20150R.EN rev.15

USER MANUAL

MPW-150R

Read before use!

Serial number of centrifuges: ……

For centrifuges with serial no (SN): **10150R051323 – 10150R053923**

CE IVD

This manual was prepared with special care. MPW MED. INSTRUMENTS may change the manual at any time and without notice because of improvements, typographical errors, or improvements to facilities

You can find the current version of the user manual on our website under:
www.mpw.pl DOWNLOAD section (one should choose demanded language version of website).

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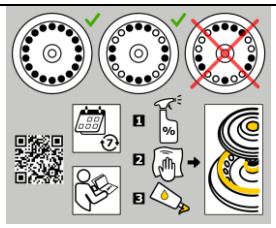
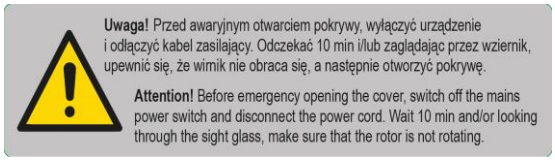
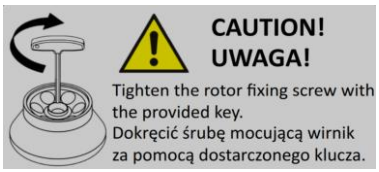
1 Symbols used in the manual and on the device

Symbol	Explanation
	**WARNING!** Warning of potential injury or health risk
	**DANGER!** Risk of electric shock with potential for severe injury or death as a consequence
	**DANGER!** Biohazard with potential for risk to health or death as a consequence
	**DANGER!** Risk of explosion with potential for severe injury or death as a consequence
	Symbol identifying a medical device for in vitro diagnostic use
	CE mark
	Symbol informing about the method of disposal
	Please read the instruction manual before you start working with the device
	Manufacturer's data

1.1 *Markings on the device*

Symbol	*Explanation*	*Location*
	Information about the direction of rotation of the rotor	Under the centrifuge lid
	Information on where and how to use the emergency lid opening mechanism	On the side of the centrifuge next to the emergency opening of the lid

	Reminder for proper rotor maintenance and Information about correct and incorrect filling of rotors	Under the centrifuge lid
	Information about the place of danger	On the side of the centrifuge next to the emergency opening of the lid
	Information reminding about the proper tightening of the rotor	Under the centrifuge lid

2 Application

- The **MPW-150R** centrifuge is a bench-top non-automatic laboratory centrifuge with cooling.
- The devices are intended for In Vitro Diagnostics (IVD). This means that it is an in vitro diagnostic medical device - in accordance with the Regulation of the European Parliament and of the Council (EU) of 5 April 2017 on in vitro diagnostic medical devices and repealing Directive 98/79/EC and Commission Decision 2010 /227/EU.
- The centrifuge is used to separate aqueous solutions and suspensions of samples with a density not higher than **1.2g/cm3** taken from human, animal and plant organisms into components of different densities under the influence of centrifugal force, in order to provide information about their biological state and to other analytical work.
- The design of the centrifuge ensures ease of use, safe operation and a wide range of applications in medical, biochemical and other laboratories.
- The centrifuge is not biotight, therefore, when centrifuging preparations that require biotightness, containers and rotors with a biotightness certificate should be used.

3 Technical specification

manufacturer	"MPW MED. INSTRUMENTS" SPÓŁDZIELNIA PRACY, Boremlowska 46 Street, 04-347 Warszawa				
type	**MPW - 150R**				
cat. no. (REF)	10150R/2-5	10150R/1-6/100	10150R/1-6/110	10150R/1-6	10150R/1-6/127
mains voltage (L1+N+PE)	230V	100V	110V	120V	127V
	±10%	±5%			
frequency, ±1%	50 Hz	60Hz			
Power consumption (max)	430W	430W			
current protection	T 6,3 A	T 10 A			
cooling medium	R452A				
capacity (max)	90ml (6x15ml)				
Speed (rpm)	90 ÷ 15000 rpm (step 1 rpm)				
g-force (RCF)	21382 x g (step 1 x g)				
kinetic energy (max.)	6900 J				
running time	00:00:01 ÷ 99:59:59 – [h. : min : s] (1s step)				
time counting	since start button is pressed / since preselected speed is reached				
short time operation mode (SHORT)	yes				
continuous operation mode (HOLD)	yes				
menu languages	English, Spanish, Italian, Portuguese, German, Russian, Polish, Swedish, French, Czech				
number of programs	100				
adjustable temperature	-20 ÷ 40°C* (step 1°C)				
initial cooling (FASTCOOL)	yes				
guaranteed temperature with max. rotor speed	≤4°C				
cooling without centrifuging	yes				
acceleration (ACEL)	10 linear characteristics				
deceleration (DECEL)	10 linear characteristics				
USB communication	yes				
electromagnetic compatibility	accordance with EN 61326-2-6:2006				
Degree of protection: (according to PN-EN 60034-5:2021-01)	IP20				
noise level	≤60dB				
weight	approx. 30,5 kg	approx. 33kg			
dimensions: height (H) width (W) depth (D)	285 mm 299 mm 595 mm				
height with open lid (H_{oc})	565 mm				

*time and possibility of obtaining a set temperature is dependent on multiple factors , including rotor type, established RPM, ambient temperature; accuracy: - ±1°C appropriate for place of temperature sensor

3.1 *Environmental conditions*

- The device may only be used indoors.
- The permissible ambient temperature is 2°C to 40°C.
- Maximum allowed relative humidity 80% at temperature up to 31°C decreasing linearly to 50% relative humidity at 40°C.
- The mains voltage fluctuations must not exceed ± 10% of the nominal voltage.
- Maximum altitude 2,000 m above sea level.
- Overvoltage category II.
- Pollution degree 2.

4 Installation

Open the package. Take out the box containing the accessories. Take out centrifuge from the container. Keep the box and packing materials in case of service shipping.

4.1 *Content of package*

name	pcs	cat. no.
centrifuge MPW-150R	1	10150R/2-5; 10150R/1-6; 10150R/1-6/100; 10150R/1-6/110; 10150R/1-6/127 (depending on voltage version)
rotor fixing screw	1	17142
rotor key	1	17099T
key for emergency lock release	1	18640
power cord 230V / power cord 120V	1	17866/17867
fuse WTA T10 250V / WTA T6,3 250V	2	17863/17862
petroleum jelly 20ml	1	17201
USB A-A cable	1	16655
user manual	1	See page 1

4.2 *Location*

- The device is heavy, so lifting and carrying the centrifuge can lead to back injuries. Risk of injury while lifting and carrying heavy loads.
- Lifting and transporting of the centrifuge should be done with a sufficient number of helpers. Use a transport aid for transporting the centrifuge.
- The device should be lifted by the underside in the vicinity of its feet and placed directly on a suitable lab table.
- Ensure safe location.
- The centrifuge shall not be located near source of heat and shall not be subjected to direct sunlight.
- Centrifuge should be flat-levelled. Effect of levelling shall be ensured by stable and flat-levelled tabletop for the centrifuge.
- Centrifuge should be set horizontally on a rigid base.
- It is necessary to ensure a ventilation zone of the minimum **30cm** round the centrifuge from every direction. Do not veil ventilation holes !
- Table for centrifuge should possess safety zone of the minimum **30cm** round the centrifuge from every direction (safety needs in case of malfunction according to EN 61010-020.
- Table for centrifuge should be free of containtments before locating of centrifuge.
- Passed parameters of the centrifuge are referring to the above-named temperatures (Technical specification).
- At the change of the place from cold to warm one, condensation of water will occur inside the centrifuge. It is important then that sufficient time be provided for drying the centrifuge prior to starting the centrifuge again (min. 4 hours).

- Do not position the centrifuge so that it is difficult to operate the power switch
- Supply voltage given on the rating plate has to be consistent with local supply voltage. MPW MED INSTRUMENTS laboratory centrifuges are 1st safety class devices and they are provided with the three-core cable with the plug resistant to dynamic loadings. Mains socket shall be provided with the safety pin - protective earth (PE).
- It is recommended to install emergency cut-out that shall be located far from the centrifuge, near the exit or beyond the room.

	▪ **Before switching on, check whether the centrifuge is connected to power supply correctly. It is obligatory to use only power cord recommended by manufacturer.**

4.3 *Current protection*

	The centrifuge is equipped with current protection (safety fuse). Fuse is situated in the plug-in socket unit at back wall of the centrifuge.

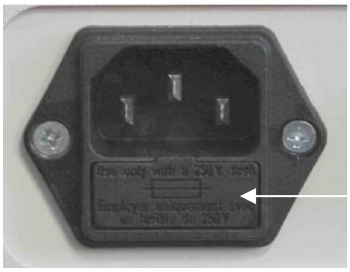


Fig.1 Plug-in socket unit

5 Safety notes

5.1 *General remarks*

- The laboratory centrifuge may be operated only by qualified laboratory personnel, after reading the operating manual.
- The operating instructions are part of the product.
- The operating manual should always be kept in the vicinity of the centrifuge.
- The centrifuge cannot be operated contrary to its purpose.
- If the centrifuge is used in a manner inconsistent with the manufacturer's guidelines, the safety of its use may be impaired.
- For centrifugation in the centrifuge, only containers and inserts provided in the list of equipment and centrifuge tubes, the diameter, length and strength of which are appropriate, should be used. The use of test tubes not included in the list should be agreed with MPW MED. INSTRUMENTS or its authorized representatives.
- Pay attention to the quality and appropriate thickness of the glass test tubes walls. Glass tubes should be centrifuge tubes, and their use in the centrifuge should be made dependent on the following guidelines:

glass tubes	**max RCF in angular rotors**
5-10 ml	3000 x g
30-100 ml	spinning not allowed

- Weighing the filled test tubes into the rotor is recommended. This will allow to minimize the differences in mass between them, and as a result to avoid the negative impact of vibrations on the engine suspension and to reduce noise levels during the operation of the centrifuge.

5.2 *Placing the rotor and accessories in the centrifuge*

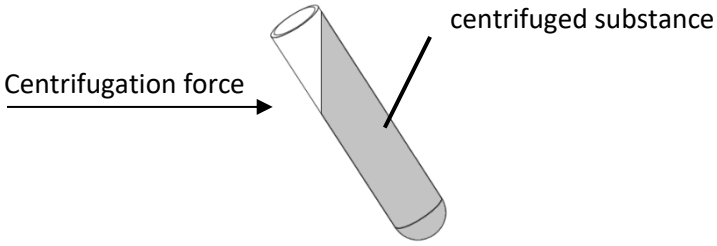
- Connect the centrifuge to the power supply (mains socket at the back of the centrifuge).
- Turn on the centrifuge (switch on the side of the centrifuge).
- Open the cover of the centrifuge by pressing the COVER key. Before installing the rotor, check that the rotating chamber is free from any contamination. If there is

dust, glass splinters, liquid residues, etc., remove them.

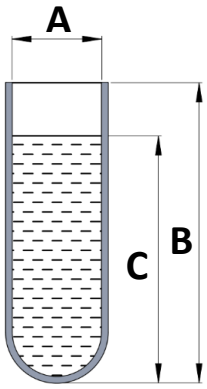
- The rotor can fall if not handled properly, therefore it should always be handled and placed in the centrifuge using both hands.
- Place the rotor on the motor axis by sliding it onto the cone as far as it will go (keeping the coaxiality between the rotor and the motor axis).
- Screw the screw fixing the rotor into the motor axis (clockwise), and then tighten it firmly with the rotor key.
- Fill the rotor with containers / hangers / test tubes according to recommendations in section Filling the rotor.
- In order to replace the rotor, first remove the tubes and containers from it, unscrew the screw securing the rotor with the enclosed rotor key, counterclockwise, then using both hands, grab the rotor on opposite sides and remove it from the motor axis.
- Install another rotor as described above instructions.

5.3 *Filling tubes*

- Fill test tubes outside the centrifuge.



- If the manufacturer of the test tube has not specified the maximum level, fill the test tubes so that the centrifuged substance does not run out of the vessel during centrifugation. To do this, use the formula below:



$$C < B - \frac{A}{2}$$

A – internal tube diameter
B – tube height
C – max liquid level

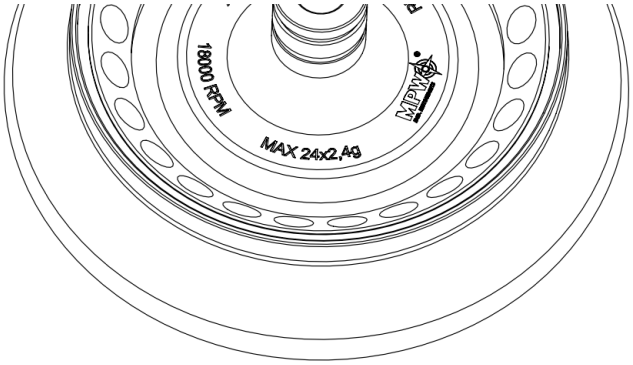
5.4 *Filling the rotor*

CAUTION!

Angle rotors must be used with a suitable cover which must be screwed securely onto the rotor. The rotor and the cover are marked with the same catalog number (REF) to eliminate the risk of incorrect selection when you have several types of rotors.

- Check that the impeller is seated correctly and firmly bolted to the motor shaft.
- Do not exceed the maximum rotor load (information is provided on the rotor).

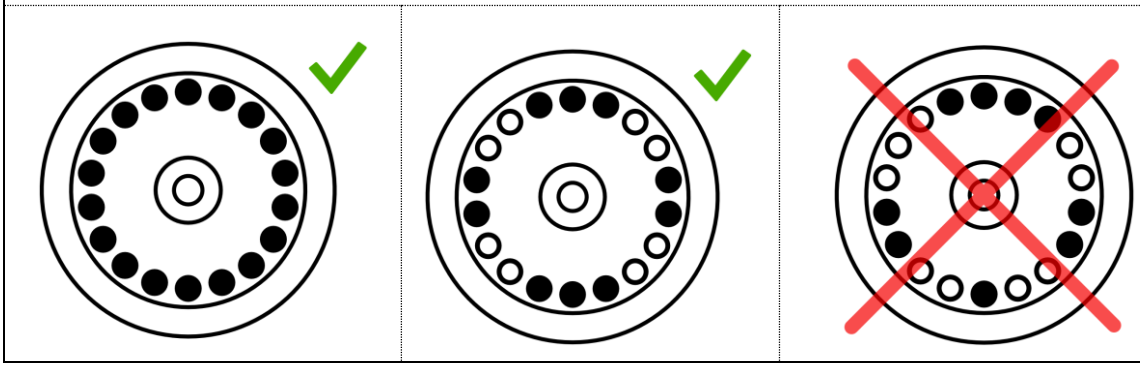
An example of the marking on the angular rotor:



MAX. 24x2,4g - means the possibility of placing 24 test tubes in the rotor, each weighing 2.4 g.

- To ensure symmetrical loading, insert test tubes of the same type and weight in pairs into opposite openings of the rotor. If reduction inserts are used, they should also be placed in the holes opposite to each other in pairs of the same type.

Examples of correct and incorrect arrangement of test tubes in the rotor:



5.5 *Safety hints*

ROTOR MAINTENANCE

- In order to increase the durability of gaskets, threaded places, rotor pins, undercuts for pins in containers, they must be cleaned, and then it is necessary to lubricate them with the technical petroleum jelly supplied with the device (catalog number 17201).
- Use only accessories that are in good technical condition.

HU EQUIPMENT MAINTENANCE

- Make sure the sealing rings (rubber) are lightly coated with grease to maintain tightness. Use high vacuum silicone grease, eg type "C" by LUBRINA.

HAZARDOUS MATERIALS

- Infectious materials should be centrifuged only in containers / rotors with covers.
- It is not allowed to centrifuge toxic or infectious materials if the rotor or test tube seal is damaged.
- Appropriate disinfection procedures should always be carried out, if hazardous substances have contaminated the centrifuge or its accessories.

EXPLOSIVE, FLAMMABLE MATERIALS

- It is not allowed to centrifuge explosive and inflammable materials.

	▪ Do not centrifuge substances that could create a potentially explosive atmosphere as a result of the high energy supply during centrifugation. ▪ The centrifuge must not be used in an explosive atmosphere. ▪ It is not allowed to centrifuge materials that may generate flammable or explosive mixtures when exposed to air.

