

## Centrifuge CM-50



## User manual





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## Dear users!

Centrifuge CM-50 is easy to use and reliable in operation. We ask you to carefully read the user manual and follow the instructions for proper operation and maintenance of the CM- 50. This will insure excellent results and enduring performance.

## General information

Centrifuge CM-50 is designed to separate solutions into fractions. This microprocessor-controlled system provides smooth rotor acceleration and braking during all segments of the operation. A big graphical display offers instant readout of all the relevant parameters, including time, braking level and rotor speed (simultaneous RPM and RCF). The centrifuge lid locks during rotation and unlocks at the end of each run. Adjustable sound alarm, brightness and sleep mode are also standard. Imbalance detection and a temperature sensor protect the unit from imbalancing and overheating.

## Technical specifications

Rotor rotation speed, RPM	1000-15000
Speed step selection, RPM	100
Centrifugal force, RCF	1000-15294
Centrifugal force step selection, RCF	10
Timer settings, Min	0.1-99
Number of braking levels	5
Total possible imbalance of test tubes, g	1.5
Environmental temperature, °C	10-40
Relative air moisture at 20°C, %	80
Power supply adapter,	24V-5A
Power consumption, W	not more than 120
Size of the device (length x width x height), mm	200x180x145
Weight, kg	3.1

## Delivery package

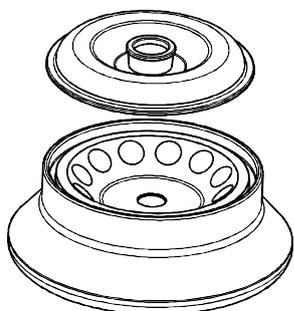
Item	Quantity
Centrifuge .....	1
Rotor nut.....	1
Rotor key .....	1
Power supply adapter 24V- 5A 120W .....	1
Power cord .....	1
User manual .....	1
Packaging material .....	1

## Preparation to work

- Unpack the device.
- Inspect the appearance of the device, the adapter and the power cord for damage.
- Open the lid of the CM-50 with the emergency lid opening lever and remove the packaging material (see emergency opening of the centrifuge lid p.7).
- In the cold season keep centrifuge at room temperature for at least 2 hours.
- Assembly the rotor.
- Rotor must rotate freely without jamming.
- Centrifuge itself determines and configures to the installed rotor.
- Connect the centrifuge to the adapter and the adapter to the socket.
- Thus, the light indicators will light up.
- In the absence of faults or damage the centrifuge can be considered ready to work.
- In the presence of faults and damage, do not use the centrifuge without consulting a specialist.

**ATTENTION! Network socket must correspond to the adapter plug. In case of non-compliance with this condition the rules of electrical safety are violated.**

## Rotor 50.01

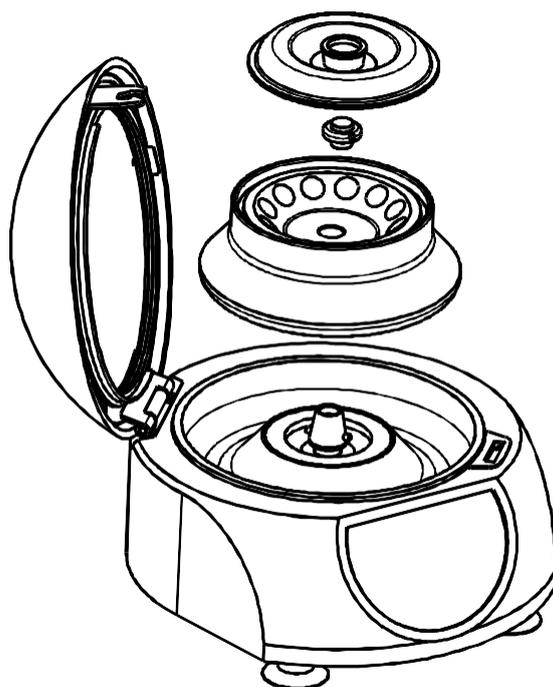


Highspeed rotor 50.01 for 12 test tubes with aerodynamic, hermetic lid.  
Maximal rotation speed 15 000 RPM.  
Maximal centrifugation force 15 294 RCF.

