

centrifuge No.:
user manual - Cat. No.:

MPW-215
20215.EN



2014-02-10

USER MANUAL



LABORATORY CENTRIFUGE

MPW-215



Read this before use!

MPW MED. INSTRUMENTS, 46 Boremlowska Street, 04-347 Warsaw/Poland
tel. +48 22 610 81 07 (service), fax +48 22 610 55 36
mpw@mpw.pl, www.mpw.pl



Contents

1. APPLICATION.	4
2. TECHNICAL DATA.	4
2.1. ACCESSORIES.	4
2.1.1. BASIC ACCESSORIES (BEING ENCLOSED TO EVERY CENTRIFUGE).	4
2.1.2. OPTIONAL ACCESSORIES.	5
2.2. EXPLOITATION MATERIALS.	6
3. INSTALLATION.	6
3.1. UNPACKING OF THE CENTRIFUGE.	6
3.2. LOCATION.	6
3.3. CONNECTION TO THE MAINS.	6
3.4. FUSES.	6
4. DESCRIPTION OF THE CENTRIFUGE.	6
4.1. GENERAL DESCRIPTION.	6
4.2. SERVICE ELEMENTS.	7
5. SAFE WORKING CONDITIONS.	7
5.1. OPERATING PERSONNEL.	7
5.2. GUARANTEE PERIOD AND OPERATION LIFE.	7
5.3. SAFEKEEPING PERIOD.	7
5.4. SAFE WORKING CONDITIONS.	7
5.5. HAZARDS AND PRECAUTIONS.	8
6. OPERATION OF THE CENTRIFUGE.	9
6.1. MOUNTING OF THE ROTOR AND ACCESSORIES.	9
6.2. CONSTRUCTION AND SAFETY MEASURES.	9
6.3. DRIVE.	9
6.4. DATA INPUT AND OUTPUT.	9
6.5. CONTROLS.	9
6.6. SAFETY DEVICES.	11
6.6.1. COVER LOCK.	11
6.6.2. REST STATE INSPECTION.	11
7. DESCRIPTION OF THE CENTRIFUGE OPERATING ELEMENTS.	11
7.1. CONTROL PANEL.	11
7.2. SWITCHING THE CENTRIFUGE ON.	13
7.3. SWITCHING THE CENTRIFUGE OFF.	13
7.4. MATHEMATICAL RELATIONS.	13
7.4.1. RCF - RELATIVE CENTRIPETAL FORCE.	13
7.4.2. NOMOGRAM OF RELATIONSHIP - ROTATIONAL SPEED/CENTRIFUGING RADIUS/RCF – DRAWING No. 5.	13
7.4.3. MAXIMUM LOAD.	13
8. HEMATOCRITE READER	14
8.1. INTENDED APPLICATION.	14
8.2. TECHNICAL DATA.	14
8.3. HEMATOCRITE READING.	14
9. CLEANING, DISINFECTION, MAINTENANCE.	16
9.1. CLEANING OF THE CENTRIFUGE.	16
9.2. CLEANING OF THE ACCESSORIES.	16
9.3. STERILIZATION AND DISINFECTIONS OF THE ROTATING CHAMBER AND ACCESSORIES.	16
9.4. GLASS CAPILLARIES CRACKING.	16

<u>10. EMERGENCY CONDITIONS – SERVICE.</u>	<u>16</u>
10.1. TROUBLESHOOTING.	16
10.2. SAFETY WORK INSPECTION.	17
10.3. INSPECTION PROCEDURES CARRIED OUT BY THE OPERATOR.	17
<u>11. CONDITIONS OF REPAIRS.</u>	<u>17</u>
<u>12. MANUFACTURER'S DATA.</u>	<u>18</u>

1. Application.

The MPW-215 centrifuge is the table top laboratory centrifuge for *in vitro* diagnostic (IVD). Its construction ensures easy operation, safe work and wide range of applications in laboratories engaged in routine medical analyses, biochemical research works etc. The rotation chamber is made of acid-proof steel. Centrifuge is intended for separation of mixtures, suspensions and systemic fluids into constituents of different densities under influence of the centrifugal force. This centrifuge is not biotight and therefore during centrifugation 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, Warsaw/Poland**

Type:

MPW-215

Mains L1+N+PE V/Hz $\pm 10\%$

230 V 50/60 Hz, optionally 115 V 50/60 Hz

Maximum power consumption

160 W

Rotational speed range

100 ÷ 13000 rpm

Maximum capacity

48 ml / 24 capillaries

Maximum acceleration

16816 x g for rotor 12480

Time range

15s ÷ 99 min:59s (1 sec. intervals adjustment)

Interference level

PN-EN-55011

Noise level

56 dB

Physical data:

Depth

435 mm

Width

355 mm

Height

270 mm

Weight

10 kg

Centrifuge operation conditions:

PN-EN 61010-1 p. 1.4.1.

Environmental temperature

+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 (being enclosed to every centrifuge).

- 17142	complete clamp	pcs.1
- 17099T	spanner for the rotor	pcs.1
- 17162	Spanner for emergency opening of the cover	pcs.1
- 17201	Technical petroleum jelly 20ml	pcs.1
- 17861	fuses WTA –T 4 A 250 V	pcs.2
- 17866	power cord 230 V	pcs.1 or
- 17867	power cord 115 V	pcs.1
- 20215/EN	Operating Instruction	pcs.1

