

USER MANUAL



Laboratory centrifuge **MPW-351e**

Read before use!

Serial number of the centrifuge:

For centrifuges with serial no (SN): from 10351ex000112







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Warning signs:

	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.

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1. Application.

The MPW-351e centrifuge is a table top laboratory centrifuge for *in vitro* diagnostic (IVD) equipped with, used to separation of samples took from people's, animal's and plant's components with different densities, to provide information about their biological state under the influence of the centrifugal force. Its construction ensures easy operation, safe work and wide range of applications at laboratories engaged in routine medical analyses, biochemical research works etc. This centrifuge is not biotight and therefore during centrifugation of preparations requiring biotightness one has to use closed and sealed containers and rotors. In the centrifuge, it is prohibited to centrifuge caustic, inflammable and explosive preparations.

2. Technical data.

Manufacturer:

"MPW MED. INSTRUMENTS"
SPÓŁDZIELNIA PRACY,
46 Boremlowska Street,
04-347 Warsaw/Poland

Type:

MPW-351e

Cat. no. (REF)

10351e/2-56 or
10351e/1-56

Mains L1+N+PE

230 V \pm 10%, 50/60 Hz,
100/110/120/127V \pm 5%, 50/60Hz

Maximum power consumption

320 W

Rotational speed range

100÷4500 rpm

Maximum capacity

0,8 ml

Maximum acceleration

3305 x g

Time range

0÷99 min,

SHORT- short duration operation

0 ÷ 10 min,

Interference level

PN-EN-55011

Noise level

56 dB

Physical data:

Depth

540 mm

Width

430 mm

Height

430 mm

Weight

40,3 kg

Environmental conditions:

Ambient temperature

PN-EN-61010-1 p. 1.4.1.
+2° ÷ 40° C

Relative humidity at ambient temperature

< 80 %

Installation category

II PN-EN 61010 -1

Degree of pollution

2 PN-EN 61010 - 1

Protection zone

300 mm

2.1. Accessories.

2.1.1. Basic accessories (enclosed to every centrifuge).

Cat. No.	Type of accessories	
10351e/2-56 or 10351e/1-56	MPW-351e laboratory centrifuge	pcs 1
17664	Complete clamp	pcs 1
17665	Spanner for the rotor	pcs 1
17642	Spanner for emergency opening of the cover	pcs 1
17861	Fuses WTA-T 4 A 250 V (230V)	pcs 2
17862	Fuses WTA-T 6,3 A 250 V (115V)	pcs 2
17866	Power cord 230 V	pcs 1
17867	Power cord 120 V (optionally)	pcs 1
See page 1.	User manual	pcs 1

2.1.2. Other accessories.

Catalog no	Specification
17111	Polycarbonate cap for bucket No. 13438;
17151	Polycarbonate cap for bucket No. 13275;

2.2. Exploitation materials.



For operating in centrifuge one should use only original company's buckets comprised in the specification of accessories as well as test-tubes for centrifuges of proper diameter, length and strength. Utilization of test-tubes of other makes shall be agreed upon with manufacturer of the centrifuge. For cleaning and disinfecting one should use agents generally applied in the health service, such as e.g. *Aerodesina-2000*, *Lysoformin 3000*, *Melseptol*, *Melsept SF*, *Sanepidex*, *Cutasept F*.

3. Installation.

3.1. Unpacking of the centrifuge.

Open the package. Take out the cardboard box containing the accessories. Take out the centrifuge from the package. Keep the package and packing materials at hand for service transport.

3.2. Location.



The centrifuge shall not be located near the radiators and shall not be subjected to direct sunlight. The table for the centrifuge shall be stable and shall have flat-levelled table top. It is necessary to ensure a safety zone of the minimum 30 cm round the centrifuge from every direction. Normal operating conditions ambient temperature is from 15° C to 35° C. Passed parameters of the centrifuge are referring to the above named temperatures. 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 (minimum 4 hours).

3.3. Connection to mains.



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. It is recommended to install emergency cut-out that shall be located far from the centrifuge, near the exit or beyond the room.
Supply voltage 230 V 50/60 Hz, optionally 120V 50/60 Hz.



Before switching on, check whether the centrifuge is connected to power supply correctly. Check centrifuge before usage whether she is installed correctly.

3.4. Fuses.

The centrifuge has standard protection with the WTA-T 4 A 250 V fuse for centrifuge supplied by 230V 50/60 Hz and WTA-T 6,3 A 250 V fuse for centrifuge supplied by 120 V 50/60 Hz. Fuse is situated in the plug-in socket unit at back wall of the centrifuge.

4. Description of the centrifuge.

4.1. General description.

New generation of MPW Med. instruments laboratory centrifuges is provided with state-of-the-art microprocessor control systems, very durable and quiet asynchronous brushless motors and accessories consistent with requirements of the present-day user.

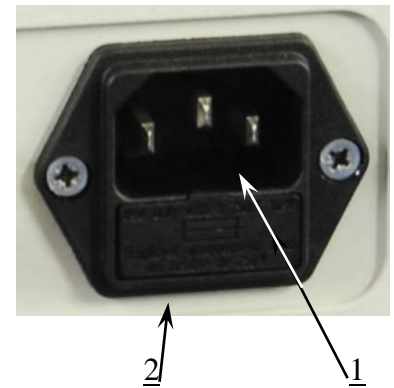
4.2. Service elements.



Drawing No.1. General view

Drawing No.2. Back of centrifuge

- 1. Plug-in socket
- 2. Fuse base



Drawing No. 3. Unit elements of the angle rotor

5. Safe working conditions.

5.1. Servicing personnel.

The MPW-351e laboratory centrifuge can be operated by laboratory personnel after getting acquainted with Operating Instruction.



This User Manual is part of the device.

Operating Instruction shall be held all the time near the centrifuge.

Operating Instruction must be kept always at hand!!!

5.2. Guarantee and operational use period.

- Guarantee period amounts to 24 months (unless otherwise specified in the purchase documents).
- Guarantee conditions are described in guarantee 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.



5.3. Hints on centrifuging.

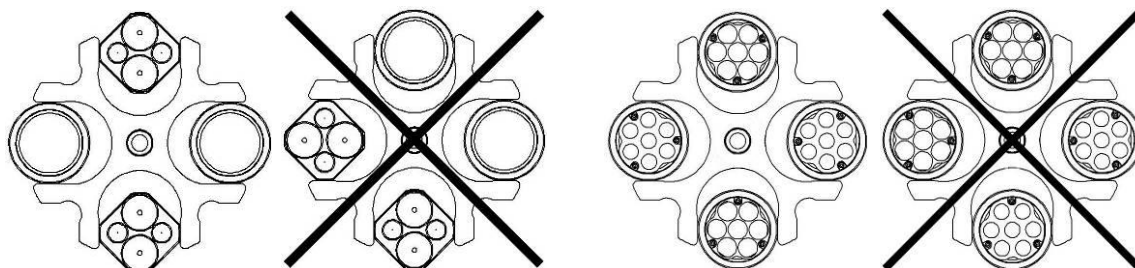


- Set the centrifuge in horizontal position on rigid base.
- Ensure safe positioning location.
- Ensure free space around the centrifuge (amounting to at least 30 cm left free).
- Ensure sufficient ventilation.
- Fix the rotor on the motor axis firmly.



- Avoid unbalance.
- Load opposite buckets with the same accessories.
- Centrifugation of the test tubes of different sizes.

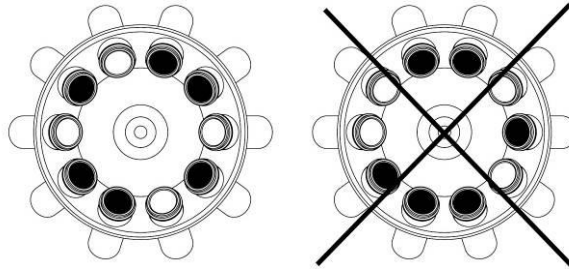
There is a possibility to centrifuge test tubes of different sizes; however, it is absolutely necessary in such cases that opposite buckets and round carriers be the same. Mass of different containers with test tubes spun at the same time has to be comparable.



- Not only the test tubes shall be inserted symmetrically, but also round carriers and their hangers shall be equally loaded. It is e.g. not allowed to operate centrifuge only external
-

part of reductive insert loaded.

- It is necessary to insert test tubes symmetrically on the opposite sides.



- Fill test tubes outside the centrifuge.
- Please pay special attention to the quality and proper thickness of the glass test tubes walls. Those shall be test tubes for centrifuges, of proper durability up to 5,000 x g.
- In order to protect the centrifuge against unbalance, fill in the test tubes up to the same weight.



- Lubricate the swing-out rotor journal pins.
- Use only accessories in good condition.
- Protect equipment against corrosion using accurate preventive maintenance.



- Infectious materials could be processed in closed buckets only.



- It is not allowed to centrifuge explosive and inflammable materials.
- It is not allowed to centrifuge substances prone to reacting in result of supplying high energy during centrifugation.

5.4. Hazards and precautions



- Prior to switching the centrifuge on, one shall read carefully all sections of this instruction in order to ensure smooth operation and avoid damages of this device or its accessories.
- Centrifuge shall not be operated by unqualified personnel.



- Centrifuge must not be transported with the rotor mounted on the shaft.

- One must use original rotors, test-tubes and spare parts only.



- In the case of faulty operation of the centrifuge one shall ask for assistance of service of MPW MED. INSTRUMENTS Company or its authorized representatives.



- It is not allowed to switch the centrifuge on if it is not installed properly or rotor is not fitted correctly.



- The centrifuge must not be operated in places where explosion hazard exists as it is not explosion-proof.
 - It is not allowed to centrifuge materials capable of generating inflammable or explosive mixtures when subjected to air.
-



- It is not allowed to subject to centrifugation toxic or infectious materials with damaged leak proof seals of the bucket or test-tube. Proper disinfection procedures have to be carried out when dangerous substances contaminated the centrifuge or its accessories.



- It isn't allowed to open the cover manually in emergency procedure when rotor is still turning.



- It isn't allowed to exceed load limit set by the manufacturer. Rotors are intended for fluids of average homogeneous density equal to 1.2 g/cm³ or smaller when centrifugation is carried out at maximum speed. When fluids of higher density shall be used, then it is necessary to limit speed (see point 7.3.3 "Maximum load").




- It is not allowed to use the rotors and round carriers with signs of corrosion or other mechanical defects.
- It is not allowed to centrifuge highly corrosive substances which may cause material impairment and lower mechanical properties of rotor and round carriers.
- It isn't allowed to use rotors and accessories not admitted by the manufacturer. Let to use commercial glass and plastic test tubes, which are destined to centrifuging in this laboratory centrifuge. One should absolutely not use poor quality test tubes. Cracking of glass vessels and test tubes could result in dangerous vibration of the centrifuge.



