

LMC-56

Laboratory centrifuge



If you have any feedback on our products or services, we would like to hear from you.
Please send all feedback to:

Manufacturer

SIA Biosan
Rātsupītes iela 7 k-2, Rīga, LV-1067, Latvija/Latvia

Phone: +371 674 261 37

Fax: +371 674 281 01

www.biosan.lv

Service e-mail: service@biosan.lv

Marketing e-mail: marketing@biosan.lv

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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 and versions:

| Model and name | Version |
|-------------------------------|--------------|
| LMC-56, laboratory centrifuge | V.1AD, V.1AE |

1.2 Edition 1.04 – May of 2022



2. Safety precautions

2.1 Symbols used in these instructions:



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

2.1 Icons used on the unit and packaging:

| | |
|---|---|
|  | CE marking, manufacturer affirms conformity with European health, safety, and environmental protection standards, see 11.1 |
|  | WEEE directive marking, see 11.1 |

2.2 General safety

- The protection provided can be ineffective if the operation of the appliance does not comply with the manufacturer's requirements.
- Store and transport the unit as described in section **Storage and transportation**.
- Use only original parts and accessories, provided by manufacturer for this product.
- 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 in design of the unit.

2.3 Electrical safety

- Connect only to the mains with voltage corresponding to that on the serial number label.
- Do not plug the unit into an ungrounded power socket, and do not use an ungrounded extension lead.
- Ensure that the power plug is easily accessible during use.
- Disconnect the unit from the mains before moving.
- If liquid penetrates into the unit, disconnect it from the mains 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**.

2.4 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 with visible signs of corrosion, wear or mechanical damage.
- Do not use the rotor without secured fixation screw (see figure below). Securing procedure is described in 4.4.



Rotor label example

- Do not fill in the tubes after they have been inserted in the rotor.
- Do not use glass tubes or tubes unsuitable for centrifugation.
- Select the correct type of rotor. Some rotors have limited maximum speed (see figure below). Selection procedure is described in 5.4.3.
- 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.
- Do not place a load exceeding the maximum load value mentioned in section **Specifications**.

2.5 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.
- The user is responsible to carry out appropriate decontamination if hazardous material spills on or penetrates into the equipment.

3. General information

LMC-56 is a modern benchtop, low-speed laboratory centrifuge designed for convenient sedimentation, centrifugation and collection of necessary samples. It provides 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.

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 provides safe operation at all speeds.
- Rotor imbalance automatic diagnostics (emergency stop, imbalance indication).
- Automatic rotor detection with active rotational speed limit.
- Relatively high speed – maximum 6,000 rpm or 3,750 g.
- Wide choice of accessory rotors and adapters.
- A wide selection of rotors – up to 13.
- Improved chamber to reduce sample heating during centrifugation.
- 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.

4. Getting started

4.1 **Unpacking.** Remove packing materials carefully and retain them for 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.

4.2 **Complete set.** Package contents:

4.2.1 Standard set:

- Laboratory centrifuge 1 pce.
- Power cable 1 pce.
- Spare fuse (inside fuse holder) 1 pce.
- Wrench for rotor fixation 1 pcs.
- Operating manual, declaration of conformity 1 copy

4.2.2 Optional accessories, on request:

- Ri-6 rotor (with BN-11/30 adapters) 1 pce
- Ri-6P rotor (with BN-11/30A adapters) 1 pce
- o BI-25-6 adapter set for Ri-6, Ri-6P 1 set of 6 pcs
- Ri-12/10 rotor (with BN-16/90 adapters) 1 pce
- o BN-13/75 adapter set for Ri-12/10 1 set of 12 pcs
- o BN-13/100 adapter set for Ri-12/10 1 set of 12 pcs
- o BN-16/100 adapter set for Ri-12/10 1 set of 12 pcs
- Ri-24/10 rotor (with BN-16/90-24 adapters) 1 pce
- o BN-13/75-24 adapter set for Ri-24/10 1 set of 24 pcs
- o BN-13/100-24 adapter set for Ri-24/10 1 set of 24 pcs
- o BN-16/100-24 adapter set for Ri-24/10 1 set of 24 pcs
- Ri-12/15 rotor (with BN-17/120 adapters) 1 pce
- Ri-2 rotor 1 pce
- o AP-96 adapter set for Ri-2 1 set of 2 pcs
- o AP-384 adapter set for Ri-2 1 set of 2 pcs
- Ri-24GC rotor for gel cards 1 pce
- RMT-24 angle rotor 1 pce
- BR-4U bucket rotor 1 pce
- o BA-2/50 buckets for BR-4U 1 set of 4 pcs
- BI-25-8 adapter set for BA-2/50 1 set of 8 pcs
- o BA-4/10 buckets for BR-4U 1 set of 4 pcs
- BN-13/75-16 adapter set for BA-4/10 1 set of 16 pcs
- BN-13/100-16 adapter set for BA-4/10 1 set of 16 pcs
- BN-16/100-16 adapter set for BA-4/10 1 set of 16 pcs
- o BA-4/15 buckets for BR-4U 1 set of 4 pcs
- o BA-8/5 buckets for BR-4U 1 set of 4 pcs
- o BA-14/2U buckets for BR-4U 1 set of 4 pcs
- RR-U rotor support stand 1 pce



