USER MANUAL

CF-260 Centrifuge

Version: C
Date: October 2024
Document Number: 03-2020-260

For research use only. Not for use in diagnostic procedures

Proper Equipment Operation
To reduce the risk of electric shock, do not remove the cover. No user serviceable parts are inside. Refer to qualified service personnel if help is required.
Use this product only in the manner described in this manual. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Cleaning
Follow internal laboratory process for cleaning and decontamination using 70% ethanol followed by a disinfecting wipe, then a final rinse with ethanol.

Preventative Maintenance
Normal use: 12 month interval.
Heavy use may require a 6 month interval.

Operating Environment
5°C to 40°C / 41°F to 104°F, Humidity: 5% to 85% RH. Internal use only

Electrical Supply
100-230V, 50/60 Hz

FCC
This device complies with part 15 of the FCC (United States Federal Communications Commission) Rules. Operation is subject to the following two conditions:
- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

CE/UKCA
This device complies with all CE and UKCA rules and requirements.
Changes or modifications to this equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Data herein has been verified and validated. It is believed adequate for the intended use of the instrument. If the instrument or procedures are used for purposes over and above the capabilities specified herein, confirmation of the validity and suitability should be obtained; otherwise Revvity does not guarantee results and assumes no obligation or liability. This publication is not a license to operate under, or a recommendation to infringe upon, any process patents.

This product is warranted to be free from defects in material and workmanship for a period of ONE YEAR from the date of delivery. Revvity will repair or replace and return free of charge any part which is returned to its factory within said period, transportation prepaid by user, and which is found upon inspection to have been defective in materials or workmanship. This warranty does not include normal wear from use; it does not apply to any instrument or parts which have been altered by anyone other than an employee of Revvity nor to any instrument which has been damaged through accident, negligence, failure to follow operating instructions, the use of electric currents or circuits other than those specified on the plate affixed to the instrument, misuse, or abuse. Revvity reserves the right to change, alter, modify, or improve any of its instruments without any obligation whatever to make corresponding changes to any instrument previously sold or shipped.

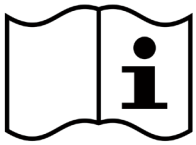
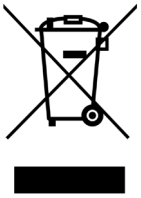
THE FORGOING OBLIGATION IS IN LIEU OF ALL OBLIGATIONS AND LIABILITIES INCLUDING NEGLIGENCE AND ALL WARRANTIES OF MERCHANTABILITY OR OTHERWISE, EXPRESSED OR IMPLIED IN FACT OR BY LAW, AND STATE OUR ENTIRE AND EXCLUSIVE LIABILITY AND BUYERS EXCLUSIVE REMEDY FOR ANY CLAIM OF DAMAGES IN CONNECTION WITH THE SALE OR FURNISHING OF GOODS OR PARTS, THEIR DESIGN, SUITABILITY FOR USE, INSTALLATION, OR OPERATION. REVVITY WILL IN NO EVENT BE LIABLE FOR ANY SPECIAL OR CONSEQUENTIAL DAMAGES WHATSOEVER, AND THEIR LIABILITY UNDER NO CIRCUMSTANCES WILL EXCEED THE CONTRACT PRICE FOR THE GOODS FOR WHICH LIABILITY IS CLAIMED.

This product has been engineered for safety; however, basic safety precautions and common sense must always be demonstrated when using any electrical product.

DO NOT attempt to modify any part of this product.
DO NOT allow the machine to be submerged in any liquid.
DO NOT use in any setting other than an indoor laboratory.
DO NOT plug power cord into an incorrect outlet or subject it to an incorrect voltage.
DO NOT use attachments not recommended by the manufacturer.
DO NOT operate the product if it is damaged in any way.
DO NOT modify the plug or cord that is provided. If the plug will not fit the outlet, have the proper outlet installed by a qualified electrician.
DO NOT operate the product with the safety ground disconnected.

Table of Contents

Table of Symbols

Symbol	Description	Symbol	Description
	Caution. Refer to the User documentation (ISO 7000-0434B)		On (power). (IEC 60417-5007)
	Hazardous voltage; risk of electric shock. (IEC 60417-6042)		Off (power). (IEC 60417-5008)
	Fuse. (IEC 60417-5016)		Consult Instructions for Use. (ISO 7000-1641)
	WEEE symbol (EN50419:2005)		CE Compliance Mark
	RoHS 2002/95/EC, 2011/65/EU, 2015/863 Compliant		FCC Compliance
	UKCA Certification Mark		

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.