2.1.2. Optional accessories.

Indeks Cat. No	Nazwa Name	Probówka MPW MPW tube
11198	Wirnik kątowy 12 x 2/1,5ml, z hermetycznie uszczelnioną pokrywą (kąt 45°) Angle rotor 12 x 2/1,5ml, with Hermetically Sealed Lid (angle 45°) (max RPM: 13000 max RCF:11525 x g R max: 6.1cm)	15011, 15128
14084	Wkładka redukcyjna na probówkę 0,5ml (O 8mm) Round carrier for 0,5ml tube (O 8,0mm)	15127
14126	Wkładka redukcyjna na probówkę 0,4ml (O 5,8mm) Round carrier for 0,4ml tube (O 5,8mm)	15124
14133	Wkładka redukcyjna na probówkę 0,2ml (O 6,2mm) Round carrier for 0,2ml tube (O 6,2mm)	15125
11731	Wirnik kątowy 24 x 2/1,5ml, z hermetycznie uszczelnioną pokrywą (kąt 45°) Angle rotor 24 x 2/1,5ml, with Hermetically Sealed Lid (angle 45°) (max RPM: 13000 max RCF:15682 x g R max: 8.3cm)	15011, 15128
14084	Wkładka redukcyjna na probówkę 0,5ml (O 8mm) Round carrier for 0,5ml tube(O 8,0mm)	15127
14126	Wkładka redukcyjna na probówkę 0,4ml (O 5,8mm) Round carrier for 0,4ml tube (O 5,8mm)	15124
14133	Wkładka redukcyjna na probówkę 0,2ml (O 6,2mm) Round carrier for 0,2ml tube (O 6,2mm)	15125
11734	Wirnik kątowy 4 x 8 x 0,2ml PCR, z hermetycznie uszczelnioną pokrywą (kąt 45°) Angle rotor 4 x 8 x 0,2ml PCR - strip tubes, with Hermetically Sealed Lid (angle 45°) (max RPM: 13000 max RCF:13225 x g R max: 7.0cm)	15122, 15130
12480	Wirnik hematokrytowy na 24 kapilary 75mm (max RPM: 13000 max RCF:16816 x g R max: 8.9cm)	15100
16166	Czytnik hematokrytowy okrągły Hematocrite reader - round	

Indeks Cat. No	PROBÓWKI TUBES
15011	Probówka z polipropylenu 2ml (O 10,8x40mm), okrągłodenna Polypropylene tube 2ml (O 10,8x40mm), round - bottom
15122	Probówki z polipropylenu PCR szeregowo 8 x 0,2ml z odrębnymi pokrywkami w szeregu (O 6x21mm) Polypropylene PCR stripe 8x0,2ml (O 6x21mm)
15124	Probówka z polipropylenu 0,4ml z pokrywką (O 5,7x46mm) Polypropylene tube 0,4ml with cap (O 5,7x46mm)
15125	Probówka z polipropylenu 0,2ml PCR (O 6x21mm) Polypropylene tube 0,2ml PCR (O 6x21mm)
15127	Probówka z polipropylenu 0,5ml z pokrywką (O 7,8x30mm) Polypropylene tube 0,5ml with cap (O 7,8x30mm)
15128	Probówka z polipropylenu 1,5ml z pokrywką (O 10,8x39mm) Polypropylene tube 1,5ml with cap (O 10,8x39mm)
15098	Zatyczka do kapilar Stopper for capillaries
15100	Kapilary szklane heparynowane (1,4 x 75mm, 37µl) Capillary tubes heparinized (1,4 x 75mm, 37µl)
15130	Probówki z polipropylenu PCR szeregowo 8 x 0,2ml z odrębnymi pokrywkami w szeregu (O 6x21mm) Polypropylene PCR stripe 8x0,2ml (O 6x21mm)

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 used 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 possible transport at a later date.

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-leveled table top. It is necessary round the centrifuge to ensure the safety zone of the minimum **30 cm** from every direction. Normal operating conditions ambient temperature is from 15° C to 35° C. Passed parameters of the spinner are referring to above named temperatures. At the change of the place from cold for warm condensation of water will occur inside the centrifuge. It is important then that sufficient time shall be provided for drying the centrifuge prior to repeat starting the centrifuge (minimum 4 hours).

3.3. Connection to the mains.

Supply voltage given on the rating plate has to be consistent with local supply voltage. MPW MED. INSTRUMENTS laboratory centrifuges are in I safety class devices and they are provided with the three-core cable with length 2,5÷3,2 m with the plug resistant to dynamic loadings.

Mains socket shall be provided with the safety pin. Zeroed potential of the sprocket of the port of power supply has to be verified by services authorized to it. This verification has to be made at the every single exchange of the port of power supply. It is recommended to install emergency cut-out that shall be installed far from the centrifuge, near the emergency exit or beyond the room. Supply voltage 230 V 50/60 Hz, optionally 115 V 50/60 Hz.

