

USER'S MANUAL

LABORATORY CENTRIFUGE CENTRIC 350



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PREFACE

Dear customer,

Congratulations for purchasing our centrifuge CENTRIC 350. You have selected a reliable device which combines many advantages.

A wide selection of programming options and electronic operation control allow a trouble-free use of the centrifuge. With a special drive, maintenance-free and quiet operation without any carbon dust pollution is guaranteed.

Your device is equipped with user-friendly options, which make the operation and standard settings easier for you. Built-in error detecting functions keep the user from entering incorrect values and they check the complete operation.

The centrifuge has the possibility to save programs. You can save up to 100 different data sets in the memory. The centrifuge always keeps the last run program in its memory for an unlimited amount of time, allowing the program to be restarted at any time - even if the centrifuge was turned off in-between. All important operation parameters can be seen at a glance.

The settings are executed via two knobs and keys on the control panel. The centrifuge and its interior are also easy to clean.

Regarding to all above, you have a device that combines functional variety with practical applications.

We thank you for your confidence and wish you a successful application of the centrifuge.

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1. SAFETY INFORMATION


Before using the machine, make sure to read and understand this manual thoroughly. Keep the manual close to the machine, easily accessible to all the users.

Improper operation can cause injury to persons or damage to the equipment.

1.1 WARNING SYMBOLS

The following are the warning symbols that are used in this manual and on the machine.

	This symbol indicates a potential risk and alerts you to proceed with caution. Documentation must be consulted in all cases where this symbol is marked, in order to find out the nature of the potential hazards and any actions which have to be taken to avoid them.
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	This symbol indicates potential biological risks and alerts you to proceed with caution.
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1.2 SAFETY INSTRUCTIONS

In the interest of your own personal safety, always observe the following safety instructions:

- Do not use rotors and buckets, which show clear signs of corrosion or mechanical defects. Please check the accessories at regular intervals.
- Always load the rotor with the same test tubes on all positions or symmetrically with the pairs of the same test tubes. To prevent negative consequences of unbalanced rotor, like damaged bearings and motor axle, or inadequate results of centrifugation, equal or equally loaded test tubes must be symmetrically arranged regarding to the rotation axis.
- Please use only the original accessories for centrifugation.
- Do not move or knock the centrifuge during operation!
- Repairs must only be performed by an authorized service technician.
- The centrifuge may only be used for specified applications. It may not be used in a hazardous or potentially flammable environment and for centrifugation of explosive or highly reactive substances.
- When handling toxic, aggressive or radioactive materials, observe national regulations or regulations defined by World Health Organization.
- Fluids or materials used for cleaning and disinfecting should be disposed of in accordance with approved laboratory regulations.
- If any liquids are spilled in the rotor chamber, on the rotor or accessories, the surfaces must be cleaned immediately. You can use a damp cloth and mild soap solution. This is particularly important for the cleaning of the bores of the fixed-angle rotors.
- Density of the liquid must not be exceeded 1.2 g/ml at maximal rotational speed.

- During longer spin times, test tubes may heat up. Observe the requirements and regulations specified by test tube manufacturer.
- The use of organic solvents and reagents may have adverse effect on the stability of plastic test tubes.
- Rotors are high-grade components which are subjected to extreme mechanical strain. Aluminium rotors are protected against corrosion.
- Please ensure that the rotors are protected from mechanical damage. Even slight scratches and cracks can cause severe inner damage to the rotor material.
- Please clean your rotors regularly using a neutral cleaning liquid (e.g. Extran...). This will protect the rotors and maintain their service life.
- If the unit is used in a manner not specified by the manufacturer the degree of protection provided by the unit may be impaired.
- Only trained operator is allowed to use the centrifuge.
- The operator shall wear gloves as protective equipment.
- During cleaning, it is necessary to use protective gloves or other safeguards.
- Bioseals are not to be relied on as the only means of safeguarding workers and the environment when handling pathogenic micro-organisms. Bioseals and related components are intended to be part of bio-containment systems as specified in international and national bio-safety guidelines instructions for use of bioseals and other bio-containment components.
- You should use caution when the materials to be used with a laboratory centrifuge are known to be toxic, radioactive, or contaminated with pathogenic micro-organisms.
- If hazardous material is spilt, it is your responsibility to carry out appropriate decontamination.
- Before using any cleaning or decontamination methods except those recommended by the manufacturer, you should check with the manufacturer that the proposed method will not damage the equipment.
- Cleaning and decontamination may be necessary as a safeguard before laboratory centrifuges, rotors, and any accessories are maintained, repaired, or transferred.
- Inspection of the protective casing, routine maintenance and the replacement of bioseals and other bio-containment components should be regularly performed by authorised service.
- The centrifuge may only be used in laboratories with basic electromagnetic environment.