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 according 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 or 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 maximum 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. Aluminum 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.

Intended Use

The CF-260 Centrifuge is a universal laboratory centrifuge. It is designed for use in medical, scientific and industrial laboratories, for separating the substances with different specific densities by centrifugal force.

In particular, it is intended for preparation of human samples (body fluids), in approved test tubes, before further analysis.

The maximum rotational speed of 18,000 RPM gives the centrifugal force of 31,150 x g.

Specifications

Part Number	CF-260-120 - 120V CF-260-220 - 220V
Power supply	120V ± 10%, 50/60Hz 220V ± 10%, 50/60Hz
Power Consumption	450 Watts
Fuses	2 x 10AT 250V (120V) 2 x 6.3AT 250V (230V)
Protection Class	I
Rotational Speed	200 to 18,000 RPM
Maximum Centrifugal Force	31,150 x g
Maximum Load	6 x 50 mL
Maximum Kinetic Energy	7300 Nm
Max. Density of material to be centrifuged	1.2 g/mL
Timer	10 sec - 99 min 50 sec timer HOLD function
Number of Programs	100
Acceleration	Levels from 0 to 9
Deceleration	Levels from 0 to 9 (0 - no braking)
Dimensions (W x D x H)	W: 14.2″ (36.0 cm), D: 16.9″ (43.0 cm), H: 11.3″ (28.8 cm)
Weight	49.6 lbs. (22.5 kg)
Noise level at max. Speed:	≤ 62 dB(A)
Ambient temperature	5 - 40°C
Relative humidity	Up to 85% RH, non-condensing
Altitude	Up to 2000 m
Warranty	1 Year
Standards Approval	CE and UKCA Approved

Installation

Unpacking

The weight of the centrifuge is 49.6 lbs. (22.5 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 or top 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.

The CF-260 Centrifuge consists of the following:

Description	Quantity
CF-260 Centrifuge	1
Hex Rotor Key	1
Power Cord	1
User Manual	1

Installation Location

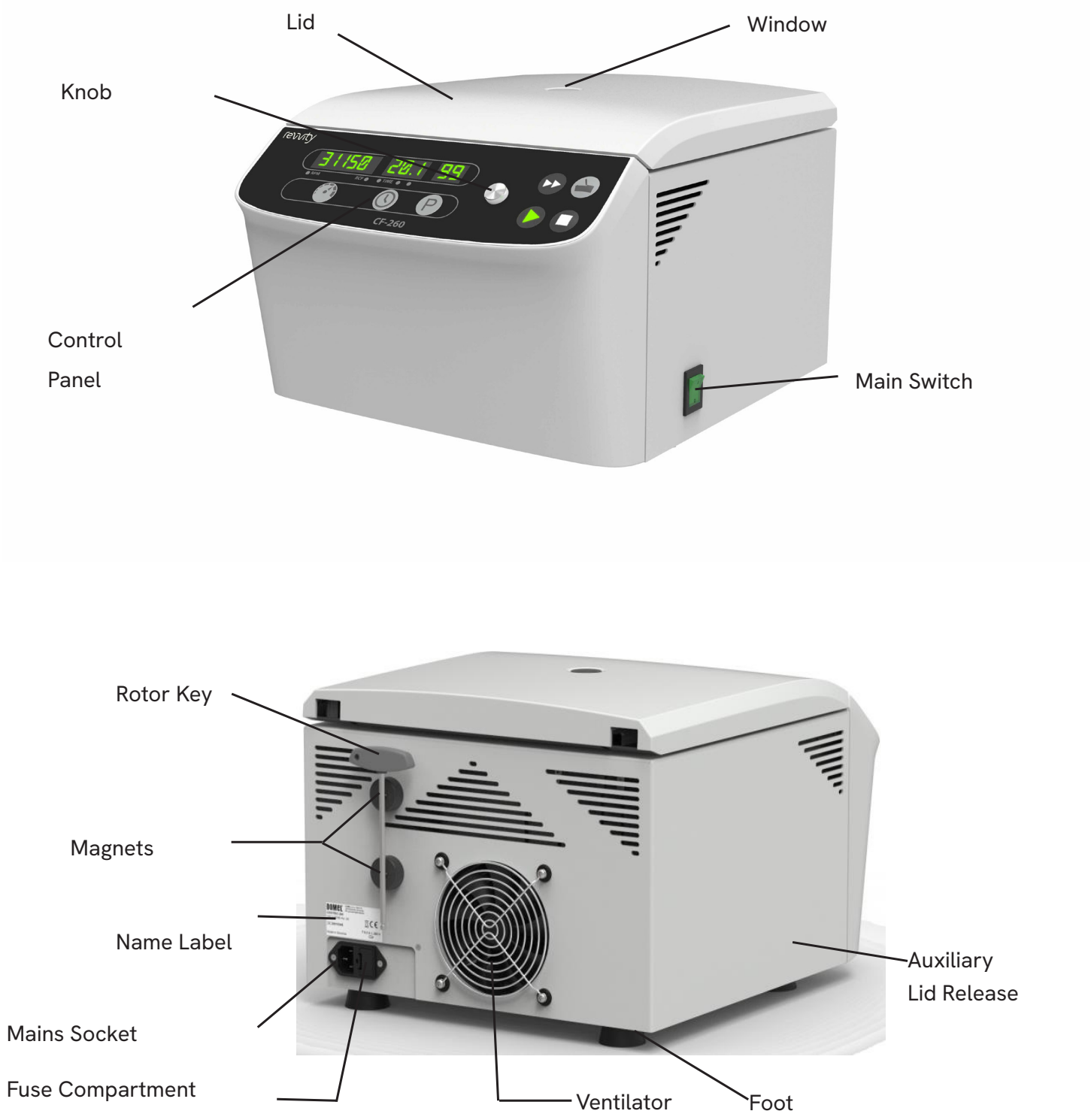
The centrifuge should only be operated indoors. Place the centrifuge on a stable, solid, horizontal and clean surface, without vibrations. Make sure that the centrifuge is not exposed to direct sunlight. To ensure sufficient ventilation, there should be enough clearance on all sides of the centrifuge. 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. Please remove all objects from this area. If the centrifuge isn't leveled, imbalances can occur, and the centrifuge can be damaged. Do not place anything under the centrifuge feet to level the centrifuge.