3.4. Fuses.

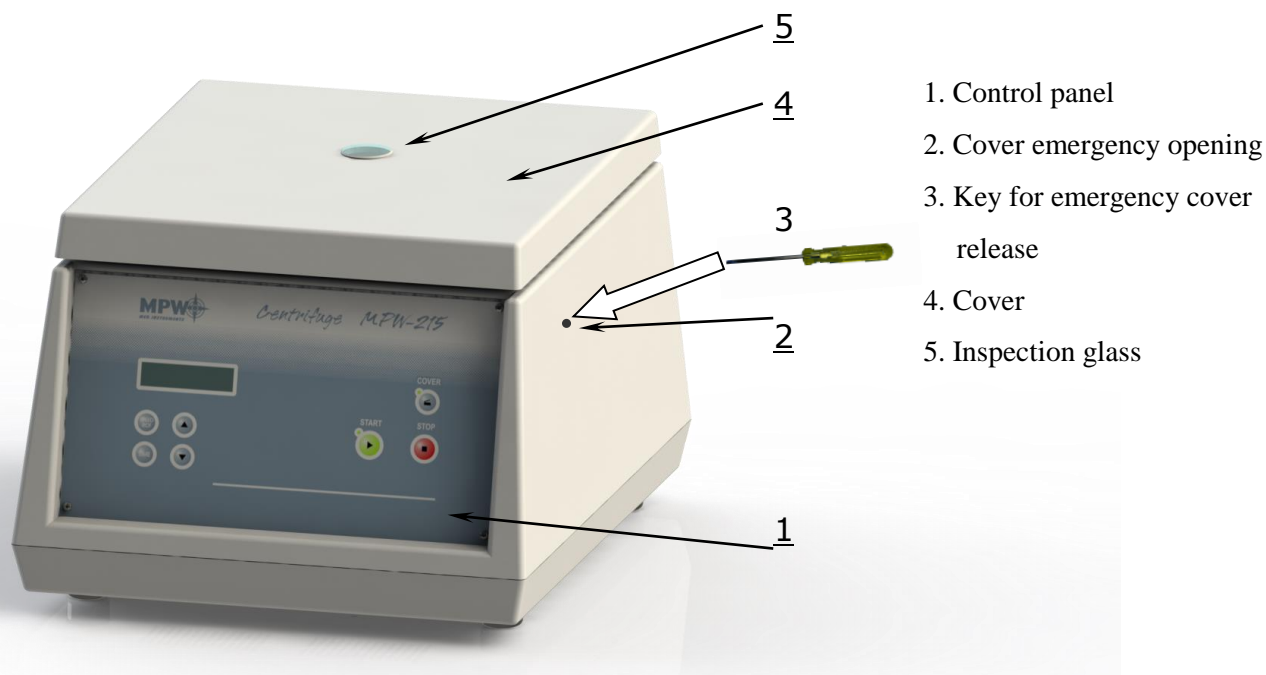
The centrifuge has standard protection with the WTA-T 4A 250 V fuse situated in the plug-in socket and master switch unit at back wall of the centrifuge (drawing no.2.).

4. Description of the centrifuge.

4.1. General description.

New generation of MPW MED. INSTRUMENTS laboratory centrifuges is provided with the modern microprocessor control systems, very durable and quiet asynchronous brushless motors and accessories consistent with the modern requirements of user.

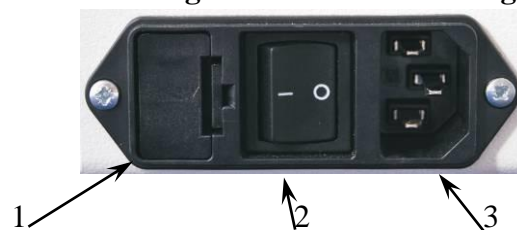
4.2. Service elements.



Drawing No.1. General view

Drawing No.2.Back of centrifuge

1. Fuse base
2. Power - switch
3. Plug-in socket



5. Safe working conditions.

5.1. Operating personnel.

The MPW-215 Laboratory Centrifuge can be operated by laboratory personnel after getting acquainted with the User Manual.

Operating Instruction shall always be near the centrifuge.

Operating Instruction must be constantly at hand!!

5.2. Guarantee period and operation life.

Guarantee period for the MPW-215 centrifuge amounts to minimum 24 months.

Principles are specified in guarantee certificate. The service life of the centrifuge specified by the manufacturer amounts to 10 years.

After termination of guarantee period it is necessary carry out yearly technical inspection of the centrifuge by service authorized by manufacturer.

The manufacturer reserves the right to make modifications at produced goods.

5.3. Safekeeping period.

Maximum period of storage of not used centrifuge amounts to 1 year. After this period one should carry out technical inspection of the centrifuge by service authorized by manufacturer.

5.4. Safe working conditions.

1. Set the centrifuge in horizontal position on rigid base.
2. Ensure safe positioning location.
3. Ensure free space around the centrifuge (amounting to at least 30 cm left free).
4. Ensure sufficient ventilation.
5. Fix the rotor on the motor axis firmly.
6. Avoid unbalance.

7. Load opposite buckets with the same accessories.
8. Centrifugation of the test tubes of different dimensions.
The possibility to centrifuge test tubes of different dimensions is existing, however, it is absolutely necessary in such cases that opposite round carriers have to be the same. The test tubes shall be not only inserted symmetrically but round carriers and their hangers shall be equally loaded. It is not allowed to operate centrifuge with asymmetric loads applied to rotors and buckets.
9. Load all holes in rotors.
10. Fill test tubes beyond the centrifuge.
11. Fill in the test tubes with the same weight, in order to protect the centrifuge against unbalance.
12. Use only accessories kept in good condition.
13. Protect equipment against corrosion using accurate preventive maintenance.
14. Infectious materials could be processed in closed buckets only.
15. It is prohibited to centrifuge explosive and inflammable materials.
16. It is prohibited to centrifuge substances prone to reacting in result of supplying high energy during centrifugation.

