Grant-bio

Laboratory centrifuge

LMC-56

Operating Manual

Contents

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.2GD, V.2GE

1.2. Edition 3.01 – November of 2024.

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.

2.2. Icons used on the unit and packaging:

CE	CE marking, manufacturer affirms conformity with European health, safety, and environmental protection standards, see section **Compliance**
	WEEE directive marking, see section **Compliance**
UK CA	UK Conformity Assessed marking, see section **Compliance**

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**.
- 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.

2.4. 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**.

2.5. 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 secured fixation screw (see figure 1, below). Securing procedure is described in **4.4**.

Figure 1. Rotor label example

- 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 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.
- 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, vacutainers, gel cards, microtest and ELISA plates. Our centrifuges are designed for safe work (metal protective 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.....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 upon even horizontal stable non-flammable surface.
- 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, 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.

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. 3/9) and lift the lid by hand.

Caution! Check the rotor, adapters and accessories 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 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 2 (✓).

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.

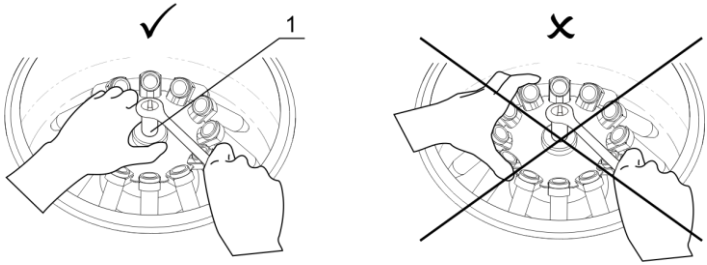


Figure 2. Rotor fixation

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.

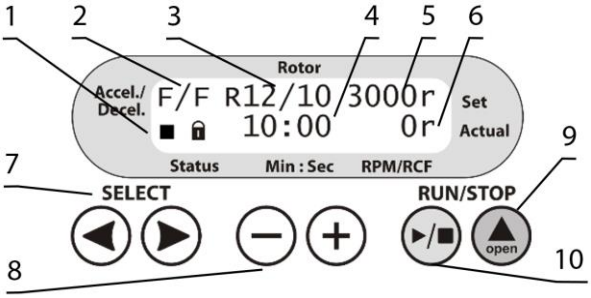


Figure 3. LMC-56 control panel.

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. 3/2);
- Set rotor speed in RPM or RCF (revolutions per minute and Relative Centrifugal Force, respectively, fig. 3/6);
- Status icons of rotor, ■ stopped or ► running (fig. 3/1, first symbol);
- Status icons of lid, closed or open (fig. 3/1, second symbol);
- Set time of centrifugation, in minutes and seconds (fig. 3/4);
- Actual rotor speed, in RPM or RCF (fig. 3/6).

5.4. Press the ▲ **Open** key (fig. 3/9) 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! Always ensure that the fixation screw on the rotor is holding the rotor tight! See **4.4** and figure 2 for fixation procedure.

Note. Safety program blocks starting of the centrifuge without first opening the lid for a rotor check. Until this action is completed, lid status icon is not displayed, and a sound signal will be emitted upon pressing the **RUN/STOP** ►/■ key.

5.5. **Setting parameters**. Use the **SELECT** ◄ and ► keys (fig. 3/7) to choose a parameter and the **–** and **+** keys (fig. 3/8) 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. 3/2, first letter). Three modes of acceleration are available, slow (shortened to **S**), normal (**N**) and fast (**F**).

5.5.2. Deceleration modes (fig. 3/2, 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.

5.5.3. Installed rotor (fig. 3/3). 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. 3/5). 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 **7.2.1** for maximum RCF.

5.5.5. Time setting (fig. 3/4). Select duration of centrifugation in minutes, step 1 minute. If the duration is set to zero minutes, centrifugation must be stopped manually.

5.6. Close the lid carefully and smoothly until a clicking sound is heard. Icon 🔒 appears on the display (fig. 3/1).

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. 3/10) to start centrifugation. Icon ► (fig. 3/1) and actual speed (fig. 3/6) are shown in the lower line of the display. The timer (fig. 3/4) 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.