NOTE: After installation, it is recommended that you wait for some time, before connecting the centrifuge to the mains power supply. This prevents damage to electronic components due to condensation, which can occur, when you bring the device from a cold environment to a warm environment.

Connecting the Power Cord

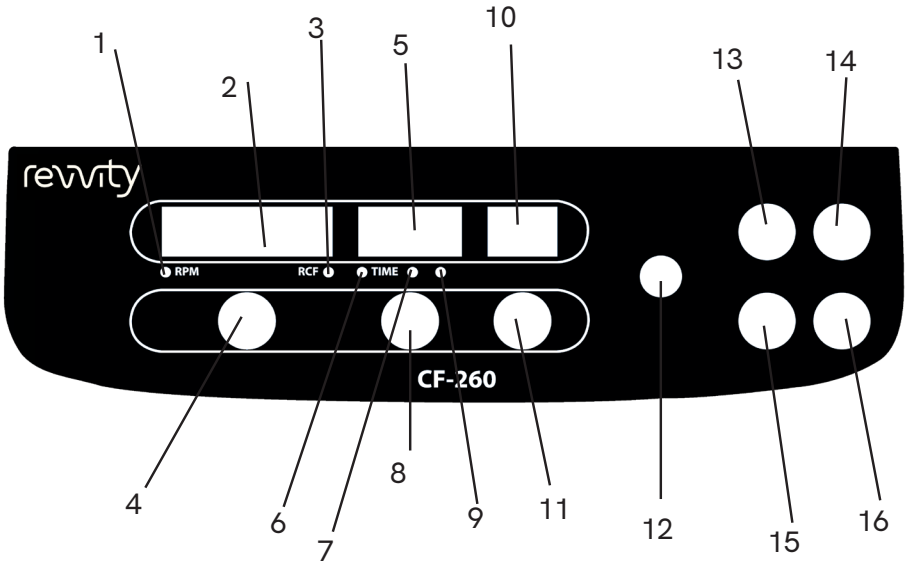
Before connecting the centrifuge to the power supply, check that the voltage and frequency correspond to the specifications on the name label of the centrifuge. The power cord of the centrifuge may only be connected to a properly grounded wall socket.

To disconnect the power 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 entrance to the room.