5.6 *Operating conditions*

	**GENERAL REMARKS** ▪ Only original equipment of centrifuges and spare parts should be used. ▪ In case of a malfunction of the centrifuge, the MPW MED factory service should be used. INSTRUMENTS or its authorized representatives. ▪ It is not allowed to start the centrifuge if it is not installed correctly or the rotor and accessories are not properly mounted. ▪ The centrifuge must not be transported with the rotor installed on the motor shaft. ▪ Fill the rotor equipment to the same weight in order to prevent unbalance of the centrifuge (point ***Filling the rotor***).

	**START-UP** ▪ Before switching on the device, carefully read all sections of this manual in order to ensure the correct operation of the device and to avoid damage to the device or its accessories.

	**CENTRIFUGAL SUBSTANCES** ▪ Rotors are designed for centrifuging liquids with an average density of **1.2 g / cm3** or less. This applies to centrifugation at maximum speed. If liquids with a higher density are to be used, be sure to enter the density value in the **PARAM / DENSITY** tab in order to reduce the available spin speed.

5.7 *Equipment life*

	▪ Each spin cycle in which the rotor has accelerated and decelerated is considered a duty cycle, independent of speed and duration. ▪ Do not use the equipment after the allowable number of cycles or after the maximum service life has passed, whichever comes first.

5.8 *Work safety*

The centrifuge should be inspected by an authorized service at least once a year (after the warranty period). Special circumstances, e.g., corrosive environment, may be the reason for more frequent checks. Tests should end with issuing a validation protocol, which specifies checking the technical condition of a laboratory centrifuge.

It is recommended to create a document that records all repairs and inspections. This document should be kept in the place where the centrifuge is used.

	**CONTROLS CONDUCTED BY THE OPERATOR** ▪ The operator must pay attention to the fact that the parts of the centrifuge, important from the safety point of view, are not damaged. This remark applies to:

	▪ Centrifuge accessories, especially structural changes, corrosion, initial cracks, abrasion of metal parts. ▪ Bolted connections. ▪ Inspection of rotor and container seals, if any. Particular attention should be paid to rubber elements (seals). In the event of any damage or visible structural changes, they should be immediately replaced with new ones. ▪ Control of the performance of annual post-warranty inspections of the technical condition of the centrifuge.
	▪ During centrifugation, it is not allowed to lift, shift the centrifuge or rest on it. ▪ During centrifugation one must not stay in the safety zone, i.e., 30 cm distance around the centrifuge, nor leave any objects, e.g., glass vessels, inside this zone. ▪ It is not allowed to put any objects on the centrifuge.
	**OPENING THE COVER DURING SPINNING** ▪ It is not allowed to use the emergency cover opening during centrifuging, because it may result in loss of health or life.
	**HANDLING OF ROTORS** ▪ It is not allowed to use accessories (rotors, lids, containers, hangers and round carriers) with signs of corrosion or other mechanical damage. ▪ It is not allowed to centrifuge substances of high corrosive aggressiveness, which may damage the materials and reduce the mechanical properties of rotors, buckets and round carriers. ▪ It is not allowed to centrifuge rotors with removed or loose covers.

5.9 *Unbalance*

	Unbalance causes noise, vibration during operation and has a negative effect on the driveline (engine and suspension). The more precisely the process of balancing the feed to the rotor is carried out, the smoother the centrifuge will run and the longer the useful life of the drive system will be. Moreover, thanks to the correct balancing, an excellent level of separation of the centrifuged substance is achieved since the separated components will not be picked up again by vibrations.

The centrifuge is equipped with a rotor imbalance sensor. In the event of its activation, the centrifugation process is stopped by quick braking and an error message is displayed. Erasing the error message is possible by pressing one of the following buttons: **BACK, STOP, COVER, SET** and ▲ ▼ ◄►.

Make sure that the rotor has been properly loaded - places in the rotor must be equipped with identically filled containers, inserts and test tubes so as to obtain the best possible weight balance (see chapter ***Filling the rotor***). If necessary, correct the load distribution and / or, in the case of horizontal rotors, clean and lubricate the rotor pins, then restart the spin.

5.10 *Emergency stop*

At any time during centrifugation, it is possible to interrupt the process and stop the centrifugation with the fastest rotor characteristics. This is done by pressing the stop button twice (**2x STOP**).

Pressing the **STOP** key once will stop the spinning with the braking characteristics set in the program. The message about interrupted centrifuging can be canceled with the following buttons: **BACK, STOP, COVER, SET** and ▲ ▼ ◄►.

5.11 *Residual risk*

The centrifuge is built according to the state-of-the-art and the recognized safety regulations. Nevertheless, still remain some level of residual risk due to improper operation and malfunctions. It is possible to decrease residual risk by strictly applying user manual conditions and correcting malfunction which could threaten safety, immediately.

5.12 *Obligation to report a serious device incident*

Any serious incident related to the device should be reported to the manufacturer and the competent authority of the Member State where the user or patient resides.

6 Product description

6.1 *Product Design and Appearance*

A new generation of MPW MED laboratory centrifuges. INSTRUMENTS is equipped with modern microprocessor controllers, very durable and quiet brushless asynchronous induction motors and equipment that meets the user's requirements.
The centrifuge has a rigid self-supporting structure. The housing is made of aluminum sheet, the back is made of steel sheet, the rotating chamber is made of stainless steel. The front part and the cover are made of ABS plastic. The lid is mounted on metal hinge axles and is secured against opening during spinning thanks to the use of an electric lock.

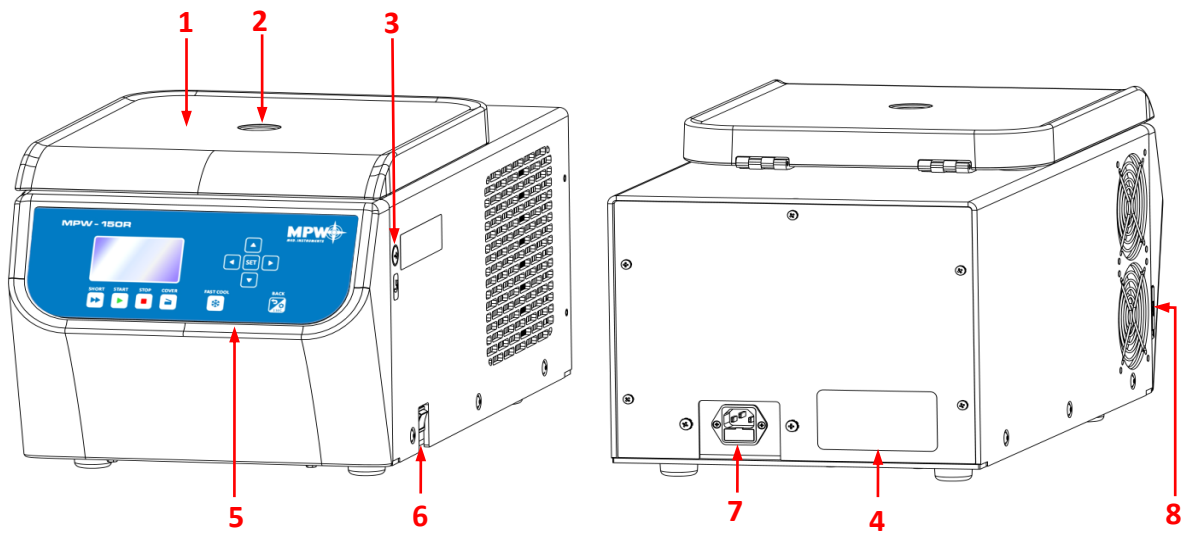
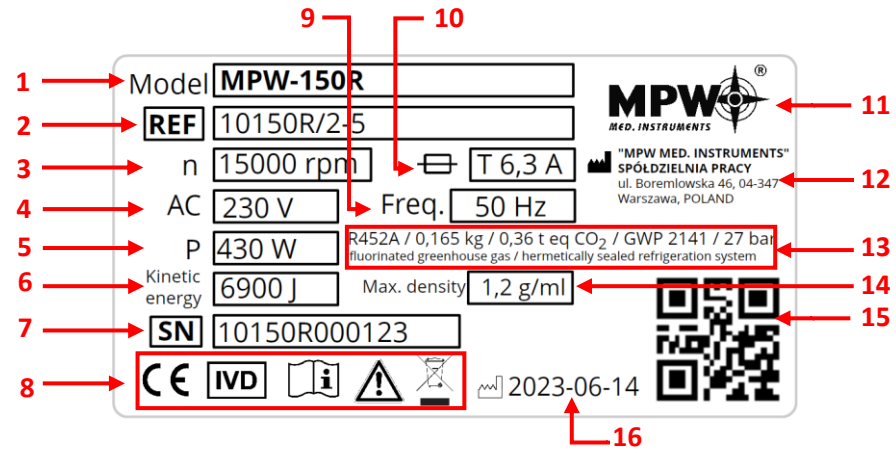


Fig.1. Front and rear view of the MPW-150R centrifuge.

1 **Centrifuge lid** 2 **Inspection glass** (is used to control the rest condition of the rotor) 3 **Emergency cover release** 4 **Name plate** 5 **Control panel** (display and control of the centrifuge operation)	6 **Main's switch** 7 **Centrifuge power socket** (with fuse socket) 8 **USB port** (sending a report to a computer for saving or printing work results)

6.2 *Name plate*

The data concerning the device should be read from the rating plate located on the rear wall of the centrifuge (the picture below is an example).



1	Centrifuge model	**9**	Rated frequency
2	Catalog number	**10**	Current protection
3	Maximum speed	**11**	Manufacturer's logo
4	Rated voltage	**12**	Manufacturer's information
5	Maximum rated power	**13**	Information about the refrigerant (refrigerated centrifuges only)
6	Kinetic energy	**14**	Density of centrifuged substance
7	Serial number	**15**	QR code for serial number
8	Approval marks and symbols (explained in chapter 1)	**16**	Date of production

6.3 *Control device*

The microprocessor control unit of the centrifuge ensures broad possibilities of providing, realisation and reading of work parameters.

6.4 *Setting parameters*

Data setting and read-out system forms hermetically closed keyboard with distinctly accessible operation points. Easily readable displays signalling individual performed operations facilitate operator's programming and recording of parameters and condition of the centrifuge.
The centrifuge is provided with the USB interface that enables connection of the centrifuge to external PC unit with the printer and recording the centrifugation parameters.

6.5 *Safety features*

Cover lock

The centrifuge can be started only with properly closed cover. While the cover can be opened only after stopping the rotor. In case of emergency opening of the cover during operation, the centrifuge will be immediately switched-off and the rotor will brake till complete stopping. During cover closing it is prohibited to press any buttons. Do not place fingers into closing area during cover closing.

Unbalance detecting

When loads of opposite buckets or carriers in rotors are unbalanced, the drive will be switched-off during acceleration or operation of the centrifuge – and the error message will be displayed.

Rotor verification and checking compatibility with set program

Directly after starting centrifuging, a unit verifies the type of the rotor applied and in the case of its incompatibility with the type indicated in the application or absence of the rotor, the spinning process shall be stopped with simultaneous displaying the error message. The conformity of the type of the rotor is signalled with a single audible signal. In case auto identification (see Other) option is checked, proper rotor will be automatically chosen, without user engagement.

Rest state inspection

Opening the centrifuge lid with the **COVER** key is possible only when the rotor is at rest. Check that the symbol ■ described in the **Display** chapter is visible on the screen. Use the sight glass on the cover to make sure the impeller is not turning. When the rotor brakes, the symbol ⬇ described in the **Display** section is visible. Emergency opening of the cover during rotor spinning is not allowed.

Checking of excessive temperature

If temperature in rotation chamber exceeds 50°C caused by, for example, malfunction of cooling system, drive will be switched off and error message will be displayed. The reboot is only possible after chilling device.

7 Centrifuging

Power switching ON/OFF is carried out with master switch situated on the right-side wall of the centrifuge. All settings on the centrifuge are done by means of the control panel.

7.1 *Control panel*

The control panel placed on the front casing serves the purpose of controlling centrifuge operation.

Control panel

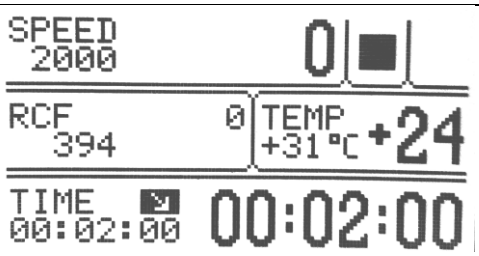
⏩	SHORT[1]	short-time centrifuging
▶	START	start centrifugation run
■	STOP[2]	end centrifugation run
⏏	COVER	cover opening
❄	FAST COOL	start fast cooling mode
1 SEC.	BACK RPM/RCF	exit the current menu / cancelling switching between SPEED display mode and RCF display mode
▲	UP	navigation in menu / increasing values
▼	DOWN	navigation in menu / decreasing values
◀	LEFT	navigation in menu
▶	RIGHT	navigation in menu
SET	SET	changing parameters / confirming changes

[1] the centrifuge is working as long as the key is pressed

[2] First-time pressing will make stopping centrifuging with acceleration characteristics set in the current program, second-time pressing will make braking as fast as possible.

7.2 *Display*

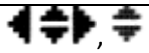
The display is located in the centre of the control panel. The main screen variants are presented below.

	After switching on centrifuge, welcome screen appears. After disappearing the welcome screen, it is possible to setting up parameters.
	**Simplified** display mode is set as default, there is possible to switch to **normal** (see chapter 9.3) display mode (with two sub modes shown below).
Normal display	
RPM display mode	**RCF display mode**
	

Switching between RPM and RCF display mode

	For normal display switching between RPM and RCF display mode may be obtain by pressing and keeping key by 1s :  then one should choose demand mode.

SPEED	rotor speed	assigned/measured
RCF	centrifugal force	assigned/measured
TIME	centrifuging time	assigned/measured
TEMP	temperature	assigned/measured
PRG ---	program no.	
11199 / ---	rotor no.	
PARA	parameters of the centrifuge	
MENU	configuration menu	

	changing values		
	density > 1,2 g/cm^3		
	centrifuging radius changed		
	counting time down (decreasing)		counting time up (increasing)
	centrifuging		centrifuging (with automatic cover opening)
	rotor stopped / closed cover		rotor stopped / opened lid
	braking		fastest decelerating
	rotor identification		
	thermal chamber		
	temperature delay		
	time delay		
	currently enlarged digits of TIME field		
	drop-down list		
	temporarily disabled		
	locked		
	time counting (blinking)		
	disabled option		active option

7.3 *Setting up RPM, RCF, time, temperature*

On the main screen, it is possible to set:

rotating speed - RPM	**SPEED**
relative centrifugal force (multiple of g-force)	**RCF**
centrifuging time	**TIME**
centrifuging temperature	**TEMP**

Exemplary change of **SPEED** setting:

- Press **SET** (to enter edit mode) –  appears.
- Via ▲▼◄► keys mark **SPEED** field (highlighted).
- Press **SET**- blinking.
- With ▲▼ choose demanded value.
- Via ◄► choose order of magnitude of changing value (highlighted).
- Repeat above two steps for other orders of magnitude.
- Confirm settings by pressing **SET**.
- Press **BACK**.

When RPM is changed, RCF is automatically corrected.

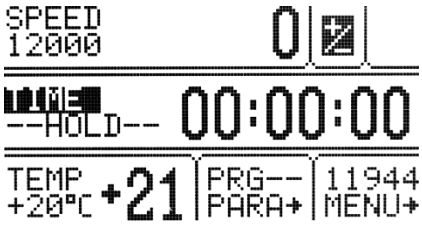
Exemplary change of **RCF** setting:

	▪ Press **SET** (to enter edit mode) – appears. ▪ Via ▲▼◄► keys mark **RCF** field (highlighted). ▪ Press **SET-** blinking. ▪ With ▲▼ choose demanded value. ▪ Via◄► choose order of magnitude of changing value (highlighted). ▪ Repeat above two steps for other orders of magnitude. ▪ Confirm settings by pressing **SET**. ▪ Press **BACK**.
When RCF is changed, RPM is automatically corrected.	