5.8.1. If the time was set to zero, centrifugation continues until stopped manually by pressing the **RUN/STOP** ►/■ key.

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 **5.5.3**.

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 ►/■**.

6.1. Grant 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 or non-stop
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.3GD**); 330 W (**V.3GE**);
Operational voltage ..... 230 V~, 50–60 Hz (**V.3GD**); 120 V~, 50–60 Hz (**V.3GE**)
Voltage fluctuations ..... 220–240 V~
Weight, accurate within ±10% ..... 16.5 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

7.1. Models and versions available:

Model	Version	Description
LMC-56, laboratory centrifuge	V.3GD	230 V, 50–60 Hz
	V.3GE	120 V, 50–60 Hz

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

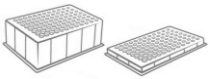
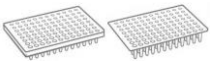
7.2.1. Optional accessories.

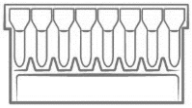
Note. Rotor detection system only detects the rotor, not the specific adapter. When multiple adapter configurations for the rotor are possible, highest RCF for the detected rotor is displayed in **g** mode.

Vessel	Rotor and adapters	Description
 Plastic conical (Falcon®) 50 ml tube Ø: 29 mm L: 115 mm	 Ri-6	Capacity per rotor: 6 tubes Maximum speed: 4200 RPM Maximum RCF: 3160 g Angle: 90°, swing out Adapter material: Aluminium
	 Ri-6P	Capacity per rotor: 6 tubes Maximum speed: 4200 RPM Maximum RCF: 3160 g Angle: 90°, swing out Adapter material: Plastic POM-C
	 BR-4U + BA-2/50	Capacity per rotor: 8 tubes Maximum speed: 4200 RPM Maximum RCF: 3260 g Angle: 90°, swing out Adapter material: Aluminium

Vessel	Rotor and adapters	Description
 Plastic conical 25 ml tube Ø: 29 mm L: 77 mm	 / + Ri-6 / Ri-6P + BI-25-6	Capacity per rotor: 6 tubes Maximum speed: 4200 RPM Maximum RCF: 3160 g Angle: 90°, swing out Adapter material: Plastic POM-C
	 + BR-4U + BA-2/50 + BI-25-8	Capacity per rotor: 8 tubes Maximum speed: 4200 RPM Maximum RCF: 3160 g Angle: 90°, swing out Adapter material: Plastic POM-C
 Plastic conical 15 ml tubes Ø: 17 mm L: 120 mm	 Ri-12/15	Capacity per rotor: 12 tubes Maximum speed: 4200 RPM Maximum RCF: 3160 g Angle: 90°, swing out Adapter material: Plastic POM-C
	 BR-4U + BA-4/FT	Capacity per rotor: 16 tubes Maximum speed: 4200 RPM Maximum RCF: 3260 g Angle: 90°, swing out Adapter material: Plastic POM-C
 Plastic round 10–15 ml tubes Ø: 16 mm L: 105 mm	 Ri-12/10	Capacity per rotor: 12 tubes Maximum speed: 4200 RPM Maximum RCF: 3160 g Angle: 90°, swing out Adapter material: Plastic POM-C
	 Ri-24/10	Capacity per rotor: 24 tubes Maximum speed: 4000 RPM Maximum RCF: 2860 g Angle: 90°, swing out Adapter material: Plastic POM-C
	 BR-4U + BA-4/RT	Capacity per rotor: 16 tubes Maximum speed: 4200 RPM Maximum RCF: 3160 g Angle: 90°, swing out Adapter material: Plastic POM-C