Lid
Window
Knob
Control
Panel
Main Switch
Rotor Key
Magnets
Name Label
Auxiliary
Lid Release
Mains Socket
Fuse Compartment
Ventilator
Foot

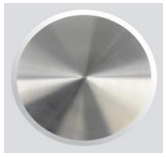
Control Panel Description

Before using the centrifuge for the first time, familiarize yourself with the control panel and the functions of the knob and keys.



1	Indicator for Selection of Rotational Speed (RPM)
2	Display for Rotational Speed (RPM) or Centrifugal Force (RCF)
3	Indicator for Selection of Centrifugal Force (RCF)
4	SPEED Key
5	Display for Time (TIME), Acceleration Level (◢) and Braking Level (◣)
6	Indicator for Selection of Time (TIME)
7	Indicator for Selection of Acceleration Level (◢)
8	TIME Key
9	Indicator for Selection of Braking Level (◣)
10	Program Display
11	PROGRAM Key
12	Knob
13	FAST SPIN Key
14	LID Key
15	START Key
16	STOP Key

Knob and Button Functions

	By rotating the knob, you change the values of the parameters on display. By rotating the knob clockwise, the value increases, and by rotating it counter-clockwise, the value decreases. By pressing on the knob, you confirm the new value for the parameter.
	By pressing this key, you stop the run of the centrifuge. The key lights up and thus indicates that the centrifuge is stopping. The braking procedure of the rotor is activated and the centrifuge stops. Until the centrifuge stops completely, the START key remains lit, thus indicating that the rotor is still turning.
	By pressing this key, you can set the rotational speed (RPM) or centrifugal force (RCF). The key lights up. By repeated pressings on this key, you select which parameter will be set. When indicator RPM is lit, you can set the rotational speed, and when indicator RCF is lit, you can set the centrifugal force. Set new values of both parameters by rotating the knob and confirm them by pressing on the knob. The key light will then turn off.
	By pressing this key, you can set the time (TIME), acceleration level (◢) and braking level (◣). The key lights up. By repeated pressings on this key, you select which parameter will be set. When indicator TIME is lit, you can set the run time, when indicator ◢ is lit, you can set the acceleration level, and when indicator ◣ is lit, you can set the braking level. Set new values of all parameters by rotating the knob and confirm them by pressing on the knob. The key light will then turn off.
	By pressing this key, you can set the programs. The key lights up. Select new program by rotating the knob and confirm it by pressing on the knob. The key light will then turn off. If you want to change the values of parameters of an existing program, set the values of individual parameters as described above, when this key is lit.
	By pressing and holding this key, you perform the fast spin. The centrifuge runs for 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 to 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.
	**SHORT PRESS**: By pressing this key, you open the lid of the centrifuge. When the lid opens, the key light turns off. When closing the lid, press it down with your hands, until it locks up. When the lid is closed, the key lights up. The key light turns off during the run of the centrifuge and thus indicates that you can't open the lid during the run **LONG PRESS:** 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. If this happens, press the key for approximately five seconds, until you hear the sound of lid latch motor, then release it. After that, you will be able to open and close the lid normally.
	By pressing this key, you start the run of the centrifuge. The key lights up and thus indicates that the centrifuge is running. 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. The next run is possible, when the rotor stops completely.

Turning ON the Instrument

Turn on the main switch, which is located on the front of the right side of the centrifuge. All segments (eights) are displayed on all displays at first, and all the keys and indicators light up simultaneously. Then centrifuge model and program version (X.XX) are displayed, 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.

Opening and Closing the Lid

By pressing the LID key, you open the lid of the centrifuge. When the lid is open, the key light turns off.
When closing the lid, press it down with your hands, until it locks up. When the lid is closed, the key lights up. The key light turns off during the run of the centrifuge and thus indicates that you can't open the lid during the run.

WARNING: Always open the centrifuge lid completely, to prevent it from falling!

WARNING: When closing the lid, make sure to always place your fingers on the top side of the lid and never in the gap between the lid and the housing of the centrifuge, otherwise you could crush your fingers!

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.