2. INTRODUCTION

2.1 INTENDED USE

Centrifuge CENTRIC 350 is a laboratory centrifuge intended to be used in laboratories for separating the substances with different specific densities by centrifugal force.

The maximum rotational speed of 15000 RPM gives the centrifugal force of 21633 x g.



Before starting the centrifuge CENTRIC 350 for the first time, please read this user's manual and observe the safety regulations.

2.2 BASIC EQUIPMENT

The following is enclosed with the centrifuge:

- 1 User's manual
- 1 Hexagonal rotor key
- 1 Power cord (cross section of the cord shall be minimum 3 x 0.75 mm²)

2.3 UNPACKING AND LIFTING OF THE DEVICE

The weight of the centrifuge is 32 kg. To prevent possible injuries, at least two people should lift and carry the centrifuge by holding it at the bottom from opposite sides.

Open the carton box. Take out the accessories and remove the packaging material. Reach with your hands under the centrifuge and lift it from the box together with another person.



When lifting the centrifuge, never hold it by the front plastic part of the housing or by the lid, as the appliance may get damaged!

Retain the packaging material for any subsequent transport or storage, which are allowed only in the original packaging.

2.4 INSTALLING THE CENTRIFUGE

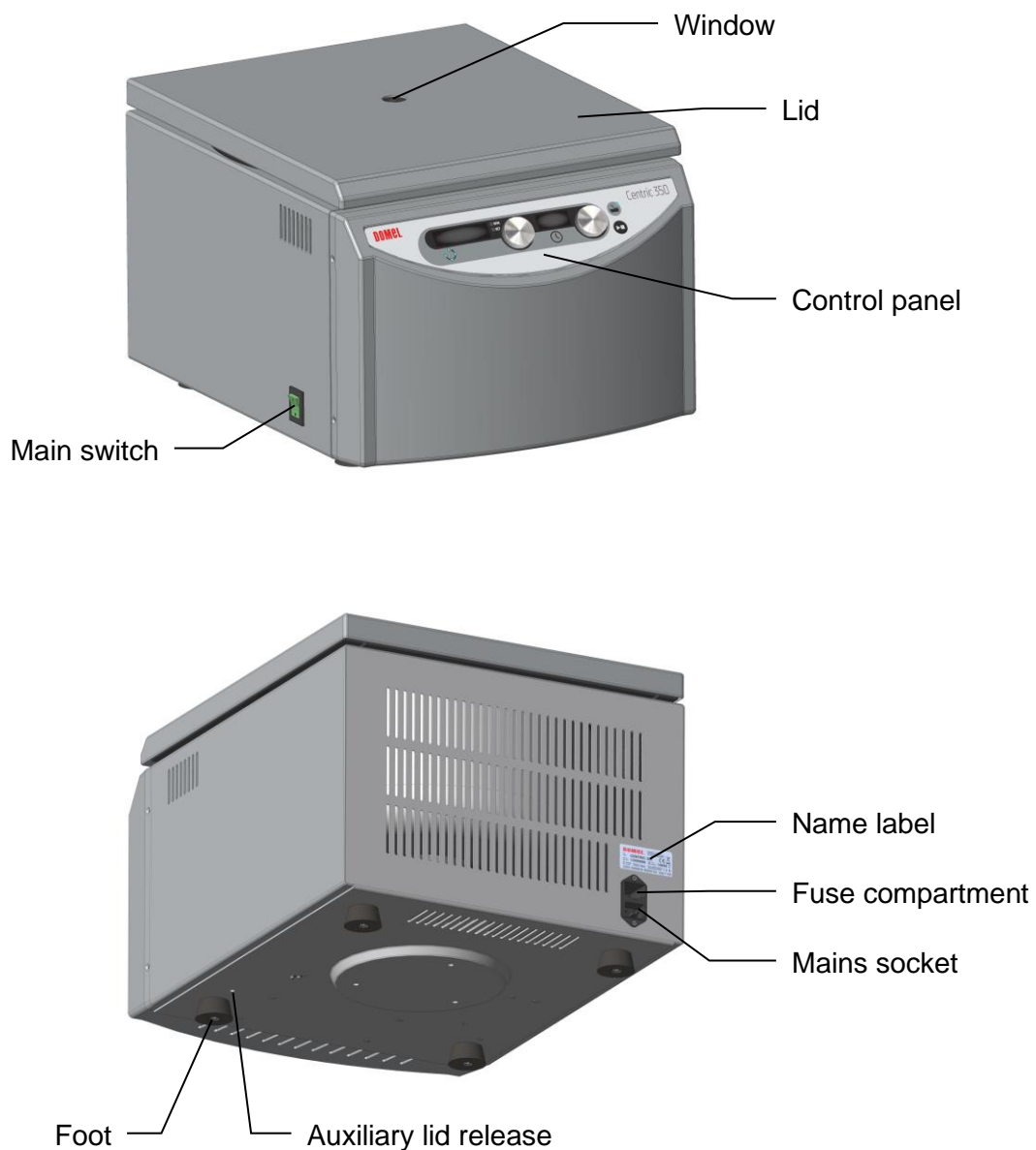
The centrifuge should only be operated indoors. Place the centrifuge on a stable, solid, horizontal and clean surface, without vibrations. Make sure that the centrifuge is not exposed to direct sunlight. To ensure sufficient ventilation, there should be enough clearance on all sides of the centrifuge. It must be far enough away from the wall and other devices. According to recommendations of the EN 61010-2-020 standard, a safety clearance of 30 cm should be observed around the centrifuge during operation. No objects or persons should be within this area because there is a possibility of injury in the event of centrifuge failure.

