Serial number .....

Production year .....

MED. INSTRUMENTS

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09-06-2014

USER MANUAL

Instruction catalogue number 20251/Eng

LABORATORY CENTRIFUGE

M P W – 2 5 1

Centrifuge catalogue number: 10251

Read these instructions before using the equipment!

CE IVD

Contents

Warning signs and hazard icons.

	**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.

1. Application.

The MPW-251 centrifuge is a table top laboratory centrifuge for *in vitro* diagnostic (IVD) equipped, used to separation of samples took from people's, animal's and plant's components with different densities, under the influence of the centrifugal force, to provide information about their biological state. 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-251***
Mains L1+N+PE V/Hz ±10%	230 V 50/60 Hz, option 115 V 50/60 Hz
Maximum power consumption	190 W
Rotational speed range	100÷18000 rpm
Maximum capacity	500 ml
Maximum acceleration	24088 x g
Time range	0÷99 min, 0÷59 s or ∞ (resolution 1 sec.)
Time counting:	from the start or from the maximum speed
Number of programs	99
Acceleration mode	10 linear characteristics
Deceleration mode	9 linear and 1 coasting characteristic
SHORT- short duration operation and initial cooling	0 ÷ 15 min,
AUTO COVER function	automatic cover opening after end of centrifuging
Computer interface	RS-232
Interference level	PN-EN-55011
Noise level	56 dB
Physical data:	
Depth	435 mm
Width	355 mm
Height	270 mm
Weight	15 kg
Environmental conditions:	PN-EN-61010-1 p. 1.4.1.
Ambient temperature	+2º ÷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

Statement of Conformity:

The following machine is in accordance with the regulations of the EU Directive 98/79/EC and with the harmonized standards PN-EN 61010-1 and PN-EN 61010-2-020.

2.1. Accessories.
2.1.1. Basic accessories (being enclosed to every centrifuge).

Cat. No.	Type of accessories	
17142	Complete clamp	pcs 1
17099T	Spanner for the rotor	pcs 1
17162	Spanner for emergency opening of the cover	pcs 1
17861	Fuses WTA-T 4 A 250 V	pcs 2
17866	Power cord 230 V	pcs 1
17867	Power cord 115 V (optionally)	pcs 1
20251/ENG	User manual	pcs 1
17201	Petroleum jelly 20 ml	pcs 1

2.1.2. Optional accessories.
Depending on customer's needs the MPW-251 centrifuge can be provided with below specified accessories:

Indeks Cat. No	Nazwa Name	Probówka MPW MPW Tube
11199	**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: 18 000 max RCF:24269 x g R max: 6.7cm)**	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
11213C/A	**Wirnik kątowy 8 x 50ml na probówki Falcon®, komplet z pojemnikami 13275 lub 13278 z pokrywką (PC) 17151 (kąt 30°)** **Angle rotor 8 x 50ml for Falcon® tubes, complete with Buckets 13275 or 13278 with PC caps 17151(angle 30°)** **(max RPM: 5 000 max RCF:3493 x g R max: 12.5cm)**	
14248	Wkładka redukcyjna na probówkę 30/25ml (O 26x102mm) Round carrier for 30/25ml tube (O 26x102mm)	15055,15117
11213C/B	**Wirnik kątowy 8 x 50ml na probówki Falcon®, komplet z pojemnikami 13276 (kąt 30°)** **Angle rotor 8 x 50ml for Falcon® tubes, complete with Buckets 13276 (angle 30°)** **(max RPM: 5 000 max RCF:3493 x g R max: 12.5cm)**	
14035	Wkładka redukcyjna na probówkę 14ml (O 28,5/17x105mm) Round carrier for 14ml tube (O 28,5/17x105mm)	15046
14036	Wkładka redukcyjna na probówkę 5ml (O 28,5/14x92mm) Round carrier for 5ml tube (O 28,5/14x92mm)	
14043	Wkładka redukcyjna na probówkę 5ml (O 29/13x85mm) Round carrier for 5ml tube (O 29/13x85mm)	15120, 15419
14071	Wkładka redukcyjna na probówkę 30ml (O 25x100mm) Round carrier for 30ml tube (O 25x100mm)	15055,15056, 15117,15424
14089	Wkładka redukcyjna na probówkę 15ml Falcon® (O 17x120mm) Round carrier for 15ml Falcon® tube (O 17x120mm)	15050
14248	Wkładka redukcyjna na probówkę 30/25ml (O 26x102mm) Round carrier for 30/25ml tube (O 26x102mm)	15055, 15117
11216	**Wirnik kątowy 12 x 5ml (O 12x85mm), z hermetycznie uszczelnioną pokrywą (kąt 45°)** **Angle rotor 12 x 5ml (O 12x85mm), with HermeticallySealed Lid (angle 45°)** **(max RPM: 14 000 max RCF:19064 x g R max: 8.7cm)**	15419
11217C/A	**Wirnik kątowy 10 x 15/10ml, komplet z pojemnikami 13080 (O 17x100/120mm) (kąt 30°)** **Angle rotor 10 x 15/10ml, complete with buckets 13080 (O 17x100/120mm) (angle 30°)** **(max RPM: 6 000 max RCF:4226 x g R max: 10.5cm)**	15048,15050, 15053,15118
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15119

14083	Wkładka redukcyjna (O 13,3mm)**** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3m **** SELL OUT ****	15119
11217C/B	**Wirnik kątowy 10 x 10ml, komplet z pojemnikami 13081 (O 17x70/85mm) (kąt 30°) Angle rotor 10 x 10ml, complete with buckets 13081 (O 17x70/85mm) (angle 30°) (max RPM: 6000 max RCF:4226 x g R max: 10.5cm)**	15053
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15054,15120, 15419
14083	Wkładka redukcyjna (O 13,3mm) **** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3m **** SELL OUT ****	15054,15120, 15419
11461	**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: 15 100 max RCF:21153 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
11462	**Wirnik kątowy 36 x 2/1,5ml, z hermetycznie uszczelnioną pokrywą (kąt 45°) Angle rotor 36 x 2/1,5ml, with Hermetically Sealed Lid (angle 45°) (max RPM: 14 000 max RCF:18187 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
11501C/A	**Wirnik kątowy 30 x 15/10ml, komplet z pojemnikami 13080 (O 17x100/120mm) (kąt 30°) Angle rotor 30 x 15/10ml, complete with 13080 buckets (O 17x100/120mm) (angle 30°) (max RPM: 4500 max RCF: 3011 x g R max: 13.3cm)**	15048,15050, 15053,15118
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15119
14083	Wkładka redukcyjna (O 13,3mm)**** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3mm) **** SELL OUT ****	15119
11501C/B	**Wirnik kątowy 30 x 10ml, komplet z pojemnikami 13081 (O 17x70/85mm) (kąt 30°) Angle rotor 30 x 10ml, complete with 13081 buckets (O 17x70/85mm) (angle 30°) (max RPM: 4 500 max RCF: 3011 x g R max: 13.3cm)**	15053
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15054,15120, 15419
14083	Wkładka redukcyjna (O 13,3mm)**** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3mm) **** SELL OUT ****	15054,15120, 15419
11715	**Wirnik kątowy 10 x 10ml (O 17x75mm), z hermetycznie uszczelnioną pokrywą (kąt 30°) Angle rotor 10 x 10ml (O 17x75mm), with Hermetically Sealed Lid (angle 30°) (max RPM:14 000 max RCF: 15558 x g R max: 7.1cm)**	15121
11716	**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: 14 000 max RCF: 15339 x g R max: 7.0cm)**	15122,15130
11717	**Wirnik kątowy 18 x 2ml na probówki z filtrem, z hermetycznie uszczelnioną pokrywą (kąt 45°) Angle rotor 18 x 2ml for tubes with filter, with Hermetically Sealed Lid (angle 45°) (max RPM: 14 000 max RCF: 18187 x g R max: 8.3cm)**	
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
11718C	**Wirnik kątowy 4 x 100ml, komplet z pojemnikami 13719 (kąt 30°)** **Angle rotor 4 x 100ml, complete with buckets 13719 (angle 30°)** **(max RPM: 5 000 max RCF: 3158 x g R max: 11.3cm)**	
14024	Wkładka redukcyjna na probówkę 15ml Falcon® (O 17x120mm) Round carrier 15ml for Falcon® tube (O 17x120mm)	15050
14188	Podkładka (guma) pod probówki szklane 100/50/30/25ml Pad (rubber) under 100/50/30/25ml glass tubes	15052,15115, 15116,15117
14189C	Wkładka redukcyjna na probówkę 50ml Falcon® (O 30x120mm) lub Nalgene®, komplet z gumową podkładką 14188 Round carrier 50ml for Falcon® tube (O 30 x120mm) or Nalgene®, complete with rubber pad 14188	15051,15052
14190C	Wkładka redukcyjna 30/25ml (O 25,5x102mm), komplet z gumową podkładką 14188 Round carrier 30/25ml (O 25,5 x100mm), complete with rubber pad 14188	15055, 15056, 15117
14192C	Wkładka redukcyjna 50ml (O 35x100mm), komplet z gumową podkładką 14188 Round carrier 50ml (O 35 x100mm), complete with rubber pad 14188	15116
14196	Podkładka (PA) pod probówki z PP 100ml PA pad under 100ml PP tube	15040
14226	Wkładka redukcyjna na probówkę 50ml z dnem stożkowym, wolnostojąca GREINER® (O 30x103mm / max wysokość probówki: 117mm) Round carrier for 50ml conical bottom tube, with skirt - GREINER® (O 13,1x100mm / max height of tube: 117mm)	
11740C/A	**Wirnik kątowy 12 x 15/10ml, komplet z pojemnikami 13080 (O 17x100/120mm) (kąt 30°)** **Angle rotor 12 x 15/10ml, complete with buckets 13080 (O 17x100/120mm) (angle 30°)** **(max RPM: 5 500 max RCF: 4058 x g R max: 12cm)**	15048,15050, 15053,15118
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15119
14083	Wkładka redukcyjna (O 13,3mm) **** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3mm) **** SELL OUT ****	15119
11740C/B	**Wirnik kątowy 12 x 10ml, komplet z pojemnikami 13081 (O 17x70/85mm) (kąt 30°)** **Angle rotor 12 x 15/10ml, complete with buckets 13080 (O 17x100/120mm) (angle 30°)** **(max RPM: 5500 max RCF: 4058 x g R max: 12cm)**	15053
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15054,15120, 15419
14083	Wkładka redukcyjna (O 13,3mm)**** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3mm) **** SELL OUT ****	15054,15120, 15419
11741C/A	**Wirnik kątowy 8 x 15/10ml, komplet z pojemnikami 13080 (O 17x100/120mm) (kąt 30°)** **Angle rotor 8 x 15/10ml, complete with buckets 13080 (O 17x100/120mm) (angle 30°)** **(max RPM:6 000 max RCF: 4226 x g R max: 10.5cm)**	15048,15050, 15053,15118
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15119
14083	Wkładka redukcyjna (O 13,3mm)**** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3mm) **** SELL OUT ****	15119