Applied test tubes:

- 1) 1.5-2 ml
- 2) 0.5 ml with adapters
- 3) 0.2 ml with adapters

## Rotor assembly and usage



**Assembly:** put the rotor on the shaft first and then tighten the nut with a provided hand driven key.

**Usage:** always load the rotor symmetrically. By minimizing the difference of weight between the filled test tubes, you reduce the wear of mechanical parts of the centrifuge. If the overall imbalance of test tubes exceeds 1 gram, centrifuge will not start, and the display will show DISBALANCE error code.

**Rotor 50.01** must be used with the aerodynamic lid, which securely covers the tubes inside the rotor, reduces noise level and the heating of test tubes.

# Understanding controls

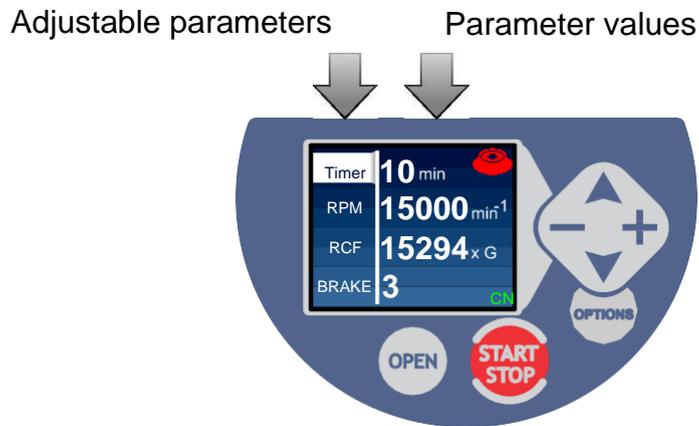


Fig.1 Control panel



Start/stop centrifugation



Lid opening



Up and Down menu scroll and parameter change



Entering options menu



By pressing and holding down "OPTIONS" for 3 seconds you enter options menu to adjust screen brightness, beeper volume and interface language.

# Operating centrifuge



Settings adjustments are made using the "+/- up/down" keyboard. Parameters can only be change while the centrifuge is not running.



Rotor icon has a color code.  
 - Green color means that the lid is opened.  
 - Red color means the lid is closed and you can now run the centrifuge.



green



red



To run centrifugation just press "START/STOP" button.



By reducing the timer to the minimum, you will reach a "Short run" mode. This mode allows using "START/STOP" button to manage the duration of the spindown. Centrifuge will run while the button is depressed and will stop automatically when released.

## Braking levels (15000 rpm, full rotor)

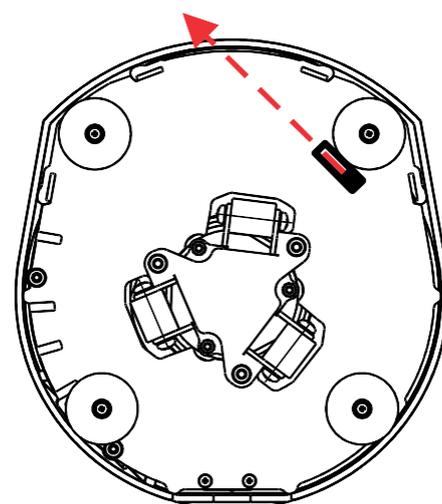
Level	Seconds
1.....	28
2.....	20
3.....	15
4.....	13
5.....	11

## Error codes and solutions

Error code	Cause	Solution
<b>“BLACK SCREEN”</b>	No main power connection. Power failure	Check connection of the power cable. Check if the power supply adapter is functioning.
 <b>THE LID IS NOT SHUT</b>	Centrifuge lid is left open.	Close and press on the lid till you hear a click.
 <b>DISBALANCE</b>	Total imbalance of test tubes is more than 1 gram.	Load rotor symmetrically.
 <b>PCB OVERHEAT</b>	Processor Control Board is overheated.	Give a little time and centrifuge will cool down automatically.
 <b>MOTOR OVERHEAT</b>	Motor is overheated.	Give a little time and centrifuge will cool down automatically.
 <b>POWER PROBLEM</b>	Bad connection of ac cord to adapter, or adapter to centrifuge. Adapter failure.	Turn off and on the machine with network switch. Check all the connections and the power supply. If necessary, replace the power supply adapter.
Rotor detection fails. Centrifuge does not start. Power supply cuts off. Imbalance detection failure.	Controller factory settings mismatch.	<b>For service specialists only!</b> Go to “TO” special menu.