Before plugging in the centrifuge, check that the mains voltage and frequency correspond to the specifications on the identification label of your centrifuge. The mains cable of the centrifuge may only be connected to a socket with a protective earth conductor.

To disconnect the mains supply from the centrifuge in the event of malfunction, an emergency switch separate from the centrifuge must be available. This switch should be outside the room where the centrifuge is installed or next to the exit of the room.

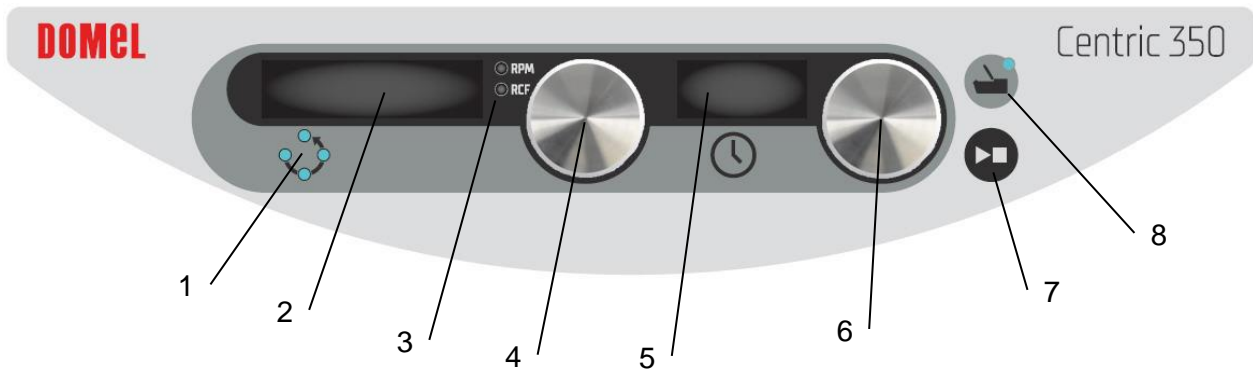
2.5 OVERALL VIEW

Main parts of the centrifuge are designated on the following pictures:



3. OPERATION

3.1 CONTROL PANEL



1	Run indicator (four lamps)
2	Display for rotational speed (RPM) and centrifugal force (RCF)
3	Indicator for selection indication between rotational speed (RPM) and centrifugal force (RCF)
4	Knob for setting and selecting between rotational speed (RPM) and centrifugal force (RCF)
5	Display for time, acceleration level (AcX) and braking level (brX)
6	Knob for setting and selecting between time, acceleration level (AcX) and braking level (brX)
7	START/STOP key
8	LID key (with lamp)

3.2 TURNING ON THE CENTRIFUGE

Use the enclosed power cord to connect the centrifuge to the mains power supply.

Turn on the main switch, which is located on the front of the left side of the centrifuge. All segments (eights) are displayed on both displays first, then centrifuge model (C-350) and program version (X.XX), then lines, and finally the values of operation parameters are displayed. The values of operation parameters (rotational speed, centrifugal force, run time, acceleration and braking level) are automatically set to the last used values.

Now you can open the lid by pressing the lid opening key. When the lid is open, the lamp on the lid opening key turns off.

Then insert the rotor to the centrifuge and tighten it firmly with rotor key. Load the rotor symmetrically with test tubes.



Close the centrifuge lid by pressing it down with your hands, until it locks up. The lamp on the lid opening key lights up. If the lamp doesn't light up, it means that the lid is still open. In that case open and close the lid again.



Before attaching the rotor, make sure that the axle and rotor are clean and undamaged.

Do not move or knock the centrifuge during operation!