11741C/B	**Wirnik kątowy 8 x 10ml, komplet z pojemnikami 13081 (O 17x70/85mm) (kąt 30°)** **Angle rotor 8 x 10ml, complete with buckets 13081 (O 17x70/85mm) (angle 30°)** **(max RPM: 6000 max RCF: 4226 x g R max: 10.5cm)**	15053
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15054,15120, 15419
14083	Wkładka redukcyjna (O 13,3mm)**** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3mm) **** SELL OUT ****	15054,15120, 15419
11742C	**Wirnik kątowy 4 x 30/25ml, komplet z pojemnikami 13329 (kąt 45°)** **Angle rotor 4 x 30/25ml, complete with buckets 13329 (angle 45°)** **(max RPM: 6 000 max RCF: 4829 x g R max: 12cm)**	
14255	Wkładka redukcyjna na probówkę 7ml (O 13x100mm) Round carrier for 7ml tube (O 13/100mm)	15054,15119
14256	Wkładka redukcyjna na probówkę 15/10ml (O 17x120mm) Round carrier for 15/10ml tube (O 17/120mm)	15046,15048, 15053,15118
11743C	**Wirnik kątowy 12 x 30/25ml, komplet z pojemnikami 13329 (kąt 30°)** **Angle rotor 12 x 30/25ml, complete with buckets 13329 (angle 30°)** **(max RPM: 5 500 max RCF: 2716 x g R max: 12cm)**	
14255	Wkładka redukcyjna na probówkę 7ml (O 13x100mm) Round carrier for 7ml tube (O 13/100mm)	15054,15119
14256	Wkładka redukcyjna na probówkę 15/10ml (O 17x120mm) Round carrier for 15/10ml tube (O 17/120mm)	15046,15048, 15053,15118
11744C	**Wirnik kątowy 10 x 50ml na probówki Falcon®, komplet z pojemnikami 13276 (kąt 30°)** **Angle rotor 10 x 50ml for Falcon® tubes, complete with buckets 13276 (angle 30°)** **(max RPM:4 500 max RCF: 2830 x g R max: 12.5cm)**	
14035	Wkładka redukcyjna na probówkę 14ml (O 28,5/17x105mm) Round carrier for 14ml tube (O 28,5/17x105mm)	15046
14036	Wkładka redukcyjna na probówkę 5ml (O 28,5/14x92mm) Round carrier for 5ml tube (O 28,5/14x92mm)	
14043	Wkładka redukcyjna na probówkę 5ml (O 29/13x85mm) Round carrier for 5ml tube (O 29/13x85mm)	15120, 15419
14071	Wkładka redukcyjna na probówkę 30ml (O 25x100mm) Round carrier for 30ml tube (O 25x100mm)	15055,15056, 15117,15424
14089	Wkładka redukcyjna na probówkę 15ml Falcon® (O 17x120mm) Round carrier for 15ml Falcon® tube (O 17x120mm)	15050
14248	Wkładka redukcyjna na probówkę 30/25ml (O 26x102mm) Round carrier for 30/25ml tube (O 26x102mm)	15055, 15117
11745C/A	**Wirnik kątowy 24 x 15/10ml, komplet z pojemnikami 13080 (O 17x100/120mm) (kąt 30°)** **Angle rotor 24 x 15/10ml, complete with buckets 13080 (O 17x100/120mm) (angle 30°)** **(max RPM: 5 000 max RCF: 3354 x g R max: 12cm)**	15048,15050, 15053,15118
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15119
14083	Wkładka redukcyjna (O 13,3mm)**** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3mm) **** SELL OUT ****	15119
11745C/B	**Wirnik kątowy 24 x 10ml, komplet z pojemnikami 13081 (O 17x70/85mm) (kąt 30°)** **Angle rotor 24 x 15/10ml, complete with buckets 13081(O 17x70/85mm) (angle 30°)** **(max RPM: 5000 max RCF: 3354 x g R max: 12cm)**	15053
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15054,15120, 15419
14083	Wkładka redukcyjna (O 13,3mm)**** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3mm) **** SELL OUT ****	15054,15120, 15419

11746C	**Wirnik kątowy 6 x 50ml na probówki Falcon®, komplet z pojemnikami 13276 (kąt 30°) Angle rotor 6 x 50ml for Falcon® tubes, complete with buckets 13276 (angle 30°) (max RPM: 6000 max RCF: 4427 x g R max: 11cm)**	
14035	Wkładka redukcyjna na probówkę 14ml (O 28,5/17x105mm) Round carrier for 14ml tube (O 28,5/17x105mm)	15046
14036	Wkładka redukcyjna na probówkę 5ml (O 28,5/14x92mm) Round carrier for 5ml tube (O 28,5/14x92mm)	
14043	Wkładka redukcyjna na probówkę 5ml (O 29/13x85mm) Round carrier for 5ml tube (O 29/13x85mm)	15120, 15419
14071	Wkładka redukcyjna na probówkę 30ml (O 25x100mm) Round carrier for 30ml tube (O 25x100mm)	15055,15056, 15117,15424
14089	Wkładka redukcyjna na probówkę 15ml Falcon® (O 17x120mm) Round carrier for 15ml Falcon® tube (O 17x120mm)	15050
14248	Wkładka redukcyjna na probówkę 30/25ml (O 26x102mm) Round carrier for 30/25ml tube (O 26x102mm)	15055, 15117
12183	**Wirnik horyzontalny 4 x 100ml Swing-out rotor 4 x 100ml (max RPM: 4 000 max RCF: 2469 x g R max: 13.8cm)**	
13182	Pojemnik 100ml (O 45x89mm) Bucket 100ml (O 45x89mm)	
14024	Wkładka redukcyjna na probówkę 15ml Falcon® (O 17x120mm) Round carrier 15ml for Falcon® tube (O 17x120mm)	15050
14181	Wkładka redukcyjna 5 x 2/7ml (O 44,5/12,5x100mm) Round carrier 5 x 2/7ml (O 44,5/12,5x100mm)	15054,15119, 15120, 15419
14186	Wkładka redukcyjna 4 x 7ml na probówki Vacutainer® (O 13,1x100mm) Round carrier 4 x 7ml for Vacutainer® tubes (O 13,1x100mm)	15054,15119, 15120, 15419
14187	Wkładka redukcyjna 4 x 15/10ml na probówki Vacutainer® (O 16,5x112mm) Round carrier 4 x 15/10ml for Vacutainer® tubes (O 16,5x112mm)	15046,15048, 15053, 15118
14188	Podkładka (guma) pod probówki szklane 100/50/30/25ml Pad (rubber) under 100/50/30/25ml glass tubes	15052,15115, 15116,15117
14189C	Wkładka redukcyjna na probówkę 50ml Falcon® (O 30x120mm) lub Nalgene®, komplet z gumową podkładką 14188 Round carrier 50ml for Falcon® tube (O 30 x120mm) or Nalgene®, complete with rubber pad 14188	15051,15052
14190C	Wkładka redukcyjna 30/25ml (O 25,5x102mm), komplet z gumową podkładką 14188 Round carrier 30/25ml (O 25,5 x100mm), complete with rubber pad 14188	15055, 15056, 15117
14192C	Wkładka redukcyjna 50ml (O 35x100mm), komplet z gumową podkładką 14188 Round carrier 50ml (O 35 x100mm), complete with rubber pad 14188	15116
14194	Wkładka redukcyjna 5 x 1,5/2/2,2ml na probówki 15123, 15015 i 15128 Round carrier 5 x 1,5/2/2,2ml for 15123, 15015 and 15128 tubes	15123,15015, 15128
14196	Podkładka (PA) pod probówki z PP 100ml PA pad under 100ml PP tube	15040
14224	Wkładka redukcyjna na probówki Sterilin® 30ml Round carrier for Sterilin® 30ml tube	15055,15056, 15222, 15223
14226	Wkładka redukcyjna na probówkę 50ml z dnem stożkowym, wolnostojąca GREINER® (O 30x103mm / max wysokość probówki: 117mm) Round carrier for 50ml conical bottom tube, with skirt - GREINER® (O 13,1x100mm / max height of tube: 117mm)	
13184C	Pojemnik 100ml (O 45x96mm) z pokrywką (Al) 17185 Bucket 100ml (O 45x96mm) with 17185 cap (Al)	
14024	Wkładka redukcyjna na probówkę 15ml Falcon® (O 17x120mm) Round carrier 15ml for Falcon® tube (O 17x120mm)	15050
14181	Wkładka redukcyjna 5 x 2/7ml (O 44,5/12,5x100mm)	15054,15119,