## Emergency opening of centrifuge lid

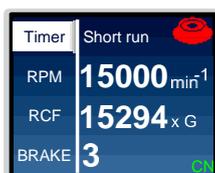
To open the lid of centrifuge in case of power failure or lock damage of the lid it is necessary to raise the centrifuge and move the lever, which is located on the bottom of a centrifuge under the control panel, to the side as it is shown on the figure.



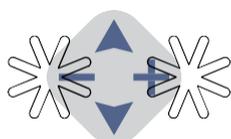
# Restoring factory settings using special "TO" menu



**For service specialists only!**



When in "CN" mode turn the centrifuge off by clicking the main power switch to "off" position.



Press and hold down both buttons (-) and (+). While holding down the buttons click the power switch to "on" position.



Centrifuge will enter to a special service menu "TO".

## Understanding the screen readouts:

Parameter	Modifiable parameter	Actual parameter
Rotor	641	615
Disbal.	190	001
Current.	142	142
Temp.	204	210 <small>TO</small>



Compare the "modifiable parameter" figures with corresponding factory default figures that you can find on the **"certificates"** page in the end of this manual. If figures do not match - correct them manually using "up/down +/-" keyboard.

## Safety features

- Do not plug the device in to a power outlet with configuration that differs from the power adapters configuration.
- Do not use the device with damaged adapter, power cord, rotor aerodynamic lid or housing.
- Do not move the device during centrifugation.
- Do not run the unit without rotor aerodynamic lid or housing.
- Do not load the rotor asymmetry.
- Do not use damaged tubes.
- Must not be operated in explosive atmospheres.
- Do not centrifugate any sort of explosive, poisonous or any other kind of hazardous liquid.
- Do not centrifugate any sort of toxic and radioactive liquids.

**ATTENTION! Studied Samples may contain pathological material, including pathogens of serious diseases.**

## Disinfection and cleaning

Before you start disinfection or cleaning make sure the power adapter is unplugged. It is recommended to perform cleaning with water and universal washing liquids. Afterwards the machine should be carefully dried. Do not let the water get inside the centrifuge.

## Transportation and storage

To ensure safety during the transportation, transported equipment should be packed in the original manufacturers packaging or similar packaging substitute. Equipment can be transported by any kind of closed transport make sure that equipment is tightly fixed, and transportation runs accordingly to regulations applied to this way of transport. Equipment should be stored in original manufacturers packaging in dry room with humidity not more than 80% and temperature range from +10 °C up to +40 °C. It is not recommended to store the equipment more than 36 month.

## Warranty statements

- Warranty applies to 24-month period from the date of purchasing.
- Malfunctions arisen by the fault of manufacturer during warranty period, are removed free of charge.
- Warranty is not valid in the following cases:
  - If the serial number label of the manufacturer is damaged.
  - If damages appear as a result of the incorrect operation, transportation or storage.
- These documents are necessary if applying for warranty repair:
  - User manual with serial number of the machine.
  - Officially signed report, describing the reasons and conditions of equipment malfunction.
- Warranty repair could be performed only if the equipment is delivered in the original manufacturers packaging or equally safe packaging. Therefore, please save the packaging after unpacking the device.
- If the above warranty requirements are disturbed, repair charges are applied to the consumer.
- For all further questions concerning exploitation and maintenance please contact manufacturer or product vendor.

# Certificate of approval

Centrifuge CM-50\_\_N\_\_\_\_\_ has been inspected for the technical conditions and meets all regulations necessary for such class of device.

Quality control person \_\_\_\_\_  
(name) (signature)

Date of manufacture \_\_\_\_\_.

Place for stamp.

# Certificate of sale

Organization \_\_\_\_\_.

Address \_\_\_\_\_.

Phone \_\_\_\_\_.

Vendor \_\_\_\_\_  
(name) (signature)

Date of sale \_\_\_\_\_.

Manufacturers' address  
21-136 Aizkraukles Str., Riga LV-1006  
Tel: (+371) 6755 8743  
Tel: (+371) 6755 1934  
E-mail: info@elmi-tech.com  
WWW: www.elmi-tech.com

## Default factory settings

<b>Rotor</b>	
<b>Disbal.</b>	
<b>Current</b>	



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