010212-AAA
		230 V~, 50–60 Hz, <b>UK</b> plug (type G)	BS-010212-AAB
		230 V~, 50–60 Hz, <b>Australian</b> plug (type I)	BS-010212-AA3

7.2 To inquire about or order the optional accessories or the replacement parts, contact Biosan or your local Biosan representative. A separate and extensive guide is available for download through the links below:

**LMC-3000 rotor selection guide**








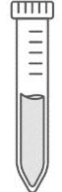

[biosan.lv/lmc3000-rotors](https://biosan.lv/lmc3000-rotors)










**LMC-4200R rotor selection guide**




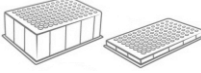



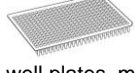

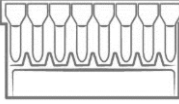

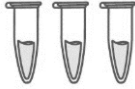



[biosan.lv/lmc4200-rotors](https://biosan.lv/lmc4200-rotors)

7.2.1 Optional rotors and accessories.

Vessel	Rotor and adapters	Catalogue number; description
 Standard conical (Falcon®) 50 ml tube Ø: 29 mm; L: 115 mm	 R-6	BS-010208-DK Capacity per rotor: 6 tubes Maximum speed / RCF: 3000 RPM / 1610 g (LMC-3000) 4200 RPM / 3160 g (LMC-4200R) Angle: 90°, swing out Adapter material: Aluminium
	 R-6P	BS-010208-XK Capacity per rotor: 6 tubes Maximum speed / RCF: 3000 RPM / 1610 g (LMC-3000) 4200 RPM / 3160 g (LMC-4200R) Angle: 90°, swing out Adapter material: Plastic POM-C
 Standard conical 25 ml tube Ø: 29 mm; L: 77 mm	 R-6 / R-6P + BI-25-6	BS-010208-DK / BS-010208-XK + BS-010221-VK Capacity per rotor: 6 tubes Maximum speed / RCF: 3000 RPM / 1610 g (LMC-3000) 4200 RPM / 3160 g (LMC-4200R) Angle: 90°, swing out Adapter material: Plastic POM-C
 Standard conical 15 ml tubes Ø: 17 mm; L: 120 mm	 R-12/15	BS-010208-EK Capacity per rotor: 12 tubes Maximum speed / RCF: 3000 RPM / 1610 g (LMC-3000) 4200 RPM / 3160 g (LMC-4200R) Angle: 90°, swing out Adapter material: Plastic POM-C

Vessel	Rotor and adapters	Catalogue number; description
 Standard round 10–15 ml tubes Ø: 16 mm; L: 105 mm	 R-12/10	BS-010208-BK Capacity per rotor: 12 tubes Maximum speed / RCF: 3000 RPM / 1610 g (LMC-3000) 4200 RPM / 3160 g (LMC-4200R) Angle: 90°, swing out Adapter material: Plastic POM-C
	 Only for <b>LMC-4200R</b> R-24/10	BS-010212-JK Capacity per rotor: 24 tubes Maximum speed: 4000 RPM Maximum RCF: 2860 g Angle: 90°, swing out Adapter material: Plastic POM-C
 2–5 mL vacutainers Ø: 13 mm; L: 82 mm	 R-12/10 + BN-13/75	BS-010208-BK + BS-010208-PK Capacity per rotor: 12 tubes Maximum speed / RCF: 3000 RPM / 1360 g (LMC-3000) 4200 RPM / 2660 g (LMC-4200R) Angle: 90°, swing out Adapter material: Plastic POM-C
	 Only for <b>LMC-4200R</b> R-24/10 + BN-13/75-24	BS-010212-JK + BS-010221-RK Capacity per rotor: 24 tubes Maximum speed: 4000 RPM Maximum RCF: 2860 g Angle: 90°, swing out Adapter material: Plastic POM-C
 4–8 mL vacutainers Ø: 13 mm; L: 107 mm	 R-12/10 + BN-13/100	BS-010208-BK + BS-010208-QK Capacity per rotor: 12 tubes Maximum speed / RCF: 3000 RPM / 1610 g (LMC-3000) 4200 RPM / 3160 g (LMC-4200R) Angle: 90°, swing out Adapter material: Plastic POM-C
	 Only for <b>LMC-4200R</b> R-24/10 + BN-13/100-24	BS-010212-JK + BS-010221-SK Capacity per rotor: 24 tubes Maximum speed: 4000 RPM Maximum RCF: 2860 g Angle: 90°, swing out Adapter material: Plastic POM-C