3.3 KEY FUNCTIONS



 (START/STOP)	<p><u>SHORT PRESS:</u> By pressing this key, you start and end the run of the centrifuge. When you press the key for the first time, the centrifuge starts to run. When you press it again, the centrifuge stops. The next run is possible, when the rotor stops completely. The running of the centrifuge is displayed by four circularly lighting lamps bellow rotational speed display (run indicator). At the end of the set running time or manual stopping of the centrifuge, the braking procedure of the rotor is activated and the centrifuge stops.</p>
	<p><u>LONG PRESS:</u> By pressing and holding this key, you start quick run. The centrifuge is running as long as you hold the key pressed. Time of run in seconds is displayed on time display. The acceleration and braking levels are fixed at 9 (the highest), and they can't be changed. When you release the key, the braking procedure of the rotor is activated and the centrifuge stops.</p>
 (LID)	<p><u>SHORT PRESS:</u> By pressing this key, you open the lid of the centrifuge. When the lid opens, the key lamp turns off. When closing the lid, press it down with your hands, until it locks up. When the lid is closed, the key lamp lights. The key lamp turns off during the run of the centrifuge and thus indicates, that you can't open the lid during the run.</p>
	<p><u>LONG PRESS:</u> By pressing and holding this key, you set the lid latch to initial position. This is needed in case of power failure during the opening of the lid, when lid latch motor stops in undefined position. When power returns, it could happen, that you can't open or close the lid. In that case, hold the key pressed for approximately two seconds, until you hear the sound of lid latch motor, then release it immediately. Then you will be able to open and close the lid normally once again.</p>



When closing the lid, make sure to place your fingers on the top side of the lid and never in the gap between the lid and the housing of the centrifuge!




3.4 SETTING THE ROTATIONAL SPEED AND CENTRIFUGAL FORCE

By rotating this knob, you change the values of the parameters. By rotating the knob to clockwise direction, the values are increasing, and by rotating it to counter-clockwise direction, they are decreasing.
By pressing on the knob you choose between:

	<ul style="list-style-type: none"> • Rotational speed (lamp RPM lights) Rotational speed can be set from 200 to 15000 RPM in steps by 10 RPM. The maximal rotational speed value is automatically set regarding to the type of used rotor.
	<ul style="list-style-type: none"> • Relative Centrifugal Force (lamp RCF lights) Relative centrifugal force can be set from 3 to 21630 x g in steps by 10 x g. Relative centrifugal force is calculated regarding to the radius of used rotor, so the minimal and maximal forces are dependent on the rotor type.

3.5 SETTING RUN TIME, ACCELERATION AND BRAKING LEVEL

By rotating this knob, you change the values of the parameters. By rotating the knob to clockwise direction, the values are increasing, and by rotating it to counter-clockwise direction, they are decreasing.
By pressing on the knob you choose between:

	<ul style="list-style-type: none"> • Run time Run time can be set between 0.10 and 99.5 minutes. Time setting from 0.10 to 9.59 minutes is possible in 1 second steps. Between 10.0 and 99.5 minutes the setting is possible in 10 second steps. By rotating the knob to the clockwise direction after 99.5 is displayed, or to the counter-clockwise direction after 0.01 is displayed, you can set continuous operation (HLd on display).
	<ul style="list-style-type: none"> • Acceleration level (AcX) Acceleration level can be set from 0 to 9. Level 0 means very slow acceleration, level 9 very fast acceleration.
	<ul style="list-style-type: none"> • Braking level (brX) Braking level can be set from 0 to 9. Level 0 means stopping without braking and level 9 maximal braking.

Run time can be changed during the operation.

You should be aware, that when you extend run time, the difference between newly set and originally set time is added to current time, and when you shorten run time, the difference is subtracted.

If the centrifuge is running in continuous operation mode (HLd), changing of time during the operation is not possible.

Example: The centrifuge started with time set to 10 minutes. It has been running for 3 minutes. Then you changed the time to 5 minutes. The centrifuge will run for another 2 minutes.

3.6 PROGRAM SETTING

You can save up to a 100 programs, with different settings of operation parameters, in the centrifuge memory.

If you want to use the existing program, follow the next procedure:

- By longer pressing on the time setting knob (more than 2 seconds), you enter to the preset programs of the centrifuge (PrOG XX). The lamp on the lid opening key starts to blink.
- By rotating the time setting knob, select one of the 100 preset programs, which you want to use.
- By short pressing on the lid opening key, confirm program selection and return to previous mode. The key lamp stops blinking, which means, that you are no longer in program setting mode. Operation parameters set in selected program are displayed on display.

