

Grant-bio

Laboratory centrifuge LMC-3000

Operating instructions



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












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




1. Safety

The following symbols mean:



Caution: Read these operating instructions fully before use and pay particular attention to sections containing this symbol

-  Use only as specified by the operating instructions, or the intrinsic protection may be impaired.
-  After transport or storage in humid conditions, dry out the unit during 2-3 hours before connecting it to the supply voltage. During drying out the intrinsic protection may be impaired.
-  The unit must be stored and transported only in a horizontal position (see marking on the package).
-  Connect only to a power supply with a voltage corresponding to that on the serial number label.
-  Connect only to a power supply which provides a safety earth (ground) terminal.
-  Ensure that the mains switch and isolating device (power supply connector) are easily accessible during use.
-  Ensure that no persons and/or dangerous materials are located within a safety zone of 300 mm around the equipment when the centrifuge is running. This area should be marked.
-  Before moving, disconnect at the power supply socket.
-  Do not operate the unit outside the laboratory premises.
-  Do not operate the unit in premises with aggressive or explosive chemical mixtures.
-  Do not put flammable or chemically vigorously reactive materials into the centrifuge.
-  If liquid is split inside the unit, disconnect it from the power supply and have it checked by a competent person.
-  It is the user's responsibility to carry out appropriate decontamination if hazardous material is spilt on or inside the equipment.
-  Before using any cleaning or decontamination method except those recommended by the manufacturer, user should check with the manufacturer that the proposed method will not damage the equipment.
-  Do not use rotors with visible signs of corrosion, wear or mechanical damage.
-  When loading use even number of tubes arranged symmetrically (facing one another) to give the unit even balance during operation. The opposite tubes must be filled up equally.

-  Do not fill in the containers after they are inserted in the rotor.
-  Centrifuge containers must not be filled over the capacity specified by the manufacturer.
-  Do not centrifuge flammable or chemically vigorously reactive materials.
-  Without additional bioseal the centrifuge is not a biosafety system in accordance to EN61010-2-20 and cannot be used for centrifuging hazardous materials contaminated with toxic, radioactive or pathogenic micro-organisms.
-  Use only original accessories (rotors, adaptors, etc.) provided by the manufacturer.
-  Rotor must always be fixed securely. Stop the operation immediately with the RUN/STOP button if any unusual noise occurs during acceleration which can be due to improper rotor fixation.
-  The unit should be saved from shocks and falling.

2. General Information

LMC-3000 is a modern benchtop laboratory centrifuge useful for sedimentation of cells, bacteria, yeast, formed blood elements. It provides operation with tubes and microtest plates. LMC-3000 is designed for safe work (metal protecting housing), easy maintenance and wide application range in biochemical, industrial and other type laboratories.

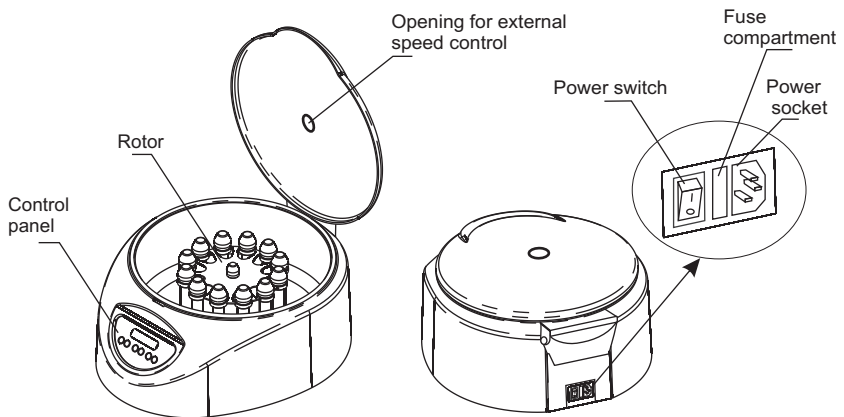


Fig.1 Overall view

3. Getting started

3.1. Unpacking

Remove packing materials carefully, and retain for future shipment or storage of the unit.

3.2. The Laboratory Centrifuge LMC-3000 set includes:

- Laboratory Centrifuge LMC-3000 1 pce.
- A spare fuse (inside the fuse holder) 1 pce.
- Power cord 1 pce.
- Rotors on request
- Wrench for rotor replacement 1 pce.
- Specifications, Operating manual, Certificate 1 pce.