Switching between SPEED and RCF.	
	On the screen appear an additional window, in which: ▪ Via ▲▼ keys mark field . ▪ Press **SET**. Change of screen mode will be active to switch off the centrifuge
Switching between basic and simplified screens is described in **Main screen modes.**	

Exemplary change of **TIME** setting:	
	▪ Press **SET** (to enter edit mode) - appears. ▪ Via▲▼◄► keys mark **TIME** field (highlighted).
00:02:00 **[hh : mm : ss]** e.g.: centrifuging time – 2 minutes 00 seconds	▪ Press **SET** - blinking. ▪ With▲▼ choose demanded value. ▪ Via◄► choose order of magnitude of changing value (highlighted). ▪ Repeat above two steps for other orders of magnitude. ▪ Confirm settings by pressing **SET**. ▪ Exit edit mode by pressing **BACK**.
00:02:00	set value
02:00	current value (most significant digits)

HOLD mode	continuous run mode



- To run centrifuging in **HOLD** mode set **00:00:00** time.
- To end centrifuging in HOLD mode press **STOP**.

Exemplary change of **TEMP** setting:

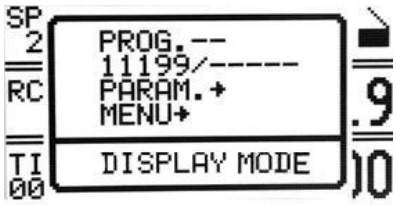
- Press **SET** (to enter edit mode) – appears.
- Via ▲▼◄► keys mark **TEMP** field (highlighted).
- Press **SET** key.
- With ▲▼ choose demanded value.
- Confirm settings by pressing **SET**.
- Press **BACK**.

7.4 *Users programs*

After switching centrifuge on, program that was used in previous session is being loaded. If any program was not used in previous session, centrifuge resume the last choosen parameters.

Program choosing:

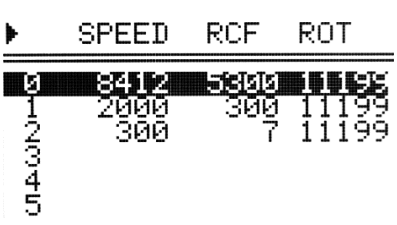
Simplified display mode



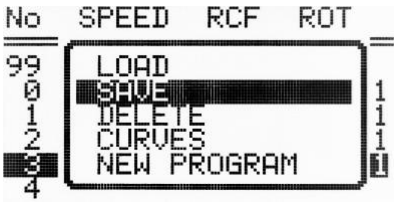
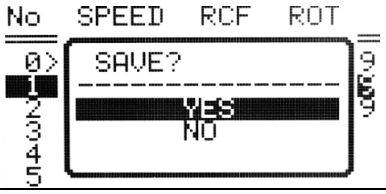
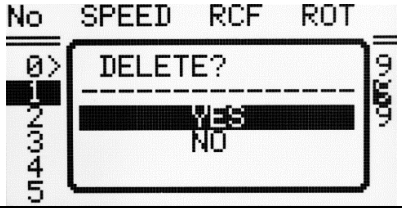
- Press and hold BACK 1SEC by 1 second.
- Choose PROG with ▲▼
- Press **SET**.
- Execute points descripted follow (below **Normal display mode** description)

Normal display mode

- Press **SET** key – appears.
- Via ▲▼◄► keys mark **PRG– –** field (highlighted)
- Press **SET** key – list of programs is visible.

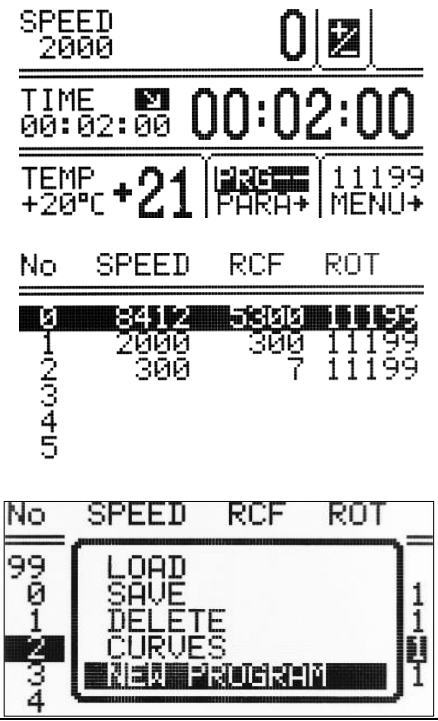


- Via ▲▼ choose demanded program.
- Confirm with **SET** key.

	**LOAD**, **SAVE**, **DELETE, CURVES, NEW PROGRAM** refer chosen program which is marked by ▶.
	**SAVE** – save settings as a program (confirm by selecting **YES** and pressing **SET**)
	**DELETE** – delete program (confirm by selecting YES and pressing **SET**)
	NEW PROGRAM– enter to create new program mode (as below)

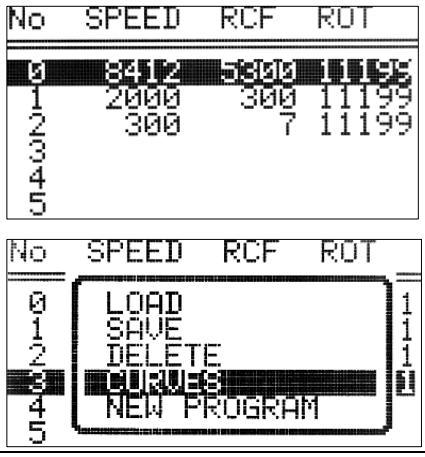
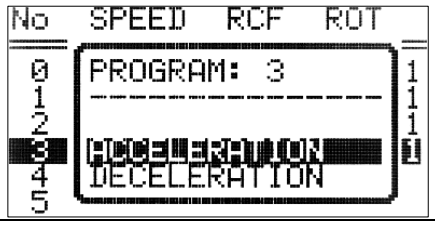
NEW PROGRAM – enter to create new program mode (as below)

Creating a new program:

	▪ Press **SET** key. ▪ Via ▲▼◄► keys mark **PRG – –** field (blinking). ▪ Press **SET** key. List of programs is visible, choose demanded position (number of program). ▪ Press **SET** key- menu of program settings will appear. ▪ Choose **NEW PROGRAM** press **SET** and **BACK**, and then set demanded parameters of centrifuging (look chapter "6. Centrifuging"). ▪ In case you want to register new program, back to the **PRG – –** menu and save it as described before.

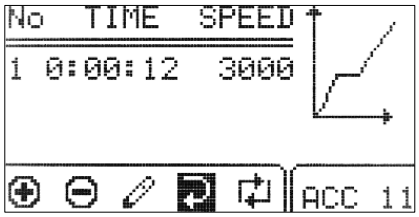
Changing parameters during centrifuging
There is a possibility to change parameters: **SPEED, RCF, TIME, and TEMP** during centrifuging. Such modifications inactivate currently running program. Modification during run is represented by **PRG – –** symbol (instead of the program number).

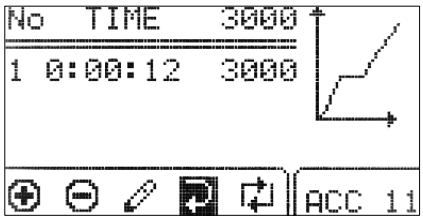
7.5 *Creator of acceleration and deceleration curves*

	PROG/**CURVES**
	▪ With ▲▼ keys choose saved program for which you intend to create the acceleration or deceleration characteristics (marked with symbol ▶). ▪ Press **SET**. ▪ With ▲▼ keys choose **CURVES.** ▪ Press **SET -** the selection frame is displayed**.**
	▪ With ▲▼ keys choose **ACCELERATION** to create acceleration characteristics or **DECELERATION** to create deceleration characteristics ▪ Confirm selection by pressing **SET**.

7.5.1 Acceleration characteristic, creation of episode 1

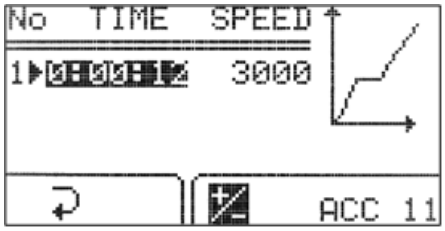
Displayed alternately **SPEED** and **3000** (example):





No	section no. (max. 4)
TIME	total acceleration time
SPEED	final RPM
ACC	characteristic's no. (10-19)
⊕	adding a new section
⊖	deleting last section
✎	editing sections
↩	exiting from characteristics wizard
⇄	switching RPM/RCF
	entering graph view

After entering the curve wizard, the symbol ↩ is highlighted. Pressing **SET** and selecting "**NO**" in response to the question "**SAVE?**" will return to the **PROG → CURVES** menu without making changes to the starting characteristics. To start editing the one-segment characteristics, select the icon ✎ with the ◄► keys and press the **SET** key.



±	editing value (flashing means editing the given value)
▪ Press **SET** ▪ With ▲▼◄► choose time for section	

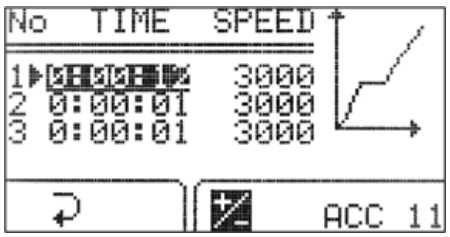
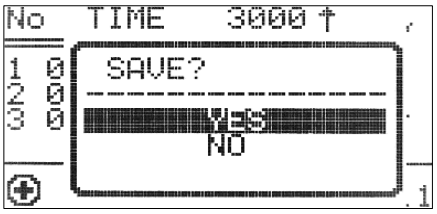
	▪ Press **SET** ▪ It is not possible to edit the maximum speed value. To do this, more sections have to be created, but the last section will always have the maximum set speed and cannot be changed. ▪ Select ↵ with ▼ ◄ buttons and press **SET** to finish editing characteristics.

7.5.2 Adding and editing sections - acceleration

To program next sections, select the ⊕ icon with the ◄► buttons and press **SET**. A new section (sections) will appear with a time of 1 second and a speed equal to the maximum speed.

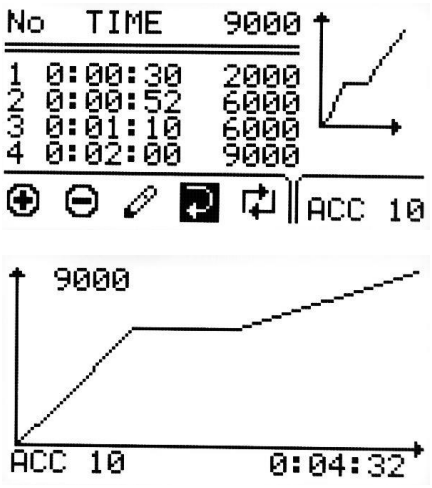
To start editing a newly added section (sections), select the ✎ icon with the ◄► buttons and press **SET**, and follow the instructions given below.

After entering the profile section editing menu, the time value of the first section will be highlighted (see the picture below).

	The maximum speed value for the section cannot be higher than the maximum speed value for the characteristic (for the last section). ▪ With ▲▼◄► highlight time or speed for desired section ▪ Press **SET** ▪ With ▲▼◄► choose value ▪ Press **SET** ▪ Repeat until setting all the sections ▪ To finish editing characteristic with ▲▼◄► choose ↵ and press **SET.** Finishing edition can be also done by pressing **BACK** button.
Saving created characteristic	
	▪ Select the ↵ icon with the ◄► buttons and press **SET** ▪ In the "Save?" window, use ▲▼ buttons to select YES to confirm saving the characteristic or NO, to exit without saving ▪ Press **SET**

7.5.3 Acceleration graph

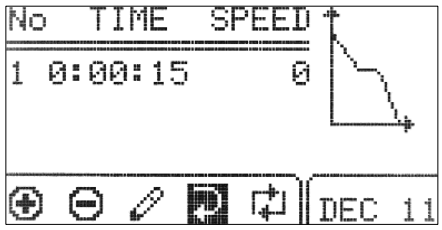
An example of given parameters and a diagram:

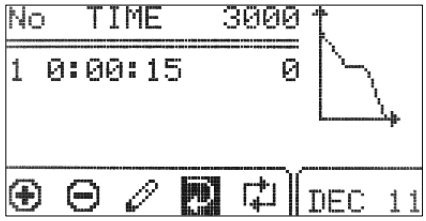


After the time value programming is completed, the **TIME + SPEED** segment of the user's startup characteristic can be displayed graphically. The set section of the characteristic curve is illustrated on the graph, which can be displayed by selecting the icon with the ◄► keys and pressing the **SET** key.

7.5.4 Deceleration characteristic, creation of episode 1

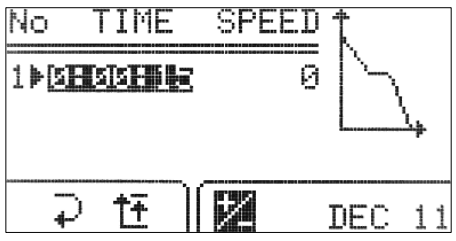
SPEED or **3000** displayed (example):





No	section no. (max. 4)
TIME	total acceleration time
SPEED	final RPM
DEC	characteristic's no. (10-19)
⊕	adding a new section
⊖	deleting last section
✎	editing sections
↩	exiting from characteristics menu
⇄	switching RPM/RCF
	entering graph view

After entering the curve wizard, the symbol ↩ is highlighted. Pressing **SET** and selecting "NO" in response to the question "**SAVE?**" will return to the **PROG → CURVES** menu without making changes to the starting characteristics. To start editing the one-segment characteristics, select the icon ✎ with the ◄► keys and press the **SET** key.



±	editing value (flashing means editing the given value)

- Press **SET**
- With ▲▼◄► choose time for section
- Press **SET**
- To edit speed
- It is not possible to edit the minimum speed value. To do this, more legends must be created, but the last leg will always be "**0**".

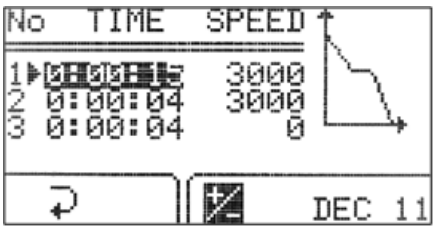
	▪ Select ↩ with ▼ ◄ buttons and press **SET** to finish editing characteristics

7.5.5 Adding and editing sections - deceleration

In order to program successive periods, select the icon ⊕ with the ◄► keys and press the **SET** key. A new segment (or segments - after successive presses of SET) will appear with the time and speed equal to the minimum speed - "**0**".

To start editing the newly added sections, select the icon ✎ with the ◄► buttons, press **SET** and make the settings as described below.

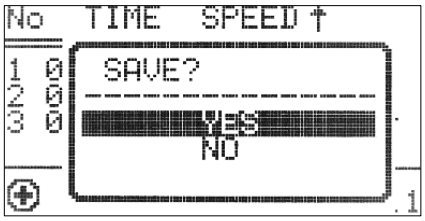
After entering the profile section editing menu, the time value of the first section will be highlighted (see the picture below).



The speed value of the last segment will always be "**0**".

- With ▲▼◄► highlight time or speed for desired section
- Press **SET**
- With ▲▼◄► choose value
- Press **SET**
- Repeat until setting all the sections
- To finish editing characteristic with ▲▼◄► choose ↩ and press **SET.** Finishing edition can be also done by pressing **BACK** button

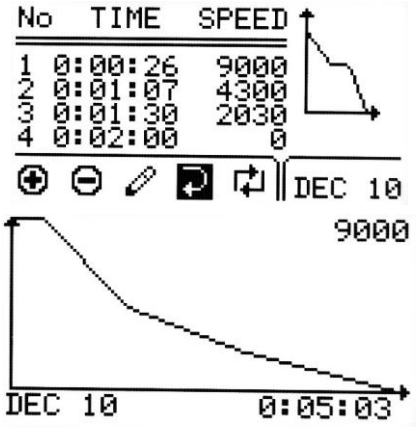
SAVING CREATED CHARACTERISTIC



- Select the ↩ icon with the ◄► buttons and press **SET**
- In the "Save?" window, use ▲▼ buttons to select YES to confirm saving the characteristic or NO, to exit without saving
- Press **SET**

7.5.6 Deceleration graph

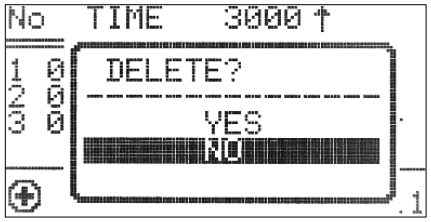
An example of given parameters and a diagram:



After programming the time value, you can graphically display the **TIME + SPEED** segment of the user's braking characteristic. The set section of the characteristic curve is illustrated on the graph, which can be displayed by selecting the icon  with the ◄► keys and pressing the **SET** key.