If you want to change the existing program, follow the next procedure:

- By longer pressing on the time setting knob (more than 2 seconds), you enter to the preset programs of the centrifuge (PrOG XX). The lamp on the lid opening key starts to blink.
- By rotating the time setting knob, select the program, which you want to change.
- By longer pressing on the lid opening key, you enter the programming mode. The key lamp is still blinking.
- With both knobs, set the desired values of centrifuge operation parameters (rotational speed, run time, acceleration level and braking level).
- When you finish entering new values, return to programs display (PrOG XX), by short pressing on the lid opening key. The key lamp is still blinking.
- If you want to change another program, select it by rotating the time setting knob, and repeat the above procedure. Otherwise skip this step.
- By rotating the time setting knob, select a program, which you want to use.
- By short pressing on the lid opening key, confirm program selection and return to previous mode. The key lamp stops blinking, which means, that you are no longer in program setting mode. Operation parameters set in selected program are displayed on display.

The following table shows factory preset values of operation parameters for all 100 programs.

Program	Rotational speed (RPM)	Run time (min)	Acceleration level (AcX)	Braking level (brX)
PROG 0	8000	10	6	6
PROG 1	8000	5	9	9
PROG 2	10000	10	6	6
PROG 3	10000	5	9	9
PROG 4	12000	10	6	6
PROG 5	12000	5	9	9
PROG 6	14000	10	6	6
PROG 7	14000	5	9	9
PROG 8	15000	10	6	6
PROG 9	15000	5	9	9
PROG 10	3000	5	5	5
⋮	3000	5	5	5
PROG 99	3000	5	5	5

3.7 ROTOR MOUNTING AND DISMOUNTING

Before attaching the rotor on the motor axle, make sure that axle and rotor are clean and undamaged. Wipe all fixing surfaces (motor axle and rotor cone) with clean, soft cloth. Thus, you will avoid potential damages to the axle and motor.

- Mount the rotor on the motor axle and tighten the rotor nut by turning it clockwise, using the supplied hexagonal rotor key.
- To dismount the rotor, turn the rotor nut counter-clockwise, using the hexagonal rotor key and then remove the rotor.



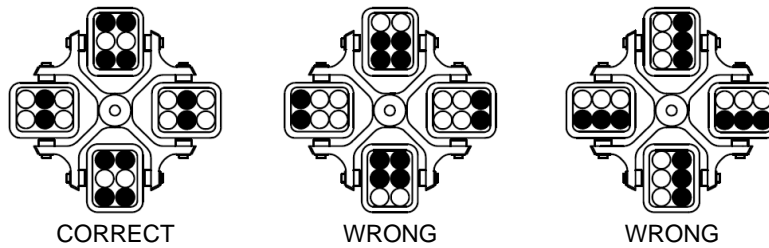
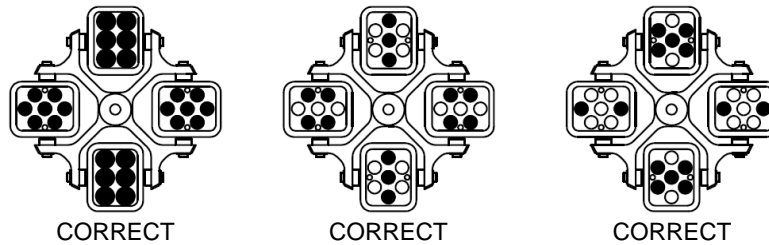
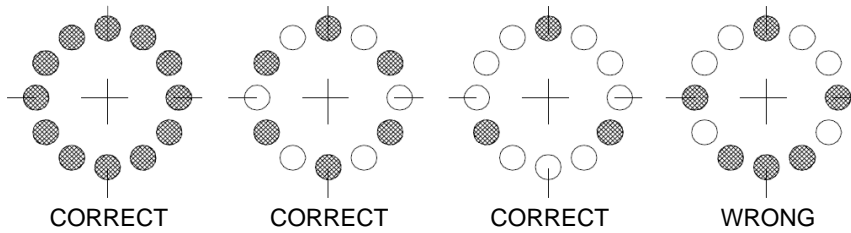
Do not use the rotors, rotor lids and test tubes, which are mechanically or chemically damaged or with visible corrosion defects!



The rotor and the rotor lid must always be securely fastened. Do not begin with centrifugation before the rotor has been securely fastened!

3.8 ROTOR LOADING

Test tubes in the rotor must always be loaded symmetrically. You may use only approved test tubes. Weight difference of the samples in test tubes should be as low as possible in order to avoid potential damages of the motor and to minimize running noise and vibration. Following are examples of correctly and wrongly loaded rotors:



In case of rotor imbalance, the centrifuge will automatically stop, after the start of the run.

3.9 ROTOR RECOGNITION

Rotor recognition is executed automatically, every time when the centrifuge starts. If you've just changed the rotor, centrifuge stops, and display shows ROTOR CHG. Press START/STOP key to clear this message. New maximal rotor speed is automatically set, to correspond to the inserted rotor. To start the centrifuge again, press START/STOP key again.