	Round carrier 5 x 2/7ml (O 44,5/12,5x100mm)	15120, 15419
14186	Wkładka redukcyjna 4 x 7ml na probówki Vacutainer® (O 13,1x100mm) Round carrier 4 x 7ml for Vacutainer® tubes (O 13,1x100mm)	15054,15119, 15120, 15419
14187	Wkładka redukcyjna 4 x 15/10ml na probówki Vacutainer® (O 16,5x112mm) Round carrier 4 x 15/10ml for Vacutainer® tubes (O 16,5x112mm)	15046,15048, 15053, 15118
14188	Podkładka (guma) pod probówki szklane 100/50/30/25ml Pad (rubber) under 100/50/30/25ml glass tubes	15052,15115, 15116,15117
14189C	Wkładka redukcyjna na probówkę 50ml Falcon® (O 30x120mm) lub Nalgene®, komplet z gumową podkładką 14188 Round carrier 50ml for Falcon® tube (O 30 x120mm) or Nalgene®, complete with rubber pad 14188	15051,15052
14190C	Wkładka redukcyjna 30/25ml (O 25,5x102mm), komplet z gumową podkładką 14188 Round carrier 30/25ml (O 25,5 x100mm), complete with rubber pad 14188	15055, 15056, 15117
14192C	Wkładka redukcyjna 50ml (O 35x100mm), komplet z gumową podkładką 14188 Round carrier 50ml (O 35 x100mm), complete with rubber pad 14188	15116
14194	Wkładka redukcyjna 5 x 1,5/2/2,2ml na probówki 15123, 15015 i 15128 Round carrier 5 x 1,5/2/2,2ml for 15123, 15015 and 15128 tubes	15123,15015, 15128
14196	Podkładka (PA) pod probówki z PP 100ml PA pad under 100ml PP tube	15040
14226	Wkładka redukcyjna na probówkę 50ml z dnem stożkowym , wolnostojąca GREINER® (O 30x103mm / max wysokość probówki: 117mm) Round carrier for 50ml conical bottom tube, with skirt - GREINER® (O 13,1x100mm / max height of tube: 117mm)	15055,15056, 15222, 15223
13195	Zawieszka 2 x 15ml na probówki Falcon®, kompletna z pojemnikami 13080 (O 17x100/120mm) Hanger 2 x 15ml for Falcon® tube, complete with buckets 13080 (O 17x100/120mm)	15048,15050, 15053,15118
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15119
14083	Wkładka redukcyjna (O 13,3mm)**** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3mm) **** SELL OUT ****	15119
13265	Pojemnik na probówkę do systemu Arthrex ACP kompletny z pokrywką (Al) Bucket for Arthrex ACP system tube, complete with cap (Al)	
13266	Pojemnik 50ml na probówkę Falcon® (O 30x100mm) Bucket 50ml for Falcon® tube (O 30x100mm)	
14089	Wkładka redukcyjna na probówkę 15ml Falcon® (O 17x120mm) Round carrier for 15ml Falcon® tube (O 17x120mm)	15050
14248	Wkładka redukcyjna na probówkę 30/25ml (O 26x102mm) Round carrier for 30/25ml tube (O 26x102mm)	15055, 15117
13267C	Pojemnik 50ml na probówkę Falcon® z pokrywką 17151 (PC) (O 30x100mm) Bucket 50ml for Falcon® tube, complete with 17151 cap (polycarbone)	
14089	Wkładka redukcyjna na probówkę 15ml Falcon® (O 17x120mm) Round carrier for 15ml Falcon® tube (O 17x120mm)	15050
14248	Wkładka redukcyjna na probówkę 30/25ml (O 26x102mm) Round carrier for 30/25ml tube (O 26x102mm)	15055, 15117
12193C/A	**Wirnik horyzontalny 8 x 15/10ml, komplet z pojemnikami 13080 (O 17x100/120mm)** **Swing-out rotor 8 x 10ml, complete with buckets 13081 (O 17x70/85mm)** **(max RPM: 4 000 max RCF: 2504 x g R max: 14cm)**	15048,15050, 15053,15118
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15119

14083	Wkładka redukcyjna (O 13,3mm)**** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3mm) **** SELL OUT ****	15119
12193C/B	**Wirnik horyzontalny 8 x 10ml, komplet z pojemnikami13081 (O 17x70/85mm)** **(max RPM: 4 000 max RCF: 2504 x g R max: 14cm)**	15053
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15054,15120, 15419
14083	Wkładka redukcyjna (O 13,3mm)**** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3mm) **** SELL OUT ****	15054,15120, 15419
12218	**Wirnik horyzontalny titracyjny, komplet z 2 zawieszkami 13219 na płytki mikrotitracyjne** **Microtiter rotor head, complete with 2 buckets 13219 for microtiter plates** **(max RPM: 3 000 max RCF: 2504 x g R max: 14cm)**	15102
12232	**Wirnik horyzontalny 4 x 70ml** **Swing-out rotor 4 x 70ml** **(max RPM: 4 000 max RCF: 2308 x g R max: 12.9cm)**	
13170	Pojemnik 12 x 5ml na probówki Monovette® (O 13x81mm) Bucket 12 x 5ml for Monovette® tubes (O 13 x 81mm)	15120, 15419
13233	Pojemnik 70ml (O 57x66mm) na wkładki redukcyjne Bucket 70ml (O 57x66mm)	
14169	Wkładka redukcyjna 8 x 4ml (O 13x81mm) Round carrier 8 x 4ml (O 13x81mm)	15120, 15419
14235	Wkładka redukcyjna 12 x 5ml (O 12x75mm) Round carrier 12 x 5ml (O 12x75mm)	15120, 15419
14238	Wkładka redukcyjna 7 x 10ml (O 17x75mm), niska Round carrier 7 x 10ml (O 17x75mm), short	15121
14239	Wkładka redukcyjna 7 x 5ml (O 13,5x75mm), niska Round carrier 7 x 5ml (O 13,5x75mm), short	15120, 15419
14240	Wkładka redukcyjna 9 x 2/1,5ml (O 11x38,5mm) Round carrier 9 x 2/1,5ml (O 11x38,5mm)	15011, 15128
14242	Wkładka redukcyjna 12 x 1,2ml na probówki S-Monovette® (O 56x66mm), niska Round carrier 12 x 1,2ml for S-Monovette® tubes (O 56x66mm), short	15016
12300	**Wirnik hematokrytowy na 24 kapilary 75mm** **Hematocrite rotor for 24 capillaries 75mm** **(max RPM: 13 000 max RCF: 16816 x g R max: 8.9cm)**	15100
16135	Czytnik hematokrytowy płaski**** DO WYCZERPANIA ZAPASÓW **** Hematocrite reader - flat**** SELL OUT ****	
16164	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
15016	Probówka S-Monovette 1,2ml S-Monovette tube 1,2ml
15040	Probówka z polipropylenu 100ml z pokrywką (O 44,7/47x103,7mm) Polypropylene tube 100ml with cap (O 44,7/47x103,7mm)
15046	Probówka z polipropylenu 14ml z korkiem (O 16,8/17,7x106mm) Polypropylene tube 14ml with cap (O 16,8/17,7x106mm)
15048	Probówka z polipropylenu 15ml Nalgene® (O 16x113mm) Polypropylene tube 15ml Nalgene® (O 16x113mm)

15050	Probówka z polipropylenu 15ml z dnem stożkowym (O 17/21x120mm) Polypropylene tube 15ml with conical bottom (O17/21x120mm)
15051	Probówka z polipropylenu 50ml Nalgene® Polypropylene tube 50ml Nalgene (O 28,8x106,7mm)
15052	Probówka z polipropylenu 50ml z dnem stożkowym, z pokrywką (O 29,5/34x117mm) Polypropylene tube 50ml with conical bottom, with cap (O 29,5/34x117mm)
15053	Probówka z polipropylenu 10ml z pokrywką (O 16x100mm) Polypropylene tube 10ml with cap (O 16x100mm)
15054	Probówka z polipropylenu 6ml z pokrywką (O 11,7/13,5x95mm) Polypropylene tube 6ml with cap (O 11,7/13,5x95mm)
15055	Probówka z polipropylenu 30ml z pokrywką (O 24,9x103mm) Polypropylene tube 30ml with cap (O 24,9x103mm)
15056	Probówka z poliwęglanu 30ml Nalgene®z pokrywką (O 25,5x94mm) Policarbonate tube 30ml Nalgene® with cap (O 25,5x94mm)
15100	Kapilary szklane heparynowane (1,4 x 75mm, 37µl) Capillary tubes heparinized (1,4 x 75mm, 37µl)
15102	Płytka titracyjna z pokrywką (85,5x127mm) Microtiter plate with cap (85,5x127mm)
15115	Probówka szklana 100ml (O 45x100mm) Glass tube 100ml (O 45x100mm)
15116	Probówka szklana 50ml (O 35x100mm) Glass tube 50ml (O 35x100mm)
15117	Probówka szklana 25ml (O 25x100mm) Glass tube 25ml (O 25x100mm)
15118	Probówka szklana 10ml (O 16x100mm) Glass tube 10ml (O 16x100mm)
15119	Probówka szklana 7ml (O 12x100mm) Glass tube 7ml (O 12x100mm)
15120	Probówka szklana 5ml (O 12x75mm) Glass tube 5ml (O 12x75mm)
15121	Probówka z PP 10ml z pokrywką (O 17/19x70mm) Polypropylene tube 10ml with cap (O 17/19x70mm)
15122	Probówki z polipropylenu PCR szeregowe 8 x 0,2ml ze zintegrowanymi pokrywkami (O6x21mm
15123	Probówka z polipropylenu 2,2ml z pokrywką - do zestawu cytologicznego (O 10,8x43mm) Polypropylene tube 2,2ml with cap - for cyto (O 10,8 x43mm)
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)
15130	Probówki z polipropylenu PCR szeregowe 8 x 0,2ml z odrębnymi pokrywkami w szeregu (O 6x21mm) Polypropylene PCR stripe 8x0,2ml (O 6x21mm)
15222	Pojemnik Sterilin® z polistyrenu 30ml z pokrywką (O 31x94mm) Sterilin®, polystyrene test tube 30ml with cap (O 31x94mm)
15223	Pojemnik Sterilin® z polipropylenu 30ml z pokrywką (O 31x94mm) Sterilin®, polypropylene test tube 30ml with cap (O31x94mm)
15419	Probówka z polipropylenu 5ml z korkiem (O 12x85mm) Polypropylene tube 5ml (O12x85mm) with cap
15424	Probówka z polipropylenu 30ml z pokrywką (O 25,5x94mm) Polypropylene tube 30ml with cap (O 25,5x94mm)

OTHER ACCESSORIES

Catalog no	Specification
16135	Hematocrite reader – flat
16164	Hematocrite reader - round
♦♦16594	Data recording set of working parameters by serial RS 232 pin;
17151	Polycarbonate cap for bucket No. 13267, 13275;
17185	Aluminium cap for bucket No. 13184.

♦♦***CAUTION!*** Optional accessories marked by: "♦♦" are manufactured for individual order.

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 to 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 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 115 V 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.