7.5.7 Deleting sections

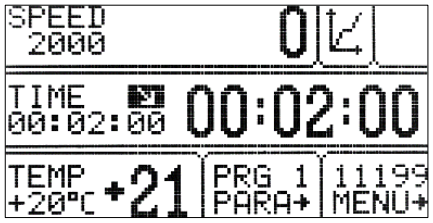
In the characteristic's wizard:



- Select the ⊖ icon with the ◄► buttons and press **SET**
- In the "Delete?" window, use ▲▼ buttons to select YES to confirm deleting the characteristic section or NO to cancel
- Press **SET**

7.6 *Programs with user characteristics*

Loading a modified program in the **CURVES** fold is signaled by the icon on the main screen:

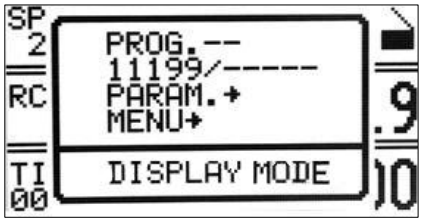


Icon  signals that program with user acceleration/deceleration characteristics are loaded.

A change in any parameter entails the deactivation of the multi-section's curves mode.

7.7 *Rotor and bucket choosing*

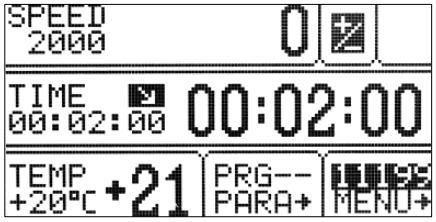
Simplified display mode



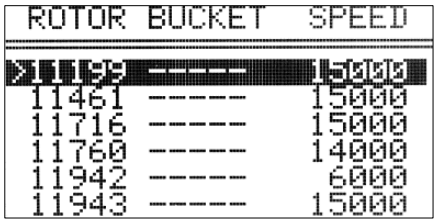
- Press and hold 

by 1 second.
- Choose rotor number (exemplary **11199/-----**) with ▲▼.
- Press **SET**.
- Execute points descripted follow (below **Normal display mode** description)

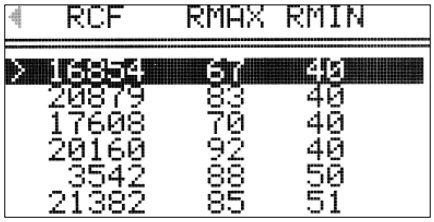
Normal display mode



- Press **SET**–  appears.
- Via ▲▼◄► mark rotor choosing field.
- Press **SET** (Rotors and buckets list will appear).



- Via ▲▼ keys mark demanded rotor number
- Confirm by pressing **SET**.
- If a bucket can be selected:
  - With ▲▼ select demanded bucket number.
  - Press **SET**.
- Press **BACK** to close edition mode.



- With ◄► keys one may switch between screens of rotors parameters

- It is possible to set **AUTOMATIC ROTOR IDENTIFICATION**. The procedure is described in subsection "Other".

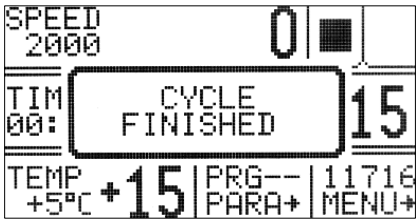
7.8 *SHORT mode*

SHORT MODE – short work mode (centrifuging with pressed **SHORT** key)

- The **SHORT** mode is activated by pressing and holding ▶▶(**SHORT**).
  In SHORT mode the centrifuge is working as long as the **SHORT** key is pressed or when set time is over.
- Centrifuging is stopped after releasing the **SHORT** key.

7.9 *Finishing the centrifuging*

- When preselected time is reached, centrifugation will end automatically.

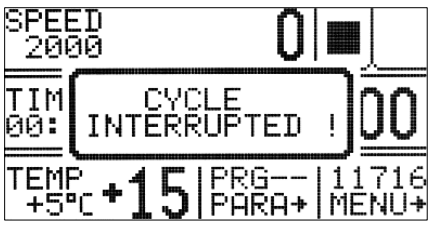


X1

- Before lapsing preselected time, one may stop centrifugation. Pressing **STOP** for the first time will stop centrifuging with the characteristic set-in loaded program.
  ↓ symbol will be shown.

x2

- Pressing **STOP** second time will stop centrifuging with the fastest characteristic.
  ⤓ symbol will be shown.



- The message about cancel of centrifuging can be delete with the **STOP**, **SET, COVER, ▲▼◄►** or **BACK** key.

8 Temperature control

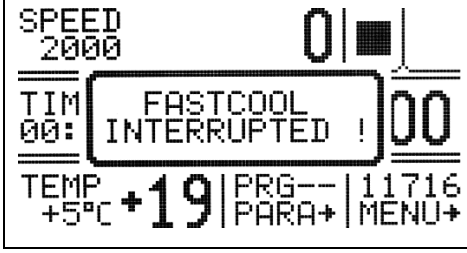
Centrifuge is equipped with ecological refrigerating system with temperature control. During centrifugation, there may appear differences in temperature on the display and temperature of the samples in the rotor. It depends on thermal conductivity of the rotor, and samples, centrifugation time, initial temperature of rotor and samples.

Exemplary change of **TEMP** setting:

	▪ Press **SET** (to enter edit mode) – appears. ▪ Via▲▼◄► keys mark TEMP field (highlated). ▪ Press **SET**. ▪ Via▲▼ set value. ▪ Confirm via SET key.
	When chamber is being cooled, symbol is visible on the screen (blinking).

8.1 *Initial cooling during centrifuging - FAST COOL*

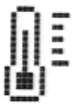
	▪ The parameters allowable to change at **FAST COOL** mode: ▪ temperature (lower than current temperature shown by centrifuge) ▪ In order to centrifuging reduced temperature samples (e.g., storage in the external refrigerator) centrifuge chamber, rotor and centrifuge container must be pre-cooling to the predetermined temperature. It causes minimalization of temperature differences. ▪ Initial cooling may be activated by **FAST COOL** key (lid must be closed – rotor is spinning at **FAST COOL** mode) ▪ When **FAST COOL** mode is active, cooling system automatically set proper parameters to obtain demanded temperature the fastest way. ▪ It is possible to exit **FAST COOL** mode at any time by pressing **STOP** key.

	**FAST COOL** mode is marked by symbol blinking in the right upper side of display.
	It is possible to exit **FAST COOL** mode at any time by pressing **STOP** key. Interruption of the function is signalled by a message.

8.2 *Initial cooling without centrifuging – THERMAL CHAMBER*

	PARA → **THERMAL CHAMBER**
 **0 RPM**	▪ There is possible to run centrifuge in THERMAL CHAMBER mode – cooling (rotor is at standstill). ▪ How to enable **THERMAL CHAMBER** is described in "Thermal chamber" chapter.

8.3 *Cooling in "START DELAY – OF TEMPERATURE" mode*

	PARA→ **START DELAY/OF TEMPERATURE**
	▪ Centrifuging process will start, when preselected temperature is reached. ▪ How to enable run **START DELAY – OF TEMPERATURE** function is described in "Start delay – of temperature" chapter.

8.4 *Cooling in „SHORT" mode*

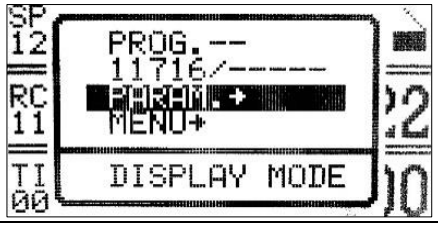
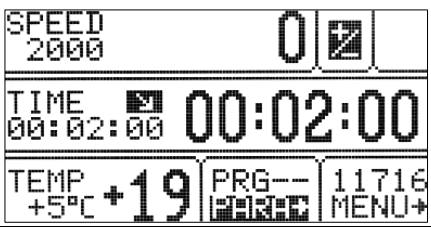
	▪ Cooling feature is available in SHORT mode. ▪ How to enable run centrifugation in **SHORT mode** is described in "SHORT mode".

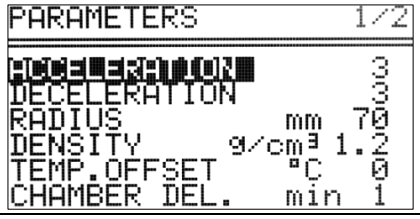
8.5 *Cooling notes*

MPW-150R centrifuge is equipped with an efficient cooling system. It allows obtaining selected temperatures in the chamber even at maximum spin speed or fast obtaining desired temperatures (e.g., +4°C). Note that time and possibility of obtaining a set temperature is dependent on multiple factors, including: the power of the cooling system, the shape of the rotor, the rotor speed, ambient temperature, etc. The accuracy of the temperature stability of ± 1 ° C is determined by the installation place of the temperature sensor.

9 Parameters of centrifugation

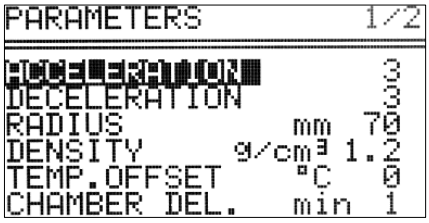
This chapter contains exemplary screens of MPW-260R centrifuge (screens for MPW-260 – without cooling – do not include temperature field).

Simplified display	
	▪ Press and hold BACK 1SEC by 1 second. ▪ Choose **PARAM.** with▲▼ ▪ Press **SET**.
Normal display	
	▪ Press **SET**. ▪ With ▲▼◄► keys select **PARAM**. ▪ Press **SET.**
▪ It is possible to switch between two different screens via ◄►▲▼ keys in **PARAMETERS** field.	



ACCELERATION	chosen acc. characteristic (0-the fastest, 9-the slowest)
DECELERATION	chosen dec. characteristic (0-the fastest, 9-the slowest)
RADIUS [mm]	current rotor radius [mm]
DENSITY (g/cm³)	sample density [g/cm³]
TEMP. OFFSET (°C)	value of temperature correction
CHAMBER DEL. (min)	delay between set thermal chamber mode and start it
THERMAL CHAMBER	cooling of the chamber without centrifuging
AUTOM. LID OPENING	opening cover after centrifuging automatically
START DELAY	starting delayed (after pressing START)

9.1 *Acceleration/deceleration – changing characteristics*

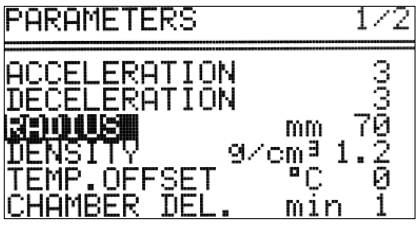


- With ▲▼ keys select **ACCELERATION** or **DECELERATION**.
- Press **SET.**
- With ▲▼ keys select demanded number of characteristics.
- Press **SET**.

ACCELERATION –10 (0 ÷ 9), linear accelerating characteristics assigned to every rotor. 0-the fastest acceleration, 9-the slowest acceleration.

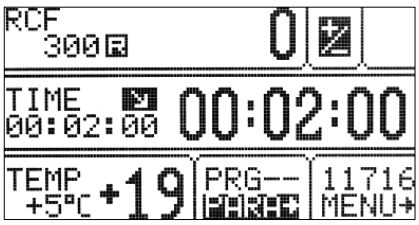
DECELERATION – 10 (0 ÷ 9), linear decelerating characteristics assigned to every rotor. 0-the fastest deceleration, 9-the slowest deceleration.

9.2 *Radius*



RADIUS [mm] - control of the radius of the rotor within the range from $\mathbf{R_{min}}$ to $\mathbf{R_{max}}$. Available values depend on chosen rotor. Radius corrections serve for more precise control RCF, exemplary when user need to know real RCF in half length of test tube.

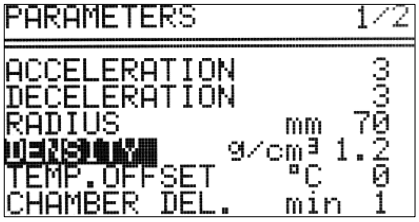
- To change the rotor radius, select **RADIUS [mm]** with ▲▼ keys.
- Press **SET**.
- Set demanded value by pressing ▲▼.
- Press **SET**.



When radius correction is activated, R symbol is visible on the screen.

Reducing of the rotor radius resulting change of displayed RCF value.

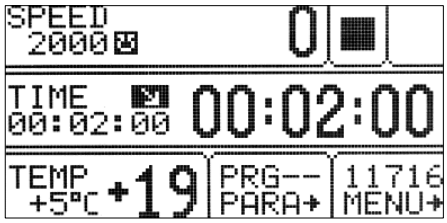
9.3 *Sample density*



DENSITY (g/cm³) – default density is set to **1,2 g/cm³**

To change the density (possible values **1,2÷9,9 g/cm³**):

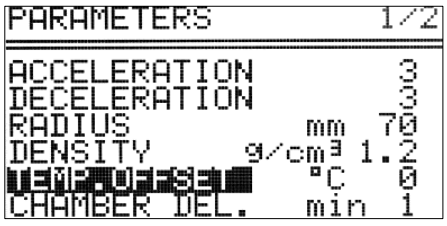
- Via ▲▼ keys select **DENSITY (g/cm³)**
- Press **SET**.
- Set demanded value by pressing ▲▼.
- Press **SET**.



When density is changed, symbol is visible on the screen.

Changing of **DENSITY** value is obligatory when density of sample placed into rotor is higher than 1.2 g/cm³. Change of **DENSITY** value led to decreasing maximum value of accessible speed.

9.4 *Temperature offset*



Temperature offsets serve for more precise control of real sample temperature. It can be helpful in case high/low initial temperature samples or high-volume samples.

- With▲▼keys select **TEMP. OFFSET**.
- Press **SET**.
- Use the ▲▼ keys to select the difference between the temperature that the cooling system will aim for and set temperature. Confirm selection by pressing **SET**.

Attention!

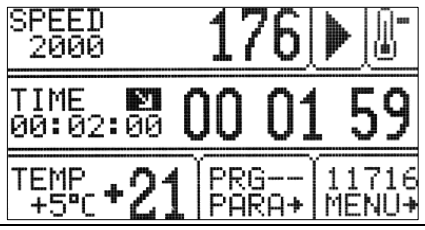
The use of the offset cannot extend the temperature range achieved by the centrifuge.

Function description

At a set temperature of 20°C and the set offset value equal to -5°C, cooling system will actually strive to reach 15°C. With a setpoint temperature of 20°C and a set offset value of 5°C the system will actually try to reach 25°C.

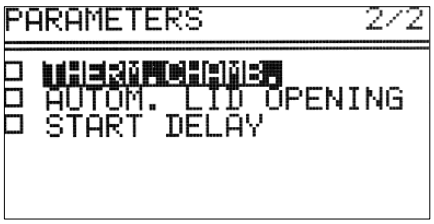
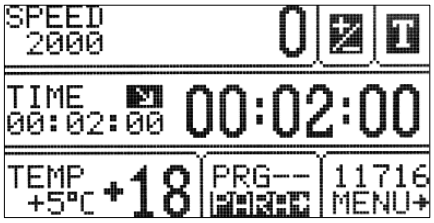
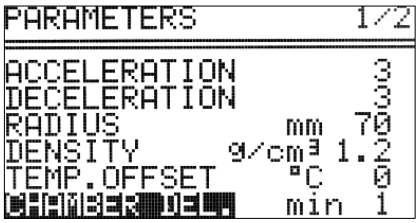
The temperature displayed on the main screen is corrected for offset value.

Offset can be selected range from -20°C to 20°C.

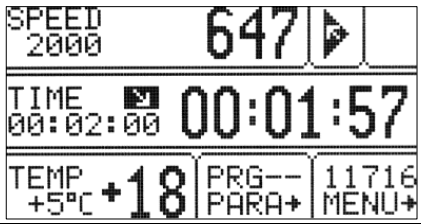


Activation of the function is signaled on the main screen with or depending on the offset value sign.