5.5. Hazards and precautions.

1. Prior to starting the trial of switching the centrifuge on, one shall read exactly all sections of this instruction in order to ensure smooth run of operation, avoiding damages of this device or its accessories.
2. Centrifuge shall be operated by personnel after introducing oneself with the "User manual".
3. One must use original rotors, test-tubes and spare parts only.
4. In case of faulty operation of the centrifuge one shall ask of assistance of service of MPW MED. INSTRUMENTS or its authorized representatives.
5. It is prohibited to switch the centrifuge on if it is not installed properly or rotor is not fitted correctly.
6. The centrifuge must not be operated in places where explosion hazard appears as it is not explosion-proof make.
7. It is prohibited to subject to centrifugation materials, which subjected to action of air, could generate inflammable or explosive mixtures.
8. It is prohibited to subject to centrifugation toxic or infectious materials with damaged leak proof seals of the rotor or test-tube. Proper disinfections procedures have to be carried out when dangerous substances contaminated the centrifuge or its accessories.
9. It isn't allowed to open the cover - manually in emergency procedure, when rotor is still turning.
10. 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 7.4.3 "Maximum load").
11. It isn't allowed to use the rotors and round carriers with signs of corrosion or other mechanical defects.
12. It isn't allowed to centrifugation substances of high corrosion aggressiveness, which could cause material impairment and lower mechanical properties of rotor and round carriers.
13. It isn't allowed to use rotors and accessories that one not admitted by the manufacturer. Let to use commercial glass and plastic test tubes, which are destined to centrifuging in this laboratory centrifuge. It is distinct warning against using poor quality elements. Cracking of vessels could result in dangerous unbalance.
14. It isn't allowed to lift or shift the centrifuge during operation and rest on it.
15. It isn't 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.
16. It isn't 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 at back wall of the centrifuge).
2. Switch supply on using switch-key situated at back wall of centrifuge.
3. Open the cover of the centrifuge by pressing the **COVER** key.
Prior to putting the rotor in one has to check if rotating chamber is free of impurities, e.g. such as dust, glass splinters, residues of fluids that must be taken away.
4. One shall release with special spanner clamp on the motor shaft and fit the rotor on the motor shaft driving it home on the cone.
5. Screw-in the bolt for fixing the rotor (clockwise) and screw it tightly home with the supplied spanner for the rotor.
6. To the fixed rotor put capillaries or test tubes on (see p. 2.1. "Accessories").
7. Fill test tubes beyond the centrifuge.
8. In case of centrifuging in angle rotor, tests have to be filled properly in order to avoid overflows.
9. For replacement of the rotor one shall release clamping by several turns of the bolt and then using both hands grab the rotor at opposite sides or using the nut of lid taking it away from motor axis by pulling it up.
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 will be started with large imbalance then dangerous vibrations will occur.*

6.2. Construction and safety measures.

The centrifuge has rigid self-supporting structure. Housing was made of ABS type plastic while front was made of aluminium sheet. Cover is fixed on steel axles of hinges and from the front is locked with electromagnetic lock blocking possibility of opening during centrifugation. The rotation chamber is made of stainless steel.

6.3. Drive.

Drive constitutes brushless induction motor of low noise level.

6.4. Data input and output.

Data setting and read-out system forms hermetically closed keyboard with distinctly accessible operation points. Easily readable displays signaling individual performed operations facilitate to operator programming and recording of parameters and condition of the centrifuge. Readable LCD display is projection given and realized centrifuging parameters (SPEED or RCF and TIME) and necessary messages. Operation of the centrifuge is simple and self-evident.

6.5. Controls.

The microprocessor setup of the control applied to the centrifuge is ensuring broad chances to give and of the realization of work parameters, it is:

- selection of rotational speed within $100 \div 13000$ rpm at 100 rpm interval or RCF x g;
- centrifugation time within $0 \div 15$ minutes by resolution 15 sec interval;

6.5.1 Rotational speed or RCF setting

Rotational speed can be setting from 100 rpm to 13000 rpm, with 100 rpm interval (RCF with 100xg interval)

Pressing button:



will occur entry to speed/RCF setting mode, switching between rpm and RCF setting follow with the next pressing the key



Setting the value is set in step at 100, using the buttons:



There are no actions for 3 seconds to exit the setting mode with saving setpoint.

6.5.2 Runtime setting

Runtime can be set from 15 sec to 99 min 59 sec, every 1 second.

single pressing:



cause entry to time setting mode, the tens minutes digit will start blinking, it is possible to setting it with buttons:



next pressing:



cause switching between tens minutes digit, minutes digit, tens seconds digit and seconds digit, choosen digit will start blinking, and it is possible to set it with buttons:



No action for 3 seconds cause exit from setting mode with saving setpoint.

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. In turn the cover can be opened only after stopping the rotor by **COVER** key.

6.6.2. Rest state inspection.

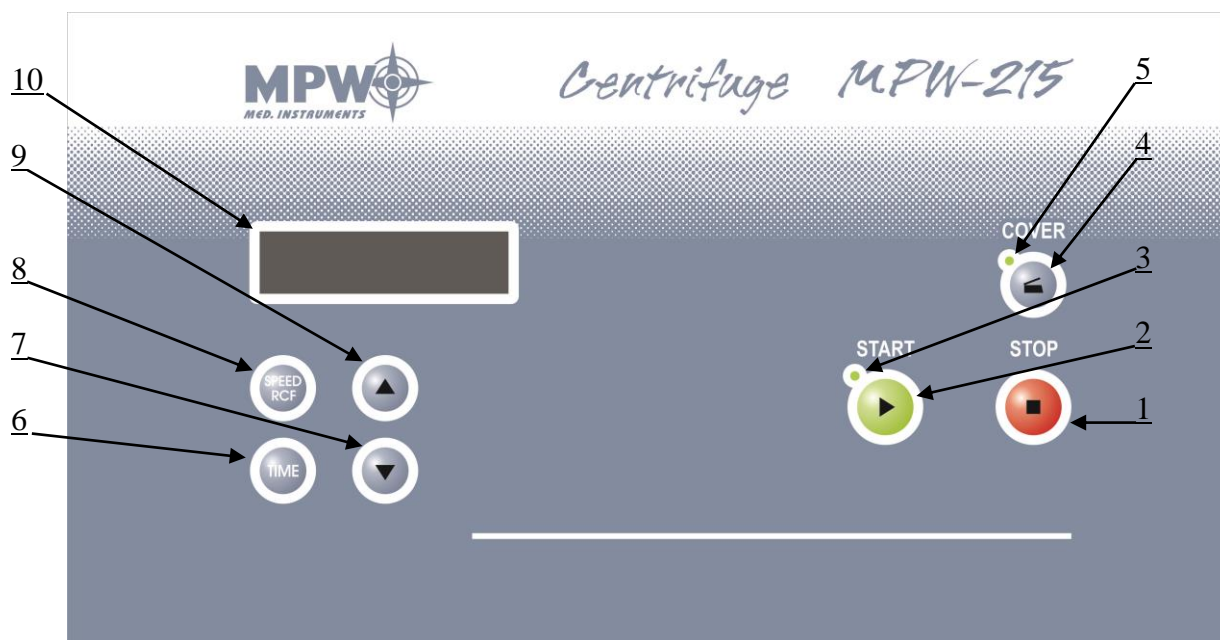
Opening of the centrifuge's cover is possible only with the rotor in the state of rest. This state is being checked by the microprocessor which recognizes and signals the rest state by illuminated **COVER** diode.