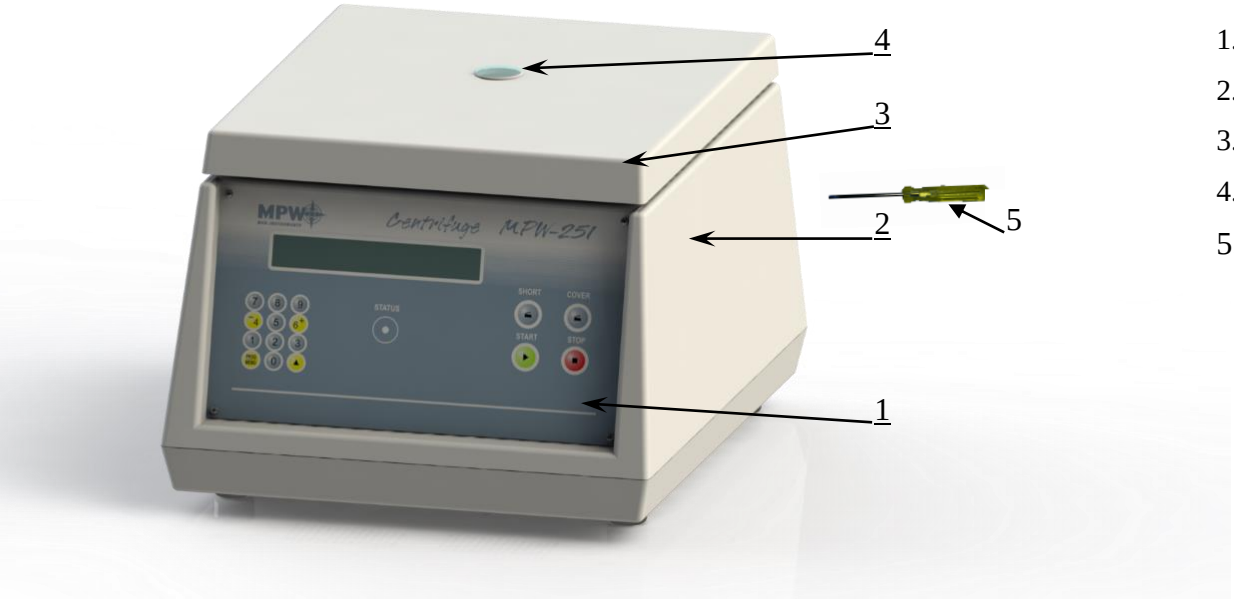
The centrifuge has standard protection with the WTA-T 4 A 250 V fuse. Fuse is situated in the plug-in socket unit at back wall of the centrifuge.

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.

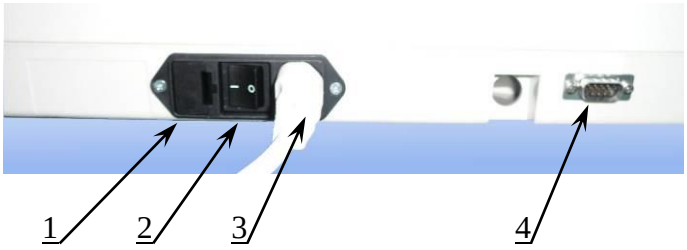
4.2. Service elements.



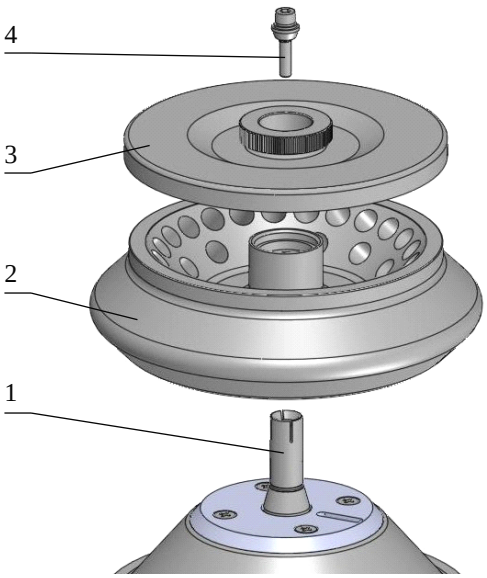
1. Control panel
2. Emergency cover open
3. Cover
4. Inspection glass
5. Key for emergency cover release

Drawing No.1. General view

Drawing No.2.Back of centrifuge



1. Power-switch
2. Fuse base
3. Plug-in socket
4. RS 232 socket



1. Motor axle
2. Rotor
3. Rotor cover
4. Complete clamp

Drawing No. 3. Unit elements of the angle rotor

5. Safe working conditions.

5.1. Servicing personnel.

The MPW-251 laboratory centrifuge can be operated by laboratory personnel after getting acquainted with User Manual.

User Manual shall be held all the time near the centrifuge.
User Manual must be kept always at hand!!!

5.2. Guarantee and operational use period.

Guarantee period for the MPW-251 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 to carry out yearly technical inspection of the centrifuge. Only service personnel authorized by manufacturer may perform the inspections.

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

5.3. Safekeeping period.

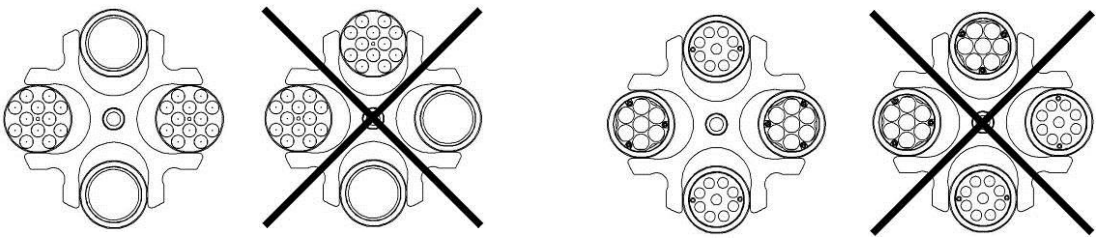
Maximum period of storage of not used centrifuge amounts to 1 year. After this period, a service authorized by manufacturer should carry out technical inspection of the centrifuge.

5.4. 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.**

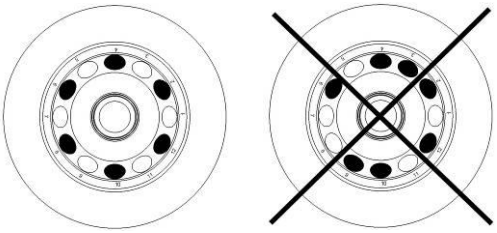
- **Avoid unbalance.**
- **Load opposite buckets with the same accessories.**
- **Centrifugation of the test tubes of different sizes.**

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.



- **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 kept 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.**

5.5. 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 of 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 subject to centrifugation materials, which subjected to action of air, could generate inflammable or explosive mixtures.**

- **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.**

- **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/cm^3 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 isn't 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 elements. Cracking of glass vessels and test tubes could result in dangerous vibration of the centrifuge.**

- **It isn't allowed to carry out centrifugation with the rotor caps taken off or not driven tight.**
- **It isn't allowed to lift or shift the centrifuge during operation, and rest on it.**
- **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.**
- **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 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 the rotating 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.
   Caution! Fitting the rotor too shallow will result in lack of identification of the rotor after start of the centrifuge, displaying the ERROR ROTOR VER. message and stopping the centrifuge.
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 to remember that every buckets swings individually. Bucket suspension studs should be lubricated periodically with technical petroleum jelly.
6. In the case of rotors designed with the cover they must not be used without it. Rotor covers must be closed exactly. Rotor covers ensure smaller drags of the rotors, proper setting of the test-tubes and airtight sealing.
7. One should use only buckets intended for selected types of the rotor - see p. 2.1. "Accessories".
8. Fill test tubes outside the centrifuge.
9. Put on or screw the caps on vessels and rotors (if applicable).
10. In case of centrifuging in an angle rotor, test tubes (buckets) have to be filled properly in order to avoid overflows.
11. ***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, ERROR UNBALANCE message will be displayed.***
12. In order to prolong lifetime of the rotor and gaskets rotors shall be lubricated with the maintenance oil, while gaskets and threaded parts shall be lubricated with the technical petroleum jelly.
13. For replacement of the rotor one shall release clamping by several turns of the bolt 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 ABS type plastic while front was made of aluminum sheet. Cover is fixed on steel axles of hinges and from the front is locked with electromagnetic lock blocking possible opening during centrifugation. Bowl forming the rotation chamber is made of thick stainless steel sheet. Rotors and buckets are from aluminum, lids from polycarbonate and aluminum 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 signaling individual performed operations facilitate operator's programming and recording of parameters and condition of the centrifuge.

The centrifuge is provided with the RS 232 serial interface that enables connection of the centrifuge to external PC unit with the printer and recording the centrifugation parameters.

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 the spin setting 1÷99;
- selection of the rotor according to the accession number;
- selection of rotational speed within 100 ÷ 18000 rpm at 100 rpm interval;
- setting centrifugation time within 0÷99 minutes range, 0÷59 sec., ∞ at 1 sec interval;
- selection of **SHORT** – short duration operation,
- selecting of the **AUTO COVER** function - automatic opening of the cover after centrifuging is finished (choice is signalling by the wheel between **SPEED** and **TIME** inscriptions);
- counting the time of the **START** key pressing or of the set speed reached;
- selecting acceleration characteristics from 0 - quickest to 9 - slowest (e.g. for rotor No. 12232 accelerating time to 4000 rpm value for characteristic curve No. 0 is 21 s., and for No. 9 is 160 s.),
- selecting deceleration characteristics from 0 – quickest to 8 - slowest (e.g. for rotor No. 12232 deceleration time from 4000 rpm value for characteristic curve No. 0 is 21 s., and for No. 8 is 170 s.).

  deceleration characteristic number 9 is subterfuge characteristics (**with time of free stopping of the rotor** e.g. for rotor 12232 is 133 s.)
- selecting the RCF with automatic calculation of the rotation speed with 100 rpm accuracy.

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 ■ 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 ⊐ symbol will display) the drive is completely disconnected from the power, which makes it impossible to start the centrifuge.

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 **ERROR UNBALANCE** message will be displayed.

6.6.3. Setup of the verification of installing the rotor and compatibility with the program.

Directly after starting centrifuging, a unit verifies the type of the rotor applied and in the case of its incompatibility with the type indicated in the application or absence of the rotor, the spinning process shall be stopped with simultaneous displaying the **ERROR ROTOR VER.** message. The conformity of the type of the rotor is signalled with a single audible signal.