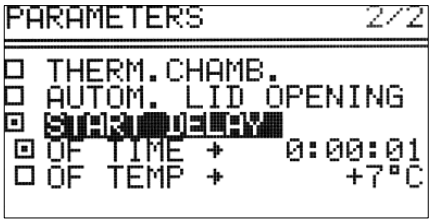
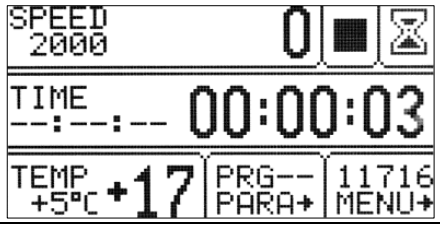
9.5 *Thermal chamber*

Cooling without centrifuging.	**THERMAL CHAMBER**
	▪ With ▲▼◄► keys select **THERMAL CHAMBER**. ▪ Press **SET** (to turn on/off). ▪ With ▲▼ keys select temperature value. ▪ Set demanded value (0°C÷40°C) by pressing ▲▼. ▪ Confirm selection by pressing **SET**. Attention, in the centrifuge without heating, do not set the thermal chamber to a value higher than currently indicated by the centrifuge.
	When THERMAL CHAMBER function is activated, T symbol is visible on the screen. Changing temperature from the main screen is not possible. Opening cover terminates THERMAL CHAMBER function (closing cover back turns it on).
	Thermal chamber is activated with delay. ▪ Set time of delaying by select **CHAMBER DEL.** ▪ Press **SET.** ▪ With ▲▼ keys select demanded value (1-5 min). ▪ Press **SET**.
▪ The function is activated automatically after confirmation and with the lid closed. The function is interrupted when the lid is opened, and the function resumes when the lid is closed again. If the **THERMAL CHAMBER** function is enabled during the centrifugation cycle, at the end of this cycle, the **THERMAL CHAMBER** function is activated until the lid is opened. ▪ Unlike other parameters, the **THERMAL CHAMBER** function can be turned on only when the centrifuge is stopped.	

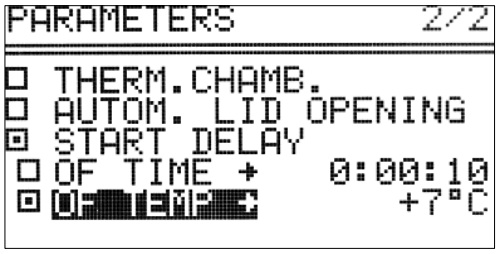
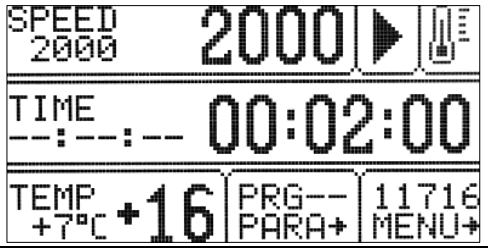
9.6 *Automatic lid opening*

Automatic lid opening	**AUTOMATIC LID OPENING**
	▪ When centrifuge process is finished, cover will be opened automatically for set option AUTOM. LID OPENING. ▪ When centrifuging is terminated by pressing **STOP**, opening cover is possible by pressing **COVER**.
	▶ symbol means that OPEN LID AFTER RUN is active.

9.7 *Start delay - of time*

⧖	Start centrifuging since preselected delay is reached.	STARY DELAY / **OF TIME**
		▪ With ▲▼ keys select **START DELAY**. Press **SET**. Start delay can be set from **0 : 0 0 : 0 1** to **9 : 5 9 : 5 9**. ▪ With ▲▼ keys select **OF TIME**. Press **SET** and ► and then **SET**. ▪ With ▲▼ keys set demanded value. ▪ Confirm by pressing **SET**. ▪ Press **BACK** to escape edit mode.
		When START DELAY function is activated, ⧖ symbol is visible on the screen.
▪ START DELAY / **OF TIME** function can be stopped at any moment by pressing **STOP**.		
▪ START DELAY / **OF TIME** function cannot be run when START DELAY / **OF TEMP.** is activated.		

9.8 *Start delay – of temperature*

	Start centrifuging time counting since preselected temperature is reached.	START DELAY / **OF TEMP.**
		▪ With ▲▼◄► keys mark **START DELAY**. ▪ Press **SET**. ▪ With ▲▼◄► keys mark **OF TEMP.** ▪ Press **SET**. ▪ Press ►, press **SET.** ▪ With ▲▼ keys set demanded value of temperature. ▪ Press **SET**. ▪ Exit edit mode by press **BACK**.
		When START DELAY – OF TEMPERATURE is turned on,  symbol is visible on the screen.
▪ When the function is active, the speed can be reduced to the optimum values for the **FAST COOL** function, when the set speed is lower than the optimum value, the rotor rotates at the set by user speed.		
▪ The delay starts - from the temperature can be interrupted at any time by pressing the **STOP** key.		
▪ START DELAY / **OF TEMP.** function cannot be run when START DELAY / **OF TIME** is activated.		

9.9 *Temporarily disabled functions*

Functions written below can be temporarily disabled.

active	SPEED	RCF	TIME	TEMP	PROG —	——— / ———	PARAM	MENU
THERMAL CHAMBER	●	●	●	○	●	●	●	●

During the spin cycle

active	SPEED	RCF	TIME	TEMP	PROG —	——— / —	PARAM	MENU
STANDARD SPIN	●	●	●	○	●	○	●	●
ACC/DEC 10-19	○	○	●	●	○	○	●	●

When setting parameters

active	SPEED	RCF	TIME	TEMP	PROG —	——— / —	PARAM	MENU
STANDARD SPIN	○	○	○	○	●	○	○	●
ACC/DEC 10-19	○	○	●	●	●	○	●	●

● available
○ disabled

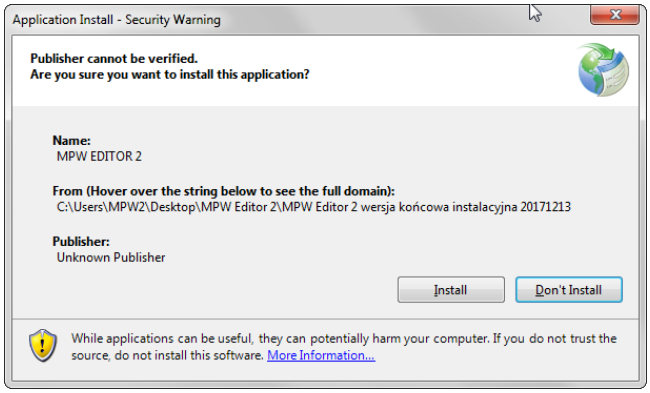
9.10 *Printing report (USB)*

When the centrifuging process is finished there is a possibility to obtain report. Report can be transferred to PC or printed.
PC (USB)
The elements needed to make connecting your computer via USB:

name	quantity (pcs.)	cat. No.
USB A-A cable	1	16655
MPW Editor 2 application	1	to downloaded from the website: www.mpw.pl

Preparation

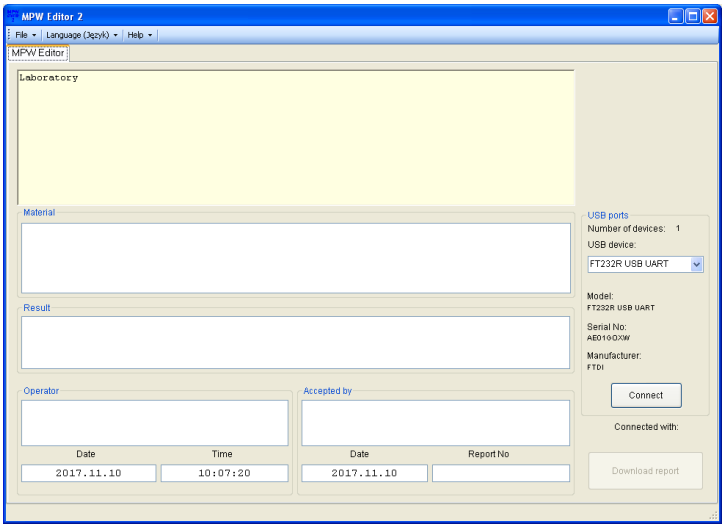
- Install **MPW Editor 2** application on the computer. Program is available for download from our website at www.mpw.pl**.**
  Operating System Requirements: **Microsoft Windows 10 (64bit).**
  The Manufacturer does not guarantee that the program will work correctly with other operating systems.



- If necessary install **FTDI USB drivers** and **.NET Framework 4.0** library (download with manufacturer's website: www.mpw.pl)

Centrifuging and printing

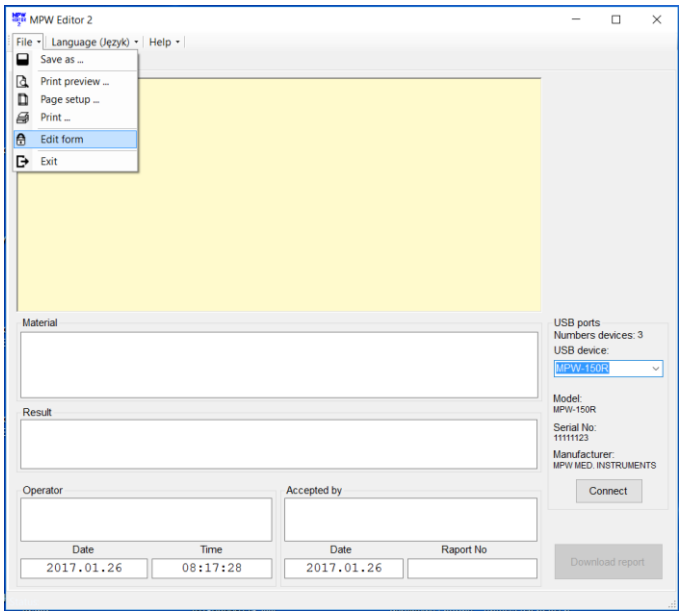
- Run **MPW Editor 2** application.
- Choose **Language\English**



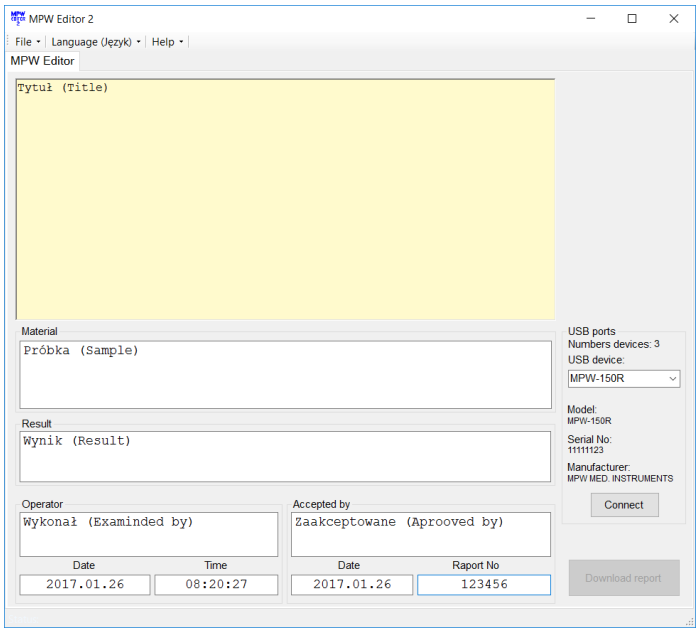
- Connect centrifuge to the PC in accordance with the „Connection scheme”
- Choose port assigned to the centrifuge (it will appear after connecting USB cable).

  Attantion:
  If the interface has not been programmed: name, serial number and manufacturer's name, the device will be identified by Windows and MPW Editor 2 with the data programmed by FTDI (manufacturer USB integrated circuit) for example FT232R USB UART.

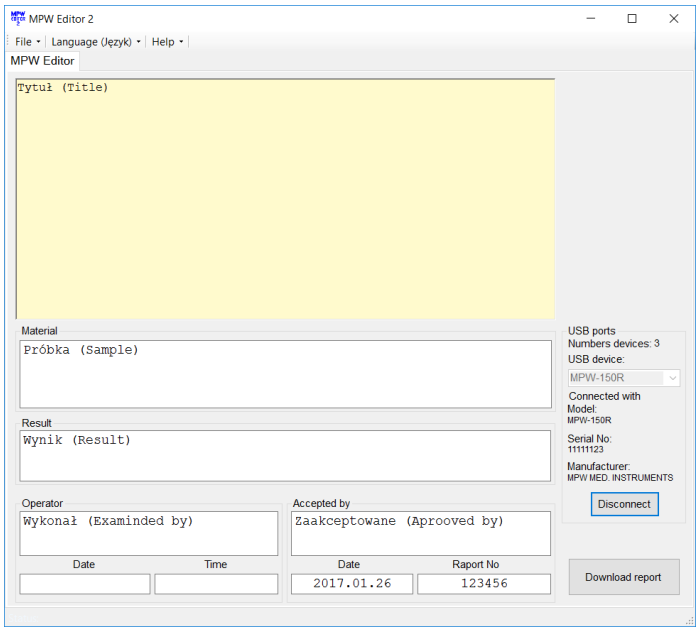
- Choose **File\Edit form**



- In the „Tytuł (Title)” field, you can place any text, for example name of the laboratory, for later use in the report template.

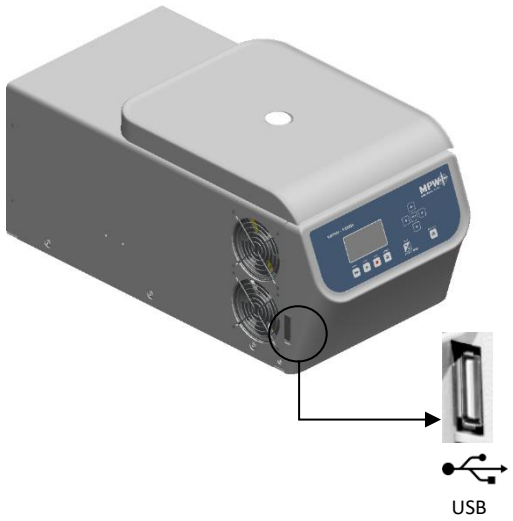


- Choose **File\Save form**.
- Ensure that USB device is selected from the list of devices.
- Press Connect. After successful communication, "PC" appears in the display.



- Fill folds: „Material”, „Result”, „Operator”, „Accepted by”, „Raport no” (optionally).
- When the centrifuging process is finished, press **Download the report**.
- When centrifuging process is completed, report will appear.
- Save report **(File/Save as)** or print it **(File/Print).**
- In order to get another report, press New test and press Download the report.
- After finishing the work, press **Disconnect** button (the "PC" disappears from the display of the centrifuge) and then closes MPW Editor 2.

Connection diagram



CENTRIFUGE (left side of front wall)

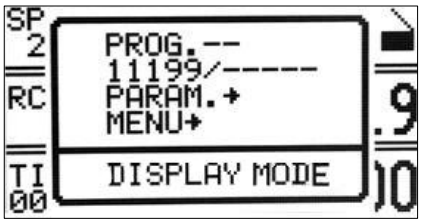
+

USB cable

+

PC

10 Menu

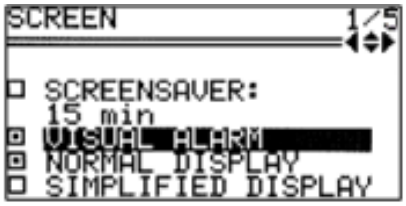
Simplified display	
	▪ Press and hold BACK by 1 second. ▪ Choose **MENU** with ▲▼ ▪ Press **SET**. Execute points descripted follow (below **Normal display mode** description)
Normal display	
	▪ Press **SET**. ▪ With ▲▼◄► keys select **MENU**. ▪ Press **SET**.
	▪ To navigate in **MENU** use ▲▼◄► keys. ▪ To enter menu press **SET**.

CONFIGURATION	centrifuge configuration
PASSWORD	password protection
LAST 10-CYCLES	10 last centrifugation cycles history
CYCLES	total working time of centrifuge, total number of working cycles
ROTOR RUNTIME	counting time of work and cycles amount for each rotor
CONTACT US	manufacturer's details
DIAGNOSTICS	error codes (service field)
FACTORY SETTINGS	restore factory settings

10.1 *Screen saver*

Setting time of screen saver	MENU/ CONFIGURATION / **SCREEN**
	▪ With ▲▼◄► keys select **SCREENSAVER**. ▪ Press **SET** and then ▼ and **SET** . ▪ With ▲▼ keys select demanded value from 1 to 60 minutes. ▪ Mark selection by pressing **SET.** ▪ Leave the menu by pressing **BACK**.