- It is not allowed to lift or shift the centrifuge during operation, and rest on it.
 - It is nor allowed to stay in the safety zone within 30 cm distance around the centrifuge neither leave within this zone some things, e.g. glass vessels.
 - It is not allowed to put any objects on the centrifuge.
-

6. Operation of the centrifuge.

6.1. Mounting of the rotor and accessories.

1. Connect the centrifuge to the mains (master switch on right side of the centrifuge).
2. Open the cover of the centrifuge by pressing the **COVER** key. Prior to putting the rotor in, one has to check if rotational chamber is free of impurities, e.g. such as dust, glass splinters, residues of fluids that must be taken away.
3. One shall fit the rotor on the motor shaft driving it home on the cone.
4. Screw-in the bolt for fixing the rotor (clockwise) and screw it tightly home with the supplied spanner for the rotor.
5. Swing-out rotors have to be provided with the buckets in all seats. One should remember that every buckets swings individually. Bucket suspension studs should be lubricated periodically with technical petroleum jelly.
6. One should use only buckets intended for selected types of the rotor - see p. 2.1. "Accessories".
7. Fill test tubes outside the centrifuge.
8. Put on or screw the caps on vessels and rotors (if applicable).
9. In the case of centrifuging in an angle rotor, test tubes (buckets) have to be filled properly in order to avoid overflows.
10.  **CAUTION: Centrifuge will tolerate small weight differences occurring during loading of rotors. However it is recommended to equalize vessels loads as much as possible in order to ensure minimal vibrations during operation. When the centrifuge is started with large imbalance, the unbalance control system will switch-off the drive system and error signal will be transmitted. On the monitoring panel, U sign will be displayed.**
11. In order to prolong lifetime of the rotor and gaskets, it is recommended to lubricate rotor's trunnions, used for hanging buckets, undercuts for trunnions in buckets, gaskets and threaded parts with the petroleum jelly.
12. For replacement of the rotor one shall unscrew clamping and then grab the rotor with both hands at opposite sides, taking it away from drive shaft by pulling it up.

6.2. Construction and safety measures.

The centrifuge has rigid self-supporting structure. Housing was made of sheet aluminium, back made of steel sheet. Front and cover was made of ABS type plastic. Cover is fixed on steel axles of hinges and from the front it is locked with two electromagnetic locks blocking possible opening during centrifugation. Rotation chamber casing was made of thick steel sheet. The rotation chamber bowl is made of stainless steel sheet. Rotors and containers are from aluminium, lids from polycarbonate and reductive inserts from the polypropylene.

6.3. Drive.

Low noise induction motor constitutes the drive.

6.4. Data input and output.

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.

6.5. Controls.

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


- selection of rotational speed within 100 ÷ 4500 rpm at 100 rpm interval;
- setting centrifugation time within 0÷99 min range at 30 s interval;
- selection of **SHORT** – short duration operation to programmed speed through 10 minutes.,

6.6. Safety devices.

Apart from the above described passive devices and safety measures there exist as well active devices and elements as follows:

6.6.1. Cover lock.

The centrifuge can be started only with properly closed cover (the dot “●” symbol will display). , the cover can be opened only after stopping the rotor. In the case of emergency opening of the cover during operation, the centrifuge will be immediately switched-off and the rotor will brake till complete stopping. With opened cover (the **O** symbol will display) the drive is completely disconnected from the power, which makes it impossible to start the centrifuge.

	EMERGENCY COVER RELEASE
	<p>In case of e.g. mains failure it is possible to open cover manually. At first, one must be sure that rotor is not in the move (use inspection glass). On the left-hand side of the casing there is a lock. Insert emergency opening key (17642) into the lock and turn it counterclockwise.</p> <p><i>The cover can be unlocked and opened only when the rotor is in the rest state.</i></p>

6.6.2. Unbalanced load checking system.

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 **U** sign will be displayed.

6.6.3. Rest state inspection.

Opening of the centrifuge's cover is possible only with the rotor in the state of rest. This state is being checked by the microprocessor which recognizes and signals with **S** sign on the display the rest state prior to opening the cover.

6.6.4. Motor temperature protection.

The motor has the temperature sensor for overheating protection.

If motor temperature exceeds admissible temperature drive will be switched off and **T** sign will be displayed. It is necessary in such case to switch off the power. After cooling down of motor and repeated including of power supply the **T** sign is disappear and if he isn't occurring further away overheating the centrifuge should work correctly.

6.7. Increase in temperature

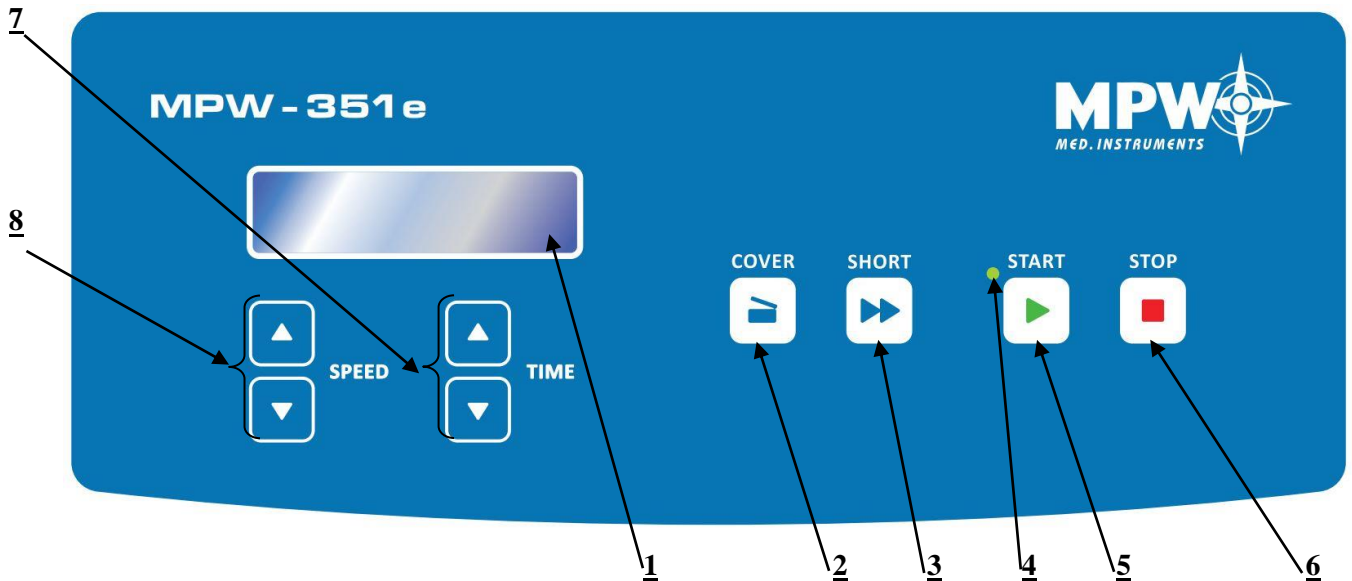
In uncooled centrifuges, the temperature in the rotor chamber, rotor and sample can increase to above 40°C, based on the run time, g-force (rcf)/speed and ambient temperature.

7. Description of the centrifuge operating elements.

Power switching ON/OFF is carried out with master switch situated on right side of the centrifuge. All settings on the centrifuge are done by means of the control panel. Panel comprises control keys and display.

7.1. Control panel - Drawing No. 4.

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



Drawing No.4. Control panel

- | | |
|------------------------|-----------------------|
| 1. Display. | 5. START key. |
| 2. COVER key. | 6. STOP key. |
| 3. SHORT key. | 7. TIME keys. |
| 4. START diode. | 8. SPEED keys. |

Control panel comprises following elements [Drawing No.4]:

1. Function **START** key [5] serves for starting centrifugation program with parameters presented on display.
2. Function **STOP** key [6] key serves for:
 - interrupting centrifugation program in any program phase and braking the rotor,
 - saving of preset **SPEED** and **TIME** centrifugation parameters
3. Function **COVER** key [2] serves for opening of the cover
4. Function **SHORT** key [3] serves for short duration operation
5. **TIME** keys [7] serve for time programming
6. **SPEED** keys [8] serve for speed programming
7. **START** diode [4] is signalling the state of the rotor - blinking – rotor rotates, not illuminated – rotor does not rotate

8. Display [1]



- | | |
|------------------------|---|
| 1. Upper display field | S : 4 digits (rpm) RCF 4 digits (x g) |
| 2. Lower display field | T : 4 digits (m/s) S (STOP) O (Opened cover) U (Unbalance),
T (overload of motor) |

7.2. Switching the centrifuge on.

After switching power ON the control system calls recently implemented program and displays in relevant fields rotational speed, duration of centrifugation and cover opening status. Provided that rotor in the centrifuge is stopped, it is possible to open the cover by means of **COVER** key.

Stopped rotor status is displayed **S** sign in the display field. When this symbol is not already displayed, then one must wait till this rotor stops and the above mentioned symbol appears.

7.2.1. Selection of the program.

Control panel can save 1 program preset by the user. Program acceptance consists in pressing **STOP** key.

7.2.2. Start of the program.

After acceptance of the program and checking if rotor was mounted, centrifuge can be started with pushing **START** key, provided that cover is closed.

7.2.3. Unbalance.

The centrifuge is provided with the rotor unbalance sensor and when it will be activated, centrifugation process will be stopped through fast braking and at the same time **U** sign will be displayed. Cancellation of this error is possible only through pressing **COVER** key after stopping of the rotor. One must check if rotor was correctly loaded, close the cover and once more start the program. In order to protect the rotor against beating in opposite areas of the rotor, it has to be provided with identically filled buckets, carriers, test-tubes etc. for getting the best balance possible. Unbalance causes noise and vibrations during operation, and adversely affects power transmission system (motor, shock absorbers). The better balance, the smoother will be the centrifuge operation and therefore longer useful life of driving system. Moreover ideal separation level is obtained, as already separated constituents would not be moved up by vibration.

7.2.4. Emergency stop.

At any time during centrifuging it is possible to interrupt the process and stop the rotor quickly with single pressing the **STOP** key.

7.2.5. End of the centrifuging.

After ending the time of centrifuging set in the program, the rotor decelerates in accordance. At end of deceleration, rotational speed drops slower in order to ensure soft settling of rotor carriers. After stopping, sound signal is generated, **S** sign is displayed. After pressing **COVER** key, the cover opens and **O** sign is displayed.

7.2.6. Programming.

Programming mode is activated with pressing **SPEED** and **TIME** (+) (-) keys after selection of parameters of the program which one would like to save or change. Acceptance of preset parameters is done by pressing **STOP** key. One can save one program only.

7.2.7. Version of the centrifuge.

The information about the centrifuge type, program version and internet address are displaying at once after switching supply on for 2 seconds.