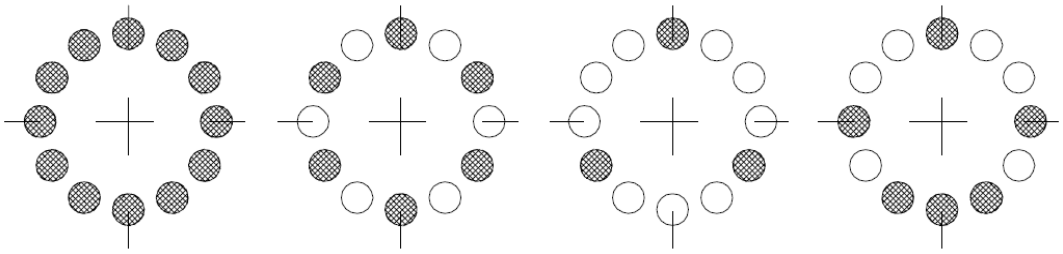
▪ Mount the rotor on the motor axle and firmly tighten the rotor nut by turning it clockwise, using the supplied hexagonal rotor key.
▪ To dismount the rotor, turn the rotor nut counter-clockwise, using the hexagonal rotor key and then remove the rotor.

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

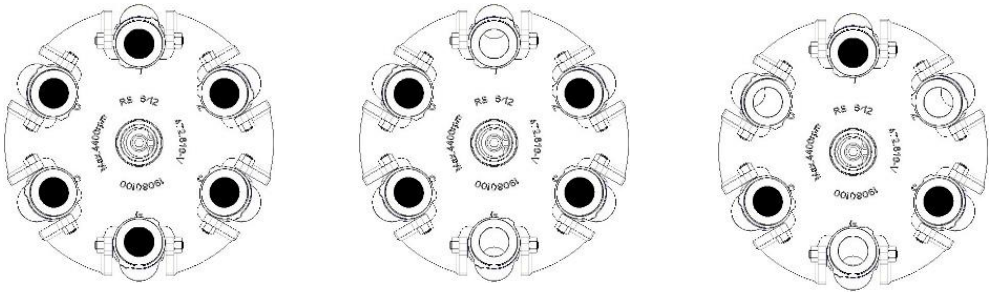
WARNING: The rotor and the rotor lid must always be securely fastened. Do not begin with centrifugation before the rotor has been securely fastened!

Rotor Loading

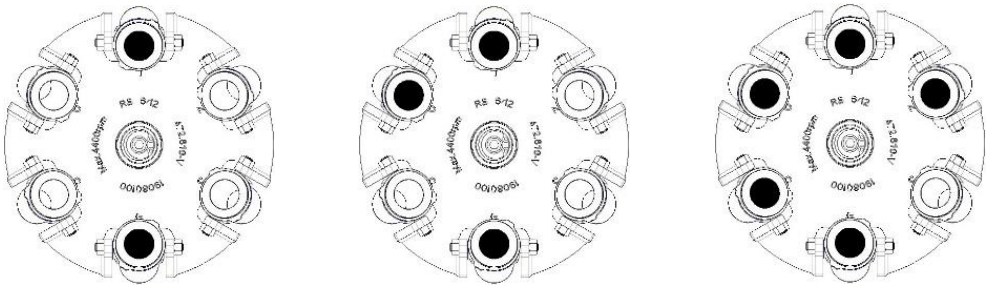
You must always load the rotor with test tubes symmetrically. You may only use approved test tubes. Weight difference of the samples in test tubes should be as low as possible in order to avoid potential damages to the motor and to minimize running noise and vibration. Following are examples of correctly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



CORRECT CORRECT CORRECT WRONG



CORRECT CORRECT CORRECT



CORRECT WRONG WRONG

NOTE: The centrifuge is equipped with imbalance sensor, to ensure safety. Imbalance at high speed may cause test tube breakage, leak or rotor crash. Therefore, additional care should be taken depending on the samples loaded.

WARNING: In case of rotor imbalance during operation, the centrifuge will automatically stop, and the display will show error message IMBAL OUR.

Setting the Rotational Speed and Centrifugal Force

By pressing the SPEED key, you can set the rotational speed (RPM) and centrifugal force (RCF). The key lights up. By repeated pressings on this key, you select which parameter will be set. When indicator RPM is lit, you can set the rotational speed, and when indicator RCF is lit, you can set the centrifugal force. Set new values of both parameters by rotating the knob and confirm them by pressing on the knob. The key light will then turn off.

▪ **Rotational speed (indicator RPM is lit)**
Rotational speed can be set from 200 to 18000 RPM in steps of 10 RPM. The maximum rotational speed is automatically set according to the rotor type in use.