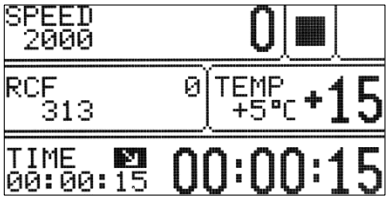
10.2 *Visual alarm*

Visual alarm	MENU/CONFIGURATION/ **SCREEN**
	▪ Via ▲▼ keys choose VISUAL ALARM ▪ Mark it by pressing **SET**. **VISUAL ALARM** cause blinking screen after ending of centrifuging or after message occurring.

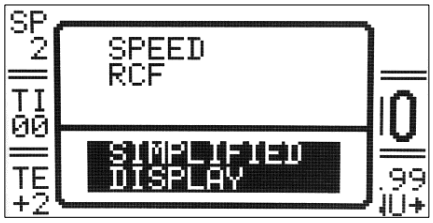
10.3 *Types of main screen*

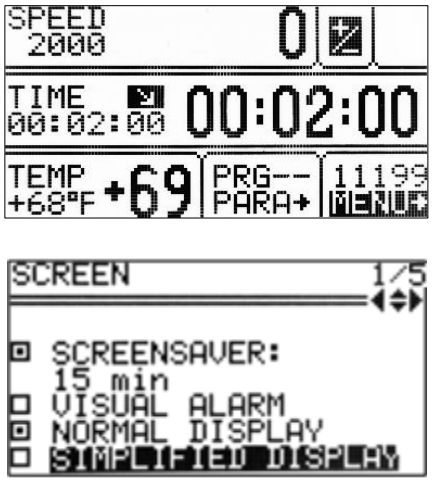
To ensure optimal adaptation to the user's preferences, work is possible in two basic screen modes.
NORMAL DISPLAY - contains an expanded number of parameters visible on the display.
SIMPLIFIED DISPLAY - contains only the most important parameters visible on the display.
For each of the above modes, you can choose priority RPM display or RCF.

By default, the **SIMPLIFIED DISPLAY** is set

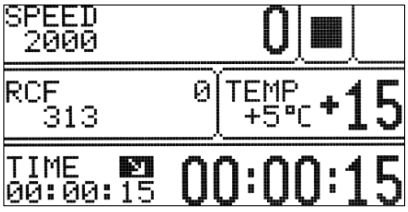
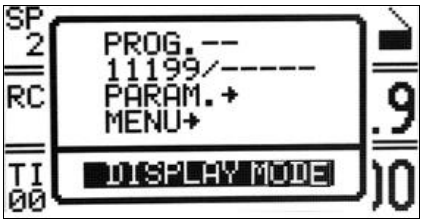
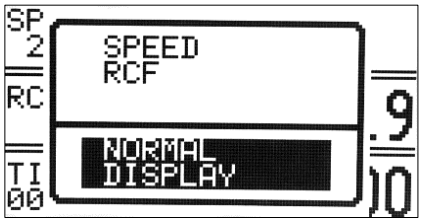
Types of main screen	
NORMAL DISPLAY	**SIMPLIFIED DISPLAY**
	
Switch between the **SPEED** (RPM) and **RCF** display priority modes	
▪ In the **NORMAL DISPLAY** mode, selecting the **SPEED** or **RCF** display mode is obtained by pressing and holding **BACK** for 1 sec. ▪ then use the ▲▼ buttons to select the desired mode (**SPEED** or **RCF**) and press **SET**.	▪ **In the SIMPLIFIED DISPLAY** mode, the selection of the **SPEED** or **RCF** display mode is obtained by pressing and holding the **BACK** key for 1 second. ▪ then use ▲▼ keys to select **DISPLAY MODE**, press **SET**, and then use ▲▼ keys to select the desired mode (**SPEED** or **RCF**) and press **SET**.

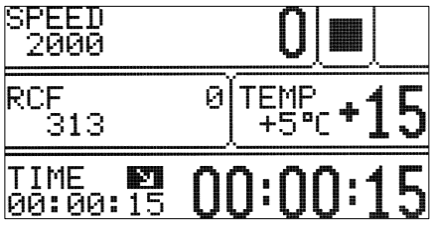
10.3.1 Switching the normal display to simplified display

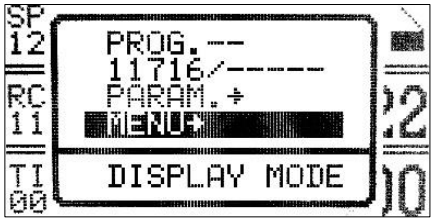
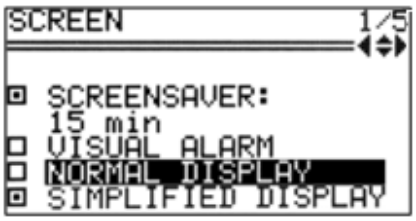
Method I	
	▪ Press the **BACK** button for **1 sec.** to return to the basic display (a short menu is displayed on the screen), then: ▪ Via▲▼ keys select **SIMPLIFIED DISPLAY**. ▪ Press **SET**.

Method II	
	▪ **Press SET** –  appears. ▪ Via ▲▼◄► keys select **MENU.** ▪ Press **SET**. ▪ Via ▲▼ keys select **CONFIGURATION** tab. ▪ Press **SET**. ▪ Via ◄► keys select **SCREEN** tab. ▪ Via ▲▼ keys select **SIMPLIFIELD DISPLAY**. ▪ Press **SET**. ▪ Leave menu via **BACK** key.

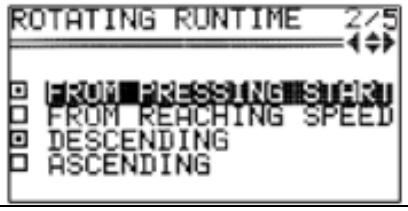
10.3.2 Switching the simplified screen to normal display

Method I	
	▪ Press the **BACK** button for **1 sec.**
	▪ Via ▲▼ keys select **DISPLAY MODE** (highlighted). ▪ Press **SET**.
	▪ Then choose **NORMAL DISPLAY** via ▲▼ keys. ▪ Press **SET**.

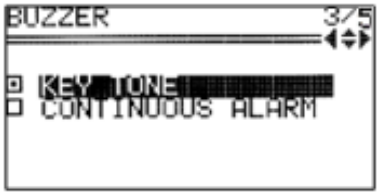
Method II	
	▪ Press the **BACK** button for **1 sec.**

	▪ Via ▲▼ keys select **MENU** (highlighted). ▪ Press **SET**.
	▪ Via ▲▼ keys select **CONFIGURATION** tab. ▪ Press **SET**. ▪ Via ◄► keys select **SCREEN** tab. ▪ Via ▲▼ keys select **NORMAL DISPLAY**. ▪ Press **SET**. ▪ Leave menu via **BACK** key.

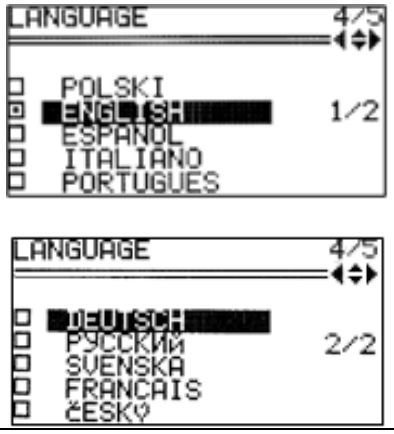
10.4 *Rotating runtime*

Way of time counting	MENU/CONFIGURATION/ **ROTATING RUNTIME**
	▪ Via ▲▼ choose demanded option. ▪ Mark it by pressing **SET**.
Counting from:	
From pressing start →	COUNTING SINCE ROTOR IS IDENTIFIED
From reaching speed →	COUNTING FROM ASSIGNED SPEED
Presenting mode:	
Descending →	COUNTING DOWN
Ascending →	COUNTING UP

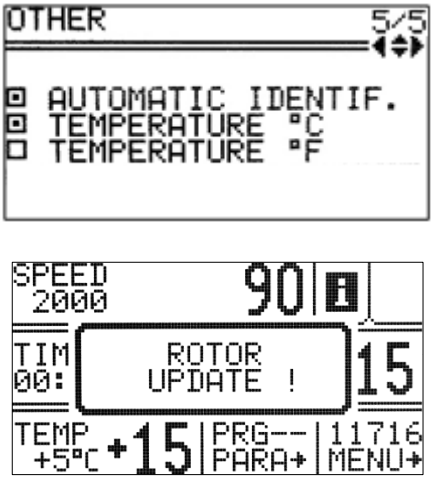
10.5 *Buzzer*

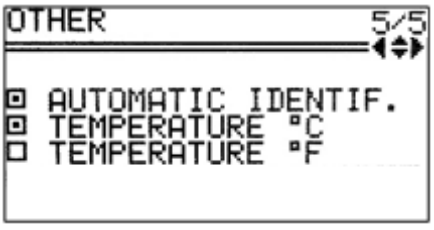
Switching ON/OFF short audible signals accompanying every pressing of any key. Switching ON/OFF signals after centrifuging.	MENU/ CONFIGURATION /**BUZZER**
	▪ With ▲▼ keys select demanded option. ▪ Mark selection by pressing **SET**. A continuous alarm means the emission of short beeps after the end of the spin, until the message about the end of the work cycle is deleted.
▪ **Warning signals are always switched on**.	

10.6 *Language*

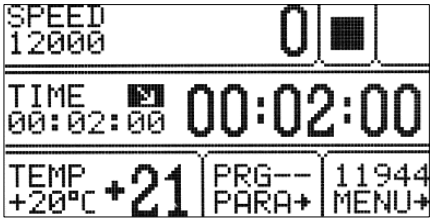
Changing menu language	MENU / CONFIGURATION / **LANGUAGE**
	▪ Via ▲▼ keys choose demanded menu language ▪ Mark it by pressing **SET.**

10.7 *Other*

Rotor automatic identification	MENU / CONFIGURATION / **OTHER**
	Thanks to the automatic rotor identification, the centrifuge automatically identifies the rotor in the chamber. Rotor identification is indicated by the message. When the function is deactivated, it is necessary to manually select the desired rotor as described in “Rotor and bucket choosing”. The AUTOMATIC IDENTIF. is turned on by default. To enable/unable the function: ▪ Via ▲▼ keys choose ☐ AUTOMATIC IDENTIF. ▪ Press **SET** (☐ change to ☒ or conversely). Autoidentification is not active for work in the loaded program mode.

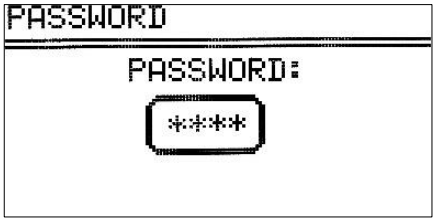
Choice of temperature unit (only MPW-260R)	MENU / CONFIGURATION / **OTHER**
	The TEMPERATURE in °C is turned on by default. To change the temperature unit: ▪ Via ▲▼ keys select unit ▪ Confirm by pressing **SET**.

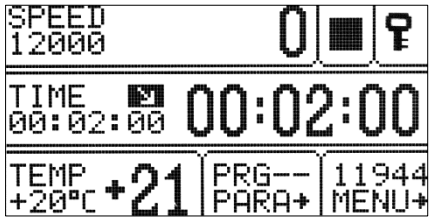
TEMPERATURE IN °C

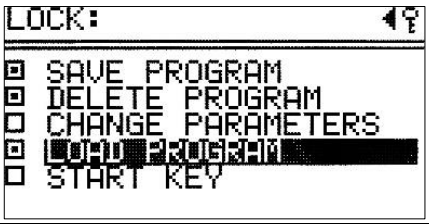


TEMPERATURE IN °F

10.8 *Password*

<table>
<tr><td>Setting up password</td><td>MENU / PASSWORD</td></tr>
<tr><td colspan="2">To prevent from an unauthorized use, a PASSWORD can be set.
Note: No PASSWORD is set by default.
The PASSWORD can be set as follows when the rotor is at a standstill.</td></tr>
<tr><td> 

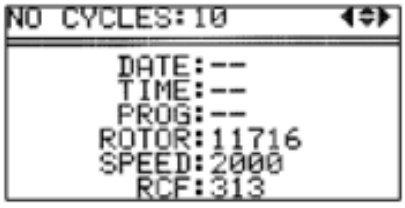

</td><td>▪ Press SET. Icon +/- starts blinking.
▪ With ◄► keys set the valid place of the PASSWORD. With ▲▼ keys set correct value.
▪ Repeat above steps for all places.
▪ Press SET.</td></tr>
<tr><td> 
</td><td>▪ As a confirmation repeat instructions described above.</td></tr>
<tr><td colspan="2">When the PASSWORD is set, the Key sign is displayed in the CODE zone. It is also displayed in the main menu (lower right corner of the screen).</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td colspan="2">▪ From then on, access to the MENU is possible after entering the password.
▪ In case of incorrect password, it will show message: ACCESS DENIED!</td></tr>
<tr><td colspan="2">▪ To delete the PASSWORD, “0000” must be set (after previously entering current password). If the PASSWORD is forgotten, the emergency code “7654” should be used to clear password and remove all locks.</td></tr>
</table>

Setting up locks	
	▪ With ▲▼ keys choose a lock. ▪ Mark a lock by pressing **SET**. ▪ Repeat above steps for desired locks. ▪ Leave menu with **BACK** key.
	▪ In the LOCK menu, press ◄ and then SET.

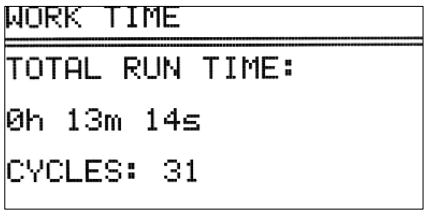
	disabled*	**description**
SAVE PROGRAM	SAVE button	no programs can be saved
DELETE PROGRAM	DELETE button	no programs can be deleted saving programs on position where one was already stored is disabled
CHANGE PARAMETERS	fields: SPEED RCF TIME TEMP PROG— ——— / ——— PARAM PROG	parameters cannot be modified
LOAD PROGRAM	LOAD button	no programs can be called up
START KEY	START key	centrifugation cannot be started

* Executing disabled procedures is only possible after entering the correct password.

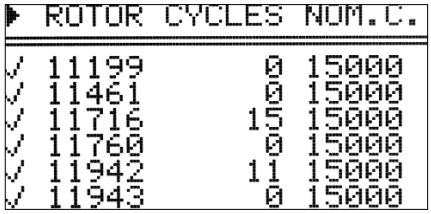
10.9 *Last 10 cycles*

Information concerning parameters of last 10 centrifuging cycles.	MENU / **LAST 10 CYCLES**
	▪ Number of cycles can be changed by ◄► keys. ▪ The list can be scrolled using ▲▼ keys. ▪ To exit press **SET/BACK** key

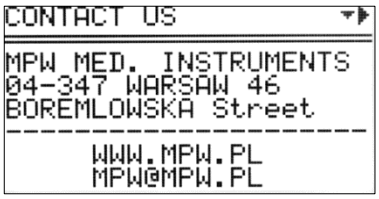
10.10 *Work time*

Total working time of centrifuge, and quantity of working cycles.	MENU / **WORK TIME**
	In the **WORK TIME** menu, the following statistics are displayed: ▪ total working (centrifugation) time ▪ working cycles counter

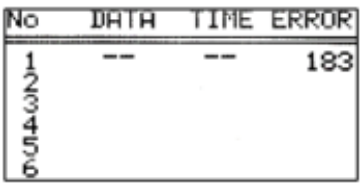
10.11 *Rotor runtime*

Information about the time of centrifuging and of the quantity of the working cycles of each rotor. The table also contains icons warning of the duty of execution of validation.	MENU / **ROTOR RUNTIME**
	CYCLES – the number of centrifuging the rotor has performed, NOM.C. – permissible number of centrifuging for the rotor. ▪ The list can be scrolled using ▲▼ keys. ▪ To exit press **BACK** key. Symbols: ✓ – more than 100 cycles left !·! – less than 100 cycles left ■ – worn rotor **It is not allowed to use rotors marked as worn.**

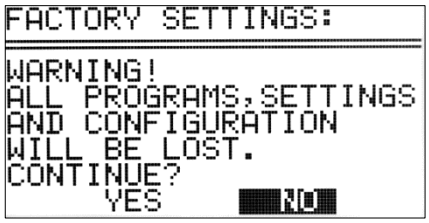
10.12 *Contact us*

Information about the type of the centrifuge, firmware version, and contact details.	MENU / **CONTACT US**
	▪ The list can be scrolled using ▲▼ keys. ▪ To exit press **BACK** key.