7.3. Mathematical relations.

7.3.1. RCF – relative centripetal force.

RCF acceleration is the acceleration generated by the rotary motion of the rotor acting upon tested product and it can be calculated according to the formula:

$$\text{RCF} = 11,18 \times r \times (n/1000)^2$$

$$\text{RCF} \quad [\times g], \quad r \text{ [cm]}, \quad n \text{ [rpm]}$$

Depending on the distance of particles of the tested product from the axis of rotation, one can establish with use of the above formula the minimum RCF, average RCF or maximum RCF. On the basis of preset RCF value and given radius of the bottom of the bucket one can calculate with it the rotational speed to be set in the program of centrifuging. Selection of the time of sedimentation and the RCF value shall be carried out experimentally for any given product.

Once every 100 rpm, an electronic circuit automatically calculates and displays RCF value. In order to program required RCF value one shall use nomograph (Drawing No. 5) or change the rotational speed, matching displayed value to required acceleration value.

7.3.2. Nomograph of relationship - rotational speed/centrifuging radius/RCF (see Annexes)

7.3.3. Maximum load.

In order to avoid overloading of the rotor one shall observe maximum load which is recorded on every rotor. Maximum permissible load is reached when all test-tubes are filled with the fluid with 1.2 g/cm³ density.

If density of the centrifuged liquid is higher than 1.2 g/cm³, then test-tubes could be filled only partially or one shall limit operation speed of the centrifuge, which is being calculated from the formula:

$$n_{\text{perm}} = n_{\text{max}} * \sqrt{\frac{1,2}{\gamma}};$$

$$\gamma = \text{specific gravity} \left[\frac{G}{\text{cm}^3} \right];$$

$$n_{\text{max}} \text{ [maximum rotational speed - rpm]}$$

8. Cleaning, disinfection, maintenance.

CAUTION! It is necessary to use protective gloves during following work.

8.1. Cleaning of the centrifuge.

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. Using wiping cloth, remove condensate or residues of the products from the rotor chamber. It is recommended to keep the cover opened when the centrifuge does not work in order to expel the moisture.



In the case the user decides to use centrifuge and equipment cleaning methods other than the ones described in this manual, the user shall contact the device manufacturer in order to check whether the cleaning method chosen does not damage the device.

8.2. Cleaning of the accessories.

In order to ensure safe operation one shall carry out in regular way periodical maintenance of the accessories. Manufactured rotors, buckets and round carriers have to withstand steady high stresses originating from the field of gravitation. Chemical reactions as well as corrosion (combination of variable pressure and chemical reactions) can cause corrosion or destruction of metals. Hard to observe surface cracks increase gradually and weaken material without visible symptoms. In the 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. In order to prevent corrosion one has to clean regularly the rotor with the fastening bolt, buckets and round carriers. Cleaning of the accessories shall be carried out outside of the centrifuge once every week or still better after each use. Then, those parts shall be dried using soft fabric or in the chamber drier at ca. 50° C.

Especially prone to the corrosion are parts made of aluminium. For cleaning them one should use neutral agent of pH value from 6 to 8. It is forbidden to use alkaline agent of pH above 8. 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. Corrosion and damages resulting from insufficient maintenance could not be subject of claims lodged against the manufacturer.

8.3. Lubrication.

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

8.4. Glass tube cracking.

In the case of glass tube cracking, all debris shall be accurately removed. Rubber inserts shall be exactly cleaned or possibly replaced. Otherwise one has to take into account following possibilities:

- Glass particles left in the rubber cushion (pad) will cause once more glass cracking.
- Glass particles left in containers make impossible uniform deflecting of the buckets and round carriers resulting in unbalance.
- Glass particles left in the rotor chamber cause metal abrasion because of strong air circulation. This dust will not only contaminate the centrifuge chamber, rotor, buckets, carriers and centrifuged material but will cause as well damages of surfaces of the accessories, rotors and the rotation chamber. For complete removal of glass particles and metal dust from the rotor chamber it is recommended to place strip of vaseline on the bowl (from the top down to bottom). Then rotor shall operate for several minutes at moderate speed. Glass and metal particles will gather on lubricated area and could be easily removed with the piece of cloth together with the grease. This operation can be repeated in case of a need.

8.5. Sterilization and disinfections of the rotational chamber and accessories.

One can use all standard disinfectants. The centrifuges and accessories are constructed from various materials and one should to take into account possible variety of materials. During sterilization by means of steam one should to consider temperature resistance of individual materials.

STERILIZATION

	Sterilization* temp. 121 °C, time 20 min	Radiation – β/γ 25 kGy	Gas (ethylene oxide)	Chemical compounds (formalin, ethanol)
PS	no	yes	no	yes
SAN	no	no	yes	yes
PMMA	no	yes	no	yes
PC	yes ¹⁾	yes	yes	yes
PVC	no ²⁾	no	yes	yes
POM	yes ¹⁾	yes	yes	yes
PE-LD	no	yes	yes	yes
PE-HD	no	yes	yes	yes
PP	yes	yes	yes	yes
PMP	yes	yes	yes	yes
ECTFE/ETFE	yes	no	yes	yes
PTFE	yes	no	yes	yes
FEP/PFA	yes	no	yes	yes
FKM	yes	-	yes	yes
EPDM	yes	-	yes	yes
NR	no	no	yes	yes
SI	yes	no	yes	yes

* Laboratory vessels have to be exactly cleaned and rinsed with the distilled water before the sterilization in the autoclave. It is always necessary to remove closures from containers!

1) The frequent steam sterilization reduces mechanical durability! PC test tubes may become useless.

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

Abbreviations of names of characterized plastics

PS:	Polystyrene	ECTFE:	Ethylene/chlorotrifluoroethylene
SAN:	Styrene-acrylonitrile	ETFE:	Ethylene/tetrafluoroethylene
PMMA:	Polymethyl methacrylate	PTFE:	Polytetrafluoroethylene
PC:	Polycarbon	FEP:	Tetrafluoroethylene/perfluoropropylene
PVC:	Polyvinyl chloride	PFA	Tetrafluoroethylene/perfluoroalkylvinylether
POM:	Acetal polyoxymethylenel	FKM	Fluorcarbon rubber
PE-LD:	Low density polyethylene	EPDM:	Ethylene propylene diene
PE-HD:	High density polyethylene	NR:	Natural rubber
PP:	Polypropylene	SI:	Silicon rubber
PMP:	Polymethylpentene		



For centrifuging infectious materials it is necessary to use hermetically closed buckets, in order to prevent they migration into the centrifuge.

Rotors, buckets and round carriers can be sterilized in autoclave with temperature 121° – 124° C and pressure 215 kPa during 20 min. 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*).



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.

9. Emergency conditions – service.

9.1. Fault finding.

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 the case of short-duration power failure the rotor is decelerate.

Please find below the most frequent faults and their repair methods.

Lack of display and check sound:	Remedies:
• <i>Is mains socket live?</i>	<i>Check mains socket fuse.</i>
• <i>Is supply cable plugged into mains?</i>	<i>Plugs supply cable correctly.</i>
• <i>Is input fuse good?</i>	<i>Replace input fuse (rated data on rating plate).</i>
• <i>Is master switch ON?</i>	<i>Switch ON power supply.</i>
• <i>The above was checked and still there is no display active and check sound audible</i>	<i>Call service.</i>
Centrifuge does not start	Remedies
P sign is displayed	<i>Call service</i>
<ul style="list-style-type: none"> • START key pressing does not generate reaction or single tone only - Rotor stopping sign, (S) is not displayed yet - Cover opening sign (O) displayed - START diode is blinking: 	<ul style="list-style-type: none"> - Wait till rotor stops and displaying the rotor stopping symbol(S) - Close cover. Dot sign “.” must displayed. - Centrifugation cycle in progress, press STOP key or wait till cycle ends.
• <i>Indications are proof for cycle in progress and motor does not start</i>	<i>Switch power supply OFF/ON. If fault still persists call service.</i>
Programming function not active	Remedies
<i>It is impossible to record parameter values to memory; last recorded program can not be recalled. Disturbances on displays possible too.</i>	<i>Call service.</i>
Centrifuge starts but not accelerates	Remedies
<i>E symbol displayed after stopping. Drive overload</i>	<i>Wait for 15 minutes and switch again after opening and closing the cover.</i>
<ul style="list-style-type: none"> • <i>After stopping U sign is displayed</i> - <i>Unequal rotor load</i> - <i>Inclined centrifuge</i> - <i>Faulty drive (mechanical damage)</i> - <i>Centrifuge was displaced during operation</i> 	<ul style="list-style-type: none"> - <i>Centrifuge load shall be balanced</i> - <i>Centrifuge shall be leveled</i> - <i>Call service</i> - <i>Switch ON the centrifuge afresh after opening and closing the cover</i>
It is not possible to open the cover.	Remedies
• <i>Rotor stopping S sign not displayed yet, after pressing COVER key single tone is audible</i>	<i>Rotor is still rotating. Wait for stopping of the rotor and the square symbol displaying</i>
• <i>Nothing is displayed</i>	<i>Check the centrifuge power supply</i>
• <i>Rotor stopping sign S is displayed, but cover can not be opened</i>	<i>Call service</i>
Centrifuge stop the program and not start	Remedies
• <i>T sign is displayed(motor overheating)</i>	<i>Switch off the centrifuge and wait for 20 minutes and switch on after opening and closing the cover.</i>
• <i>The centrifuge still not starts.</i>	<i>Call service</i>

9.2. Work safety inspection.

For safety reasons, inspections of the centrifuge carried out by the authorized service at least once a year after the period of warranty. The reason for more frequent inspections could be corrosion inducing environment. Examinations should end with issuing "Report of validation, the check on the technical state of the laboratory centrifuge". It is being recommended to establish "Technical passport" or "Log of the apparatus", in whom every repairs and reviews are being registered. Both these documents should be stored in the place of use of the centrifuge.

9.3. Inspection procedures carried out by the operator.

Operator has to pay special attention to the fact that the centrifuge parts of key importance due to safety reasons are not damaged.

This remark is specifically important as for:

1. Motor suspension
2. Motor axis concentricity
3. Fixing the pins in the bucket.
4. Centrifuge accessories and especially structural changes, corrosion, preliminary cracks, abrasion of metal parts.
5. Screw joints.
6. Inspection of the rotor assembly.
7. Inspection of bioseals of the buckets if such are used.
8. Control of execution of the guarantee yearly technical inspection of the centrifuge

Only the manufacturer-specified holders, included in the equipment list, as well as centrifuge capillaries, which diameter, length and durability are suitable, should be used for spinning in this centrifuge. The use of equipment made by other manufacturers should be consulted with the manufacturer of the centrifuge. Disinfectants and cleaning agents generally used in medical care should be used in this centrifuge (e.g. *Aerodesina-2000, Lysoformin 3000, Melseptol, Melsept SF, Sanepidex, Cutasept F*).