7. Description of the centrifuge operating elements.

All settings on the centrifuge are done by means of the control panel. Panel comprises control keys with signalling diodes and LCD display.

7.1. Control panel.

For controlling centrifuge operation serves control panel placed on front casing wall. Control panel comprises following elements:



Drawing No.3. Control panel of centrifuge MPW-215.

- ◆ **START** key [element No.2 on the Drawing No.3] can be used to:
 - starting the centrifugation program with the parameters displayed on display,
 - blinking diode on the **START** key [element No. 3] signalling rotary motion of rotor.The centrifuge can be activated if:
 - the cover is closed (showing up of sign of the dot on the display [element No.10]),
 - the diode is not shining on the **COVER** key [element No.5]
- ◆ **STOP** key [element No. 1] serves for aborting the actually running operation:
 - interrupting centrifugation program in any program phase and braking the rotor.
 - finishing of rotor braking process – on the display will shine sign **S** (Stop) also signalling this state by sound.
- ◆ **COVER** key [element No. 4] serves for:
 - open the centrifuge cover,Open or incorrectly closing the cover is signalling by diode shining, key is active only if the rotor is not centrifuging. The cover can be opened only if rotor is stopped, on the display will be displayed sign **S** and the centrifuge will signal possibility of opening cover by short five sounds.

ATTENTION: *It is not possible to open lid of the centrifuge at moment when the sign = signalling of possibility to change the parameter value is active, even in spite of the stopped rotor.*

- ◆ Decreasing key, arrow down ▼ [element No. 7] serves for:
 - decreasing the values of parameters.
- ◆ Increasing key, arrow up ▲ [element No. 9] serves for:
 - increasing the values of parameters.
- ◆ **SPEED/RCF** key [element No. 8] serves for:
 - selecting the possibility of changing the centrifuging speed – SPEED
 - next pressing of the key switching-over the programming mode from speed to RCF values.
- ◆ **TIME** key [element No. 6] serves for:
 - programming the centrifuging time.

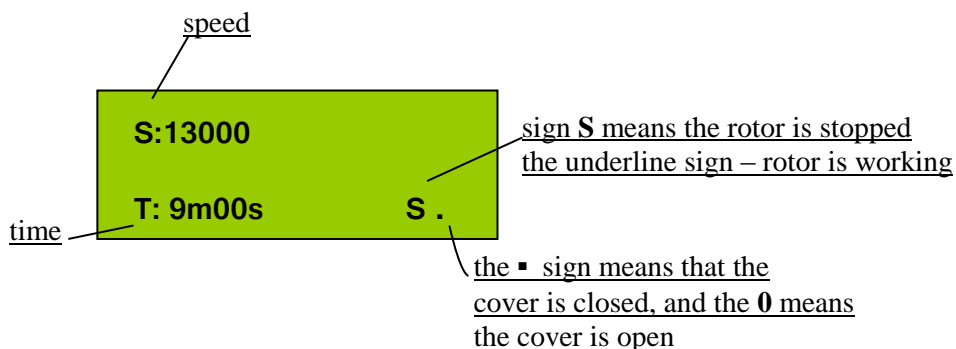
◆ **LCD display** [element No. 10]

The centrifuge has readable LCD display, on which are showing information being referred to the actual condition of the system – SPEED or RCF on the upper line and TIME on the lower line.

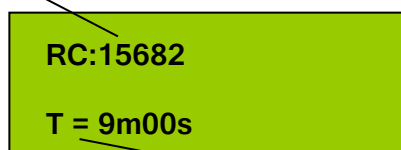
The information about the centrifuge type, program version and internet address are displaying at once after switching supply on for three seconds.

MPW – 215 v.0.06

— following the information about program has been lately made, the time, speed and acceleration characteristic settings will be displayed.



after pressing the **SPEED/RCF** key twice
[element No. 8 on Drawing No.3.] the display shows the
acceleration value corresponding to the
programmed speed



The “=” sign means that the
given parameter can be modified

During operation of the centrifuge one cannot change the program parameters, but only interrupt its further realization with pressing the **STOP** key, [element No.1].

7.2. Switching the centrifuge on.

After acquainting with operation elements, programming and preparing the centrifuge to operation one shall set the program, next close the cover and press the **START** key. The centrifuge will start and realize the setup program.

7.3. Switching the centrifuge off.

The centrifuge is automatically switching off when the program is realized. It is possible to finish earlier the realization of given program by pressing the **STOP** key. After ending the centrifugation process one should remember to switch off the centrifuge using the main switch being located on the side of centrifuge.

7.4. Mathematical relations.

7.4.1. RCF - relative centripetal force.

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

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

where	RCF	[x g]
	r	[cm]
	n	[rpm]

Depending on the distance of particles of the tested product from the axis of rotation one can find from above formula minimum RCF, average RCF or maximum RCF. On the basis of preset RCF value and given radius of the bottom of rotor hole one can calculate from the formula 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 a given product.