Vessel	Rotor and adapters	Catalogue number; description
 <p>8–9 mL vacutainers Ø: 16 mm; L: 105 mm</p>	 <p>R-12/10 + BN-16/100</p>	BS-010208-BK + BS-010208-RK Capacity per rotor: 12 tubes Maximum speed / RCF: 3000 RPM / 1610 g (LMC-3000) 4200 RPM / 3160 g (LMC-4200R) Angle: 90°, swing out Adapter material: Plastic POM-C
	 <p><b>Only for LMC-4200R</b></p> <p>R-24/10 + BN-16/100-24</p>	BS-010212-JK + BS-010221-TK Capacity per rotor: 24 tubes Maximum speed: 4000 RPM Maximum RCF: 2860 g Angle: 90°, swing out Adapter material: Plastic POM-C
 <p>96- and 384-well, deep-well plates, microplates LxWx H<sub>max</sub>: 128x85.6x45 mm</p>	 <p>R-2</p>	BS-010208-AK Capacity per rotor: 2 plates Maximum speed: 2000 RPM Maximum RCF: 560 g Angle: 90°, swing out
 <p>Semi- and unskirted 96-well microplates LxWx H<sub>max</sub>: 128x85.6x45 mm</p>	 <p>R-2 + AP-96</p>	BS-010208-AK + BS-010219-DK Capacity per rotor: 2 plates Maximum speed: 2000 RPM Maximum RCF: 560 g Angle: 90°, swing out Adapter material: Plastic Ertacetal C
 <p>384-well plates, micro- plates, unskirted LxWx H<sub>max</sub>: 128x85.6x45 mm</p>	 <p>R-2 + AP-384</p>	BS-010208-AK + BS-010219-EK Capacity per rotor: 2 plates Maximum speed: 2000 RPM Maximum RCF: 560 g Angle: 90°, swing out Adapter material: Plastic Ertacetal C
 <p>Gel cards L: 74 mm; H: 53 mm</p>	 <p>R-24/GC</p>	BS-010208-VK Capacity per rotor: 24 gel cards Maximum speed: 1500 RPM Maximum RCF: 280 g Angle: 90°, swing out
 <p>1.5–2 mL microtubes Ø: 11 mm; L: 40 mm</p>	 <p><b>Only for LMC-4200R</b></p> <p>RMT-24</p>	BS-010221-BK Capacity per rotor: 24 microtubes Maximum speed: 4200 RPM Maximum RCF: 1835 g Angle: 45°, fixed

Vessel	Rotor and adapters	Catalogue number; description
Stand for rotors	 RR-U	BS-010208-UK
		Stand for a single rotor

### 7.2.2 Replacement parts. Rotor default adapter sets.

Model	For rotor	Description	Max. RCF	Catalogue number
BN-11/30	R-6P	Plastic adapters for 6 of 50 ml centrifuge tubes (ØxH: 40x103 mm)	3160g	BS-010208-ZK
BN-11/30A	R-6	Aluminium adapters for 6 of 50 ml centrifuge tubes (ØxH: 40x103 mm)	3160g	On request
BN-17/120	R-12/15	Adapters for 12 of 15 ml centrifuge tubes (ØxH: 17x120 mm)	3160g	BS-010208-TK
BN-16/90T	R-12/10	Adapters for 12 of 10-15 ml centrifuge tubes (ØxH: 16x90 mm)	3160g	BS-010208-4K
BN-16/90T-24	R-24/10	Adapters for 24 of 10-15 ml centrifuge tubes (ØxH: 16x90 mm)	2860g	On request

## 8. Care and maintenance

### 8.1 Service.

- 8.1.1 If the unit is disabled (e.g., no centrifugation, no reaction to key presses, lid cannot close, etc.) or requires maintenance, disconnect the unit from the mains and contact Biosan or your local Biosan representative.
- 8.1.2 All maintenance and repair operations (except listed below) must be performed only by qualified and specially trained personnel.
- 8.1.3 Operating integrity check. If the unit follows the procedure described in section **Operation**, then no additional checks are required.

8.2 **Cleaning and disinfection.** Perform cleaning as requested. After cleaning procedures, check the centrifuge casing, chamber, rotors and adapters for any signs of wear or corrosion, contact Biosan or your local Biosan representative for replacement.

- 8.2.1 Use mild soap and water with a soft cloth or sponge for cleaning the exterior. Rinse remaining washing solution with distilled water. Wipe dry the excess water with clean, soft cloth or sponge.
- 8.2.2 To disinfect the plastic and metal parts, use 75% ethanol or DNA/RNA removing solution (e.g., Biosan PDS-250). After disinfecting it is necessary to wipe the surfaces dry.



**Caution!** Wet or chemical residue may lead to deterioration and corrosion.



### 8.2.3 Autoclaving.

- The unit itself and its power cable are not autoclavable.
- Rotors and adapters are autoclavable, 20 min. at 121 °C.
- Before autoclaving, remove adapters from rotors, clean and rinse with distilled water.
- Place plastic parts on an even surface to avoid deformation.



**Caution!** Check whether autoclaving is permitted!

Do not use any chemicals additives to the steam!

For safety reasons, all autoclavable plastic parts may be autoclaved a maximum of 15 autoclaving cycles!