10. Repair conditions.

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 Operating Instruction provisions, when damage results from the User's fault. Repairs should be carried out in authorized service workshops, guaranteed 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.

11. 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.

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

12. Disposal.

	<ul style="list-style-type: none">▪ The device disposed of in accordance with applicable regulations.▪ Pursuant to guideline 2002/96/EC (WEEE), all devices supplied after August 13, 2005, may not be disposed as part of domestic waste.▪ The device belongs to 8th group (medical devices) and is categorized in business to business field.▪ The icon of the crossed-out trash can shows that the device may not be disposed as part of domestic waste.▪ The waste disposal guidelines of the individual EC countries might vary. If necessary, contact your supplier.
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13. Manufacturer's data.

"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

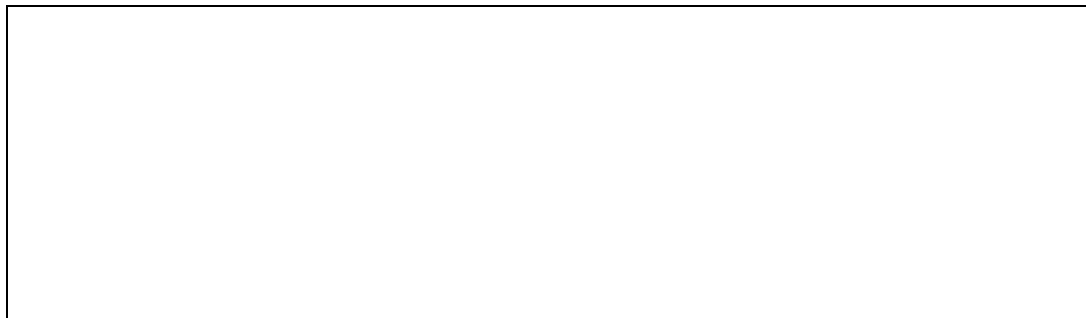
website: www.mpw.pl

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.

14. Distributor information.

DISTRIBUTOR:



15. Table of chemical resistance

Table of chemical resistance to the interaction of various categories of reagents of plastics

Groups of the substance in temp. 20°C	PS	SAN	PMMA	PC	PCV	POM	PE-LD	PE-HD	PP	PMP	ECTFE ETFE	PTFE FEP PFA	FKM	EPDM	NR	SI
Aldehydes	-	-	○	○	-	○	-	+	+	○	+	+	+	+	○	○
Cyclic alcohols	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+
Esters	-	-	-	-	-	-	+	○	○	○	+	+	-	○	○	○
Ether	-	-	-	-	-	+	+	○	○	-	+	+	-	-	-	-
Ketones	-	-	-	-	-	+	○	○	○	○	○	+	-	○	-	-
Strong or concentrated acids	○	-	-	-	+	-	+	+	+	+	+	+		+	-	-
Weak or diluted acids	○	○	○	○	+	-	+	+	+	+	+	+	+	+	○	○
Oxidizing acids or oxidizing substances	-	-	-	-	-	-	-	-	-	-	+	+	○	○	-	-
cyclic hydrocarbons	-	-	○	○	+	+	+	+	+	○	+	+	○	-	-	-
Ahs	-	-	-	-	-	+	+	○	○	-	+	+	○	-	-	-
Haloid hydrocarbons	-	-	-	-	-	+	+	○	○	-	+	+	○	-	-	-
Alkalis	+	+	-	-	+	+	+	+	+	+	+	+	○	+	+	○

+ = very good chemical resistance

Permanent action of the substance isn't causing damage through 30 days. The material is able to be resistant through years.

○ = chemical resistance of good to limited

Continuous action of the substance is causing insignificant damage through the period of 7-30 days, partly reversible (e.g. puffing up, softening, reduced mechanical durability, discoloring).

- = limited chemical resistance

The material isn't able to have the continuous contact with the substance. The immediate occurrence of damage is possible (e.g. the loss of mechanical durability, the deformation, discoloring, bursting, dissolving).

Abbreviations of names of characterized plastics

PS:	Polystyrene	ECTFE:	Ethylene/chlorotrifluoroethylene
SAN:	Styrene-acrylonitrile	ETFE:	Ethylene/tetrafluoroethylene
PMMA:	Polymethyl methacrylate	PTFE:	Polytetrafluoroethylene
PC:	Polycarbon	FEP:	Tetrafluoroethylene/perfluoropropylene
PVC:	Polyvinyl chloride	PFA:	Tetrafluoroethylene/perfluoroalkylvinylether
POM:	Acetal polyoxymethylenel	FKM:	Fluorcarbon rubber
PE-LD:	Low density polyethylene	EPDM:	Ethylene propylene diene
PE-HD:	High density polyethylene	NR:	Natural rubber
PP:	Polypropylene	SI:	Silicon rubber
PMP:	Polymethylpentene		

16. Annexes

A. Wyposażenie dodatkowe/Optional accessories**MPW-351e****WIRNIK / ROTOR****PARAMETRY WIRNIKA / ROTOR PARAMETERS****POJEMNIK/BUCKET****WKŁADKA / ADAPTER**

[liczba probówek na wirnik/tubes per rotor] PROBÓWKA / TUBE

11215**RPM 4500, RCF 3283, Rmax 145, α 45****13080****14082**

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

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

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

[32] 15054 6 ml probówka z pokrywką (11,5 x 92 mm), Sarstedt®
6 ml tube with cap (11,5 x 92 mm), Sarstedt®[32] 15119 7 ml probówka szklana (12 x 100 mm)
7 ml glass tube (12 x 100 mm)**bez wkładki/without adapter**

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

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

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

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

[32] 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®[32] 15048 15 ml Thermo Nalgene® (16 x 113 mm)
15 ml Thermo Nalgene® (16 x 113 mm)[32] 15053 10 ml probówka z pokrywką (16 x 106 mm)
10 ml tube with cap (16 x 106 mm)[32] 15118 10 ml probówka szklana (16 x 100 mm)
10 ml glass tube (16 x 100 mm)[32] * 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)**13081****14082**

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

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

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

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

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

[32] 15120 5 ml probówka szklana (12 x 75 mm)
5 ml glass tube (12 x 75 mm)**bez wkładki/without adapter**

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

[32] * 10 ml Thermo Nalgene® Oak Ridge (16 x 81,5 mm)

[32] 15121 10 ml probówka z dnem okrągłym i pokrywką (17 x 70 mm)
10 ml tube, round bottom, with cap (17 x 70 mm)

A. Wyposażenie dodatkowe/Optional accessories**11254****RPM 4500, RCF 3011, Rmax 133, α 30****13276****14035**

[10] 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®

[10] 15048 15 ml Thermo Nalgene® (16 x 113 mm)
15 ml Thermo Nalgene® (16 x 113 mm)

[10] 15053 10 ml probówka z pokrywką (16 x 106 mm)
10 ml tube with cap (16 x 106 mm)

[10] 15118 10 ml probówka szklana (16 x 100 mm)
10 ml glass tube (16 x 100 mm)

14036

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

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

[10] 15054 6 ml probówka z pokrywką (11,5 x 92 mm), Sarstedt®
6 ml tube with cap (11,5 x 92 mm), Sarstedt®

[10] 15119 7 ml probówka szklana (12 x 100 mm)
7 ml glass tube (12 x 100 mm)

14043

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

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

[10] * Sarstedt S-Monovette® (13 x 90 mm), (4,9; 5,6 ml)

[10] 15120 5 ml probówka szklana (12 x 75 mm)
5 ml glass tube (12 x 75 mm)

[10] 15419 5 ml probówka z korkiem (12 x 85 mm), Sarstedt®
5 ml tube with cap (12 x 85 mm), Sarstedt®

14071

[10] * 28 ml Thermo Nalgene® Oak Ridge (25,4 x 101,8 mm)

[10] 15055 30 ml probówka z pokrywką (25,4 x 103,2 mm)
30 ml tube with cap (25,4 x 103,2 mm)

[10] 15056 30 ml Thermo Nalgene® Oak Ridge (25,5 x 94,3 mm)
30 ml Thermo Nalgene® Oak Ridge (25,5 x 94,3 mm)

[10] 15117 25 ml probówka szklana (25 x 100 mm)
25 ml glass tube (25 x 100 mm)

[10] 15424 30 ml probówka z pokrywką (25,5 x 94 mm), Nalgene®
30 ml tube with cap (25,5 x 94 mm), Nalgene®

14073

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

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

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

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

[10] 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®

[10] 15048 15 ml Thermo Nalgene® (16 x 113 mm)
15 ml Thermo Nalgene® (16 x 113 mm)

[10] 15053 10 ml probówka z pokrywką (16 x 106 mm)
10 ml tube with cap (16 x 106 mm)

[10] 15118 10 ml probówka szklana (16 x 100 mm)
10 ml glass tube (16 x 100 mm)

14089

[10] * 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)

14248

[10] 15055 30 ml probówka z pokrywką (25,4 x 103,2 mm)
30 ml tube with cap (25,4 x 103,2 mm)

[10] 15117 25 ml probówka szklana (25 x 100 mm)
25 ml glass tube (25 x 100 mm)

14089+14868

[10] * 5 ml probówka z korkiem wciskany (17 x 54,2 mm), Eppendorf®
5 ml tube with snap cap (17 x 54,2 mm), Eppendorf®

[10] * 5 ml probówka z korkiem zakręcany (17 x 66 mm), Eppendorf®
5 ml tube with screw cap (17 x 66 mm), Eppendorf®