6.6.4. Rest state inspection.

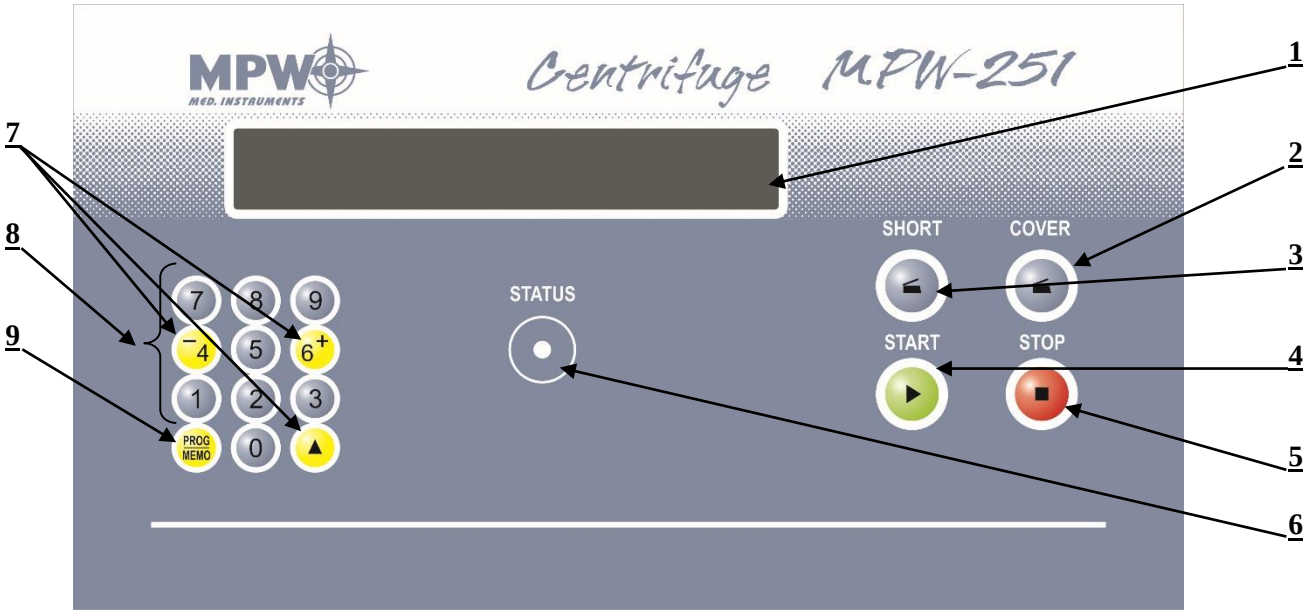
Opening of the centrifuge's cover is possible only with the rotor in the state of rest. This state is being checked by the microprocessor which recognizes and signals the rest state prior to opening the cover.

7. Description of the centrifuge operating elements.

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

7.1. Control panel - Drawing No. 4.

For controlling centrifuge operation serves control panel placed on front casing wall.



Drawing No.4.Control panel

1. Display.
2. **COVER** key**.**
3. **SHORT** key**.**
4. **START** key**.**
5. **STOP** key**.**
6. **STATUS** diode.
7. Function keys.
8. Numeric keypad.
9. **PROG/MEMO** key**.**

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

1. Rotor status signalling **STATUS** [6] blinking – rotor rotates, not illuminated – rotor stopped;

2. Signalling of the choice of the option **AUTO COVER** behind means of wheel on the display

3. Function key **START** [4]

4. Function key **STOP** [5]

5. Function key **COVER** [2]

6. Function key **SHORT** [3]

7. Numeric keypad digits **0 – 9** [8]

8. Two-function key **PROG/MEMO** [9]

9. Two-function keys **4**−; **6**+; ▲ [7]

- Sound signal serves for signalling function recording and determinating of the centrifuge status,
- **START** key can be used for starting centrifugation program with parameters presented on display,
- **STOP** key serves for:

- interrupting centrifugation program in any program phase and braking the rotor,
- interrupting of programming of centrifugation parameters without saving them,
- clearing the errors

- **COVER** key serves for opening of the cover,

- **PROG/MEMO** key serves for:

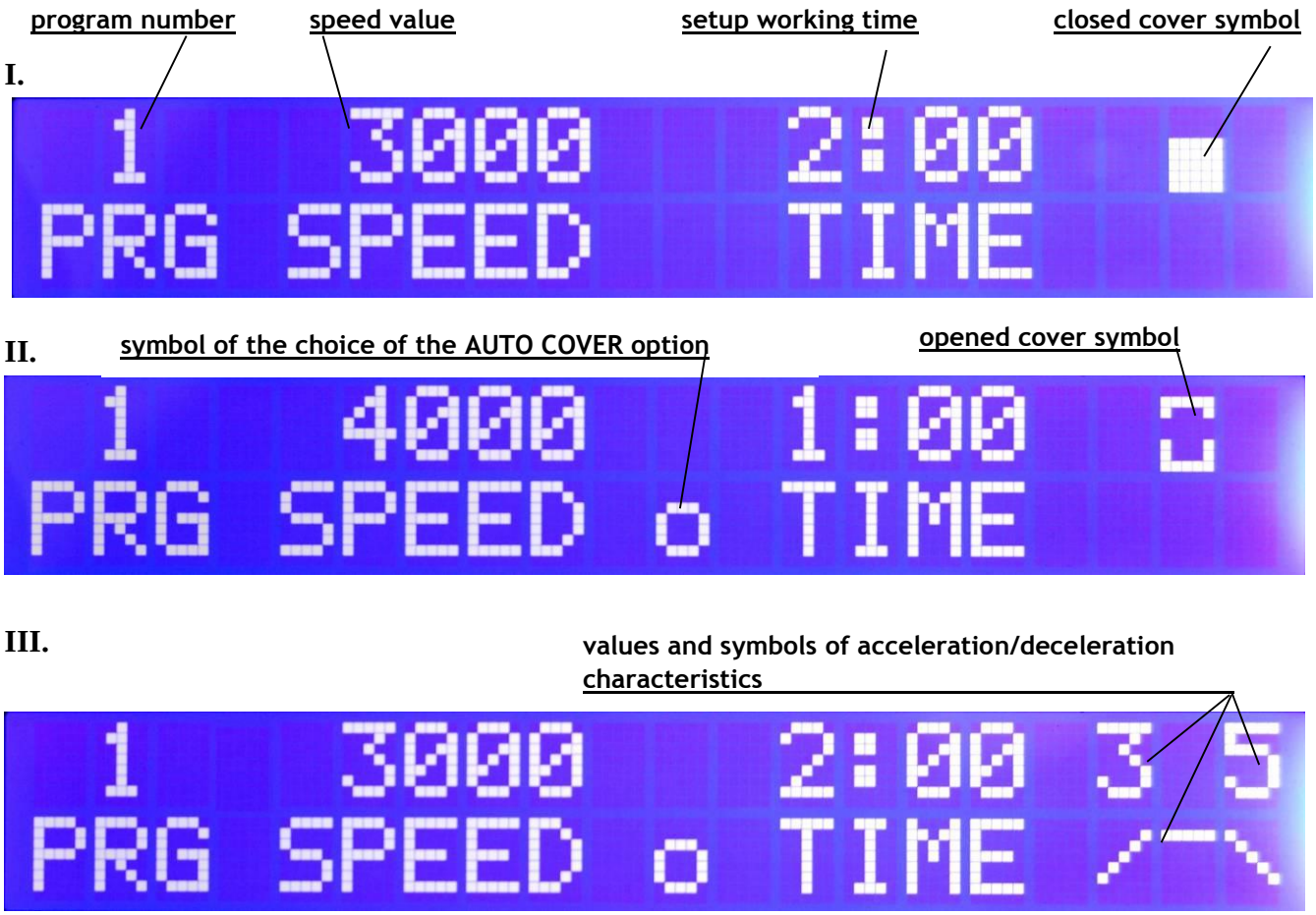
- scrolling of programs,
- switching to programming mode,
- saving pre-programmed program,
- scrolling of programs at down,

- ▲ key serves for:

- rolling of parameters list when in programming mode
- scrolling of programs
- introducing of the double digit number of the program

- **SHORT** key serves for short duration operation - Pressing will make speeding up of the rotor to the speed written down in the program. The centrifuge will be working as long as the key is pressed. The time is being taken into account from pressing of the **SHORT** key. Impressing of the key will make stopping of the rotor.
- Yellow key **4**— serves for changing of parameter value at down
- Yellow key **6**+ serves for changing of parameter value at up.

10. Display field [1]
On the top of display are contains the parameters of the centrifuging, lower part are displayed messages of the state of work.



11. ERRORS:

- **ERROR USER STOP**

- **ERROR ROTOR VER.**

- **ERROR UNBALANCE**

- **ERROR POWER FAIL**

- **ERROR MOTOR FAIL**

7.2. Switching on the centrifuge.

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

7.2.1. Selection of the program.

Control panel can save up to 99 programs preset by the user. Selection of the program consists in selection of its number by means of numeric keypad as follows:

for 1 digit number	press digits on numeric keypad
for 2 digit number	press ▲ key [-] symbol will be displayed press ▲ key [- -] symbol will be displayed press tens digit, digit will be filled-in in tens place [4-] press units digit, digit will be filled-in in units place [4 7]

After selecting program number in relevant fields will be displayed parameters of this program. In order to make calling easier were introduced functions increment program number ▲ key and decrement program number – **PROG/MEMO** key. Those functions are active for 3 seconds from last program selection.

7.2.2. Start of the program.

After selection of program number and checking if proper rotor was mounted consistent with requirements of this program, it's possible to start centrifugation process by single pressing of **START** key.

The centrifuge can be started provided that:
- cover is closed
- symbol ■ is on
- **ERROR** message is not displayed.

7.2.3. Rotor installation and software compatibility verification unit.

It is impossible to set rotor speed above maximum rotational speed preset for it. It is impossible as well to centrifuge without the rotor or with the rotor with the other number that preprogrammed because the system will verificated correctness of installed the rotor and compare number of the installed rotor with programmed one at low rotational speed range. In case of incompatibility centrifuge will be stopped and **ERROR ROTOR VER.** message will be displayed. Consecutive start of centrifuge is possible only after cancellation of the **ERROR ROTOR VER.** message pressing the **STOP** key, then introduction of proper speed correction or installing proper rotor with preset number.