**Caution!** Never exceed the maximum permissible values for autoclaving temperature and time!

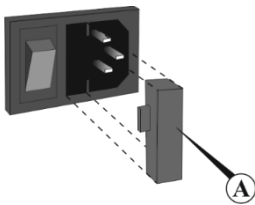


**Caution!** Check the rotors and adapters for integrity and lack of deformations!

8.2.4 In model **LMC-4200R**, wipe away any ice and condensation in the working chamber after operation. For the ease of cleaning, chamber is equipped with a drain hole with tube (fig. 3/1).

8.2.5 In model **LMC-4200R**, clean the condenser of the unit at least once per year. Disconnect from electric circuit. Unscrew 4 screws and remove the grate on the rear panel of the unit, then vacuum the condenser. Replace the grate and screws.

8.3 **Fuse replacement.** Disconnect from electric circuit. Remove the power plug from the rear of the unit. Pull out the fuse holder by applying leverage in recess (fig. 7/A). Remove the fuse from the holder. Check and replace with the correct fuse if necessary. Consult with the table below (type **M** - time lag: **Medium**):



**Figure 7. Fuse holder**

Model and version	Fuse type
LMC-3000 V.6AD	M 1 A
LMC-3000 V.6AE	M 2 A
LMC-4200R V.6AD	M 6.3 A

8.4 **Disposal.** Disposal of the appliance requires special precautions and must be carried out at an appropriate disposal site, separate from normal household waste. Cleaning and decontamination may be necessary as a safeguard before laboratory centrifuges, rotors, and any accessories are maintained, repaired, or transferred. To prevent pollution of the environment, all waste resulting from the disposal of the product must be collected and disposed of in the country of use, in accordance with the applicable requirements for the handling of electronic waste.

## 9. Storage and transportation

- 9.1 Store and transport the unit in a horizontal position (see package label) at ambient temperatures between -20°C and +60°C and maximum relative humidity of 80%.
- 9.2 Save the unit from shocks and falling.
- 9.3 After transportation or storage and before connecting it to the electric circuit, keep the unit under room temperature for 2-3 hrs.
- 9.4 For extended storage, the unit does not require special procedures.

## 10. Warranty and Claims

- 10.1 The Manufacturer guarantees the compliance of unit with the requirements of Specifications, provided the Customer follows the operation, storage and transportation instructions.
- 10.2 Biosan cannot accept any liability for damage resulting from the use of accessories and spare parts other than those recommended or from improper use.
- 10.3 The warranted service life of the unit from the date of its delivery to the Customer is 24 months, excluding optional accessories mentioned in the section **Ordering information**. Prolonged storage does not extend the warranty. For extended warranty, see **10.7**.
- 10.4 The maximum service life of all rotors and associated metal cups is 7 years from the start of operation. The maximum service life of the plastic cups is 2 years from the start of operation.
- 10.5 Warranty covers only the units transported in the original package.
- 10.6 If any manufacturing defects are discovered by the Customer, an unsatisfactory equipment claim shall be compiled, certified and sent to the local distributor address. Please visit the **Technical support** section on our website at the link below to obtain the claim form.
- 10.7 Extended warranty.
  - For **LMC-4200R**, a *Premium* class model, one year of extended warranty is available free of charge after registration, during 6 months from the date of sale. Online registration form can be found in section **Warranty registration** on our website at the link below.
  - For **LMC-3000**, a *Basic Plus* class model, extended warranty is a paid service. Contact your local Biosan representative or our service department through the **Technical support** section on our website at the link below.

10.8 Description of the classes of our products is available in the **Product class description** section on our website at the link below.

**Technical support**



[biosan.lv/en/support](https://biosan.lv/en/support)

**Warranty registration**



[biosan.lv/register-en](https://biosan.lv/register-en)

**Product class description**



[biosan.lv/classes-en](https://biosan.lv/classes-en)

10.9 The following information will be required in the event that warranty or post-warranty service comes necessary. Complete the table below and retain for your records.

Model	Serial number	Date of sale
LMC-3000, LMC-4200R, Laboratory centrifuges		

10.10 **Production date.** Production date is placed in the serial number, on the label of the unit. Serial number consists of 14 digits styled XXXXXXYYMMZZZZ, where XXXXXX is model code, YY and MM – year and month of production, ZZZZ – unit number.

## 11. EU Declaration of Conformity

11.1 Laboratory centrifuge **LMC-3000** and laboratory centrifuge with refrigeration **LMC-4200R** are in conformity with the following relevant Union legislations:

<b>LVD 2014/35/EU</b>	<b>LVS EN 61010-1:2011</b> Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements. <b>LVS EN 61010-2-020:2016</b> Particular requirements for laboratory centrifuges.
<b>EMC 2014/30/EU</b>	<b>LVS EN 61326-1:2013</b> Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements.
<b>RoHS3 2015/863/EU</b>	Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
<b>WEEE 2012/19/EU</b>	Directive on waste electrical and electronic equipment.

11.2 Declaration of Conformity is available for download on the page for the relevant model on our website by links below, in the **Downloads** section:



[LMC-3000](#)



[LMC-4200R](#)

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