Ri-6



Ri-6P



Ri-12/10



Ri-24/10



Ri-12/15



Ri-2



Ri-24GC



RMT-24



BR-4U with BA-2/50



BR-4U with BA-4/10



BR-4U with BA-8/5



BR-4U with BA-14/2U

4.3 **Setup.**

- Place the unit upon even horizontal stable non-flammable surface 30 cm away from any flammable materials, and clear 20 cm around the unit on all sides for ventilation.
- Remove the protective film from the display.
- Connect the power cable to the socket on the rear side of the unit, and position it with easy access to the power switch and plug.
- 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.

4.4 Rotor replacement.

- Check the power cable for any signs of damage. Connect the power cable to a properly grounded mains socket. Set the power switch on the unit to position **I** (on). Press the **▲ Open** key (fig. 2/9) 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. 1/1) counter clockwise to release the rotor.
- Replace the rotor and secure the new rotor carefully by turning the fixation screw tightly.



Caution! Do not hold the rotor by rings or adapters mounting when mounting and fixing it. Hold the rotor as shown on figure 1 (✓).



Caution! Since some plastic tubes and microtest plates can be damaged at higher speeds, maximum speed is limited for some rotors. **LMC-56** detects the rotor automatically, see **5.13**.

- 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 cable from electric circuit.

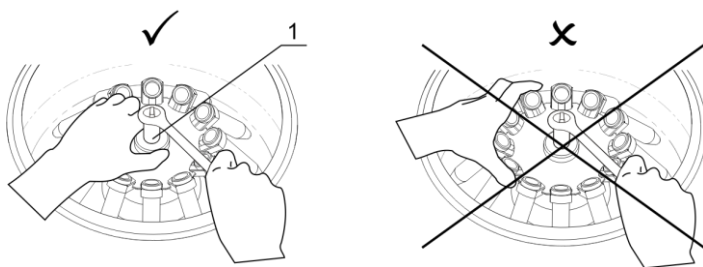


Figure 1. Rotor fixation

5. Operation

5.1 Recommendations during operation:

- Use even numbers of tubes arranged symmetrically (one opposite another) when loading to give the unit even balance during operation. The opposite tubes must be filled up equally.
- 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.
- Do not use glass tubes or tubes unsuitable for centrifugation.
- 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.
- Since some plastic tubes and microtest plates can be damaged at higher speeds, maximum speed is limited for some rotors. **LMC-56** detects the rotor automatically, see 5.13.

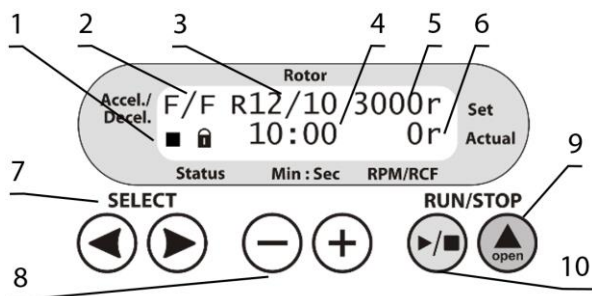


Figure 2. LMC-56 control panel.

- 5.2 Check the power cable for any signs of damage. Connect the power cable to a properly grounded mains socket. Set the power switch on the side to position I (on).
- 5.3 The centrifuge turns on. The following readouts appear on the display:
- Acceleration and deceleration modes (fig. 2/2);
 - Set rotor speed in RPM or RCF¹ (fig. 2/6);
 - Status icons of rotor, ■ stopped or ► running (fig. 2/1, first symbol);
 - Status icons of lid, ■ closed or ► open (fig. 2/1, second symbol);
 - Set time of centrifugation, in minutes and seconds (fig. 2/4);
 - Actual rotor speed, in RPM or RCF (fig. 2/6);
- 5.4 Press the ▲ **Open** key (fig. 2/9) and lift the lid by hand. Check the rotor, 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! Check the rotor fixation every 10 days. Tighten the fixation screw, if necessary, see figure 1.