7.2.4. ERROR UNBALANCE fault.

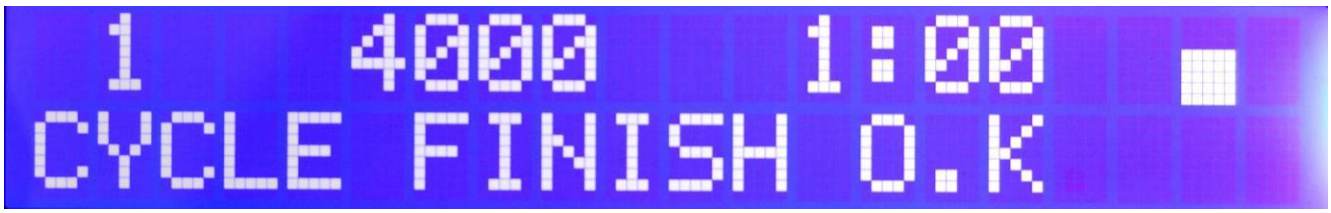
The centrifuge is provided with the rotor unbalance sensor and when it will be activated, centrifugation process will be stopped through fast braking and at the same time **ERROR UNBALANCE** message will be displayed. Cancellation of this error is possible only through pressing **COVER** key after stopping 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.

7.2.5. Emergency stop.

In any centrifuging moment it's possible to interrupt the process and fast stop the rotor with single pressing **STOP** key. The **ERROR USER STOP** message will be displayed as a result of that the application wasn't ended correctly.

7.2.6. End of the centrifuging.

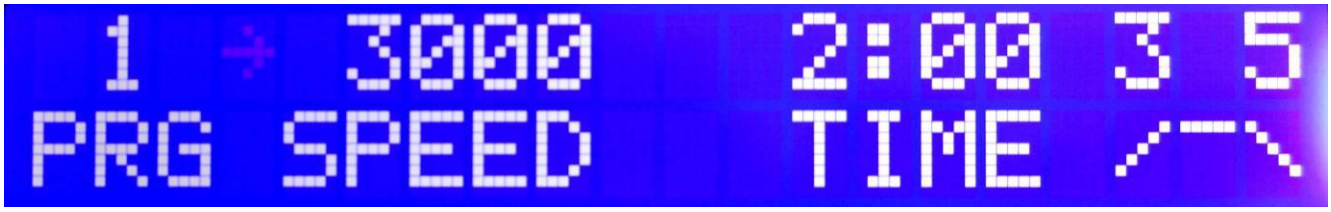
After ending the time of centrifuging stored in the program is occurring braking of rotations in accordance to chosen characteristics in the program. At end of deceleration rotational speed drops slower in order to ensure soft settling of rotor carriers. After stopping, follows audible sound signal and displayed ■ symbol and message **CYCLE FINISH O.K.** (clearing this message is occurring after pressing the **STOP** key or after opening the cover). After pressing **COVER** key cover opens and ⊐ symbol is displayed.



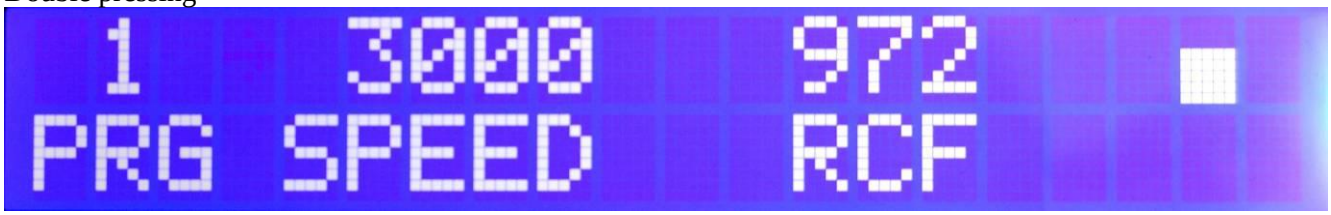
7.2.7. Parameters monitoring during centrifuging.

For easy finding in the course of centrifuging in order to check preset parameters monitoring function was introduced, that is called by pressing any key on numeric keypad. Single-time pressing will make them be displayed speed, time, acceleration characteristic and deceleration characteristic. Double pressing will display the set RCF value. After 3 seconds display return for displaying current measurements of rotational speed and time.

Single time pressing



Double pressing



7.2.8. Programming.

Programming mode is activated with pressing **PROG/MEMO** key after previous selection of number of the program, which we would like to set or edit. On the display occurs **PARAM EDIT** message that means transformation into setting mode.

Using ▲ key we press forward list of parameters subjected to edition as follows:

(rotor)

(rotational speed)

(acceleration)

(time of rotation in minutes, symbol - - - - which is before **"0"** is for infinity centrifuging)

(time of rotation in seconds)

(acceleration mode)

(deceleration mode)

(is for selection time counting begins when **START** key is pressed)

or

(is for selection time counting begins when rpm of the rotor rich rotational speed set up in the program)

(automatic opening of the cover after end of centrifuging)

and so on in round – robin algorithm.

After setting on selected parameters there is possible change of the parameter values:

up **6**+ key

down **4**— key

After setting required parameters program is being recorded in the memory by means of **PROG/MEMO** key. Confirmation of the program recording is prolonged by sound signal. It is possible to resign from the changes introduced at any moment and leave programming mode without saving by pressing **STOP** key.

7.2.9. Changing parameters during centrifuging

There is the possibility of changing parameters during the spin cycle. Entry into the parameter editor follows with key press START. During a spin, you can edit the following parameters:

(rotational speed)

(spin time in minutes, setting – – – – symbol (before **0)** will cause the time setting spin endlessly

(spin time in minutes)

(deceleration curve)

(the option to automatically open the lid at the end of the centrifuging)

Changes in the value of the above amount shall be made in accordance with the instructions in section 7.2.8 Leaving the editofollowed by pressing PROG/MEMO (the chosen setting will be saved along with the confirmation beep) or after pressing STOP (the settings will not be saved) after changing parameters in the spin time screen is displayed:

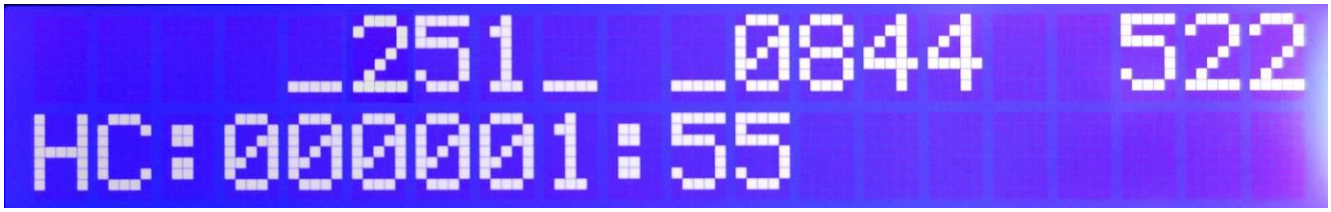
It is possible to make multiple changes in the duration of one cycle.

7.2.10. Cancellation of the programs.

Centrifuge program enables complete cancellation of the programs being saved. After pressing **PROG/MEMO** and No. 9 keys is displayed **clear** message. Pressing **PROG/MEMO** key deletes all programs saved up to now, while use of **STOP** key causes withdrawal from this option.

7.2.11. Version of the centrifuge.

Pressing **PROG/MEMO** and No. 7 keys will cause displaying the centrifuge and software versions, e.g. _251_ _0844 522, and total time of work of the centrifuge in hours and minutes.



7.3. Mathematical relations.

7.3.1. RCF – relative centripetal force.

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

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

RCF [x g], **r** [cm], **n** [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, 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 – Drawing No. 5.

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/cm^3 density.
If density of the centrifuged liquid is higher than 1.2 g/cm^3, then test-tubes could be filled only partially or one shall limit operation speed of the centrifuge, which is being calculated from the formula:

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

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

n_{max} [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 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 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 aluminum. 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 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.

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 PCV hose 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 centrifuge terminates the cycle and displays **PROGRAM ERROR** code.

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

1. Lack of display and check sound:	**Remedies:**
• *Is mains socket live?*	*Check mains socket fuse.*
• *Is supply cable plugged into mains?*	*Plugs correctly supply cable.*
• *Is input fuse good?*	*Replace input fuse (rated data on rating plate).*
• *Is master switch **ON**?*	*Switch **ON** power supply.*
• *Above was checked and still there is no display active and check sound audible.*	*Call service.*
2. Centrifuge does not start	**Remedies**
P *message and* **ERROR MOTOR FAIL** *is displayed*	*Call service*
• ***START** key pressing does not generate reaction or single tone only* - *Rotor stopping symbol,(■) is not displayed yet* - *Cover opening symbol (⊐) displayed* - *status led is blinking:*	 - *Wait till rotor stops and displaying the rotor stopping symbol(■)* - *Close cover. Square symbol (■) must displayed.* - *Centrifugation cycle in progress, press **STOP** key or wait till cycle ends.*
• *Indications are proof for cycle in progress and motor does not start*	*Switch power supply **OFF/ON**. If fault still persists call service.*
3. Centrifuge starts but not accelerates	**Remedies**

• *After stopping* **ERROR UNBALANCE** *message is displayed* - *Unequal rotor load* - *Inclined centrifuge* - *Faulty drive (mechanical damage)* - *Centrifuge was displaced during operation*	 - *Centrifuge load shall be balanced* - *Centrifuge shall be leveled* - *Call service* - *Switch* ***ON*** *the centrifuge afresh after opening and closing the cover*
• *After stopping* **ERROR ROTOR VER.** *message is displayed*	*Check:* - *if rotor number in started program is consistent with the number of the rotor installed in the centrifuge* - *rotor status (if there are coding magnets inserted)*
• *Centrifuge does not recognize the rotor and does not stop*	*Switch the centrifuge* ***OFF****, then* ***ON*** *and check correctness of loaded program*
• *Centrifuge still does not recognize the rotor*	*Call service*
4. It isn't possible to open cover.	**Remedies**
• *Rotor stopping symbol (* ■ *) not displayed yet, after pressing* **COVER** *key single tone is audible*	*Rotor is still rotating. Wait for stopping of the rotor and the square symbol displaying*
• *Nothing is displayed*	*Check the centrifuge power supply*
• *Rotor stopping symbol (* ■ *) is displayed, but cover can not be opened*	*Call service*
5. Centrifuge is working and mains failure	**Remedies**
• **ERROR POWER FAIL** *message is displayed*	*Wait for stopping of the rotor, clear the error by pressing the* **STOP** *key.*

Emergency cover release

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

The cover can be unlock and opened only when the rotor is in the rest state.