Vessel	Rotor and adapters	Description
 2–5 mL vacutainers Ø: 13 mm L: 82 mm	 Ri-12/10 + BN-13/75	Capacity per rotor: 12 tubes Maximum speed: 4200 RPM Maximum RCF: 3160 g Angle: 90°, swing out Adapter material: Plastic POM-C
	 Ri-24/10 + BN-13/75-24	Capacity per rotor: 24 tubes Maximum speed: 4000 RPM Maximum RCF: 2860 g Angle: 90°, swing out Adapter material: Plastic POM-C
	 BR-4U + BA-4/VT + BN-13/75-16	Capacity per rotor: 16 tubes Maximum speed: 4200 RPM Maximum RCF: 3160 g Angle: 90°, swing out Adapter material: Plastic POM-C
 4–8 mL vacutainers Ø: 13 mm L: 107 mm	 Ri-12/10 + BN-13/100	Capacity per rotor: 12 tubes Maximum speed: 4000 RPM Maximum RCF: 3160 g Angle: 90°, swing out Adapter material: Plastic POM-C
	 Ri-24/10 + BN-13/100-24	Capacity per rotor: 24 tubes Maximum speed: 4000 RPM Maximum RCF: 2860 g Angle: 90°, swing out Adapter material: Plastic POM-C
	 BR-4U + BA-4/VT + BN-13/100-16	Capacity per rotor: 16 tubes Maximum speed: 4200 RPM Maximum RCF: 3160 g Angle: 90°, swing out Adapter material: Plastic POM-C

Vessel	Rotor and adapters	Description
 8–9 mL vacutainers Ø: 16 mm L: 105 mm	 Ri-12/10 + BN-16/100	Capacity per rotor: 12 tubes Maximum speed: 4200 RPM Maximum RCF: 3160 g Angle: 90°, swing out Adapter material: Plastic POM-C
	 Ri-24/10 + BN-16/100-24	Capacity per rotor: 24 tubes Maximum speed: 4000 RPM Maximum RCF: 2860 g Angle: 90°, swing out Adapter material: Plastic POM-C
	 BR-4U + BA-4/VT	Capacity per rotor: 16 tubes Maximum speed: 4200 RPM Maximum RCF: 3160 g Angle: 90°, swing out Adapter material: Plastic POM-C
 96- and 384-well, deep-well plates, microplates L: 128 mm W: 85.6 mm H_{max}: 45 mm	 Ri-2	Capacity per rotor: 2 plates Maximum speed: 2000 RPM Maximum RCF: 560 g Angle: 90°, swing out
 Semi- and unskirted 96-well microplates L: 128 mm W: 85.6 mm H_{max}: 45 mm	 Ri-2 + AP-96	Capacity per rotor: 2 plates Maximum speed: 2000 RPM Maximum RCF: 560 g Angle: 90°, swing out Adapter material: Plastic Ertacetal C
 384-well plates, micro-plates, unskirted L: 128 mm W: 85.6 mm H_{max}: 45 mm	 Ri-2 + AP-384	Capacity per rotor: 2 plates Maximum speed: 2000 RPM Maximum RCF: 560 g Angle: 90°, swing out Adapter material: Plastic Ertacetal C

Vessel	Rotor and adapters	Description
 Gel cards L: 74 mm H: 53 mm	 Ri-24/GC	Capacity per rotor: 24 gel cards Maximum speed: 1500 RPM Maximum RCF: 280 g Angle: 90°, swing out
 5 mL microtubes and tubes Ø: 16 mm; L: 60 mm	 BR-4U + BA-8/5	Capacity per rotor: 32 tubes Maximum speed: 4200 RPM Maximum RCF: 3260 g Angle: 90°, swing out Adapter material: Plastic POM-C
 1.5–2 mL microtubes Ø: 11 mm; L: 40 mm	 RMT-24	Capacity per rotor: 24 microtubes Maximum speed: 6000 RPM Maximum RCF: 3750 g Angle: 45°, fixed
	 BR-4U + BA-14/2U	Capacity per rotor: 56 microtubes Maximum speed: 4200 RPM Maximum RCF: 3260 g Angle: 90°, swing out Adapter material: Plastic POM-C
Stand for rotors	 RR-U	