Rotor	Code	Rotor number / Number of magnets	Radius (mm)	Max. speed (RPM)	RCF (x g)	Max. vol.
RC 12	473.370	0 / 0	124	2500	866	12 x cyto
RA 24/2	456.600	1 / 2	86	15000	21633	24 x 2 ml
RA 24/2 AERO	473.400	1 / 2	86	15000	21633	24 x 2 ml
RA 30/2	456.620	2 / 4	98	13000	18516	30 x 2 ml
RA 16/5	472.890	2 / 4	98	13000	18516	16 x 5 ml
RA 6/PCR	457.380	2 / 4	92	13000	17382	6 x PCR
RH 24	456.630	2 / 4	92	13000	17382	24 x hem.
RS 4/100	473.450	3 / 6	154	4400	3333	4 x 100 ml
RS 4/200	473.380	3 / 6	159	4400	3441	4 x 200 ml
RA 6/50	457.450	4 / 8	130	4400	2813	6 x 50 ml
RA 30/12	457.485	4 / 8	140	4400	3030	30 x 12 ml
RA 30/15	457.490	4 / 8	153	4400	3311	30 x 15 ml
RM 2/3	457.340	5 / 10	132	3000	1328	2 x 3 micro.

IMPORTANT: After changing the rotor, you must first start the centrifuge, so that rotor recognition is executed and maximal rotor speed is set. For the correct calculation of the relative centrifugal force RCF, you must then enter the radius of currently used rotor in parameter "rOr", following the procedure described in the chapter "5.3 USER'S PARAMETERS" on page 18.

3.10 AUXILIARY LID RELEASE

In case of power failure during the operation of the centrifuge, the lid can be opened manually. Manual opening of the lid is performed the following way:



Turn off the main switch of the centrifuge. Wait until rotor fully stops. Check this by looking through the lid window!

On the bottom side of the centrifuge, behind the front right foot, there is a plastic plug, which you pull out of the hole. There is a string fastened to the plug. Pull the string vertically downwards to open the lid of the centrifuge. Then insert the string and the plug back in the hole.

3.11 DISPLAY OF THE SET VALUES DURING THE RUN

The centrifuge shows the current values of the operation parameters on displays. If you wish to check the set values of the parameters, rotate the desired parameter knob for one step. Display will show the set value of the parameter for approximately one second. After that, display will automatically return to the current value.

4. MAINTENANCE AND CLEANING OF THE CENTRIFUGE

4.1 CLEANING THE CENTRIFUGE

For regular cleaning of the outside surface of the centrifuge and the rotor chamber, use mild neutral detergent.

Open the lid of the centrifuge and turn off the main switch. Disconnect the mains plug. Remove the rotor with rotor key. For cleaning and disinfection, use only neutral cleaners.

After cleaning with detergent, the rubber seal around the rotor chamber should be cleaned well with water and lubricated with glycerine.

Before cleaning or decontaminating the centrifuge using methods not recommended in this manual, you should consult with manufacturer in order to avoid the damage on the centrifuge.

To ensure that the centrifuge functions correctly and safely in the long-term, please avoid the use of aggressive chemicals, that can damage the rotor and accessories. Please check the centrifuge regularly for damage caused by corrosion.

4.2 CLEANING THE ROTOR

The rotor and accessories must be cleaned regularly to prevent contamination caused by residue. Check the rotor and the housing monthly for residue and corrosion. This applies in particular to the rotor bores. For cleaning the rotor use a neutral cleaning liquid. This will protect the rotor and extend its service life.



Do not use damaged rotors and accessories for centrifugation!

To avoid the damage to the rotor, replace the sealing rings regularly.

4.3 ROTOR STERILIZATION

The rotors are autoclavable at the temperature of 121°C, for 20 minutes. After the rotor has been autoclaved for a maximum of twenty times, seals of the rotor must be replaced (this is valid for rotors with seals).

5. TROUBLESHOOTING

5.1 ERROR MESSAGES

If error happens during the operation of the centrifuge, error message appears on display, and the centrifuge stops automatically. For the list of errors, see below table.