9.2. Work safety inspection.

For safety reasons, inspection 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". 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 rotors and 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 resulted from the User's fault. Repairs should be carried out in authorized service workshops, granted with the MPW Certificate. The centrifuge shall be sent to repair after decontaminating disinfections. Information about authorized service workshops could be obtained from the Manufacturer,

11. Disposal.

When you are disposing the device, the respective statutory rules must be observed.
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.

12. Manufacturer's data.

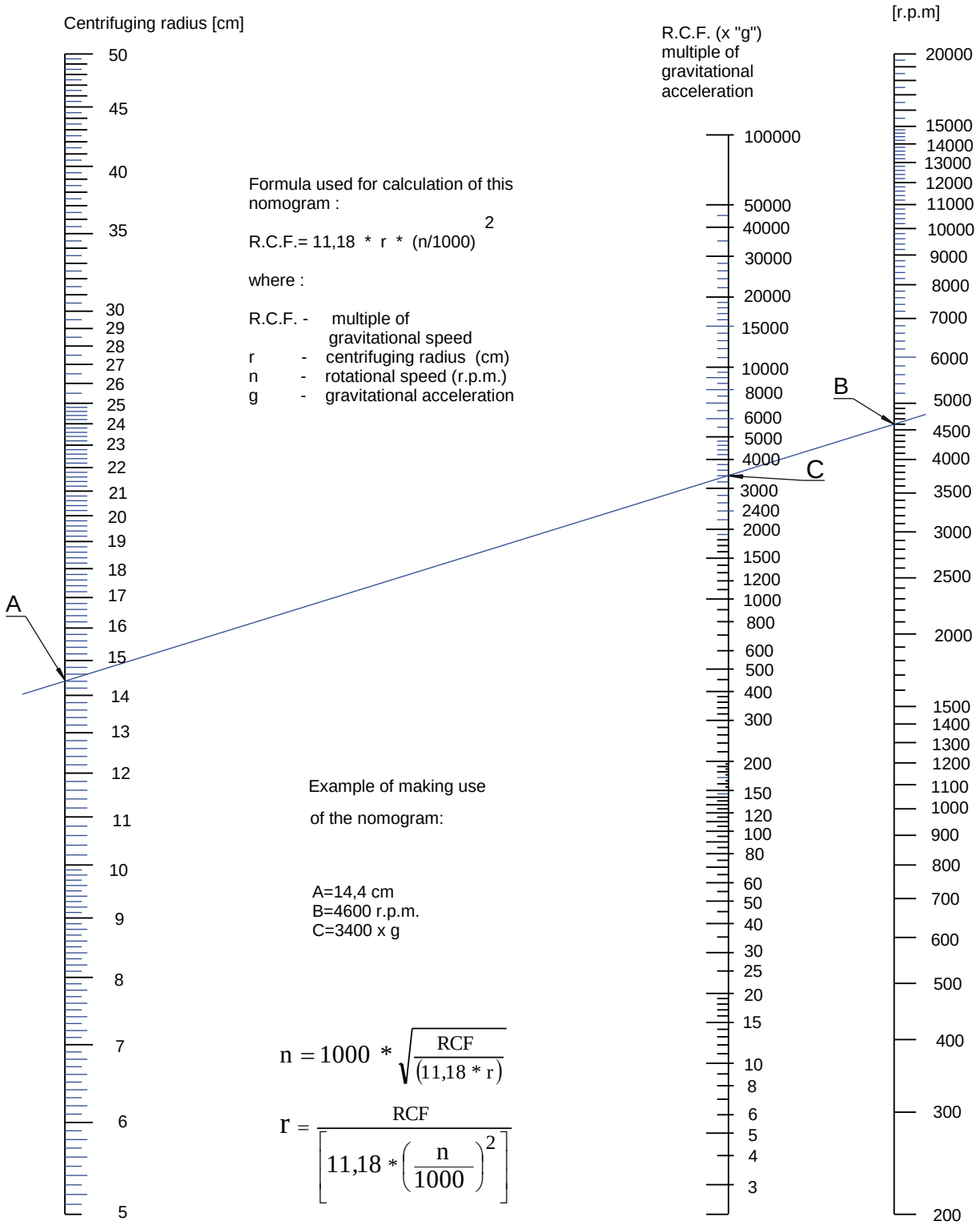
MPW MED. INSTRUMENTS
46 Boremlowska Street
PL - 04-347 Warsaw/Poland

Tel. (+ 48 22) 673 04 08 Selling
(+ 48 22) 610 81 07 Service
Fax. (+ 48 22) 610 55 36

E-mail: mpw@mpw.pl
www.mpw.pl

13. Distributor information.

YOUR DISTRIBUTOR:



Formula used for calculation of this nomogram :

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

where :

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

Example of making use of the nomogram:

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

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

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

14. Short Operating Instruction

IMPORTANT!!!
One should to take special attention for points described in detail Operating Instruction.

1. Put on the centrifuge on the stable table with flat leveled top. Ensure protective zone around the centrifuge with at least 30 cm left free (see at p. 3.2 Operating Instruction).
2. Check on rating plate correctness of the voltage and power frequency.
3. Plug in the power cord to plug-in socket located on the back wall of the centrifuge.
4. Plug in the plug of power cord to main socket.
5. Turn on the supply pushing power switch located on the back wall.
6. Open the cover.
7. Take the transport's protective insert off the motor.
8. Mount the motor according to detailed Operating Instruction.
9. Introducing the operational parameters (Programming).

Select the program number pressing one of the keys with number from 1÷9.

If the number is binary, one should to press twice the ▲ key – two horizontal dash will occur on the display – then choose the required program number with keys within range from 1÷9.

On display will display the accel/decel characteristic symbol with set the program number, press the **PROG/MEMO** key – message **PARAM PRG EDIT** occurs on the display.

Press the ▲ key – message **ROTOR** occurs on the display. Then pressing the **4¯** or **6+** key search the **rotor number**, which will be use. The number is placed on rotor.

Press the ▲ key – message **SPEED** occurs on the display. Pressing the **4¯** or **6+** key set required **rotational speed**.

Press the ▲ key – message **RCF** occurs on the display, and value which result from required speed. Set required **RCF** pressing the **4¯** or **6+** key.

NOTE! **Entering the value of RCF – the speed establishes automatically, and by analogy, setting speed the value of RCF enters automatically.**

Press the ▲ key – message **ELAPS** occurs on the display – pressing the **4¯** or **6+** key set required **operation time** in minutes within the range from 0 to 99 min.

Press the ▲ key – message _ _ **SEC** occurs on the display – pressing the **4¯** or **6+** key set required **operation time** specifying the measuring value in seconds (e.g. 54 min, 32 s).

Press the ▲ key – message **ACCEL** occurs on the display – pressing the **4¯** or **6+** key – search required **acceleration characteristic** within the range from 0 to 9.

Press the ▲ key – message **DECEL** occurs on the display – pressing the **4¯** or **6+** key – search required **deceleration characteristic** within the range from 0 to 9.

Press the ▲ key – message **BEGIN** occurs on the display – pressing the **4—** or **6+** key – set the start moment of time counting:

begin start On = from the moment pressing the **START** key;

begin speed Up = from the moment of reaching the setting rotational speed.

Press the ▲ key – message **AUTO COVER** occurs on the display – pressing the **4—** or **6+** key – set **ON** or **OFF**

Recording into memory the set program will be done by pressing the **PROG/MEMO** key.

The program stays in memory. Once more switching the centrifuge on will displayed recently realized program. It is possible select the other program pressing its number on keyboard.

10. Starting of the centrifuge:

a. Close the cover.

b. Press the **START** key.

c. After ending of centrifuging open the cover by **COVER** key.

d. Take the centrifuged preparation out.

15. 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. Attachments:
Print the parameters of spin – RS-232 / USB (option)

After completion of the centrifugation process, you can print the report. Hard copy can be obtained by using send to a computer equipped with a USB connector. Devices allowed to print report are additional accessories.

- **Komputer PC –** RS-232

Name	quantity (pcs)	cat. no
Data cable RS-232	1	16593
MPW Editor application	1	

- **Komputer PC –** USB

Elementy potrzebne do podłączenia komputera przez złącze USB:

Name	quantity (pcs)	cat. no
Data cable RS-232	1	16594
USB converter + USB cable	1	
MPW Editor application	1	

USB
or
RS-232

Preparation

Connect centrifuge to the PC with the USB A-A cable (connection diagram is given below).

if necessary install FTDI USB drivers (for details see attached CD).

Ensure that virtual serial port **COM** (USB Serial Port) settings are set as described below (run control panel/system/ **device manager**):