¹ Revolutions per minute and Relative Centrifugal Force

5.5 **Setting parameters.** Use the **SELECT** ◀ and ▶ keys (fig. 2/7) to choose a parameter and the – and + keys (fig. 2/8) 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. 2/2, first letter). Three modes of acceleration are available, slow (shortened to **S**), normal (**N**) and fast (**F**).

5.5.2 Deceleration modes (fig. 2/2, 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.

5.5.3 Installed rotor (fig. 2/3). Combinations of rotors, adapters and their maximum allowed speed is listed below in the table below:

| Rotor (adapter) | Code on display (fig. 4/3) | Maximum speed, RPM | Maximum RCF, g |
|------------------------------------|----------------------------|--------------------|----------------|
| Ri-6 or Ri-6P, any adapter | R6 | 4200 | 3160 |
| Ri-12/15, any adapter | R12/15 | 4200 | 3160 |
| Ri-24/10, any adapter | R24/10 | 4000 | 2860 |
| Ri-12/10, any adapter except below | R12/10 | 4200 | 3160 |
| Ri-12/10 with BN-13/75 | BN1375 | 4200 | 2660 |
| Ri-2, any adapter | R2 | 2000 | 560 |
| Ri-24GC | R24GC | 1500 | 280 |
| RMT-24 | RMT-24 | 6000 | 3750 |
| BR-4U, any adapter | BR-4U | 4200 | 3260 |



Note. **LMC-56** detects the rotor and adjusts the speed automatically. See **5.13** for additional information.

5.5.4 Rotation parameters (fig. 2/5). 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 the installed rotor, as shown in Table 1.



Note. Rotor detection system only detects the rotor, not the specific adapter. When more than 1 adapter condition for the rotor is possible, highest RCF condition for the detected rotor is displayed in **g** mode, please refer to **7.2.2** for maximum RCF.

5.5.5 Time setting (fig. 2/4). 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. 2/1).



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. 2/10) to start centrifugation. Icon ▶ (fig. 2/1) and actual speed (fig. 2/6) are shown in the lower line of the display. The timer (fig. 2/4) 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 stops 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 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!

- 5.12 **Lid emergency opening.** Disconnect the power cord from the mains. Ensure that the rotor has stopped. 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 **Automatic rotor detection for LMC-56.** The centrifuge **LMC-56** has automatic rotor detection. It detects currently inserted rotor in the beginning of rotation initiation and will automatically limit the RPM of various rotors mentioned in **Table 1**.
- 5.13.1 Algorithm of rotor detection.
- Press **RUN/STOP ►/■** to initiate rotor rotation, rotor detection is automatically started at 300 ± 50 RPM with duration of up to 5 seconds.
 - If the set RPM is in the correct range for the rotor, the centrifuge continues operation.
 - If the set RPM is not correct for the rotor, the centrifuge automatically adjusts to the closest possible working RPM of the rotor.
 - If the adjusted RPM is satisfactory, stop the sound signal by pressing **RUN/STOP ►/■**.

6. Specifications

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

6.2 Centrifugation specifications:

| | |
|--|----------------|
| Speed setting range (depending on the rotor) | |
| In RPM | 100 – 6000 RPM |
| In relative centrifugal force (RCF) | 10 – 3750 g |
| Speed increment | 100 RPM or 5 g |
| Timer setting..... | 1 – 90 min |
| Timer increment | 1 min |
| Acceleration, RPM/s | |
| Slow mode | 50 |
| Normal mode..... | 75 |
| Fast mode (depending on the load) | 280 |
| Deceleration, RPM/s | |
| Brakes off (depending on the load) | 30 |
| Slow mode | 8 |
| Normal mode..... | 50 |
| Fast mode (depending on the load) | 150 |

6.3 General specifications:

| | |
|--|--|
| Rotor imbalance automatic diagnostics ..Emergency stop, display indication “IMBALANCE” | |
| Rotor detection | Yes |
| Rotation direction | Counterclockwise |
| Display..... | 2x16, LCD |
| Chamber diameter..... | 355 mm |
| Dimensions..... | 560x480x315 mm |
| Power consumption | 320 W (V.1AD); 330 W (V.1AE); |
| Operational voltage | 230 V, 50/60 Hz (V.1AD); 120 V, 50/60 Hz (V.1AE) |
| Weight, accurate within ±10% | 16.5 kg |

6.4 Workroom requirements

| CPS-20 part | Controller unit |
|-----------------------|---|
| Workroom description | 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 |

7. Ordering information

7.1 Models and versions available:

| Model | Version | Description | Catalogue number |
|--------|---------|-----------------|------------------|
| LMC-56 | V.1AD | 230 V, 50/60 Hz | BS-040118-CK |
| | V.1AE | 120 V, 50/60 Hz | |

7.2 To inquire about or order the optional accessories or the replacement parts, contact Biosan or your local Biosan representative.