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

7.4.2. Nomogram of relationship - rotational speed/centrifuging radius/RCF – Drawing No. 5.

7.4.3. 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 that is being calculated from the formula:

$$n_{perm} = n_{max} * \sqrt{\frac{1,2}{\gamma}}; \quad \gamma = \text{specific gravity} \left[\frac{G}{cm^3} \right]; \quad n_{max} \text{ [maximum rotational speed - rpm]}$$

8. Hematocrite reader

8.1. Intended application.

The round reader is an instrument for determining the percentage volume of hematocrite HCT of red blood corpuscles in the blood centrifuged in capillaries. Hematocrite HCT is relation between volumes of red blood corpuscles contained in the blood sample and total capacity of blood sample. Its value is specified in percentage units and defines percentage of erythrocytes in plasma. Hematocrite value depends on number of erythrocytes and volume of plasma, so indirectly from irrigation ratio of organism.

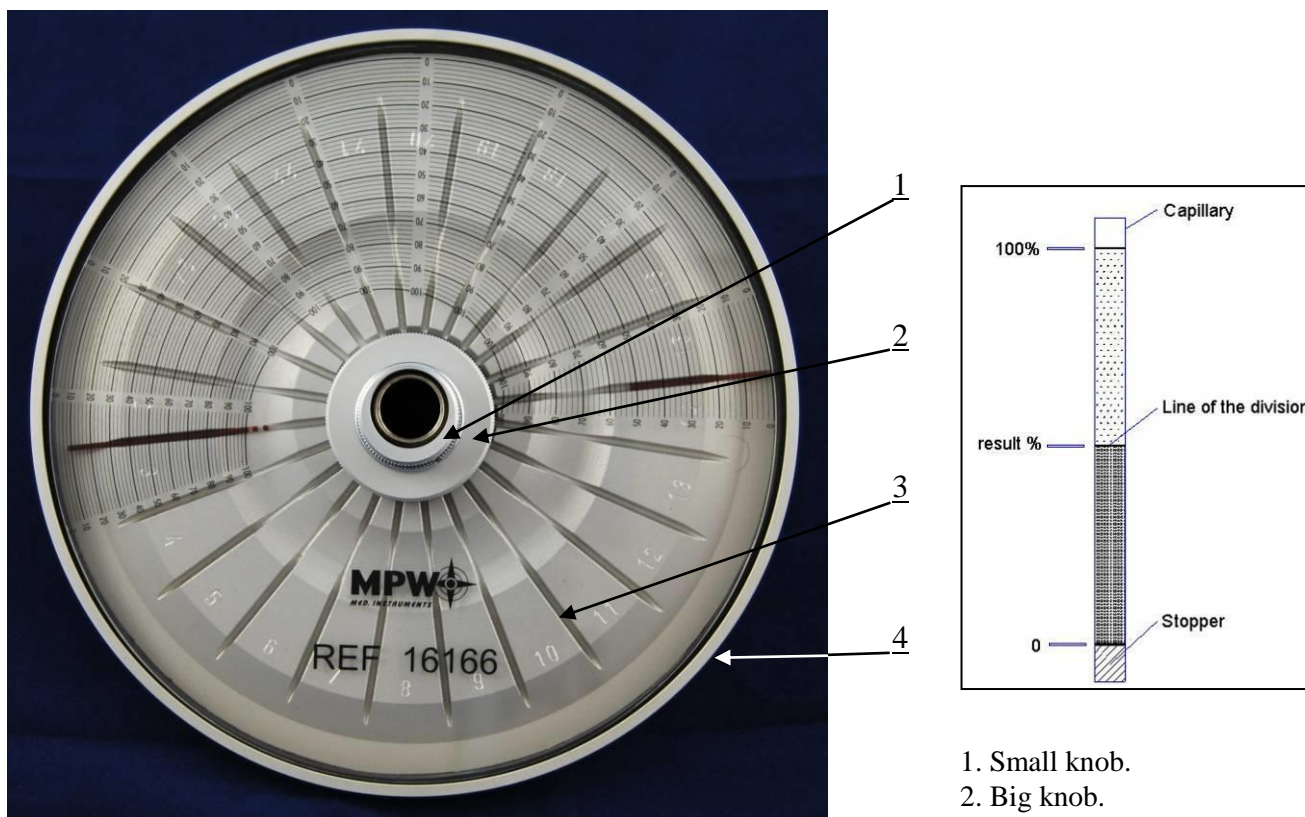
8.2. Technical data.

The reader **No 16166** is additional equipment for laboratory centrifuges with hematocrite rotors No 12480 produced by MPW MED. INSTRUMENTS.

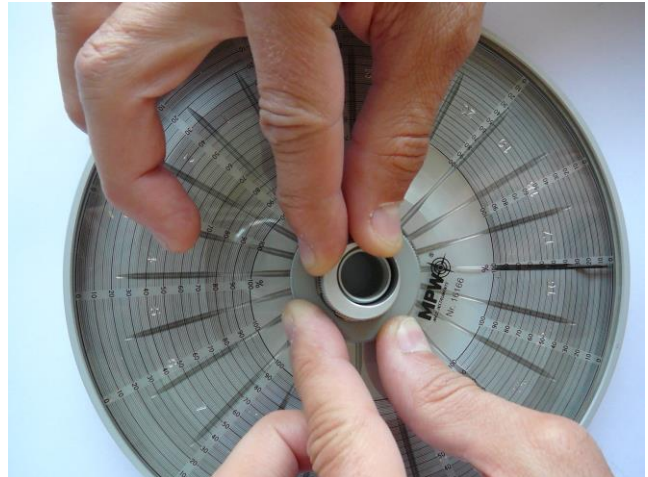
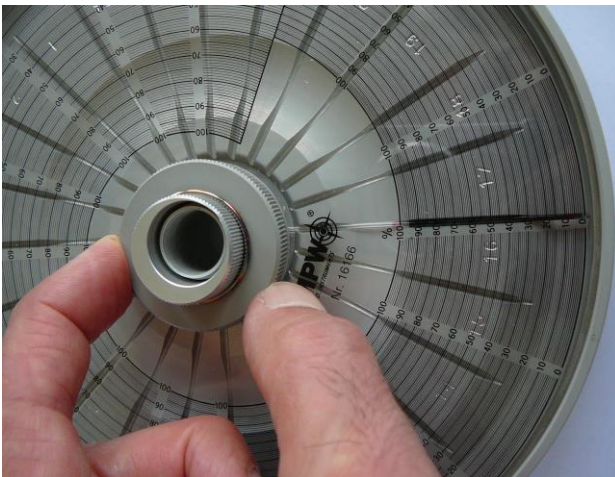
The reader is suitable to read hematocrite from capillary which is long 75 mm on the rotor without remove them.