A. Wyposażenie dodatkowe/Optional accessories	
bez wkładki/without adapter	
[10] 15051	50 ml Thermo Nalgene® Oak Ridge (28,8 x 106,7 mm) 50 ml Thermo Nalgene® Oak Ridge (28,8 x 106,7 mm)
[10] *	50 ml probówka z dnem stożkowym z zakrętką (30 x 117 mm), Falcon®; [15052] 50ml (30 x 117mm) 50 ml tube, conical bottom, with cap (30 x 117 mm), Falcon®; [15052] 50ml Sarstedt® (30 x 117 mm)
[10] *	50 ml probówka z dnem stożkowym bez rantu (30 x 115 mm), Greiner® 50 ml tube, conical bottom, without skirt (30 x 115 mm), Greiner®
[10] *	50 ml probówka Advanced Oak Ridge (29x102 mm), Herolab® nr 25 32 11 50 ml tube, Advanced Oak Ridge (29 x 102 mm), Herolab® no. 25 32 11
13278C	
14035	
[10] 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®
[10] 15048	15 ml Thermo Nalgene® (16 x 113 mm) 15 ml Thermo Nalgene® (16 x 113 mm)
[10] 15053	10 ml probówka z pokrywką (16 x 106 mm) 10 ml tube with cap (16 x 106 mm)
[10] 15118	10 ml probówka szklana (16 x 100 mm) 10 ml glass tube (16 x 100 mm)
14036	
[10] 15054	6 ml probówka z pokrywką (11,5 x 92 mm), Sarstedt® 6 ml tube with cap (11,5 x 92 mm), Sarstedt®
[10] 15119	7 ml probówka szklana (12 x 100 mm) 7 ml glass tube (12 x 100 mm)
14043	
[10] *	Greiner Vacuette® (13 x 75 mm), (1-4,5 ml)
[10] 15120	5 ml probówka szklana (12 x 75 mm) 5 ml glass tube (12 x 75 mm)
[10] 15419	5 ml probówka z korkiem (12 x 85 mm), Sarstedt® 5 ml tube with cap (12 x 85 mm), Sarstedt®
14071	
[10] *	28 ml Thermo Nalgene® Oak Ridge (25,4 x 101,8 mm)
[10] 15055	30 ml probówka z pokrywką (25,4 x 103,2 mm) 30 ml tube with cap (25,4 x 103,2 mm)
[10] 15056	30 ml Thermo Nalgene® Oak Ridge (25,5 x 94,3 mm) 30 ml Thermo Nalgene® Oak Ridge (25,5 x 94,3 mm)
[10] 15117	25 ml probówka szklana (25 x 100 mm) 25 ml glass tube (25 x 100 mm)
[10] 15424	30 ml probówka z pokrywką (25,5 x 94 mm), Nalgene® 30 ml tube with cap (25,5 x 94 mm), Nalgene®
14073	
[10] *	Greiner Vacuette® (16 x 100 mm), (7-9 ml)
[10] *	Sarstedt S-Monovette® (15 x 92 mm), (7,5; 8,2; 8,5 ml)
[10] *	BD Vacutainer® (16 x 100 mm), (2,5-11 ml)
[10] *	Sarstedt S-Monovette® (16 x 92 mm), (9; 10 ml)
[10] 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®
[10] 15053	10 ml probówka z pokrywką (16 x 106 mm) 10 ml tube with cap (16 x 106 mm)
[10] 15118	10 ml probówka szklana (16 x 100 mm) 10 ml glass tube (16 x 100 mm)
14089	
[10] *	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)
14248	
[10] 15055	30 ml probówka z pokrywką (25,4 x 103,2 mm) 30 ml tube with cap (25,4 x 103,2 mm)
[10] 15117	25 ml probówka szklana (25 x 100 mm) 25 ml glass tube (25 x 100 mm)
14089+14868	
[10] *	5 ml probówka z korkiem wciskany (17 x 54,2 mm), Eppendorf® 5 ml tube with snap cap (17 x 54,2 mm), Eppendorf®
bez wkładki/without adapter	
[10] 15051	50 ml Thermo Nalgene® Oak Ridge (28,8 x 106,7 mm) 50 ml Thermo Nalgene® Oak Ridge (28,8 x 106,7 mm)
[10] *	50 ml probówka z dnem stożkowym z zakrętką (30 x 117 mm), Falcon®; [15052] 50ml (30 x 117mm) 50 ml tube, conical bottom, with cap (30 x 117 mm), Falcon®; [15052] 50ml Sarstedt® (30 x 117 mm)
[10] *	50 ml probówka z dnem stożkowym bez rantu (30 x 115 mm), Greiner® 50 ml tube, conical bottom, without skirt (30 x 115 mm), Greiner®
[10] *	50 ml probówka Advanced Oak Ridge (29x102 mm), Herolab® nr 25 32 11 50 ml tube, Advanced Oak Ridge (29 x 102 mm), Herolab® no. 25 32 11

A. Wyposażenie dodatkowe/Optional accessories**11453****RPM 4500, RCF 2332, Rmax 103, α 30****13080****14082**

[24]	*	BD Vacutainer® (13 x 100 mm), (4-7 ml)
[24]	*	Greiner Vacuette® (13 x 100 mm), (3,5-6 ml)
[24]	*	Sarstedt S-Monovette® (11 x 92 mm), (4,5; 5 ml)
[24]	15054	6 ml probówka z pokrywką (11,5 x 92 mm), Sarstedt® 6 ml tube with cap (11,5 x 92 mm), Sarstedt®
[24]	15119	7 ml probówka szklana (12 x 100 mm) 7 ml glass tube (12 x 100 mm)
bez wkładki/without adapter		
[24]	*	BD Vacutainer® (16 x 100 mm), (2,5-11 ml)
[24]	*	Greiner Vacuette® (16 x 100 mm), (7-9 ml)
[24]	*	Sarstedt S-Monovette® (15 x 92 mm), (7,5; 8,2; 8,5 ml)
[24]	*	Sarstedt S-Monovette® (16 x 92 mm), (9; 10 ml)
[24]	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®
[24]	15048	15 ml Thermo Nalgene® (16 x 113 mm) 15 ml Thermo Nalgene® (16 x 113 mm)
[24]	15053	10 ml probówka z pokrywką (16 x 106 mm) 10 ml tube with cap (16 x 106 mm)
[24]	15118	10 ml probówka szklana (16 x 100 mm) 10 ml glass tube (16 x 100 mm)
[24]	*	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)

13081**14082**

[24]	*	BD Vacutainer® (13 x 75 mm), (1,6-5,3 ml)
[24]	*	Greiner Vacuette® (13 x 75 mm), (1-4,5 ml)
[24]	*	Sarstedt S-Monovette® (11 x 66 mm), (1,6; 2; 2,7; 3; 3,1 ml)
[24]	*	Sarstedt S-Monovette® (13 x 65 mm), (2,6; 2,9; 3,4; 3,8 ml)
[24]	*	Sarstedt S-Monovette® (13 x 75 mm), (2,7; 3; 4,3 ml)
[24]	15120	5 ml probówka szklana (12 x 75 mm) 5 ml glass tube (12 x 75 mm)
bez wkładki/without adapter		
[24]	*	Sarstedt S-Monovette® (15 x 75 mm), (4; 4,3; 5,5 ml)
[24]	*	10 ml Thermo Nalgene® Oak Ridge (16 x 81,5 mm)
[24]	15121	10 ml probówka z dnem okrągłym i pokrywką (17 x 70 mm) 10 ml tube, round bottom, with cap (17 x 70 mm)

11454**RPM 4500, RCF 2490, Rmax 110, α 30****13080****14082**

[12]	*	BD Vacutainer® (13 x 100 mm), (4-7 ml)
[12]	*	Greiner Vacuette® (13 x 100 mm), (3,5-6 ml)
[12]	*	Sarstedt S-Monovette® (11 x 92 mm), (4,5; 5 ml)
[12]	15054	6 ml probówka z pokrywką (11,5 x 92 mm), Sarstedt® 6 ml tube with cap (11,5 x 92 mm), Sarstedt®
[12]	15119	7 ml probówka szklana (12 x 100 mm) 7 ml glass tube (12 x 100 mm)

A. Wyposażenie dodatkowe/Optional accessories	
bez wkładki/without adapter	
[12]	* BD Vacutainer® (16 x 100 mm), (2,5-11 ml)
[12]	* Greiner Vacuette® (16 x 100 mm), (7-9 ml)
[12]	* Sarstedt S-Monovette® (15 x 92 mm), (7,5; 8,2; 8,5 ml)
[12]	* Sarstedt S-Monovette® (16 x 92 mm), (9; 10 ml)
[12] 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®
[12] 15048	15 ml Thermo Nalgene® (16 x 113 mm) 15 ml Thermo Nalgene® (16 x 113 mm)
[12] 15053	10 ml probówka z pokrywką (16 x 106 mm) 10 ml tube with cap (16 x 106 mm)
[12] 15118	10 ml probówka szklana (16 x 100 mm) 10 ml glass tube (16 x 100 mm)
[12]	* 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)
13081	
14082	
[12]	* BD Vacutainer® (13 x 75 mm), (1,6-5,3 ml)
[12]	* Greiner Vacuette® (13 x 75 mm), (1-4,5 ml)
[12]	* Sarstedt S-Monovette® (11 x 66 mm), (1,6; 2; 2,7; 3; 3,1 ml)
[12]	* Sarstedt S-Monovette® (13 x 65 mm), (2,6; 2,9; 3,4; 3,8 ml)
[12]	* Sarstedt S-Monovette® (13 x 75 mm), (2,7; 3; 4,3 ml)
[12] 15120	5 ml probówka szklana (12 x 75 mm) 5 ml glass tube (12 x 75 mm)
bez wkładki/without adapter	
[12]	* Sarstedt S-Monovette® (15 x 75 mm), (4; 4,3; 5,5 ml)
[12]	* 10 ml Thermo Nalgene® Oak Ridge (16 x 81,5 mm)
[12] 15121	10 ml probówka z dnem okrągłym i pokrywką (17 x 70 mm) 10 ml tube, round bottom, with cap (17 x 70 mm)
11455	
RPM 4500, RCF 2332, Rmax 103, ɸ 30	
13329	
14255	
[10]	* Sarstedt S-Monovette® (11 x 92 mm), (4,5; 5 ml)
[10] 15119	7 ml probówka szklana (12 x 100 mm) 7 ml glass tube (12 x 100 mm)
14256	
[10] 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®
[10] 15048	15 ml Thermo Nalgene® (16 x 113 mm) 15 ml Thermo Nalgene® (16 x 113 mm)
[10] 15053	10 ml probówka z pokrywką (16 x 106 mm) 10 ml tube with cap (16 x 106 mm)
[10] 15118	10 ml probówka szklana (16 x 100 mm) 10 ml glass tube (16 x 100 mm)
bez wkładki/without adapter	
[10] 15055	30 ml probówka z pokrywką (25,4 x 103,2 mm) 30 ml tube with cap (25,4 x 103,2 mm)
[10] 15424	30 ml probówka z pokrywką (25,5 x 94 mm), Nalgene® 30 ml tube with cap (25,5 x 94 mm), Nalgene®

A. Wyposażenie dodatkowe/Optional accessories**11501****RPM 4500, RCF 3011, Rmax 133, α 30****13080****14082**

[30]	*	BD Vacutainer® (13 x 100 mm), (4-7 ml)
[30]	*	Greiner Vacuette® (13 x 100 mm), (3,5-6 ml)
[30]	*	Sarstedt S-Monovette® (11 x 92 mm), (4,5; 5 ml)
[30]	15054	6 ml probówka z pokrywką (11,5 x 92 mm), Sarstedt® 6 ml tube with cap (11,5 x 92 mm), Sarstedt®
[30]	15119	7 ml probówka szklana (12 x 100 mm) 7 ml glass tube (12 x 100 mm)
bez wkładki/without adapter		
[30]	*	BD Vacutainer® (16 x 100 mm), (2,5-11 ml)
[30]	*	Greiner Vacuette® (16 x 100 mm), (7-9 ml)
[30]	*	Sarstedt S-Monovette® (16 x 92 mm), (9; 10 ml)
[30]	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®
[30]	15048	15 ml Thermo Nalgene® (16 x 113 mm) 15 ml Thermo Nalgene® (16 x 113 mm)
[30]	15053	10 ml probówka z pokrywką (16 x 106 mm) 10 ml tube with cap (16 x 106 mm)
[30]	15118	10 ml probówka szklana (16 x 100 mm) 10 ml glass tube (16 x 100 mm)
[30]	*	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)