10.13 *Diagnostics*

Information about errors arisen in working of the centrifuge (for service).	MENU / **DIAGNOSTICS**
	**Intended for service purposes!**

10.14 *Factory settings*

Restoring factory settings.	MENU/ **FACTORY SETTINGS**
All settings of user programs will be deleted.	
	▪ Via ◄► keys choose **YES** or **NO**. ▪ Confirm by pressing **SET**.

11 Maintenance

11.1 *Cleaning of the centrifuge*

	▪ **Pull the mains plug before cleaning.** ▪ **Before any cleaning or decontamination process other than that is recommended by the manufacturer, the user has to ask the manufacturer if the planned process does not damage the device** ▪ For cleaning, water with soap or other water-soluble **mild detergent** shall be used. ▪ One should avoid corrosive and aggressive substances. It is prohibited to use alkaline solutions, inflammable solvents or agents containing abrasive particles. ▪ Do not lubricate the centrifuge motor shaft. ▪ The unused centrifuge should have cover opened. **Once a week** ▪ Using wiping cloth, remove condensate or residues of the products from the rotor chamber. **Once a month** ▪ Check the rotor fixing screw thread. In case of damage, replaced it. ▪ Check the centrifuging chamber whether it is damaged. In case of damage, it cannot be longer put into operation. Notify authorized service workshop.

11.2 *Maintenance of centrifuge elements*

	The rotor pins shall be always lubricated with petroleum jelly. In this way, the uniform deflection of the buckets and quiet centrifuge operation is ensured.

Cleaning of the accessories

	▪ In order to ensure safe operation, one shall carry out in **regular** way periodical maintenance of the accessories. ▪ Rotors, buckets and round carriers have to withstand high stresses originating from the centrifugal force. Chemical reactions as well as corrosion (combination of variable pressure and chemical reactions) can cause destruction of metals. Hard to observe surface cracks increase gradually and weaken material without visible symptoms. ▪ In case of observation of surface damage, crevice or other change, as well as the

	corrosion, the given part (rotor, bucket, etc.) shall be immediately replaced. ▪ The rotor, including the fixing screw, buckets and round carriers must be regularly cleaned to prevent corrosion. ▪ Cleaning of the accessories shall be carried out outside of the centrifuge **once every week** or still better after each use. For cleaning them one should use neutral agent of pH value 6÷8. It is forbidden to use alkaline agent of **pH > 8**. Then, those parts shall be dried using soft fabric or in the chamber drier at ca. 50°C. ▪ Angle rotor should be placed on a fabric with holes facing down, for effective drying. ▪ Do not use bleach on plastic parts of the rotor. ▪ In this way, the useful service life of the device is substantially increased and susceptibility to corrosion is diminished. Accurate maintenance increases the service life as well and protects against premature rotor failures. ▪ Do not use bleach on plastic parts of the rotor. ▪ According to laboratory standards, minimize the immersion time in each solution. ▪ Especially prone to the corrosion are parts made of aluminum. ▪ Corrosion and damages resulting from insufficient maintenance could not be subject of claims lodged against the manufacturer. ▪ The unused rotor should have the lid removed.

HS accessories maintenance.

	▪ Check the general condition of seals. ▪ Make sure that rubber O-rings are lightly coated with silicone grease. Use high vacuum grease, e.g., type „C" by LUBRINA. ▪ In order to maintain hermetic sealing, it is recommended to replace the sealing rings after each autoclaving. ▪ Store hermetically sealed rotors and buckets with the lids removed.

11.3 *Sterilization*

Plastics - legend to abbreviations

PS	polystyrene	**ECTFE**	ethylene/chlorotrifluoroethylene
SAN	styrene-acrylonitrile	**ETFE**	ethylene/tetrafluoroethylene
PMMA	polymethyl methacrylate	**PTFE**	polytetrafluoroethylene
PC	polycarbonate	**FEP**	tetrafluoroethylene/perfluoro propylene
PVC	polyvinyl chloride	**PFA**	tetrafluoroethylene/perfluoroalkylvinylether
POM	acetal polyoxymethylene	**FKM**	fluorocarbon rubber
PE-LD	low density polyethylene	**EPDM**	ethylene propylene diene
PE-HD	high density polyethylene	**NR**	natural rubber
PP	polypropylene	**SI**	silicon rubber
PMP	polymethyl pentene		

One can use all standard disinfectants. Centrifuges and devices are made of different materials, one should consider their variety.

	radiation β radiation γ 25 kGy	**C_2H_4O** (ethylene oxide)	**formalin, ethanol**
PS	●	○	●
SAN	○	●	●
PMMA	●	○	●

PC	●	●	●
PVC	○	●	●
POM	●	●	●
PE-LD	●	●	●
PE-HD	●	●	●
PP	●	●	●
PMP	●	●	●
ECTFE, ETFE	○	●	●
PTFE	○	●	●
FEP, PFA	○	●	●
FKM	○	●	●
EPDM	○	●	●
NR	○	●	●
SI	○	●	●

● may be used

○ cannot be used

In the centrifuge, disinfectants and cleaning agents generally used in medical care should be used (e.g., *Aerodesina-2000, Lysoformin 3000, Melseptol, Melsept SF, Sanepidex, Cutasept F*).

11.3.1 Autoclaving

- Rotors, buckets and round carriers can be sterilized in autoclave with temperature 121°C during 20 min (215 kPa), unless otherwise specified in the OPTIONAL ACCESSORY.
- During sterilization (autoclaved) by means of steam one should consider temperature resistance of individual materials.
- Deformation of the accessories (carriers or lids made of plastic) may occur during autoclaving.
- Do not autoclave disposable materials (e.g., tubes, cyto-container).
- The life of the accessory depends on the frequency of autoclaving and use.
- Autoclaving reduces lifespan of plastic components. They should be replaced if any signs of damage are visible, including a change in color or shape or when leakage etc.
- Pressure in closed containers can cause plastic deformation or explosion.
- Prior to autoclaving the rotors and accessories, thoroughly wash and rinse with distilled water.
- Never exceed the permissible autoclaving temperature and time.
- If you want to keep the hermetic seals, replace the sealing rings after each autoclave.

Chemical resistance of plastics

	autoclaving 121 °C, 20 min		**autoclaving** 121 °C,20 min
PS	○	**PMP**	●
SAN	○	**ECTFE, ETFE**	●
PMMA	○	**PTFE**	●
PC	●	**FEP, PFA**	●
PVC	○[1)]	**FKM**	●
POM	●	**EPDM**	●
PE-LD	○	**NR**	○
PE-HD	○	**SI**	●
PP	●		

● may be used

○ cannot be used

1) Except PVC hoses which are resistant to the steam sterilization in the temperature 121°C.

11.4 *Chemical resistance*

Chemical resistance of plastics

	aldehydes	cyclic alcohols	esters	ether	ketones	strong or concentrated acids	weak or diluted acids	oxidizing substances	cyclic hydrocarbons	ahs	haloid hydrocarbons	alkalis
PS	○	●	○	○	○	○/●	○/●	○	○	○	○	●
SAN	○	●	○	○	○	○	○/●	○	○	○	○	●
PMMA	○/●	●	○	○	○	○	○/●	○	○/●	○	○	○
PC	○/●	●	○	○	○	○	○/●	○	○/●	○	○	○
PVC	○	●	○	○	○	●	●	○	●	○	○	●
POM	○/●	●	○	●	●	○	○	○	●	●	●	●
PE-LD		●	●	●	○/●	●	●	○	●	●	●	●
PE-HD	●	●	○/●	○/●	○/●	●	●	○	●	○/●	○/●	●
PP	●	●	○/●	○/●	○/●	●	●	○	●	○/●	○/●	●
PMP	○/●	●	○/●		○/●	●	●	○	○/●	○	○	●
ECTFE ETFE	●	●	●	●	○	●	●	●	●	●	●	●
PTFE FEP PFA	●	●	●	●	●	●	●	●	●	●	●	●
FKM	●	○	○	○	○	○	●	○/●	○/●	○/●	○/●	○/●
EPDM	●	●	○/●	○	○/●	●	●	○/●	○	○	○	●
NR	○/●	●	○/●	○	○	○	○/●	○	○	○	○	●
SI	○/●	●	○/●	○	○	○	○/●	○	○	○	○	○/●

●	very good	Permanent action of the substance does not cause damage through 30 days. The material is able to be resistant through years
○/●	good to limited	Continuous action of the substance causes insignificant and partly reversible damage through the period of 7-30 days (e.g., puffing up, softening, reduced mechanical durability, discoloring).
○	limited	The material should not have the continuous contact with the substance. The immediate occurrence of damage is possible (e.g., the loss of mechanical durability, deformation, discoloring, bursting, dissolving).

Rubber inserts shall be exactly cleaned or possibly replaced. Centrifuges and accessories are made of different materials.

Do not use bleach on plastic parts of the rotor.

	**DANGER!** MPW accessories are not biotight. For centrifuging infectious materials, it is necessary to use hermetically closed tubes meeting demands of biotightness, in order to prevent germs migration into the centrifuge and beyond it.
	User is responsible for proper disinfections of the centrifuge if some dangerous material was spilled inside or outside of the centrifuge. During the above mentioned works one must wear safety gloves.

12 Troubleshooting

Majority of faults could be removed by switching the centrifuge OFF and then ON. After switching the centrifuge ON, there shall be displayed parameters of the recently implemented program and sound signals comprising four successive tones shall be generated. In case of short-duration power failure the centrifuge terminates the cycle and displays PROGRAM ERROR code.

problem	question	remedy
Centrifuge does not start	*Is supply cable plugged into mains?*	*Plugs supply cable correctly.*
	Is master switch ON?	*Switch ON power supply.*
Motor error is displayed		Call service.
Centrifuge does not start (indications are proof for cycle in progress and motor does not start)	*Is* ▶ *symbol displayed?*	Wait till rotor stops and the ▶ symbol goes off.
	Is ◥ *symbol displayed?*	Close cover. ◥ symbol must switch off.
	Is ⋮ *symbol blinking?*	Centrifugation cycle in progress, press **STOP** key or wait till cycle ends.
Centrifuge does not accelerate *(unbalance error)*	*Unequal rotor load.*	Centrifuge load shall be balanced.
	Inclined centrifuge.	Centrifuge shall be levelled.
	Faulty drive (mechanical damage).	Call service.
	Was centrifuge displaced during operation?	Switch ON the centrifuge again after opening and closing the cover.
(motor error)	*After stopping error rotor message is displayed*	Check if rotor number in started program is consistent with the number of the rotor installed in the centrifuge. Check rotor status (if there are coding magnets inserted)
	Centrifuge does not recognize the rotor and does not stop.	Switch the centrifuge OFF, then ON and check correctness of loaded program
It is not possible to open the cover	⋮ *symbol on the display is blinking, after pressing COVER key single tone is audible*	Rotor is still rotating. Wait for stopping of the rotor and displaying of the ■ symbol.
	The sensor is connected correctly, and the error is still applying.	Call service.
Mains failure during run	*The message will be displayed on the display about the decay of tension.*	Wait for stopping of the rotor, clear the error by pressing the SET key.
Temperature sensor error	*The overheating message will be displayed.*	Switch the centrifuge OFF, then ON.
		Call service.
Error of the exceeding the temperature (50°C) in the chamber	*The overheating message will be displayed.*	Open the cover. Wait for the centrifuge to cool down.

12.1 *Messages*

Screen messages that may occur during operation.	
MESSAGE	**EXPLANATION**
"SPEED OF ROTOR" "IDENTIFICATION <> 90 RPM"	Please try start centrifuging again, if error still occur, contact manufacturer's authorized service.
"IMBALANCE FAST STOP !" "PLEASE REMOVE CAUSE" "THEN RESTART"	Rotor is not balanced correctly, please balance rotor.
"NO ROTOR OR IDENTIFICATION" "SENSOR DAMAGED !"	Make sure, is rotor mounted in the centrifuge chamber. If it is right contact manufacturer's authorized service.

"INCORRECT ROTOR NUMBER !"	Change rotor number in centrifuge settings or use autoidentification.
"WRONG DIRECTION OF ROTATION" "OR UNKNOWN ROTOR !"	Make sure if correct rotor for centrifuge is mounted. List of accessories is described in chapter 15.
"PLEASE CLOSE THE LID" "HAND !"	Necessity of manually closing the lid.
"ROTOR STOPPING !" "Please wait..."	Initializing after mains failure with rotating rotor, wait until rotor stop.

Emergency messages

In case of emergency messages (centrifuge is not working properly) contact the manufacturer's authorized service center.

MESSAGE
"OVERHEATING MOTOR !" "INVERTER ERROR !"
"INVERTER SERIAL BUS ERROR !"
"TEMPERATURE SENSOR ERROR"
"PRESSURE CONTROL FAILURE!"
"OPENING COVER in RUN!"
"SPEED METER ERROR"
"I2C BUS ERROR"
"OVERHEATING CENTRIFUGE !"
"ROTOR OVERSPEED !"
"COVER LOCK MALFUNCTION !"

12.2 *Emergency cover release*

EMERGENCY COVER RELEASE

Attention! *The cover may be opened in emergency only when the rotor is at rest. Before emergency opening the cover, switch off the mains power switch and disconnect the power cord. Wait 10 min and/or looking through the sight glass, make sure that the rotor is not rotating.*

There is a plug on the right-hand side, which must be unscrewed counterclockwise using the emergency lid release key (catalog no. 18640). Then pull on the cap until the cover is open.

The emergency opening of the cover can be used, for example, in the event of a power failure, failure of the control panel, etc.

13 Guarantee

Manufacturer grants to the Buyer the guarantee on conditions specified in the Guarantee Certificate. Buyer forfeits the right to guarantee repair when using the device inconsistently with the User manual provisions, when damage results from the User's fault.

Repairs should be carried out in authorized service workshops, granted with the MPW Certificate.

The centrifuge shall be sent to repair after decontaminating disinfections. Information about authorized service workshops could be obtained from the Manufacturer.

- Guarantee period amounts to 24 months (unless otherwise specified in the purchase documents).
- Guarantee conditions are described in guaranteed card.
- The service life of the centrifuge specified by the manufacturer amounts to 10 years.
- After 24 months from the start of the warranty period (date of purchase), a technical inspection of the centrifuge should be carried out (validation) by an authorized service of the manufacturer. Subsequent inspections should be carried out at annual intervals.
- Maximum period of storage of not used centrifuge amounts to 1 year. After this period, a service authorized by manufacturer should carry out technical inspection of the centrifuge.
- Manufacturer reserves the right to make technical changes in manufactured products.

14 Transport and storage

CAUTION! Due to the heavy weight of the device, lifting and carrying it may cause injury to the spine.

Store the device only in a closed and dry room.
Remove rotor from centrifuge before transport.
Lift and carry with the adequate number of people.
Use transport equipment.
Use the original packaging and transport protection for transport.

14.1 *Transport and storage conditions*

	Storage (in the package)	**Storage (without the package)**	**Transport**
Temperature	-25 ÷ +55 °C	-5 ÷ +45 °C	-25 ÷ +60 °C (general) -20 ÷ +55 °C (air)
Relative humidity	10 ÷75 %	10 ÷75 %	10 ÷75 %
Pressure	70 ÷ 106 kPa	70 ÷ 106 kPa	30 ÷ 106 kPa

15 Disposal

- Dispose of the device in accordance with the applicable legal regulations in the country of use.
- In the countries of the European Community, the disposal of electrical equipment is regulated under the EU Directive 2012/19/EU on waste electrical and electronic equipment (WEEE).
  According to these regulations, centrifuges may not be collected together with municipal or household waste.
- Disposal regulations in individual EU countries may differ. In case of doubt, please contact the supplier of the device.