7.2.1 Optional accessories. Rotors and rotor holder.

| Model | Description | Maximum speed ¹ , RPM | Maximum RCF ² , g | Catalogue number |
|----------|--|----------------------------------|------------------------------|------------------|
| Ri-6 | For 6 conical centrifuge tubes of 50 ml, with aluminium tube holders, ØxH: 40x103 mm | 4200 | 3160 | BS-010221-HK |
| Ri-6P | For 6 conical centrifuge tubes of 50 ml, with plastic tube holders, ØxH: 40x103 mm | 4200 | 3160 | BS-010221-IK |
| Ri-12/15 | For 12 conical centrifuge tubes of 15 ml, ØxH: 17x120 mm | 4200 | 3160 | BS-010221-KK |
| Ri-12/10 | For 12 round-bottom centrifuge tubes of 10-15 ml, ØxH: 16x90 mm | 4200 | 3160 | BS-010221-MK |
| Ri-24/10 | For 24 round-bottom centrifuge tubes of 10-15 ml, ØxH: 16x90 mm | 4000 | 2860 | BS-010221-LK |
| Ri-2 | For 2 standard 96-well microplates, LxWxH _{max} 128x85.6x45 mm | 2000 | 560 | BS-010221-GK |
| Ri-24GC | For 24 of 8-column gel cards for blood group serology testing, LxW 53x74 mm | 1500 | 280 | BS-010221-NK |
| RMT-24 | For 24 of 1.5 or 2 ml microtubes, angled rotor | 6000 | 3750 | BS-010221-AK |
| BR-4U | Bucket rotor, 4 places for adapters | 4200 | 3260 | BS-010221-BK |
| RR-U | Stand for rotors | | | BS-010208-UK |

- Centrifuge tube and microplate manufacturers: Corning, Falcon, Greiner Bio-one, Nunc, Sarstedt.
- Gel card manufacturers: Grifols, Diamed.



Note. Rotor detection system only detects the rotor, not the specific adapter. When more than 1 adapter condition for the rotor is possible, highest RCF condition for the detected rotor is displayed in **g** mode, please refer to **7.2.2** for maximum RCF.

¹ Accurate within ±5%

² Relative Centrifugal Force

7.2.2 Optional accessories. Rotor adapter sets.

| Model | For rotor | Description | Max. RCF ¹ | Catalogue number |
|--------------|-------------|--|-----------------------|------------------|
| BI-25-6 | Ri-6, Ri-6P | Adapter set for 25 ml conical tubes | 3160g | BS-010221-VK |
| BN-13/75 | Ri-12/10 | Adapters for 2-5 ml vacutainers (ØxH: 13x75 mm) | 2660g | BS-010208-PK |
| BN-13/100 | Ri-12/10 | Adapters for 4-8 ml vacutainers (ØxH: 13x100 mm) | 3160g | BS-010208-QK |
| BN-16/100 | Ri-12/10 | Adapters for 8-9 ml vacutainers (ØxH: 16x100 mm) | 3160g | BS-010208-RK |
| BN-13/75-24 | Ri-24/10 | Adapters for 2-5 ml vacutainers (ØxH: 13x75 mm) | 2860g | BS-010221-RK |
| BN-13/100-24 | Ri-24/10 | Adapters for 4-8 ml vacutainers (ØxH: 13x100 mm) | 2860g | BS-010221-SK |
| BN-16/100-24 | Ri-24/10 | Adapters for 8-9 ml vacutainers (ØxH: 16x100 mm) | 2860g | BS-010221-TK |
| AP-96 | Ri-2 | Adapters for unskirted, semi-skirted 96-well microplates (LxWxH _{max} : 128x85.6x45 mm) | 560g | BS-010219-DK |
| AP-384 | Ri-2 | Adapters for 384-well microplates (LxWxH _{max} : 128x85.6x45 mm) | 560g | BS-010219-EK |
| BA-2/50 | BR-4U | Bucket adapters for 2 tubes of 50 ml | 3260g | BS-010221-CK |
| BI-25-8 | BA-2/50 | Adapter set for 25 ml conical tubes | 3260g | BS-010221-UK |
| BA-4/15 | BR-4U | Bucket adapters for 4 tubes of 15 ml | 3260g | BS-010221-DK |
| BN-13/75-16 | BA-4/15 | Adapters for 2-5 ml vacutainers (ØxH: 13x75 mm) | 3260g | BS-010221-OK |
| BN-13/100-16 | BA-4/15 | Adapters for 4-8 ml vacutainers (ØxH: 13x100 mm) | 3260g | BS-010221-PK |
| BN-16/100-16 | BA-4/15 | Adapters for 8-9 ml vacutainers (ØxH: 16x100 mm) | 3260g | BS-010221-QK |
| BA-4/10 | BR-4U | Bucket adapters for 4 tubes of 10 ml | 2960g | BS-010221-EK |
| BA-8/5 | BR-4U | Bucket adapters for 8 tubes of 5 ml | 2370g | BS-010221-FK |
| BA-14/2U | BR-4U | Bucket adapters for 14 microtubes of 2 ml | 2070g | BS-010221-JK |