13081**14082**

[30]	*	BD Vacutainer® (13 x 75 mm), (1,6-5,3 ml)
[30]	*	Greiner Vacuette® (13 x 75 mm), (1-4,5 ml)
[30]	*	Sarstedt S-Monovette® (11 x 66 mm), (1,6; 2; 2,7; 3; 3,1 ml)
[30]	*	Sarstedt S-Monovette® (13 x 65 mm), (2,6; 2,9; 3,4; 3,8 ml)
[30]	*	Sarstedt S-Monovette® (13 x 75 mm), (2,7; 3; 4,3 ml)
[30]	15120	5 ml probówka szklana (12 x 75 mm) 5 ml glass tube (12 x 75 mm)
bez wkładki/without adapter		
[30]	*	Sarstedt S-Monovette® (15 x 75 mm), (4; 4,3; 5,5 ml)
[30]	*	10 ml Thermo Nalgene® Oak Ridge (16 x 81,5 mm)
[30]	15121	10 ml probówka z dnem okrągłym i pokrywką (17 x 70 mm) 10 ml tube, round bottom, with cap (17 x 70 mm)

11743**RPM 4500, RCF 2717, Rmax 120, α 30****13329****14255**

[12]	*	Sarstedt S-Monovette® (11 x 92 mm), (4,5; 5 ml)
[12]	15119	7 ml probówka szklana (12 x 100 mm) 7 ml glass tube (12 x 100 mm)

14256

[12]	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®
[12]	15048	15 ml Thermo Nalgene® (16 x 113 mm) 15 ml Thermo Nalgene® (16 x 113 mm)
[12]	15053	10 ml probówka z pokrywką (16 x 106 mm) 10 ml tube with cap (16 x 106 mm)
[12]	15118	10 ml probówka szklana (16 x 100 mm) 10 ml glass tube (16 x 100 mm)

bez wkładki/without adapter

[12]	15055	30 ml probówka z pokrywką (25,4 x 103,2 mm) 30 ml tube with cap (25,4 x 103,2 mm)
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A. Wyposażenie dodatkowe/Optional accessories**12285****RPM 4500, RCF 2626, Rmax 116, α 90****13286****bez wkładki/without adapter**

[8]	15102	plytka titracyjna MTP 28,8ml (86x128x15/17,5 mm) microtiter plate MTP 28,8 ml (86 x 128 x 15/17,5 mm)
[2]	*	plytka titracyjna DWP 96/2000 μ l (127,8x85,5x44,1 mm) deepwell plate DWP 96/2000 μ l (127,8 x 85,5 x 44,1 mm)

12436**RPM 4500, RCF 3305, Rmax 146, α 90****13437****14072**

[4]	15116	50 ml probówka szklana (35 x 100 mm) 50 ml glass tube (35 x 100 mm)
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14106

[28]	*	Greiner Vacuette® (13 x 75 mm), (1-4,5 ml)
[28]	*	Sarstedt S-Monovette® (13 x 75 mm), (2,7; 3; 4,3 ml)
[28]	*	BD Vacutainer® (13 x 100 mm), (4-7 ml)
[28]	*	Greiner Vacuette® (13 x 100 mm), (3,5-6 ml)
[28]	*	Sarstedt S-Monovette® (11 x 92 mm), (4,5; 5 ml)
[28]	*	Sarstedt S-Monovette® (13 x 90 mm), (4,9; 5,6 ml)
[28]	15120	5 ml probówka szklana (12 x 75 mm) 5 ml glass tube (12 x 75 mm)
[28]	15419	5 ml probówka z korkiem (12 x 85 mm), Sarstedt® 5 ml tube with cap (12 x 85 mm), Sarstedt®
[28]	15054	6 ml probówka z pokrywką (11,5 x 92 mm), Sarstedt® 6 ml tube with cap (11,5 x 92 mm), Sarstedt®
[28]	15119	7 ml probówka szklana (12 x 100 mm) 7 ml glass tube (12 x 100 mm)

14108

[28]	*	Sarstedt S-Monovette® (15 x 75 mm), (4; 4,3; 5,5 ml)
[28]	*	BD Vacutainer® (16 x 100 mm), (2,5-11 ml)
[28]	*	Greiner Vacuette® (16 x 100 mm), (7-9 ml)
[28]	*	Sarstedt S-Monovette® (15 x 92 mm), (7,5; 8,2; 8,5 ml)
[28]	*	10 ml Thermo Nalgene® Oak Ridge (16 x 81,5 mm)
[28]	15048	15 ml Thermo Nalgene® (16 x 113 mm) 15 ml Thermo Nalgene® (16 x 113 mm)
[28]	15053	10 ml probówka z pokrywką (16 x 106 mm) 10 ml tube with cap (16 x 106 mm)
[28]	15118	10 ml probówka szklana (16 x 100 mm) 10 ml glass tube (16 x 100 mm)

14109

[28]	*	BD Vacutainer® (13 x 75 mm), (1,6-5,3 ml)
[28]	*	Greiner Vacuette® (13 x 75 mm), (1-4,5 ml)
[28]	*	Sarstedt S-Monovette® (11 x 66 mm), (1,6; 2; 2,7; 3; 3,1 ml)
[28]	*	Sarstedt S-Monovette® (13 x 65 mm), (2,6; 2,9; 3,4; 3,8 ml)
[28]	*	Sarstedt S-Monovette® (13 x 75 mm), (2,7; 3; 4,3 ml)
[28]	*	BD Vacutainer® (13 x 100 mm), (4-7 ml)
[28]	*	Greiner Vacuette® (13 x 100 mm), (3,5-6 ml)
[28]	*	Sarstedt S-Monovette® (11 x 92 mm), (4,5; 5 ml)
[28]	*	Sarstedt S-Monovette® (13 x 90 mm), (4,9; 5,6 ml)
[28]	15120	5 ml probówka szklana (12 x 75 mm) 5 ml glass tube (12 x 75 mm)
[28]	15419	5 ml probówka z korkiem (12 x 85 mm), Sarstedt® 5 ml tube with cap (12 x 85 mm), Sarstedt®
[28]	15054	6 ml probówka z pokrywką (11,5 x 92 mm), Sarstedt® 6 ml tube with cap (11,5 x 92 mm), Sarstedt®
[28]	15119	7 ml probówka szklana (12 x 100 mm) 7 ml glass tube (12 x 100 mm)

A. Wyposażenie dodatkowe/Optional accessories		
14110		
[28]	*	BD Vacutainer® (16 x 100 mm), (2,5-11 ml)
[28]	*	Greiner Vacuette® (16 x 100 mm), (7-9 ml)
[28]	*	10 ml Thermo Nalgene® Oak Ridge (16 x 81,5 mm)
[28]	15048	15 ml Thermo Nalgene® (16 x 113 mm) 15 ml Thermo Nalgene® (16 x 113 mm)
[28]	15053	10 ml probówka z pokrywką (16 x 106 mm) 10 ml tube with cap (16 x 106 mm)
[28]	15118	10 ml probówka szklana (16 x 100 mm) 10 ml glass tube (16 x 100 mm)
[28]	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®
14113		
[4]	15051	50 ml Thermo Nalgene® Oak Ridge (28,8 x 106,7 mm) 50 ml Thermo Nalgene® Oak Ridge (28,8 x 106,7 mm)
[4]	*	50 ml probówka z dnem stożkowym z zakrętką (30 x 117 mm), Falcon®; [15052] 50ml (30 x 117mm) 50 ml tube, conical bottom, with cap (30 x 117 mm), Falcon®; [15052] 50ml Sarstedt® (30 x 117 mm)
[4]	*	50 ml probówka z dnem stożkowym bez rantu (30 x 115 mm), Greiner® 50 ml tube, conical bottom, without skirt (30 x 115 mm), Greiner®
14197		
[4]	15115	100 ml probówka szklana (44 x 100 mm) 100 ml glass tube (44 x 100 mm)
[4]	15040	100 ml probówka z pokrywką (45,2 x 103,7 mm) 100 ml tube with cap (45,2 x 103,7 mm)
14441		
[48]	15119	7 ml probówka szklana (12 x 100 mm) 7 ml glass tube (12 x 100 mm)
14446		
[48]	*	Sarstedt S-Monovette® (11 x 92 mm), (4,5; 5 ml)
[48]	*	Sarstedt S-Monovette® (11 x 66 mm), (1,6; 2; 2,7; 3; 3,1 ml)
[48]	15054	6 ml probówka z pokrywką (11,5 x 92 mm), Sarstedt® 6 ml tube with cap (11,5 x 92 mm), Sarstedt®
[48]	15119	7 ml probówka szklana (12 x 100 mm) 7 ml glass tube (12 x 100 mm)
[48]	15120	5 ml probówka szklana (12 x 75 mm) 5 ml glass tube (12 x 75 mm)
[48]	15419	5 ml probówka z korkiem (12 x 85 mm), Sarstedt® 5 ml tube with cap (12 x 85 mm), Sarstedt®
14447		
[48]	15016	Sarstedt S-Monovette® (8 x 66 mm), (1,1; 1,2; 1,4 ml) Sarstedt S-Monovette® (8 x 66 mm), (1,1; 1,2; 1,4 ml)
14449		
[16]	*	BD Vacutainer® (16 x 100 mm), (2,5-11 ml)
[16]	*	Sarstedt S-Monovette® (16 x 92 mm), (9; 10 ml)
[16]	15053	10 ml probówka z pokrywką (16 x 106 mm) 10 ml tube with cap (16 x 106 mm)
[16]	*	13 ml probówka (ø16x100mm), Sarstedt® nr 62.515.006 13 ml tube (ø16 x 100 mm), Sarstedt® no. 62.515.006
14450		
[32]	*	2-1,5 ml probówka (10,8x41,8 mm), Eppendorf®; [15011], 2 ml (10,8x41,8 mm); [15128], 1,5ml (10,8x40,5 mm) 2-1,5 ml tube (10,8x41,8 mm), Eppendorf®; [15011], 2 ml (10,8x41,8 mm); [15128], 1,5ml (10,8x40,5 mm)
bez wkładki/without adapter		
[4]	15440	200 ml butelka płaskodenna (56 x 112 mm), Herolab® nr 25 33 73 200 ml bottle, flat bottom (56 x 112 mm), Herolab® no. 25 33 73
14111 NIE AUTOKLAWOWAĆ/DO NOT AUTOCLAVE		
[20]	*	Sarstedt S-Monovette® (15 x 75 mm), (4; 4,3; 5,5 ml)
[20]	*	10 ml Thermo Nalgene® Oak Ridge (16 x 81,5 mm)
[20]	15053	10 ml probówka z pokrywką (16 x 106 mm) 10 ml tube with cap (16 x 106 mm)
[20]	15118	10 ml probówka szklana (16 x 100 mm) 10 ml glass tube (16 x 100 mm)
[20]	*	13 ml probówka (ø16x100mm), Sarstedt® nr 62.515.006 13 ml tube (ø16 x 100 mm), Sarstedt® no. 62.515.006
13042		
14043		
[4]	15119	7 ml probówka szklana (12 x 100 mm) 7 ml glass tube (12 x 100 mm)
[4]	15120	5 ml probówka szklana (12 x 75 mm) 5 ml glass tube (12 x 75 mm)
14089		
[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)

