

1. Introduction

Congratulations, you have acquired ELMi centrifuge, a product of advanced technology and high quality!

Centrifuge CM-7S Plus is easy to use and reliable in operation. We ask you to carefully read the user manual and observe all the requirements of the maintenance and operation this will ensure long and flawless exploitation of the device.

Centrifuge CM-7S Plus is designed to separate solutions into fractions. The device is used in medicine, analytical chemistry, microbiology, virology, clinical biochemistry, etc.

1.1 Technical specifications

Rotor rotation speed, RPM	from 100 to 3500 → maxim
Maximal relative centrifugal force, RCF (G)	2300
Accuracy of rotation speed maintenance, %	±2
Timer range, min	diapazon minim de timp, minute 1-99
Braking levels	6
Step-type behaviour of setting:	setarea vitezei (10)
rotor rotation speed, RPM	10
centrifugal force, RCF (G)	10
time, sec	incrementarea 1
The level of noise 1 m in distance, db(A)	no more than 61
Working range of temperatures, °C	from +10 to +40
Relative air moisture, %	80
Total allowed imbalance of test tubes, g	no more than 7
Allowed deviations of voltage, V	110-240
Allowed deviations of frequency, Hz	nivelul de zgomot 50-60
Maximal consumable power, W	250
Size of the device (length x width x height), mm	431 x 410 x 247
Weight, kg	13.8

1.2 Delivery package

Item	Quantity
Centrifuge.....	1
Power cord	1
Rotor	1
Rotor key / emergency lid opening key.....	1
Rotor nut and spacer	1
User manual	1
Packaging.....	1

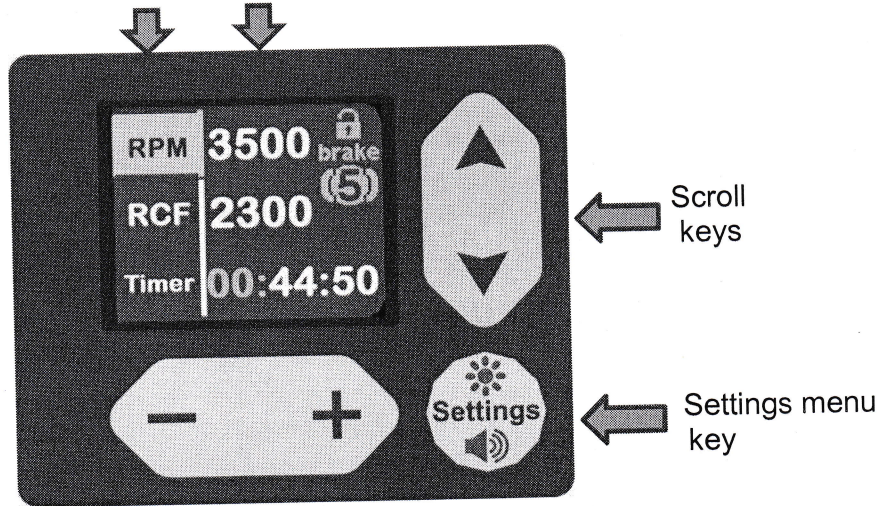
4. Control description

Centrifuge consists of a stainless still casing, rotor mounted in it, electric motor and control system. The rotor is covered with self-locking transparent lid. A network switch is mounted in the back of the casing. Control panel on the front of the casing contains display and buttons with the following functions:

capac transparent pentru procedura de verificare periodică a funcțiilor

display digital

Adjustable parameter Parameter value

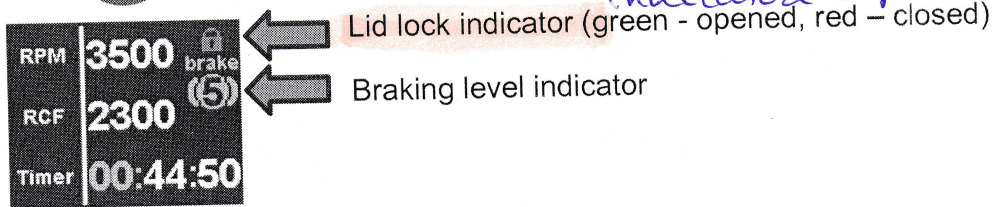


- Button to unblock the lid of centrifuge.

Indicator pornire / oprire

- Button to start the centrifugation or to end the cycle before the estimated time.

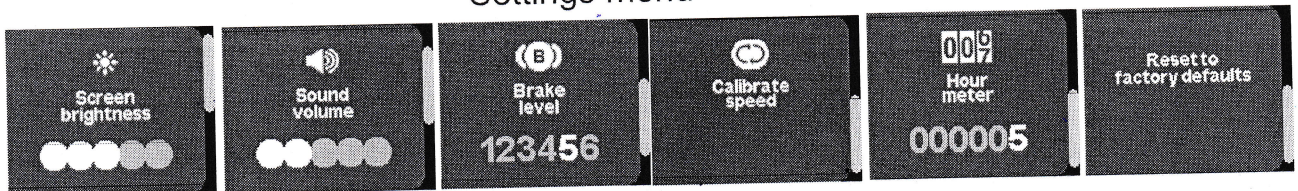
indicatori capac deschis



Lid lock indicator (green - opened, red - closed)

Braking level indicator

Settings menu



Parameters such as screen brightness, beeper volume and brake level can be adjusted in the settings menu.
 Parameters of each brake level are displayed on page 6.
 The working hour meter of centrifuge is also located in the settings menu.
 Speed calibration and factory default reset menus are for service engineers only.