7.2.2. Replacement parts. Rotor default adapter sets.

Model	For rotor	Description	Max. RCF
BN-11/30	Ri-6P	Plastic adapters for 6 of 50 ml centrifuge tubes (ØxH: 40x103 mm)	3160g
BN-11/30A	Ri-6	Aluminium adapters for 6 of 50 ml centrifuge tubes (ØxH: 40x103 mm)	3160g
BN-17/120	Ri-12/15	Adapters for 12 of 15 ml centrifuge tubes (ØxH: 17x120 mm)	3160g
BN-16/90T	Ri-12/10	Adapters for 12 of 10-15 ml centrifuge tubes (ØxH: 16x90 mm)	3160g
BN-16/90T-24	Ri-24/10	Adapters for 24 of 10-15 ml centrifuge tubes (ØxH: 16x90 mm)	2860g

8.1. When used in laboratory conditions and according to this working manual, this product is guaranteed for TWO YEARS against faulty materials or workmanship. For full details of the Grant Bio Warranty policy, please contact Grant Instruments.
8.2. **Service**.
8.2.1. 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 Grant or your local Grant representative.
8.2.2. All maintenance and repair operations (except listed below) must be performed only by qualified and specially trained personnel.
8.2.3. Operating integrity check. If the unit follows the procedure described in section **Operation**, then no additional checks are required.

8.3. **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 Grant or your local Grant representative for replacement.
8.3.1. 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.
8.3.2. To disinfect the plastic and metal parts, use 75% ethanol or DNA/RNA removing solution. After disinfecting, wipe the surfaces dry.

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

8.3.3. 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!

8.4. **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. 4). Check and replace with a correct fuse, if necessary, see table below:

Model & version	**Fuse**[1]
LMC-56 **V.3GD**, 230 V~, 50–60 Hz	M 2 A
LMC-56 **V.3GE**, 120 V~, 50–60 Hz	M 4 A

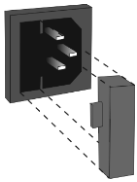


Figure 4. Fuse holder

8.5. **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.

[1] Fuse type M - time lag Medium

EU Declaration of Conformity

All the products covered by this Manual comply with the requirements of the EU harmonised legislation verified using the following standards

Low Voltage Directive (2014/35/EC) for Electrical safety.	LVS EN 61010 Part 1 LVS EN 61010 Part 2-020
EMC directive (2014/30/EC) for Electromagnetic compatibility	LVS EN 61326-1
RoHS Directive (Directive 2011/65/EC including 2015/863) for Hazardous substances	LVS EN 50581

UK Declaration of Conformity

All the products covered by this Manual comply with the requirements of UK statutory requirements verified using the following standards.

Electrical Equipment (Safety) Regulations 2016	BS EN 61010 Part 1 BS EN 61010 Part 2-020
Electromagnetic Compatibility Regulations 2016	BS EN 61326-1
The Restriction of the Use of Certain Substances in Electrical and Electronic equipment Regulations 2012	BS EN 50581

Waste Electrical and Electronic Equipment (WEEE)

All the products covered by this Manual are marked with the crossed-out wheelie bin symbol indicating they must not be disposed of with unsorted waste. Safe recycling of WEEE helps conserve natural resources and protect human health.

Grant Instruments complies fully with the UK Waste Electrical & Electronic Equipment (WEEE) regulations 2013. We are a member of the B2B compliance scheme (Scheme Approval Number WEE/MP3338PT/SCH), which handle our WEEE obligations on our behalf. Grant Instruments have been issued with a unique registration number by the Environmental Agency, this reference number is WEE/GA0048TZ.

For information regarding WEEE collections in the UK please contact our B2B Compliance Scheme directly on 01691 676 124 or **www.b2bcompliance.org.uk**

In the EU, Grant Instruments complies with WEEE Directive 2012/19/EU.
Contact your local equipment supplier for WEEE collections.

REACH Regulations

This product does not contain any Substances of Very High Concern (SVHCs) at greater than 0.1% that have to be identified in accordance with Regulation (EC) No 1907/2006 and therefore does not have an entry in the SCIP database.

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Laboratory centrifuge / LMC-56 / 3.01