7.2.3 Replacement parts. Rotor adapter sets.

| Model | For rotor | Description | Max. RCF ¹ | Catalogue number |
|-------------|-----------|---|-----------------------|------------------|
| BN-11/30 | Ri-6P | Plastic adapters for 6 of 50 ml centrifuge tubes (ØxH: 40x103 mm) | 3160g | BS-010208-ZK |
| BN-11/30A | Ri-6 | Aluminium adapters for 6 of 50 ml centrifuge tubes (ØxH: 40x103 mm) | 3160g | On request |
| BN-17/120 | Ri-12/15 | Adapters for 12 of 15 ml centrifuge tubes (ØxH: 17x120 mm) | 3160g | BS-010208-TK |
| BN-16/90 | Ri-12/10 | Adapters for 12 of 10-15 ml centrifuge tubes (ØxH: 16x90 mm) | 3160g | BS-010208-SK |
| BN-16/90-24 | Ri-24/10 | Adapters for 24 of 10-15 ml centrifuge tubes (ØxH: 16x90 mm) | 2860g | On request |

¹ Relative Centrifugal Force

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.

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.

8.2.3 The rotor and other accessories are autoclavable (120°C, 20 min).

8.3 **Fuse replacement.** Disconnect the power cable from the mains. Disconnect the power cable from the socket on the rear of the unit. Open the fuse holder, located near the socket (fig. 3). Check and replace with a correct fuse, if necessary, see table below:

| Model & version | Fuse ¹ |
|-------------------------------|-------------------|
| LMC-56 V.1AD, 230 V, 50/60 Hz | M 2 A |
| LMC-56 V.1AE, 120 V, 60 Hz | M 4 A |

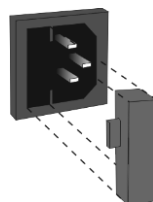


Figure 3. Fuse holder

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. 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.

¹ Fuse type M - time lag Medium

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.

10. Warranty

- 10.1 The Manufacturer guarantees the compliance of the unit with the requirements of Specifications, provided the Customer follows the operation, storage and transportation instructions.
- 10.2 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**. For extended warranty, see **10.6**.
- 10.3 The maximum service life of all rotors and associated metal cups is 7 years from the start of operation. The service life of the plastic cups is 2 years from the start of operation.
- 10.4 Warranty covers only the units transported in the original package.
- 10.5 If any manufacturing defects are discovered by the Customer, an unsatisfactory equipment report shall be compiled, certified and sent to the local distributor address. To obtain the claim form, visit **Technical support** page on our website at link below.
- 10.6 Extended warranty. For **LMC-56**, the *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.
- 10.7 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

Registration



biosan.lv/register-en

Product class description



biosan.lv/classes-en

- 10.8 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-56 , Laboratory centrifuge | | |

- 10.9 **Production date.** Production date is placed in the serial number, on the label of the unit. Serial number consists of 14 digits styled XXXXXYYMMZZZZ, 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-56** is in conformity with the following relevant Union legislations:

| | |
|--------------------------|--|
| LVD 2014/35/EU | LVS EN 61010-1:2011 Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements. LVS EN 61010-2-020:2016 Particular requirements for laboratory centrifuges. |
| EMC 2014/30/EU | LVS EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements. |
| RoHS3 2015/863/EU | Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment. |
| WEEE 2012/19/EU | 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-56

SIA Biosan

Ratsupites 7 k-2, Riga, LV-1067, Latvia

Phone: +371 67426137 Fax: +371 67428101

<https://biosan.lv>

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