* 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		
bez wkładki/without adapter		
[8]	*	50 ml probówka z dnem stożkowym z zakrętką (30 x 117 mm), Falcon®; [15052] 50ml (30 x 117mm) 50 ml tube, conical bottom, with cap (30 x 117 mm), Falcon®; [15052] 50ml Sarstedt® (30 x 117 mm)
[8]	*	50 ml probówka z dnem stożkowym bez rantu (30 x 115 mm), Greiner® 50 ml tube, conical bottom, without skirt (30 x 115 mm), Greiner®
13044		
bez wkładki/without adapter		
[16]	*	BD Vacutainer® (16 x 100 mm), (2,5-11 ml)
[16]	*	Sarstedt S-Monovette® (15 x 92 mm), (7,5; 8,2; 8,5 ml)
[16]	*	Sarstedt S-Monovette® (16 x 92 mm), (9; 10 ml)
[16]	15053	10 ml probówka z pokrywką (16 x 106 mm) 10 ml tube with cap (16 x 106 mm)
[16]	15118	10 ml probówka szklana (16 x 100 mm) 10 ml glass tube (16 x 100 mm)
[16]	*	13 ml probówka (ø16x100mm), Sarstedt® nr 62.515.006 13 ml tube (ø16 x 100 mm), Sarstedt® no. 62.515.006
[16]	*	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)
13045		
14043		
[4]	*	Greiner Vacuette® (13 x 75 mm), (1-4,5 ml)
[4]	15119	7 ml probówka szklana (12 x 100 mm) 7 ml glass tube (12 x 100 mm)
[4]	15120	5 ml probówka szklana (12 x 75 mm) 5 ml glass tube (12 x 75 mm)
14089		
[4]	*	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)
bez wkładki/without adapter		
[4]	*	50 ml probówka z dnem stożkowym z zakrętką (30 x 117 mm), Falcon®; [15052] 50ml (30 x 117mm) 50 ml tube, conical bottom, with cap (30 x 117 mm), Falcon®; [15052] 50ml Sarstedt® (30 x 117 mm)
[4]	*	50 ml probówka z dnem stożkowym bez rantu (30 x 115 mm), Greiner® 50 ml tube, conical bottom, without skirt (30 x 115 mm), Greiner®
13593		
14024		
[4]	*	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)
14181		
[20]	*	Sarstedt S-Monovette® (11 x 66 mm), (1,6; 2; 2,7; 3; 3,1 ml)
[20]	*	Sarstedt S-Monovette® (11 x 92 mm), (4,5; 5 ml)
[20]	15054	6 ml probówka z pokrywką (11,5 x 92 mm), Sarstedt® 6 ml tube with cap (11,5 x 92 mm), Sarstedt®
[20]	15119	7 ml probówka szklana (12 x 100 mm) 7 ml glass tube (12 x 100 mm)
[20]	15120	5 ml probówka szklana (12 x 75 mm) 5 ml glass tube (12 x 75 mm)
[20]	15419	5 ml probówka z korkiem (12 x 85 mm), Sarstedt® 5 ml tube with cap (12 x 85 mm), Sarstedt®
14186		
[16]	*	BD Vacutainer® (13 x 75 mm), (1,6-5,3 ml)
[16]	*	BD Vacutainer® (13 x 100 mm), (4-7 ml)
[16]	*	Greiner Vacuette® (13 x 75 mm), (1-4,5 ml)
[16]	*	Greiner Vacuette® (13 x 100 mm), (3,5-6 ml)
[16]	*	Sarstedt S-Monovette® (11 x 66 mm), (1,6; 2; 2,7; 3; 3,1 ml)
[16]	*	Sarstedt S-Monovette® (13 x 65 mm), (2,6; 2,9; 3,4; 3,8 ml)
[16]	*	Sarstedt S-Monovette® (13 x 75 mm), (2,7; 3; 4,3 ml)
[16]	*	Sarstedt S-Monovette® (11 x 92 mm), (4,5; 5 ml)
[16]	*	Sarstedt S-Monovette® (13 x 90 mm), (4,9; 5,6 ml)
[16]	15054	6 ml probówka z pokrywką (11,5 x 92 mm), Sarstedt® 6 ml tube with cap (11,5 x 92 mm), Sarstedt®
[16]	15119	7 ml probówka szklana (12 x 100 mm) 7 ml glass tube (12 x 100 mm)
[16]	15120	5 ml probówka szklana (12 x 75 mm) 5 ml glass tube (12 x 75 mm)
[16]	15419	5 ml probówka z korkiem (12 x 85 mm), Sarstedt® 5 ml tube with cap (12 x 85 mm), Sarstedt®

A. Wyposażenie dodatkowe/Optional accessories		
14187		
[16]	*	BD Vacutainer® (16 x 100 mm), (2,5-11 ml)
[16]	*	Greiner Vacuette® (16 x 100 mm), (7-9 ml)
[16]	*	Sarstedt S-Monovette® (15 x 92 mm), (7,5; 8,2; 8,5 ml)
[16]	*	Sarstedt S-Monovette® (15 x 75 mm), (4; 4,3; 5,5 ml)
[16]	*	10 ml Thermo Nalgene® Oak Ridge (16 x 81,5 mm)
[16]	15048	15 ml Thermo Nalgene® (16 x 113 mm) 15 ml Thermo Nalgene® (16 x 113 mm)
[16]	15053	10 ml probówka z pokrywką (16 x 106 mm) 10 ml tube with cap (16 x 106 mm)
[16]	15118	10 ml probówka szklana (16 x 100 mm) 10 ml glass tube (16 x 100 mm)
[16]	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®
14188		
[4]	15115	100 ml probówka szklana (44 x 100 mm) 100 ml glass tube (44 x 100 mm)
[4]	15040	100 ml probówka z pokrywką (45,2 x 103,7 mm) 100 ml tube with cap (45,2 x 103,7 mm)
14194		
[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) 2-1,5 ml tube (10,8x41,8 mm), Eppendorf®; [15011], 2 ml (10,8x41,8 mm); [15128], 1,5ml (10,8x40,5 mm)
14226		
[4]	*	50 ml probówka z dnem stożkowym z rantem (30 x 115 mm), Greiner® 50 ml tube, conical bottom, skirted (30 x 115 mm), Greiner®
14189C		
[4]	15051	50 ml Thermo Nalgene® Oak Ridge (28,8 x 106,7 mm) 50 ml Thermo Nalgene® Oak Ridge (28,8 x 106,7 mm)
[4]	*	50 ml probówka z dnem stożkowym z zakrętką (30 x 117 mm), Falcon®; [15052] 50ml (30 x 117mm) 50 ml tube, conical bottom, with cap (30 x 117 mm), Falcon®; [15052] 50ml Sarstedt® (30 x 117 mm)
[4]	*	50 ml probówka z dnem stożkowym bez rantu (30 x 115 mm), Greiner® 50 ml tube, conical bottom, without skirt (30 x 115 mm), Greiner®
14190C		
[4]	15055	30 ml probówka z pokrywką (25,4 x 103,2 mm) 30 ml tube with cap (25,4 x 103,2 mm)
[4]	15117	25 ml probówka szklana (25 x 100 mm) 25 ml glass tube (25 x 100 mm)
14192C		
[4]	15116	50 ml probówka szklana (35 x 100 mm) 50 ml glass tube (35 x 100 mm)
13438C		
14072		
[4]	15116	50 ml probówka szklana (35 x 100 mm) 50 ml glass tube (35 x 100 mm)
14106		
[28]	*	Greiner Vacuette® (13 x 75 mm), (1-4,5 ml)
[28]	*	Sarstedt S-Monovette® (13 x 75 mm), (2,7; 3; 4,3 ml)
[28]	*	BD Vacutainer® (13 x 100 mm), (4-7 ml)
[28]	*	Greiner Vacuette® (13 x 100 mm), (3,5-6 ml)
[28]	*	Sarstedt S-Monovette® (11 x 92 mm), (4,5; 5 ml)
[28]	*	Sarstedt S-Monovette® (13 x 90 mm), (4,9; 5,6 ml)
[28]	15120	5 ml probówka szklana (12 x 75 mm) 5 ml glass tube (12 x 75 mm)
[28]	15419	5 ml probówka z korkiem (12 x 85 mm), Sarstedt® 5 ml tube with cap (12 x 85 mm), Sarstedt®
[28]	15054	6 ml probówka z pokrywką (11,5 x 92 mm), Sarstedt® 6 ml tube with cap (11,5 x 92 mm), Sarstedt®
[28]	15119	7 ml probówka szklana (12 x 100 mm) 7 ml glass tube (12 x 100 mm)
14108		
[28]	*	Sarstedt S-Monovette® (15 x 75 mm), (4; 4,3; 5,5 ml)
[28]	*	BD Vacutainer® (16 x 100 mm), (2,5-11 ml)
[28]	*	Greiner Vacuette® (16 x 100 mm), (7-9 ml)
[28]	*	Sarstedt S-Monovette® (15 x 92 mm), (7,5; 8,2; 8,5 ml)
[28]	*	10 ml Thermo Nalgene® Oak Ridge (16 x 81,5 mm)
[28]	15053	10 ml probówka z pokrywką (16 x 106 mm) 10 ml tube with cap (16 x 106 mm)
[28]	15118	10 ml probówka szklana (16 x 100 mm) 10 ml glass tube (16 x 100 mm)