16 List of changes in the manual

Rev.	***Release date***	***Description of changes***
14	03.04.2023	Addition of markings used in the manual and on the device. Update of nameplate, CE declaration and equipment lists. Updating records regarding the intended use and disposal of the product. Removal of the RTC function.
15	16.06.2023	Updating of the description in the technical data table. Updating the CE declaration of conformity, equipment list and nameplate.

17 Manufacturer’s info

"MPW MED. INSTRUMENTS" SPÓŁDZIELNIA PRACY
Boremlowska 46 Street
04-347 Warsaw
tel. (+48) 22 610 56 67 (sales department - POLAND)
(+48) 22 879 70 46 (sales department - outside POLAND)
(+48) 22 610 81 07 (service)
fax: (+48) 22 610 55 36
e-mail: mpw@mpw.pl
website: www.mpw.pl

000042924 - number of entry in the Waste Database

PL/CA01–01782 - identification number given by Office for Registration of Medicinal Products, Medical Devices and Biocidal Products.

Distributor’s info

DISTRIBUTOR:

18 Annexes

A. Wyposażenie dodatkowe/Optional accessories

MPW-150R

WIRNIK / ROTOR

PARAMETRY/PARAMETERS (RCF [x g], Rmax [mm], ∡ [°])

POJEMNIK/BUCKET
WKŁADKA / ADAPTER
[liczba probówek na wirnik/tubes per rotor] PROBÓWKA / TUBE

11199
RPM 15000 RCF 16854 Rmax 67 ∡ 45

bez pojemnika/without bucket
bez wkładki/without adapter
[12] * 2-1,5 ml probówka (10,8x41,8 mm), Eppendorf®; [15011], 2 ml (10,8x41,8 mm); [15128], 1,5ml (10,8x40,5 mm)
14084
[12] * 0,5 ml probówka PCR (7,8 x 31 mm)
0,5 ml PCR tube (7,8 x 31 mm)
14126
[12] * 0,4 ml probówka PCR (5,7 x 48,6 mm)
0,4 ml PCR tube (5,7 x 48,6 mm)
14133
[12] * 0,2 ml probówka PCR (6 x 21,6 mm)
0,2 ml PCR tube (6 x 21,6 mm)

11461
RPM 15000 RCF 20879 Rmax 83 ∡ 45

bez pojemnika/without bucket
bez wkładki/without adapter
[24] * 2-1,5 ml probówka (10,8x41,8 mm), Eppendorf®; [15011], 2 ml (10,8x41,8 mm); [15128], 1,5ml (10,8x40,5 mm)
14084
[24] * 0,5 ml probówka PCR (7,8 x 31 mm)
0,5 ml PCR tube (7,8 x 31 mm)
14126
[24] * 0,4 ml probówka PCR (5,7 x 48,6 mm)
0,4 ml PCR tube (5,7 x 48,6 mm)
14133
[24] * 0,2 ml probówka PCR (6 x 21,6 mm)
0,2 ml PCR tube (6 x 21,6 mm)

11716
RPM 15000 RCF 17609 Rmax 70 ∡ 45

bez pojemnika/without bucket
bez wkładki/without adapter
[4] * 8 x 0,2 ml probówki szeregowe PCR-strip (10,2 x 72,4 mm)
8 x 0,2 ml PCR strip (10,2 x 72,4 mm)
[32] * 0,2 ml probówka PCR (6 x 21,6 mm)
0,2 ml PCR tube (6 x 21,6 mm)
[4] * 8 x 0,2 ml probówki szeregowe PCR strip (7,3 x 77,2 mm)
8 x 0,2 ml PCR strip (7,3 x 77,2 mm)
[4] * 4 x 0,2 ml probówki szeregowe PCR-strip (10,2 x 37,2 mm)
4 x 0,2 ml PCR strip (10,2 x 37,2 mm)

11760
RPM 15000 RCF 21382 Rmax 85 ∡ 45

bez pojemnika/without bucket
bez wkładki/without adapter
[24] * 2-1,5 ml probówka (10,8x41,8 mm), Eppendorf®; [15011], 2 ml (10,8x41,8 mm); [15128], 1,5ml (10,8x40,5 mm)
[24] * 2 ml probówki z filtrem - spin columns (10,8 x 46 mm)
2 ml spin columns (with filter) (10,8 x 46 mm); [15011], 2 ml (10,8x41,8 mm); [15128], 1,5ml
14084
[24] * 0,5 ml probówka PCR (7,8 x 31 mm)
0,5 ml PCR tube (7,8 x 31 mm)
14126
[24] * 0,4 ml probówka PCR (5,7 x 48,6 mm)
0,4 ml PCR tube (5,7 x 48,6 mm)
14133
[24] * 0,2 ml probówka PCR (6 x 21,6 mm)
0,2 ml PCR tube (6 x 21,6 mm)

11943
RPM 15000 RCF 21382 Rmax 85 ∡ 45

** probówka niedostępna w ofercie MPW lub dostępny odpowiednik (np:[15050]), patrz kolumna z prawej*
tube is not offered by MPW or equivalent is available (e.g. [15050]), see column on the right

A. Wyposażenie dodatkowe/Optional accessories

MPW-150R

bez pojemnika/without bucket

bez wkładki/without adapter

[20] * 1,6 ml probówka Cryo (12,3 x 46,5 mm)
1,6 ml Cryo tube (12,3 x 46,5 mm)

[20] * 1,8 ml probówka Cryo (12,3 x 46,5 mm)
1,8 ml Cryo tube (12,3 x 46,5 mm)

11944

RPM 15000 RCF 21382 Rmax 85 ⌀ 45

bez pojemnika/without bucket

bez wkładki/without adapter

[6] * 5 ml probówka z korkiem zakręcanym (17 x 66 mm), Eppendorf®
5 ml tube with screw cap (17 x 66 mm), Eppendorf®

[12] * 5 ml probówka z korkiem wciskanym (17 x 54,2 mm), Eppendorf®
5 ml tube with snap cap (17 x 54,2 mm), Eppendorf®

11945

RPM 6000 RCF 3542 Rmax 88 ⌀ 30

13080

14082

[8] * BD Vacutainer® (13 x 100 mm), (4-7 ml)

[8] * Greiner Vacuette® (13 x 100 mm), (3,5-6 ml)

[8] * Sarstedt S-Monovette® (11 x 92 mm), (4,5; 5 ml)

[8] * 7 ml probówka szklana (12 x 100 mm)
7 ml glass tube (12 x 100 mm)
RCF max.=3000 RPM max.=5522

bez wkładki/without adapter

[8] 15046 14 ml probówka z pokrywką (16,8 x 113,7 mm), Sarstedt®
14 ml tube with cap (16,8 x 113,7 mm), Sarstedt®

[8] * BD Vacutainer® (16 x 100 mm), (2,5-11 ml)

[8] * Greiner Vacuette® (16 x 100 mm), (7-9 ml)

[8] * Sarstedt S-Monovette® (15 x 92 mm), (7,5; 8,2; 8,5 ml)

[8] * Sarstedt S-Monovette® (16 x 92 mm), (9; 10 ml)

[8] * 15 ml probówka z dnem stożkowym z zakrętką (17 x 120 mm), Falcon®; [15050], 15ml (17 x 120 mm)
15 ml tube, conical bottom, with cap (17 x 120 mm), Falcon®; [15050] 15ml Sarstedt®(17 x 120 mm)

[8] 15118 10 ml probówka szklana (16 x 100 mm)
10 ml glass tube (16 x 100 mm)
RCF max.=3000 RPM max.=5522

[8] * 15 ml Thermo Nalgene® (16 x 113 mm)
15 ml Thermo Nalgene® (16 x 113 mm)

[8] * 10 ml probówka z pokrywką (16 x 106 mm)
10 ml tube with cap (16 x 106 mm)

14082+14815

[8] * BD Vacutainer® (13 x 75 mm), (1,6-5,3 ml)

[8] * Greiner Vacuette® (13 x 75 mm), (1-4,5 ml)

[8] * Sarstedt S-Monovette® (11 x 66 mm), (1,6; 2; 2,7; 3; 3,1 ml)

[8] * Sarstedt S-Monovette® (13 x 65 mm), (2,6; 2,9; 3,4; 3,8 ml)

[8] * Sarstedt S-Monovette® (13 x 75 mm), (2,7; 3; 4,3 ml)

[8] * 5 ml probówka szklana (12 x 75 mm)
5 ml glass tube (12 x 75 mm)
RCF max.=3000 RPM max.=5522

14815

[8] 15121 10 ml probówka z dnem okrągłym i pokywką (17 x 70 mm)
10 ml tube, round bottom, with cap (17 x 70 mm)

[8] * Sarstedt S-Monovette® (15 x 75 mm), (4; 4,3; 5,5 ml)

[8] * 10 ml Thermo Nalgene® Oak Ridge (16 x 81,5 mm)

12300

RPM 13000 RCF 16816 Rmax 89 ⌀ 90

bez pojemnika/without bucket

bez wkładki/without adapter

[24] * 37 µl kapilara hematokrytowa (1,4 x 75 mm)
37 µl micro-hematocrit capillary tube (1,4 x 75 mm)

Suma końcowa

** probówka niedostępna w ofercie MPW lub dostępny odpowiednik (np:[15050]), patrz kolumna z prawej*
tube is not offered by MPW or equivalent is available (e.g. [15050]), see column on the right

MPW®
MED. INSTRUMENTS

CE

EU DECLARATION OF CONFORMITY

This EU declaration of conformity is issued under the sole responsibility of the manufacturer.

Manufacturer:	**"MPW MED. INSTRUMENTS" SPÓŁDZIELNIA PRACY** **46 Boremlowska Street, 04-347 Warsaw, Poland**
The Quality Management System complies with the standards:	PN-EN ISO 9001:2015, PN-EN ISO 13485:2016
SRN:	PL-MF-000032831
Device name:	**Refrigerated laboratory centrifuge MPW-150R** (with the accessory indicated in the operating instructions provided with the centrifuge)
BASIC UDI-DI:	590538636-IVD-CEN-017-6L
Catalogue numbers:	10150R/2-5 10150R/1-6 10150R/1-6/100 10150R/1-6/110 10150R/1-6/127

The aforementioned device is in conformity with the following EU regulations and directives:

2017/746 (IVDR)	REGULATION (EU) 2017/746 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5 April 2017 on in vitro diagnostic medical devices and repealing Directive 98/79/EC and Commission Decision 2010/227/EU, including the changes published prior to the date of this declaration.
2011/65/EU (RoHS 2)	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, including the changes published prior to the date of this declaration.
Intended purpose:	The device is intended for the separation of the mixtures of the liquid substances derived from the human body, including blood, urine, and other body fluids, and for the preparation of the samples intended for further in vitro diagnostics procedures.
Risk class:	Class A (in accordance with the rule 5 of Annex VIII of Regulation (EU) 2017/746).

The conformity assessment of the device and accessory has been carried out in accordance with Article 48(10) of Regulation (EU) 2017/746.

Wojciech Anisiewicz
Vice-President of the Management Board

Łukasz Sałański
President of the Management Board

Warsaw, 23 January 2023

no. 10.150R.16o.en

DECLARATION OF DECONTAMINATION

(repair)

In order to protect our employees please fill out the declaration of decontamination completely before sending centrifuge to the manufacturer (repair).

If it is impossible to completely and effectively decontaminate the device, it should be treated in accordance with the regulations for medical waste.

1. **Device:**
   – type: ……
   – serial No.: ……

2. **Description of decontamination**
   (see user manual)
   ……
   ……
   ……
   ……

3. **Decontamination carried out by:**
   name: ……

4. **Date and signature:**
   ……

DECLARATION OF DECONTAMINATION

(return)

In order to protect our employees please fill out the declaration of decontamination completely before sending centrifuge to the manufacturer (return).

If it is impossible to completely and effectively decontaminate the device, it should be treated in accordance with the regulations for medical waste.

1. **Device:**

   – type: ……

   – serial No.: ……

2. **Description of decontamination**

   (see user manual)

   ……

   ……

   ……

   ……

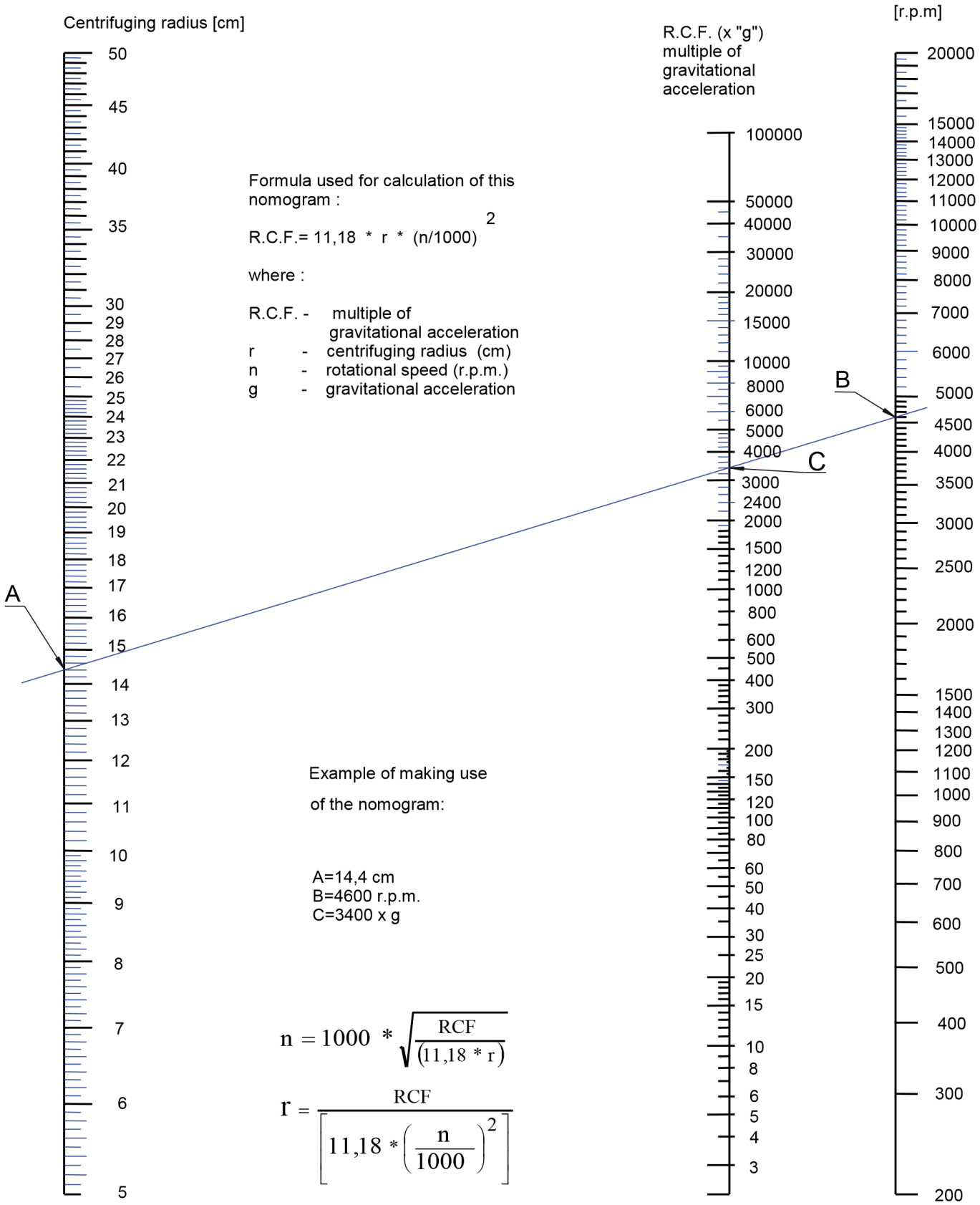
3. **Decontamination carried out by:**

   name: ……

4. **Date and signature:**

   …….

NOMOGRAM



Formula used for calculation of this nomogram :

$$R.C.F. = 11{,}18 * r * (n/1000)^2$$

where :

R.C.F. - multiple of gravitational acceleration
r - centrifuging radius (cm)
n - rotational speed (r.p.m.)
g - gravitational acceleration

Example of making use of the nomogram:

A=14,4 cm
B=4600 r.p.m.
C=3400 x g

$$n = 1000 * \sqrt{\frac{RCF}{(11{,}18 * r)}}$$

$$r = \frac{RCF}{\left[11{,}18 * \left(\frac{n}{1000}\right)^2\right]}$$