5. Operating

Place the test tubes in the rotor adapters. Always load the rotor symmetrically by minimizing weight difference between the filled test tubes you reduce the wear on mechanical parts of centrifuge. The total imbalance of test tubes should not exceed 7 grams. *blokada kapaciteta centrifuge*
For safety reasons the centrifuge lid automatically locks when closed and unlocks at the end of centrifugation cycle. Lid can be unlocked with "OPEN" button but only with stand still rotor. Settings and adjustments of the parameters of centrifuge must be made before the start of centrifugation cycle, with opened or closed lid. After pressing start, during the centrifugation cycle parameters can't be adjusted.

5.1. Setting rotor rotation speed / G force parameter:

Select the RPM / RCF parameter with scroll keys and set needed value with tuning keys. The centrifuge is equipped with rotor detecting system that manages top speed parameter to the rotor type.

5.2 Setting time parameter:

Select the time parameter with scroll keys and set needed countdown timer value with tuning keys.

5.3 Unlocking centrifuge lid:

Unlock centrifuge lid by pressing the "OPEN" button. For safety reasons, pressing this button during centrifugation stop the cycle before the estimated time. After the end of centrifugation cycle the lid unlocks automatically.

5.4 Starting the centrifuge:

Close the centrifuge lid and start the centrifugation cycle by pressing the "START/STOP" button.

5.5 Stopping centrifuge before estimated time runs out:

To stop the centrifuge before the end of centrifugation cycle press the "START/STOP" button. This action can be done with "OPEN" button as well.

5.6 Setting braking level:

To set desired braking level enter settings menu and select value from 1 to 6. Braking levels have the following parameters:

Braking level

Stopping time from 3500 RPM to 0

1	30 sec
2	45 sec (default setting)
3	60 sec
4	90 sec
5	120 sec
6	150 sec

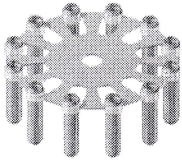
Attention! Operation must be stopped immediately if there are any unusual noises or vibration.

Attention! Check the rotor and rubber seal for wear each time before starting the centrifuge.

7. Applied rotors

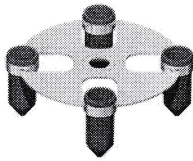
Rotor

Description



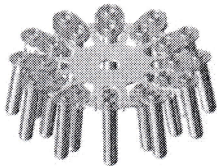
ROTOR 6M

Universal stainless-steel rotor for 12 adapters
Maximal volume of applied test tubes: 12 ml
Maximal size of applied test tubes: (D x L) 17.5 x 115 mm
Top speed: 3500 rpm
Total test tube imbalance limit: 5 g
Autoclave sterilization at a temperature up to 121 °C (20 minutes) is allowed.



ROTOR 6M.01

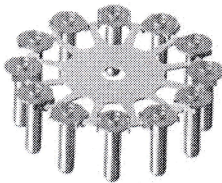
Universal rotor for 4 adapters
Maximal volume of applied test tubes: 50 ml
Maximal size of applied test tubes: (D x L) 30 x 135 mm
Top speed: 3500 rpm
Total test tube imbalance limit: 3 g
Autoclave sterilization at a temperature up to 121 °C (20 minutes) is allowed.



ROTOR 6M.02

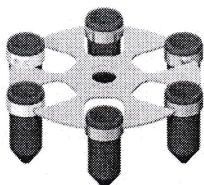
Universal stainless-steel rotor for 24 adapters
Maximal volume of applied test tubes: 12 ml
Maximal size of applied test tubes:
Inward row (D x L) 17.5 x 115 mm
Outward row (D x L) 17.5 x 140 mm
Top speed: 3500 rpm.
Total test tube imbalance limit: 7 g
Autoclave sterilization at a temperature up to 121 °C (20 minutes) is allowed.

*memarul de tuberi 24
tipul tuburilor - 12ml*



ROTOR 6M.05

Universal stainless-steel rotor for 12 adapters
Maximal volume of applied test tubes: 15 ml
Maximal size of applied test tubes: (D x L) 17.5 x 140 mm
Top speed: 3500 rpm
Total test tube imbalance limit: 5 g
Autoclave sterilization at a temperature up to 121 °C (20 minutes) is allowed.



ROTOR 6M.06

Universal rotor for 6 adapters
Maximal volume of applied test tubes: 50 ml
Maximal size of applied test tubes: (D x L) 30 x 125 mm
Top speed: 3500 rpm
Total test tube imbalance limit: 5 g
Autoclave sterilization at a temperature up to 121 °C (20 minutes) is allowed.