A. Wyposażenie dodatkowe/Optional accessories	
14109	
[28]	* BD Vacutainer® (13 x 75 mm), (1,6-5,3 ml)
[28]	* Greiner Vacuette® (13 x 75 mm), (1-4,5 ml)
[28]	* Sarstedt S-Monovette® (11 x 66 mm), (1,6; 2; 2,7; 3; 3,1 ml)
[28]	* Sarstedt S-Monovette® (13 x 65 mm), (2,6; 2,9; 3,4; 3,8 ml)
[28]	* Sarstedt S-Monovette® (13 x 75 mm), (2,7; 3; 4,3 ml)
[28]	* BD Vacutainer® (13 x 100 mm), (4-7 ml)
[28]	* Greiner Vacuette® (13 x 100 mm), (3,5-6 ml)
[28]	* Sarstedt S-Monovette® (11 x 92 mm), (4,5; 5 ml)
[28]	* Sarstedt S-Monovette® (13 x 90 mm), (4,9; 5,6 ml)
[28]	15120 5 ml probówka szklana (12 x 75 mm) 5 ml glass tube (12 x 75 mm)
[28]	15419 5 ml probówka z korkiem (12 x 85 mm), Sarstedt® 5 ml tube with cap (12 x 85 mm), Sarstedt®
[28]	15054 6 ml probówka z pokrywką (11,5 x 92 mm), Sarstedt® 6 ml tube with cap (11,5 x 92 mm), Sarstedt®
[28]	15119 7 ml probówka szklana (12 x 100 mm) 7 ml glass tube (12 x 100 mm)
14110	
[28]	* Sarstedt S-Monovette® (15 x 75 mm), (4; 4,3; 5,5 ml)
[28]	* BD Vacutainer® (16 x 100 mm), (2,5-11 ml)
[28]	* Sarstedt S-Monovette® (15 x 92 mm), (7,5; 8,2; 8,5 ml)
[28]	* 10 ml Thermo Nalgene® Oak Ridge (16 x 81,5 mm)
[28]	15053 10 ml probówka z pokrywką (16 x 106 mm) 10 ml tube with cap (16 x 106 mm)
[28]	15118 10 ml probówka szklana (16 x 100 mm) 10 ml glass tube (16 x 100 mm)
[28]	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®
14113	
[4]	15051 50 ml Thermo Nalgene® Oak Ridge (28,8 x 106,7 mm) 50 ml Thermo Nalgene® Oak Ridge (28,8 x 106,7 mm)
[4]	* 50 ml probówka z dnem stożkowym z zakrętką (30 x 117 mm), Falcon®; [15052] 50ml (30 x 117mm) 50 ml tube, conical bottom, with cap (30 x 117 mm), Falcon®; [15052] 50ml Sarstedt® (30 x 117 mm)
[4]	* 50 ml probówka z dnem stożkowym bez rantu (30 x 115 mm), Greiner® 50 ml tube, conical bottom, without skirt (30 x 115 mm), Greiner®
14197	
[4]	15115 100 ml probówka szklana (44 x 100 mm) 100 ml glass tube (44 x 100 mm)
[4]	15040 100 ml probówka z pokrywką (45,2 x 103,7 mm) 100 ml tube with cap (45,2 x 103,7 mm)
14441	
[48]	15119 7 ml probówka szklana (12 x 100 mm) 7 ml glass tube (12 x 100 mm)
14446	
[48]	* Sarstedt S-Monovette® (11 x 92 mm), (4,5; 5 ml)
[48]	* Sarstedt S-Monovette® (11 x 66 mm), (1,6; 2; 2,7; 3; 3,1 ml)
[48]	15054 6 ml probówka z pokrywką (11,5 x 92 mm), Sarstedt® 6 ml tube with cap (11,5 x 92 mm), Sarstedt®
[48]	15119 7 ml probówka szklana (12 x 100 mm) 7 ml glass tube (12 x 100 mm)
[48]	15120 5 ml probówka szklana (12 x 75 mm) 5 ml glass tube (12 x 75 mm)
[48]	15419 5 ml probówka z korkiem (12 x 85 mm), Sarstedt® 5 ml tube with cap (12 x 85 mm), Sarstedt®
14447	
[48]	15016 Sarstedt S-Monovette® (8 x 66 mm), (1,1; 1,2; 1,4 ml) Sarstedt S-Monovette® (8 x 66 mm), (1,1; 1,2; 1,4 ml)
14449	
[16]	* Sarstedt S-Monovette® (15 x 92 mm), (7,5; 8,2; 8,5 ml)
[16]	* Sarstedt S-Monovette® (16 x 92 mm), (9; 10 ml)
[16]	* Sarstedt S-Monovette® (15 x 75 mm), (4; 4,3; 5,5 ml)
[16]	15053 10 ml probówka z pokrywką (16 x 106 mm) 10 ml tube with cap (16 x 106 mm)
bez wkładki/without adapter	
[4]	15440 200 ml butelka płaskodenna (56 x 112 mm), Herolab® nr 25 33 73 200 ml bottle, flat bottom (56 x 112 mm), Herolab® no. 25 33 73

A. Wyposażenie dodatkowe/Optional accessories		
14111 NIE AUTOKLAWOWAĆ/DO NOT AUTOCLAVE		
[20]	*	Sarstedt S-Monovette® (15 x 75 mm), (4; 4,3; 5,5 ml)
[20]	*	10 ml Thermo Nalgene® Oak Ridge (16 x 81,5 mm)
[20]	15053	10 ml probówka z pokrywką (16 x 106 mm) 10 ml tube with cap (16 x 106 mm)
[20]	15118	10 ml probówka szklana (16 x 100 mm) 10 ml glass tube (16 x 100 mm)
[20]	*	13 ml probówka (ø16x100mm), Sarstedt® nr 62.515.006 13 ml tube (ø16 x 100 mm), Sarstedt® no. 62.515.006

DECLARATION OF CONFORMITY

Product name: **Laboratory centrifuge MPW-351e**

Product type: **Laboratory centrifuge**

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

Product classification on the basis of the Directive 98/79/EC: Non classified to list A or B and not for self-testing.

Product complies with the requirements:

• **Directive 98/79/EC (IVD), including the requirements of harmonized standards:**

EN 15223-1:2016

EN ISO 18113-3:2011

EN 13612:2002

EN 61326-2-6:2006

EN 13612:2002/AC:2002

EN 61010-2-101:2002

EN 13975:2003

EN 62304:2006

EN ISO 14971:2012

EN 62304:2006/AC:2008

EN ISO 18113-1:2011

EN 62366:2008

• **selected harmonized standards of Directive 2014/35/UE (LVD):**

EN 61010-1:2010

EN 61010-2-020:2006

• **directive 2014/30/UE (EMC).**

„MPW MED. INSTRUMENTS”
SPÓŁDZIELNIA PRACY
w Warszawie

Członek Zarządu
Wojciech Anisiewicz

PREZES ZARZĄDU
mgr Łukasz Satański

„MPW MED. INSTRUMENTS”
SPÓŁDZIELNIA PRACY

Warsaw, 46 Boremlowska Street
applies Quality Management System in line with
PN-EN ISO 9001:2015, PN-EN ISO 13485:2016

Certifying authority:





DECLARATION OF CONFORMITY

(with RoHS 2 Directive 2011/65/EU)

DEKLARACJA ZGODNOŚCI

(z dyrektywą RoHS 2 2011/65/UE)

PRODUCT DETAILS/DANE PRODUKTU

Product name/Nazwa produktu:

Laboratory centrifuge MPW-351e /

Wirówka laboratoryjna MPW-351e

Product type/Typ:

Laboratory centrifuge/Wirówka laboratoryjna

Manufactured by/Wytworzona przez:

"MPW MED. INSTRUMENTS"

SPÓŁDZIELNIA PRACY

ul. Boremlowska 46, 03-347 Warszawa, Polska

We hereby declare under our sole responsibility, that the product above is in compliance with the requirements of RoHS 2 Directive 2011/65/EU. /

Niniejszym deklarujemy z pełną odpowiedzialnością, że produkt, do którego odnosi się niniejsza deklaracja, jest zgodny z Dyrektywą RoHS 2 2011/65/UE.

"MPW MED. INSTRUMENTS"
SPÓŁDZIELNIA PRACY
w Warszawie

Warsaw/Warszawa, 2018.09.15

(place and date of issue/miejsce i data
sporządzenia deklaracji)

Wojciech Anisiewicz

Member of Management
Board/Członek Zarządu

(name and signature of authorized person/imię i nazwisko osoby
upoważnionej do sporządzenia deklaracji)

Łukasz Sałański

President of Management
Board/Prezes Zarządu

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).

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).

1. Device:

– type:

– serial No.:

2. Description of decontamination

(see user manual)

.....
.....
.....
.....

3. Decontamination carried out by:

name:

4. Date and signature:

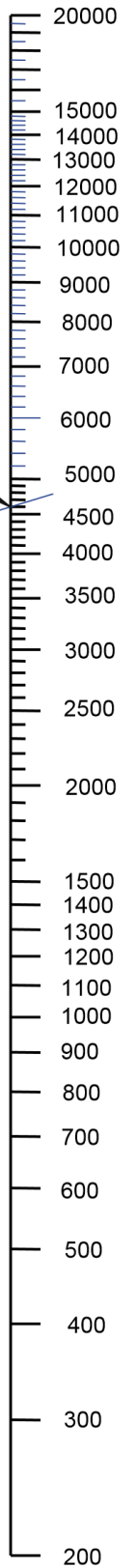
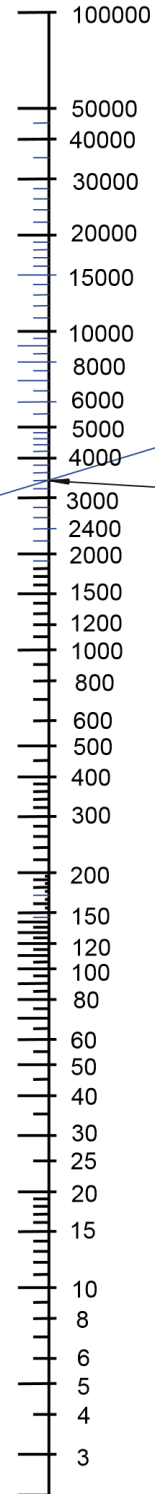
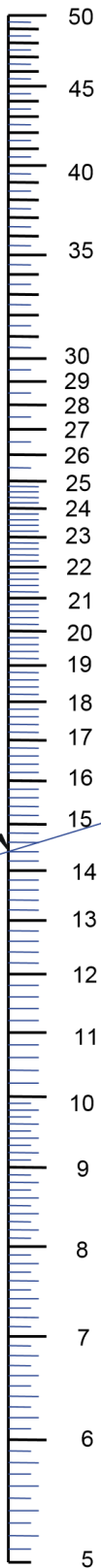
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NOMOGRAM

Centrifuging radius [cm]

R.C.F. (x "g")
multiple of
gravitational
acceleration

[r.p.m.]



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

A

B

C

Example of making use
of the nomogram:

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

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

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