DISPLAY		PROBLEM	SOLUTION	WHO REPAIRS
SPEED	TIME			
ROTOR	CHG	Rotor change	Repeat run	User
	SEN	Rotor sensor	Check if the rotor is in the centrifuge	User
			Check rotor sensor	Service-SP
			Check rotor sensor	Service
			Electronics error	Service
	SPD	Rotor is still turning	Wait till rotor stops	User
	HI	Rotor speed too high	Reduce speed	User
Check rotor sensor			Service-SP	
IMB	SEN	Imbalance sensor	Check imbalance sensor	Service-SP
			Check imbalance sensor	Service
			Electronics error	Service
	OUR	Imbalance to high	Check rotor loading arrangement	User
			Check the samples weight in the rotor	User
			Check if the rotor and rotor lid are fastened	User
			Check the rotor and lid	User
		Check rotor sensor	Service-SP	
		Repeat the balancing procedure	Service	
LID	OPN	The lid of the centrifuge open	Close the lid of the centrifuge	User
	SEN	Lid latch not engaged	Open and close the lid of the centrifuge again	User
			Check lid sensors	Service-SP
MOTOR	SEN	Speed sensor error	Check speed sensor	Service-SP
			Check speed sensor	Service
			Electronics error	Service
	SPD	Speed deviates for more than +/- 500 RPM / 5 s	Check rotor, motor and frequency regulator	Service
			Electronics error	Service

DISPLAY		PROBLEM	SOLUTION	WHO REPAIRS
SPEED	TIME			
DRIVE	HIV	Voltage overload on the DC link	Reduce braking level	User
			Error on frequency regulator	Service
			Error on braking resistor	Service
	LOV	Voltage too low on the DC link	Check power supply	Service
	OC	Current overload of the motor	Repeat run	User
			Reduce acceleration level	User
			Check start-up parameters	Service-SP
			Check motor	Service
			Error on frequency regulator	Service
	OL	Driver overload	Repeat run	User
			Reduce acceleration level	User
			Check start-up parameters	Service-SP
			Check motor	Service
			Error on frequency regulator	Service
	HOT	Driver temperature too high	Reduce speed	User
Check motor			Service	
Error on frequency regulator			Service	
MAINS	INT	Power failure during the run	Repeat run	User
-----	---	Sleep mode		

Note: SP = service parameters

5.2 EXIT FROM ERROR DISPLAY



By pressing START/STOP key, you exit from error display and go back to stand-by position.

If error is still displayed, turn off the main switch of the centrifuge and turn it on again.

If the centrifuge still doesn't return to stand-by position, call service!

5.3 USER'S PARAMETERS

With user's parameters, you can check the data of currently used rotor and the centrifuge.

For entering to user's parameters, the centrifuge must be in stand-by position, and then simultaneously press time and speed knobs and hold them for about 2 seconds. When the first parameter is displayed, release the knobs.

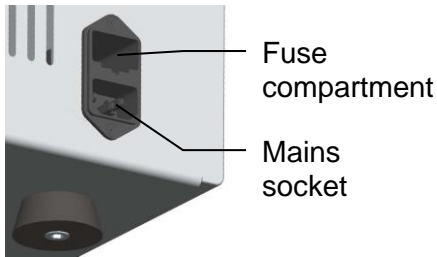
You can check the parameters by rotating the time knob.

To exit from user's parameters, press START/STOP key.

DISPLAY		PARAMETER DESCRIPTION
SPEED	TIME	
2	nr	Number of currently used rotor.
98	rOr	Radius (mm) of currently used rotor. The value can be set by rotating the speed knob. (25 - 200 mm)
13000	rOS	Maximal permitted speed for currently used rotor.
26.0	InH	Imbalance value for currently used rotor over 3000 RPM. Expressed in percentage of the maximal value, which was set at calibration procedure of imbalance sensor.
25.0	InL	Imbalance value for currently used rotor below 3000 RPM. Expressed in percentage of the maximal value, which was set at calibration procedure of imbalance sensor.
23	HrS	Number of working hours of the centrifuge.
4	Hr3	Number of working hours of rotor number 3 (RS 4/100).
DISAB	SLI	Automatic start of operation at lid closing. The setting can be chosen by rotating the speed knob. (DISAB = disable, EnABL = enable)
EnABL	OLI	Automatic opening of the lid at operation stop. The setting can be chosen by rotating the speed knob. (DISAB = disable, EnABL = enable)
DISAB	BSE	Blockade of operation parameters settings during the operation. The setting can be chosen by rotating the speed knob. (DISAB = disable, EnABL = enable)
DECrE	tIn	Decreasing or increasing of time display. The setting can be chosen by rotating the speed knob. (DECrE = decreasing, InCrE = increasing)
EnABL	BEP	Turn on the beeper. The setting can be chosen by rotating the speed knob. (DISAB = disable, EnABL = enable)

Note: Values in SPEED column of the above table are informative only, and they depend on inserted rotor and individual centrifuge.

5.4 REPLACING THE CENTRIFUGE FUSES



The following fuses are required for CENTRIC 350:
 2 x 10AT 250V (230V)
 2 x 16AT 250V (120V)

- Unplug mains plug from the mains socket.
- By pressing the locking device on the bottom side of the fuse compartment, fuse holder is released and you can pull it out.
- Replace fuses.
- Insert fuse holder and push it, until it locks.