▪ **Relative Centrifugal Force (indicator RCF is lit)**
Relative centrifugal force can be set from 5 to 31150 x g in steps of 10 x g.
Relative centrifugal force is calculated regarding to the radius of used rotor, so the minimum and maximum forces are dependent on the rotor type.

Setting the Run Time, Acceleration and Braking Level

By pressing the TIME key, you can set the time (TIME), acceleration level (◢) and braking level (◣). The key lights up. By repeated pressings on this key, you select which parameter will be set. When indicator TIME is lit, you can set the run time, when indicator ◢ is lit, you can set the acceleration level, and when indicator ◣ is lit, you can set the braking level. Set new values of all parameters by rotating the knob and confirm them by pressing on the knob. The key light will then turn off.

▪ **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 either clockwise until after 99.5 is displayed, or counter-clockwise until after 0.10 is displayed, you can set continuous operation (HLd on display).
NOTE: 0.10 = 10 s, 9.59 = 9 min 59 s, 10.0 = 10 min, 99.5 = 99 min 50 s

▪ **Acceleration level (AcX)**
Acceleration level can be set from 0 to 9. Level 0 means very slow acceleration, level 9 very fast acceleration.

▪ **Braking level (brX)**
Braking level can be set from 0 to 9. Level 0 means stopping without braking, level 9 maximum braking.

NOTE: All the operation parameters can be changed during the operation of the centrifuge, and it starts to work with the new settings after that.

▪ **Changing the run time during 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. For 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.

Program Setting

You can save 100 programs, with different operational parameters, in the centrifuge memory.

NOTE: You can cancel the procedure for program setting by pressing the STOP key and return to stand-by mode without confirming the data.

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

By pressing the PROGRAM key, you can set and select programs. The key lights up. Select new program by rotating the knob and confirm it by pressing on the knob. The key light turns off. Operation parameters set in selected program are displayed on display.

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

By pressing the PROGRAM key, you can set the programs. The key lights up. Select the program that you want to change, by rotating the knob. While the PROGRAM key is lit, set the values of individual operation parameters, rotational speed, centrifugal force, run time, acceleration level and braking level) using the procedures, described in the previous chapters.

If you want to change another program, select it by rotating the knob, and set the values of individual operation parameters for this program. Otherwise skip this step. By rotating the knob, select a program that you want to use and confirm it by pressing on the knob. The light for the PROGRAM key will then turn off. 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)	Accelera-tion Level (AcX)	Braking Level (brX)
0	13,000	10	6	6
1	10,000	2	9	9
2	1,500	10	6	6
3	3,000	10	9	9
4	4,000	3	6	6
5	15,000	3	9	9
6	4,00	3	6	6
7	15,000	5	9	9
8	5,000	10	6	6
9	16,000	10	9	9
10	1,200	10	5	5
11	3,000	5	5	5
:	3,000	5	5	5
99	3,000	5	5	5

Starting and Stopping the Centrifuge

Before starting the centrifuge, turn on the main switch, open the centrifuge lid, insert the rotor and load it with test tubes, close the centrifuge lid and set the operation parameters or select a suitable program.

By pressing the START key, you start the run of the centrifuge. The key lights up and thus indicates that the centrifuge is running.
After the expiration of set running time or after manual stopping of the centrifuge, the braking procedure of the rotor is activated and the centrifuge stops. The next run is possible, when the rotor stops completely.

By pressing the STOP key, you stop the run of the centrifuge. The key lights up and thus indicates that the centrifuge is stopping. The braking procedure of the rotor is activated and the centrifuge stops. Until the centrifuge stops completely, START key is lit, thus indicating that the rotor is still turning.

WARNING: Do not move or knock the centrifuge during operation!

Rotor Recognition

Rotor recognition is executed automatically, every time when the centrifuge starts. After rotor change, the centrifuge stops and display shows ROTOR CHG. Press the STOP key to clear this message. New maximum rotational speed is automatically set, to correspond with the inserted rotor. To start the centrifuge again, press the START key.

Rotor	RS 8/15	RA 24/2	RA 24/2 AERO	RA 30/2	RS 6/12	RA 6/50	RA 16/5
Part Number	448807	228442	375944	228451	398241	448806	403055
Max. Speed (rpm)	6,000	18,000	18,000	14,000	4,400	6,000	14,000
Rotor	**RA 6/PCR**	**RH 24**	**RM 2/2**				
Part Number	273335	246701	429192				
Max. Speed (rpm)	14,000	14,000	5,700				

Display the Set Values During the Run

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, select the desired parameter by pressing the corresponding key. The key lights up. Display shows the set value of the parameter. To exit the display of the set values, press on the knob. The key light will then turn off.