3.3. Set up:

- place the centrifuge on the even stable surface;
- plug the mains power cord into the socket on the rear, and position the centrifuge so that there is easy access to the power switch and connector;
- It is necessary to observe the safety area of 300 mm around the centrifuge in accordance with EN-61010-2-20. Persons and hazardous materials must not be located in the safety area whilst the centrifuge is in operation. This area should be marked.
- do not place any objects in front of the ventilation slots underneath and 100 mm behind the centrifuge.

3.4. Rotor replacement

- Hold the rotor with one hand and with the help of the supplied wrench (13 mm) turn fixation nut (fig.2/1) anti-clockwise to release the rotor.
- Replace the rotor and secure the new rotor carefully and turning the fixation nut tightly.

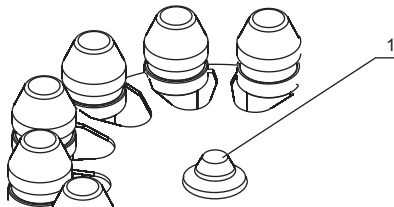


Fig.2 Rotor

4. Operation of LMC-3000

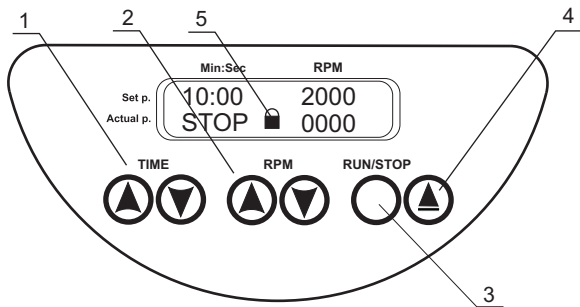





Fig.3 Control panel

- 4.1. Check the power cord for any signs of damage and replace if necessary. Connect the power cord to the mains outlet. Switch ON the power switch on the rear.
- 4.2. The centrifuge turns on and lid opens automatically. The display shows the following readouts:
 - previously set time and speed in the upper line (*set p.*);
 - mode indication (OPEN - lid open, rotor stopped) and current speed - 0 RPM in the lower line (*actual p.*).
- 4.3.  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 facing one another. The loading in the opposite tubes must be equal.
- 4.5. Close the lid (the clicking sound of the lock) readings STOP and  (fig.3/5) in the lower line of the display indicate that the lid is closed.
 **Note!** If any of these readings has not appeared on the display centrifugation cannot be started. Try to open and close the lid again.
- 4.6. With the “▲” and “▼” **TIME** buttons (fig. 3/1) set the required time interval (0-90 min, increment 1 min).
- 4.7. With the “▲” and “▼” **RPM** buttons (fig. 3/2) set the required speed (100-3000 RPM, increment 100 RPM). Note that the speed can also be adjusted during operation.



Note that some plastic tubes and microtest plates can be damaged at higher speeds. Refer to the tube material specifications to make sure that it will not get damaged at the set speed. Do not set speed higher than 2000 RPM when working with microtest plates!.

- 4.8. Press **RUN/STOP** button (fig. 3/3) to start centrifugation. Blinking indication RUN and current speed is displayed in the lower line. The timer in the upper line starts countdown after the set speed is achieved (stable indication RUN).



Note: If the rotor imbalance occurs causing vibration the centrifuge stops automatically (indication IMBALANCE). After the rotor is stopped open the lid and remedy the cause of imbalance.

- 4.9. Centrifugation is stopped automatically after the set time elapses (while braking display shows blinking indication STOP. A sound signal is emitted after full stop of the rotor (press **RUN/STOP** button (fig.3/3) to stop the signal).
- 4.10. If necessary centrifugation can be stopped before the set time elapses by pressing **RUN/STOP** button. The set time interval will be shown on the display.
- 4.11. Press the button ▲ (fig.3/4) and open the lid lifting it upwards with a hand (it is possible to open the lid only when the rotor is stopped). Display shows OPEN.
- 4.12. At the end of operation turn OFF the centrifuge with switch on the rear. Disconnect the power cord from the mains outlet.