8.3. Hematocrite reading.

It is necessary to set the reader up for the hematocrite rotor [element No.4] after stopping whirling and the removing of the lid. Holding the big knob [element No.2], turn the small knob [element No.1] until line 0 covers lower part of the filling of blood of the capillary. With big knob [element No.2] we are covering the line marking 100 % from filling the sample with the top level. Line which is covering with the line of the division red blood corpuscles and plasmas is shows us the percentage result.



Drawing No.4. General view of reader.



Drawing No.5. Hematocrite reading

9. Cleaning, disinfection, maintenance.

CAUTION! *To following work it is necessary to use protective gloves.*

9.1. Cleaning of the centrifuge.

For cleaning shall be used water with soap or other water soluble mild detergent. One should to avoid corrosion inducing substances and aggressive substances. It is prohibited to use alkaline solutions, inflammable solvents or agents containing abrasive particles. Using wiping cloth remove from the rotor chamber condensate or residues of the products. It is recommended to keep the cover opened when the centrifuge does not work in order to expel the moisture.

9.2. Cleaning of the accessories.

In order to ensure safety operation one shall in regular way carry out periodical maintenance of the accessories. Manufactured rotors, buckets and round carriers have to withstand steady high stresses originated from the centrifugal force. 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 the corrosion, 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 50° C.

Especially prone to the corrosion are parts made of aluminium. For cleaning them one should use very neutral agent of pH value from 6 to 8. It is forbidden to use alkaline agent of pH above 8. In this way substantially is increased useful service life and diminished susceptibility to corrosion. Accurate maintenance increases as well service life and protects against premature rotor failures. Corrosion and damages resulting from insufficient maintenance could not be object of claims lodged against the manufacturer.

9.3. Sterilization and disinfections of the rotating 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. We would like to add that for centrifuging for instance infectious materials it is necessary to use hermetically closed buckets in order to protect their migration into the centrifuge. Buckets and rotors can be sterilized in autoclave with temperature 121° – 124° C and pressure 215 kPa during 15 min. Disinfections is carried out with disinfectants generally used in the Health Service (see paragraph 2.2.).

User is responsible for proper disinfections of the centrifuge, if some dangerous material was spilled inside or outside of the centrifuge.

During above mentioned works one must wear safety gloves.

9.4. Glass capillaries cracking.

In the case of cracking of capillaries all pieces shall be accurately removed.

10. Emergency conditions – service.

10.1. Troubleshooting.

Majority of faults could be cancelled by switching the centrifuge OFF and then ON. In the case of short-duration power failure the centrifuge terminates cycle.

Below have been presented most often applying for errors and the method of removing them.

1. Lack of the display:	Remedies:
<i>Is mains socket live ?</i>	<i>Check mains socket fuse.</i>
<i>Is supply cable plugged into socket ?</i>	<i>Plug correctly supply cable.</i>
<i>Is input fuse good ?</i>	<i>Replace input fuse (rated data on rating plate).</i>
<i>Is master switch switched ON ?</i>	<i>Switch ON power supply.</i>
<i>Above was checked and still there is not display active.</i>	<i>Call service.</i>
2. Centrifuge does not start:	Remedies:
<i>START key pushing does not generate reaction or</i>	

<i>single tone only</i>	
<i>P message is displayed</i>	<i>Call service</i>
<i>diode of cover is shining</i>	<i>Close cover. The lock has to be locked with typical sound. He has to the sign of the dot appear on the display. If the diode is not switching off one shall call service.</i>
<i>diode of START key is shining</i>	<i>Switch power supply OFF/ON. If fault still persists then call service.</i>
<i>The digit of display parameters is blinking</i>	<i>Push the STOP key which has being recorded program. If fault still persists then call service.</i>
3. Centrifuge starts but does not accelerate	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>
4. One can not open the cover:	Remedies:
<i>With the attempt opening cover is audible buzzing of the lock.</i>	<i>One should lift up till the yellow diode COVER is switching on. Failed spring of cover lifting or bended the lock striker. One should bend the striker or call service.</i>
<i>diode COVER is not shining and the centrifuge not swirling.</i>	<i>Lock is failed. Call service.</i>

Emergency cover release

In the case of e.g. mains failure it is possible to open the cover hand. Place the key 17162 into the hole on the right side of the casing and push in. The cover will be opened.

CAUTION! Cover can be released and opened only when rotor is in the rest state.

10.2. Safety work inspection.

It is necessary for safety reason to inspection 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". Is being recommended to establish "Technical passport" or "Log of the apparatus", whom every repairs and reviews are being registered in. Both these documents should to deposit in the place of use the centrifuge.

10.3. Inspection procedures carried out by the operator.

Operator has to pay special attention to the fact that the centrifuge parts important because of safety reasons are not damaged.

This remark is specifically important for:

1. Motor suspension.
2. Motor axis concentricity.
3. Centrifuge accessories and especially structural changes, corrosion, preliminary cracks, abrasion of metal parts.
4. Screw joints.
5. Inspection of the rotor assembly.
6. Control for guarantee yearly technical inspection of the centrifuge.

11. Conditions of repairs.

Manufacturer grants to the Buyer a 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 resulted from the User 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.