Fast Spin

By pressing and holding the FAST SPIN key you perform the fast spin. The centrifuge will run as long as you hold the key pressed. Time of run in seconds is displayed on time display, and the program display shows FS (fast spin). The acceleration and braking levels are fixed to 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.

Reset of Lid Latch

By pressing and holding the LID key, you set the lid latch to initial position. This is needed in the 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. If this happens, press the key for approximately five seconds, until you hear the sound of lid latch motor, then release it. After that, you will be able to open and close the lid normally.

Auxiliary Lid Release

In case of power failure, the lid can be opened manually. If power failure occurs during the operation of the centrifuge, the rotor may continue rotating for several minutes, before it stops.

WARNING: Before auxiliary lid release, turn off the main switch of the centrifuge and wait until rotor fully stops. Check this by looking through the lid window. Otherwise, injury from rotating rotor may occur!

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.

Automatic Braking After Power Restoration

If power failure occurs during the operation of the centrifuge, the rotor may continue rotating for several minutes, before it stops. When power returns, the centrifuge checks if the rotor is still rotating. If it is still rotating, then the display shows message Error brX (X is a number from 0 to 9 and represents the set braking level). The centrifuge begins with the automatic rotor braking, which is performed with preset braking level. When rotor stops, display shows error message MAINS INT and thus warns you, that power failure occurred during operation and the centrifugation was interrupted.
By pressing the STOP key, you exit from error display and go back to stand-by mode. You can use the centrifuge again.

Maintenance and Cleaning of the Centrifuge

Regular Service

We recommend having the centrifuge and associated rotors checked by authorized service at least once a year. You must thoroughly clean and disinfect the centrifuge prior to service.

Cleaning the Centrifuge

After every centrifugation, please remove any condensed water from the rotor chamber using a soft, absorbent cloth. After use, leave the centrifuge lid open, so the inside can dry out. For regular cleaning of the outside surface of the centrifuge and the rotor chamber, use mild neutral detergent. Make sure that no liquid penetrates the inside of the housing. Open the lid of the centrifuge and turn off the main switch. Disconnect the power cord from mains socket. Remove the rotor with rotor key. Clean all accessible surfaces of the device and accessories at least once a week and every time, when contaminated. After cleaning with detergent, the rubber seal around the rotor chamber should be thoroughly cleaned with water and lubricated with glycerin, to prevent it from becoming brittle.

For cleaning and disinfection, use only neutral cleaners and disinfectants. Before cleaning or decontaminating the centrifuge, using means and methods not recommended in this manual,you should consult with the manufacturer, in order to avoid the damage to the centrifuge. To ensure safe and long operation of the centrifuge, please avoid the use of aggressive chemicals, which can damage the centrifuge, rotor and accessories. Please check them regularly for damage caused by corrosion.

Cleaning the Rotor

The rotor and accessories must be regularly cleaned to prevent contamination and corrosion caused by residue. Check the rotor and accessories monthly. 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.

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

WARNING: Do not use damaged rotors and accessories for centrifugation!

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).

Troubleshooting

If an error occurs during the operation of the centrifuge, an error message appears on the display, and the centrifuge stops automatically. The display shows message ERROR and number of the error EXX (XX is the error number).

Display		Problem	Solution	Responsi-ble
Speed	Time			
ROTOR	CHG	Rotor change	Repeat run	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 too 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 the 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	Responsible
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
	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
-----	---	After 1 hour of standstill centrifuge goes to sleep mode (lines on all displays)	Press any key	User

Note: SP = service parameters

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.

Users Parameters

Accessing Parameters

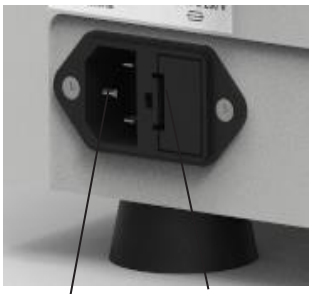
With user's parameters, you can check and set some of the operational properties of the centrifuge.