Note: The electrical lid lock allows opening the lid only when the centrifuge is connected to the power supply and is turned on. Do not force the lid to open when the centrifuge is switched off!

Lid emergency opening

Disconnect the power cord from the mains outlet and allow the centrifuge to stop.

Slide the centrifuge 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 centrifuge as this may cause spilling of the materials from the containers inside the centrifuge.


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" and move the lever from the left to the right hand side to release the lid lock.

5. Specifications

-
- Speed range 100 - 3000 RPM (increment 100 RPM);
 - Rotation direction counterclockwise;
 - Working diameter 335 mm;
 - Timer 1 - 90 min (increment - 1 min);
 - Rotor imbalance automatic diagnostics (emergency stop, indication "IMBALANCE");
 - Rotor slowdown time, not more 30 sec;
 - Display LCD;
 - Power 230 V, 50/60 Hz; 130 W or 115 V, 50/60 Hz;
 - Dimensions 470x400x235 mm;
 - Weight, not more 13,5 kg;

- **Operating conditions**

The product is designed for operation in closed laboratory rooms at ambient temperature from +2°C to +40°C and maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.

- R-12/10** Speed range 100 - 3000 RPM, swing-out rotor with plastic open holders for 12 round bottom centrifuge tubes without cap (10-15 ml, max. dia x length - 16 x 105 mm);
- R-12/15** Speed range 100 - 3000 RPM, swing-out rotor with open plastic holders for 12 conical bottom centrifuge tubes with cap (15 ml, max. dia x length - 17 x 120 mm);
-  **R-2** Speed range **100 - 2000** RPM, swing-out rotor for 2 x standard 96-well microtest plates (max. WxDxH 128x85.6x45 mm);
- R-6** Speed range 100 - 3000 RPM, swing-out rotor for 6 x conical bottom centrifuge tubes with cap (50 ml, max. dia x length - 29 x 115 mm).

To improve the design manufacturer reserves the right to make changes in specification without prior notice.

6. Maintenance

6.1. Guarantee

When used in laboratory conditions and according to these working instructions, this product is guaranteed for TWO YEARS against faulty materials or workmanship.

6.2. Service & Maintenance

There are no user-serviceable parts inside the unit. For all maintenance and repairs (except as defined below) return to our service department in the UK or in other countries, our distributor.

6.3. Cleaning & Disinfection

Cleaning liquids that do not contain concentrate organic solvents, alkali or acid can be used for device cleaning.

Rotors and other accessories are not autoclavable.

Standard ethanol (75%) can be used for disinfection. It is recommended to perform disinfection after operation session by cleaning the parts inside the centrifuge chamber.

6.4. Replacement of fuses (fig.4)

Disconnect from the power supply socket.

Remove the IEC power plug from the rear of the unit. Pull out the fuse drawer by applying leverage in recess (A). Remove the fuse from the holder. Check and replace with the correct fuse if necessary (230V, T1A(250V); 115V, T2A(250V).

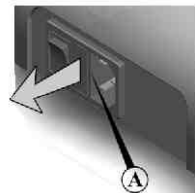


Fig.4 Fuse holder

6.5. Routine safety tests

If routine tests are to be made, we recommend a test of the integrity of the protective earth conductor and an insulation test at 500 Vdc. Routine flash tests are not recommended for any electrical equipment, because repeated high voltage tests degrade insulation materials.

Declaration of Conformity

Manufacturer:

BIOSAN LTD.
Ratsupites 7, build.2, Riga, LV-1067, Latvia

Equipment name/type number:

LMC-3000

Description of Equipment:

Centrifuge

Directive:

EMC Directive 2004/108/EC
Low Voltage Directive 2006/95/EC

Applied Standards

EN 61326-1:2006

Electrical equipment for measurement,
Control and laboratory use - EMC
requirements

Harmonized Standards:

Part 1:

General requirements

LVS EN 61010-1:2001

Safety requirements for electrical
equipment for measurement, control
and laboratory use.

General requirements

LVS EN 61010-2-020:2006

Particular requirements for laboratory
centrifuges.

I declare that this apparatus conforms to the requirements of the above Directive(s)


Svetlana Bankovska
Executive Director
Biosan Ltd.

Dated 29 10 2010

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