6. TECHNICAL DATA

Code:	473.3.000 - 230 V 1473.3.000 - 120 V
Power supply:	230 V \pm 10 %, 50 / 60 Hz 120 V \pm 10 %, 50 / 60 Hz
Power consumption:	500 W
Fuses:	230 V = 2 x 10 A T 120 V = 2 x 16 A T
Protection class:	I
Rotational speed:	200 to 15000 RPM
Maximal centrifugal force:	21633 x g
Maximal load:	4 x 200 ml
Maximal kinetic energy:	5020 Nm
Max. density of material to be centrifuged:	1.2 g/ml
Run time:	10 s to 99 min 50 s, continuous operation (HOLD)
Number of programs:	100 programs
Acceleration:	levels from 0 to 9
Deceleration:	levels from 0 to 9 (0 - no braking)
Ambient temperature:	2 °C to 35 °C
Maximal relative humidity:	85 %, non-condensing
Dimensions (H x W x D):	325 x 405 x 500 mm
Weight:	32 kg

We reserve the right to alter specification details without prior notice or liability!

7. APPENDIX

7.1 CALCULATION OF CENTRIFUGAL FORCE

For the calculation of the centrifugal force (RCF), stated as a multiple of the gravitational force "g", use the following formula:

$$RCF = 11.18 \times r \times (n / 1000)^2$$

RCF Relative centrifugal force (x g)
 r Radius of the rotor (cm)
 n Rotational speed (RPM)

7.2 CALCULATION OF MAXIMAL PERMITTED ROTOR SPEED

Users are responsible and must consider the limitations about maximal permitted rotor speed and about correct rotor load.

The maximal permitted speed for each type of rotor is marked on each rotor. It is defined for the use of samples with maximal density of 1.2 g/cm³.

If you need to use higher density samples, maximal permitted rotor speed must be reduced according to the following formula:

$$M = (1.2 \times n^2 / S)^{1/2}$$

M Reduced maximal permitted rotor speed
 n Maximal permitted rotor speed for samples with density of 1.2 g/cm³
 S Density of used sample

7.3 EQUIPMENT DECONTAMINATION

	The device may be contaminated.
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If infectious materials get into the centrifugal chamber, on the rotors or accessories, they must be appropriately decontaminated.

They may only be decontaminated by hand with soft cloth and liquids, which contain the following ingredients: ethanol, n-propanol, ethyl hexanol.

After using disinfectants, remove the disinfectant residue by wiping it with a damp cloth.

The surfaces must be dried immediately after disinfecting.

You must perform the decontamination before the device is shipped to the service and before it is sent to disassembly after the end of the life cycle.

7.4 TRANSPORT AND STORAGE

Transport and storage are allowed only in the original packaging. Remove the rotor from the centrifuge before transport and storage.

The centrifuge is heavy. To prevent possible injuries, at least two people should lift and carry the centrifuge by holding it at the bottom from opposite sides. Use a transport aid for transferring the device.

Permissible environmental conditions for transport and storage of the equipment:

- Ambient temperature: - 25 °C to 60 °C
- Relative humidity: 10 % to 75 %

7.5 EQUIPMENT DISPOSAL



This equipment is marked with the crossed-out wheeled bin symbol, to indicate that this equipment may not be disposed of as unsorted municipal waste.

It's your responsibility to correctly dispose of your equipment at life-cycle end, by handing it over to an authorized facility for separate collection and recycling of waste equipment. It's also your responsibility to decontaminate your equipment in case of biological, chemical or radiological contamination, and so protect the persons involved in the disposal and recycling of the equipment from health hazards.

For more information about where you can dispose of your waste equipment, please contact your local dealer, from whom you purchased the equipment.

By doing so, you will help to preserve natural and environmental resources and you will ensure that your equipment is recycled in a manner that protects human health.



EU DECLARATION OF CONFORMITY

Manufacturer / name and address

Domel, d.o.o.
BU Laboratory Systems
Otoki 21
4228 Železniki
Slovenia

DOMEL®

We declare under our sole responsibility that

product:
type / model:

**Laboratory centrifuge
Centric 350**

is in conformity with the provisions of the following regulations and also complies with the following standards

1. Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits

Standards: EN 61010-1:2010, EN 61010-2-020:2017

2. Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility

Standards: EN 61326-1:2013

3. Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, amended by Commission Delegated Directive (EU) 2015/863 and Directive (EU) 2017/2102 of the European Parliament and of the Council

Standards: EN IEC 63000:2018

Place and date of issue

Name, surname and signature of authorized person

Železniki, 01.10.2019

manager

Andrej Eržen