Entry -For entering to user's parameters, the centrifuge must be in stand-by mode. Simultaneously press the SPEED and PROGRAM keys and hold them for about 5 seconds. When the first parameter is displayed and the TIME key lights up, release the keys. You can select the parameters by rotating the knob. If you want to change the setting of the parameter, press the SPEED key, which lights up. The light for the TIME key will then turn off. Then change the setting of the parameter by rotating the knob and confirm it by pressing on the knob. The light for the SPEED key will turn off and the TIME key will light up.

Display		Description
Speed	Time	
dIS	bSE	Block the changing of operation parameters during the operation of the centrifuge. (dIS = disable, Enb = enable)
dECrE	tIn	Decreasing or increasing of time display. (dECrE = decreasing, InCrE = increasing)
Enb	bEP	Turn on the beeper. (dIS = disable, Enb = enable)
1	SLE	Time, after which the centrifuge goes to sleep mode.
dIS	tSS	Time starts running after the speed is reached, instead at motor start. dIS = disable, Enb = enable)

Note: Values in SETTING column of the above table are factory default values of user's parameters. Values are informative only, and they depend on inserted rotor and individual centrifuge.

Replacing the Centrifuge Fuses



The following fuses are required for CF-260 Centrifuge:
2 x 6.3AT 250V (230V)
2 x 10AT 250V (120V)

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

Appendix

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 x r x (n / 1000)2

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

Calculation of Maximum Permitted Rotor Speed

Users are responsible and must consider the limitations for maximum permitted rotor speed and about correct rotor load.
The maximum permitted speed for each type of rotor is marked on each rotor. It is defined for the use of samples with maximum density of 1.2 g/cm3.
If you need to use higher density samples, maximum permitted rotor speed must be reduced according to the following formula:

M = (1.2 x n2/ S)½

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

Equipment Decontamination

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.

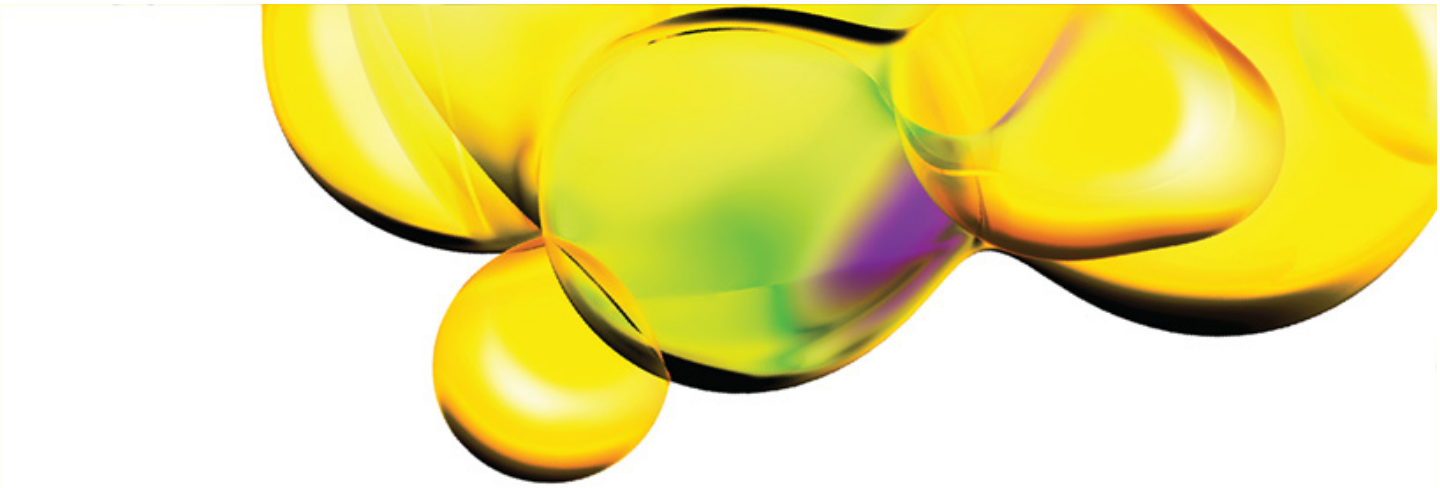
Transport and Storage

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, be careful when lifting and carrying the centrifuge. Use a transport aid for transferring the device. Permissible environmental conditions for transport and storage of the equipment:

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

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.



www.revvity.com

For research use only. Not for use in diagnostic procedures.

Revvity, Inc.
940 Winter Street
Waltham, MA 02451
USA
www.revvity.com

For a complete listing of our global offices, visit www.revvity.com