12. Manufacturer's data.

“MPW MED. INSTRUMENTS”

SPÓŁDZIELNIA PRACY

Poland, PL - 04-347 Warsaw,

46 Boremłowska Street.


Tel.	(+ 48 22) 610 56 67	Export and sales department
	(+ 48 22) 610 81 07	Service department
Fax.	(+ 48 22) 610 55 36	

E-mail: mpw@mpw.pl

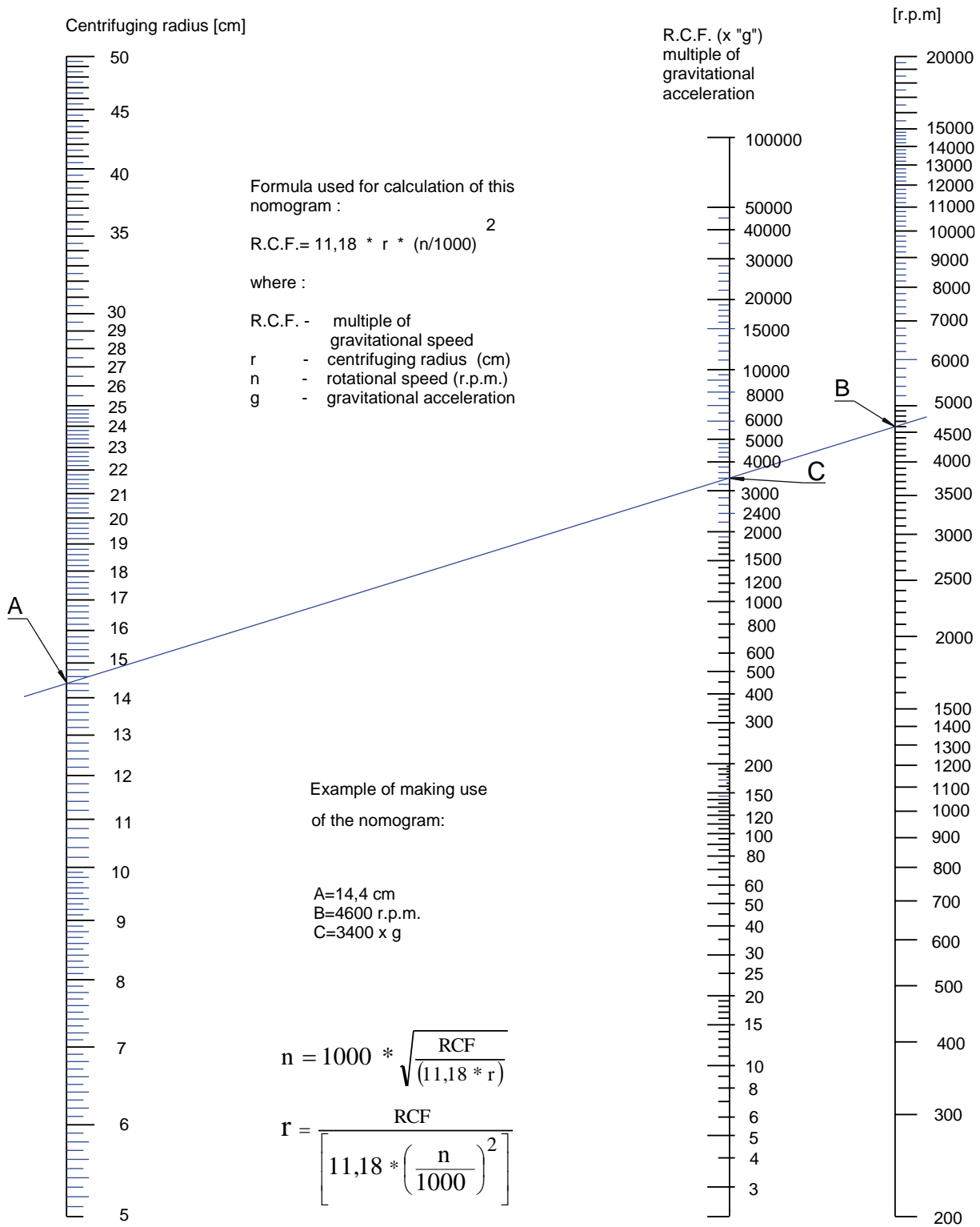
Website: www.mpw.pl

13. Information about Distributor

YOUR DISTRIBUTOR:



Drawing No. 6 – Nomogram



DECLARATION OF CONFORMITY

Product

Laboratory centrifuge

Model

MPW-215

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 harmonised standards:**

PN-EN ISO 13485:2012

PN-EN ISO 18113-3:2011

PN-EN ISO 13485:2012/AC:2013-03

PN-EN 61010-2-101:2005

PN-EN 13612:2006

PN-EN 61326-2-6:2013-08

PN-EN ISO 14971:2012

PN-EN ISO 62366:2008

• **selected harmonized standards of Directive 2006/95/EC (LVD):**

PN-EN 61010-1:2011

PN-EN 61010-2-020:2008

• **Directive 2004/108/WE (EMC)**

• **standard PN-EN ISO 15223-1:2012**

CZŁONEK ZARZĄDU

PREZES ZARZĄDU

Wojciech Nojszewski

mgr Hanna Matyńska

„MPW MED. INSTRUMENTS”
SPÓŁDZIELNIA PRACY
w Warszawie

„MPW MED. INSTRUMENTS”
SPÓŁDZIELNIA PRACY

Warsaw, 46 Boremlowska Street
Quality policy in line with ISO 9001:2008

Certifying authority



Warsaw, 13.11.2014

nr 10.215.03

DECLARATION OF DECONTAMINATION

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

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

5. **Device**

– type:

– serial No.:

6. **Description of decontamination**

(see user manual)

.....

.....

.....

.....

7. **Decontamination carried out by:**

– name:

8. **Date and signature**

.....