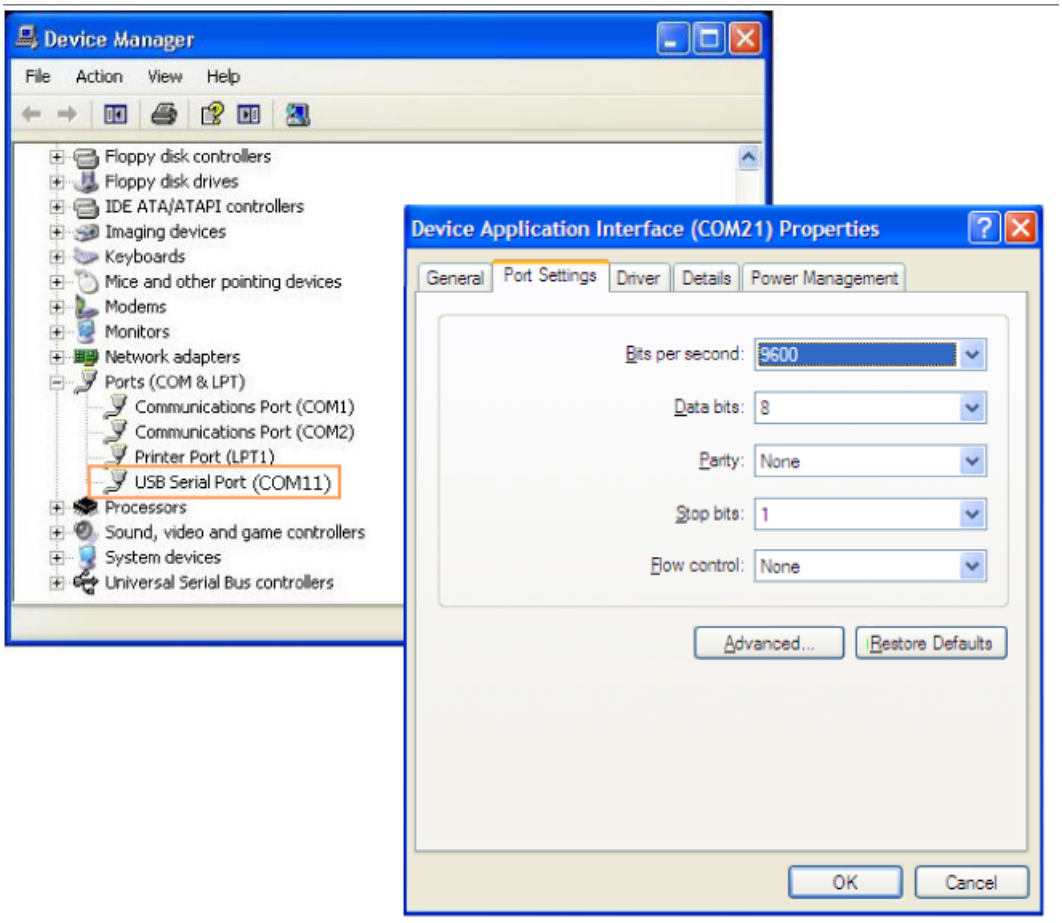
Baud rate = 9600

Data length = 8

Parity = none

Stop bite = 1

Flow control = none



Install MPW Editor application (Windows) delivered on CD.

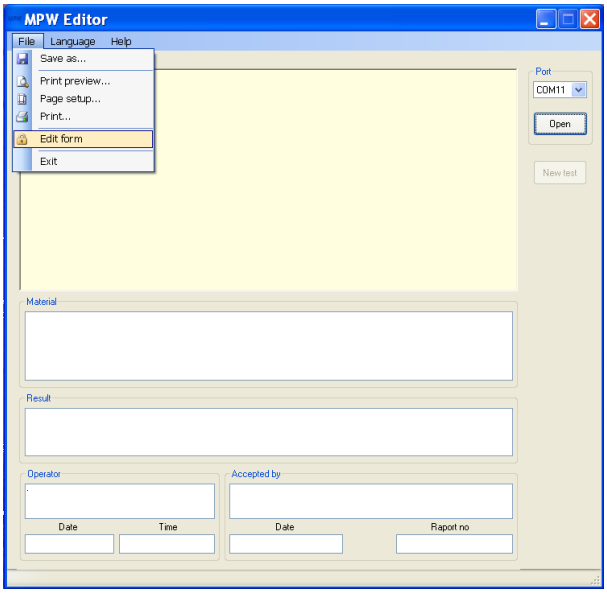
Centrifuging and printing report

Run **MPW Editor** application.

Choose **Język\English**

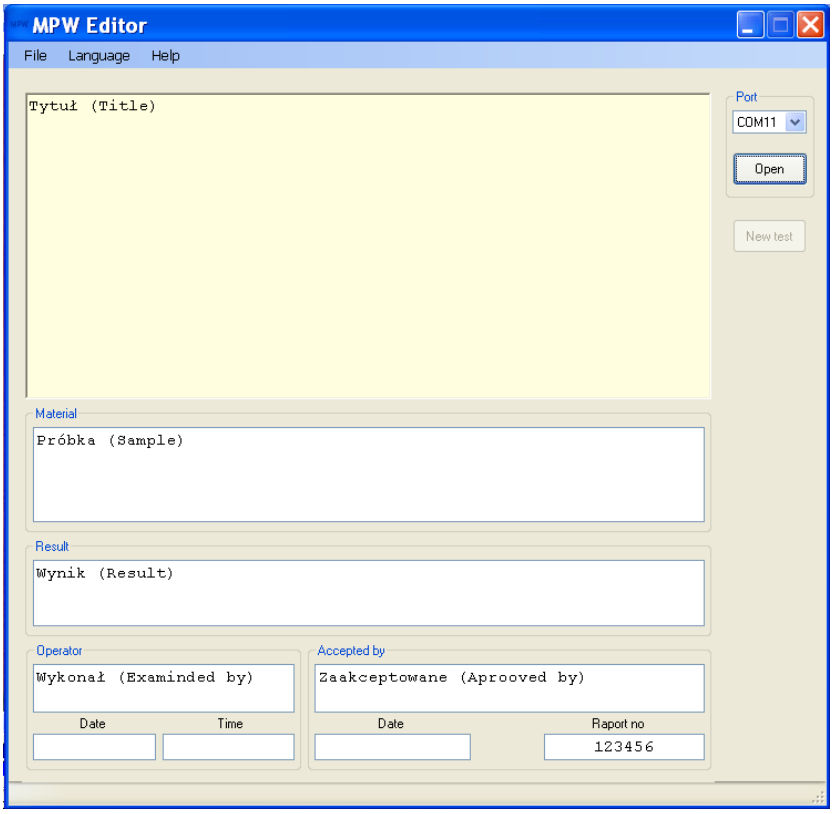
Choose **COM** port assigned to the centrifuge (it will appear after connecting USB cable, e.g. COM11).

Choose **File\Edit form**



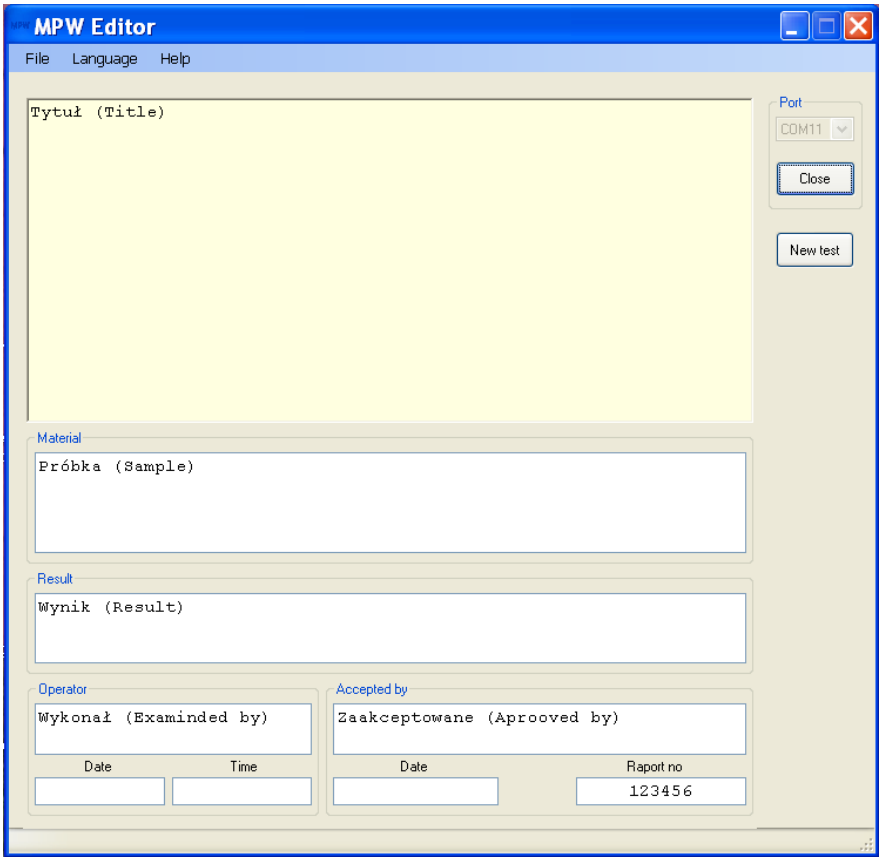
Fill individual folds (**optionally**).

In the folds with explerary caption „Tytuł (Title)", there is a possibility to paste form system clipboard any picture (e.g. company logo).



Choose **File\Save form**

Choose **Open**

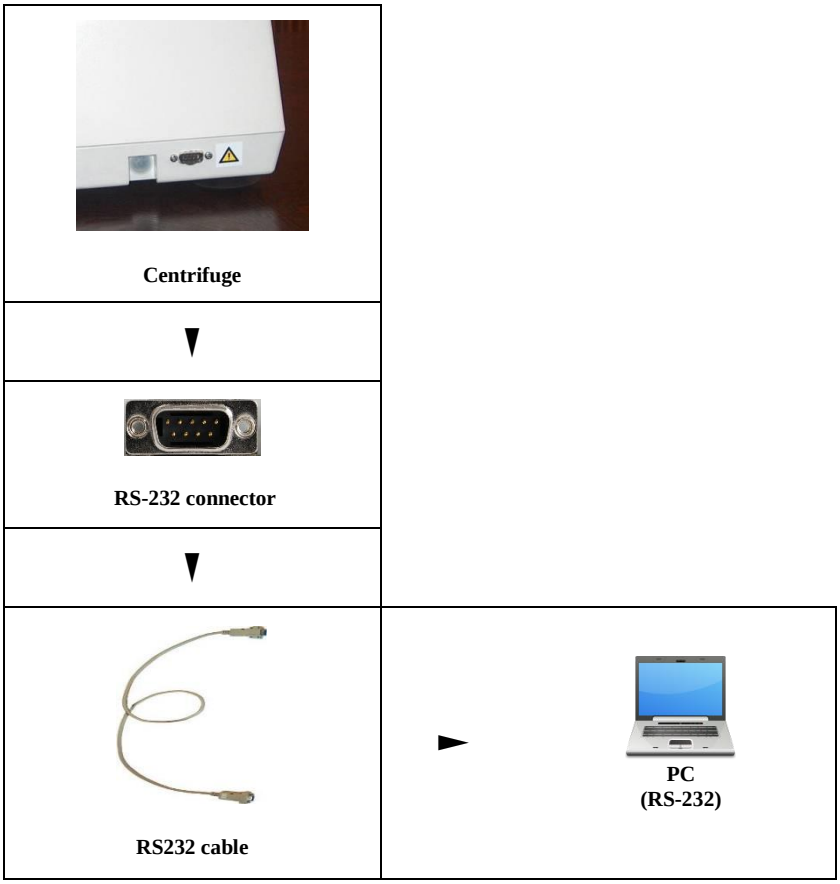


Start centrifuging.

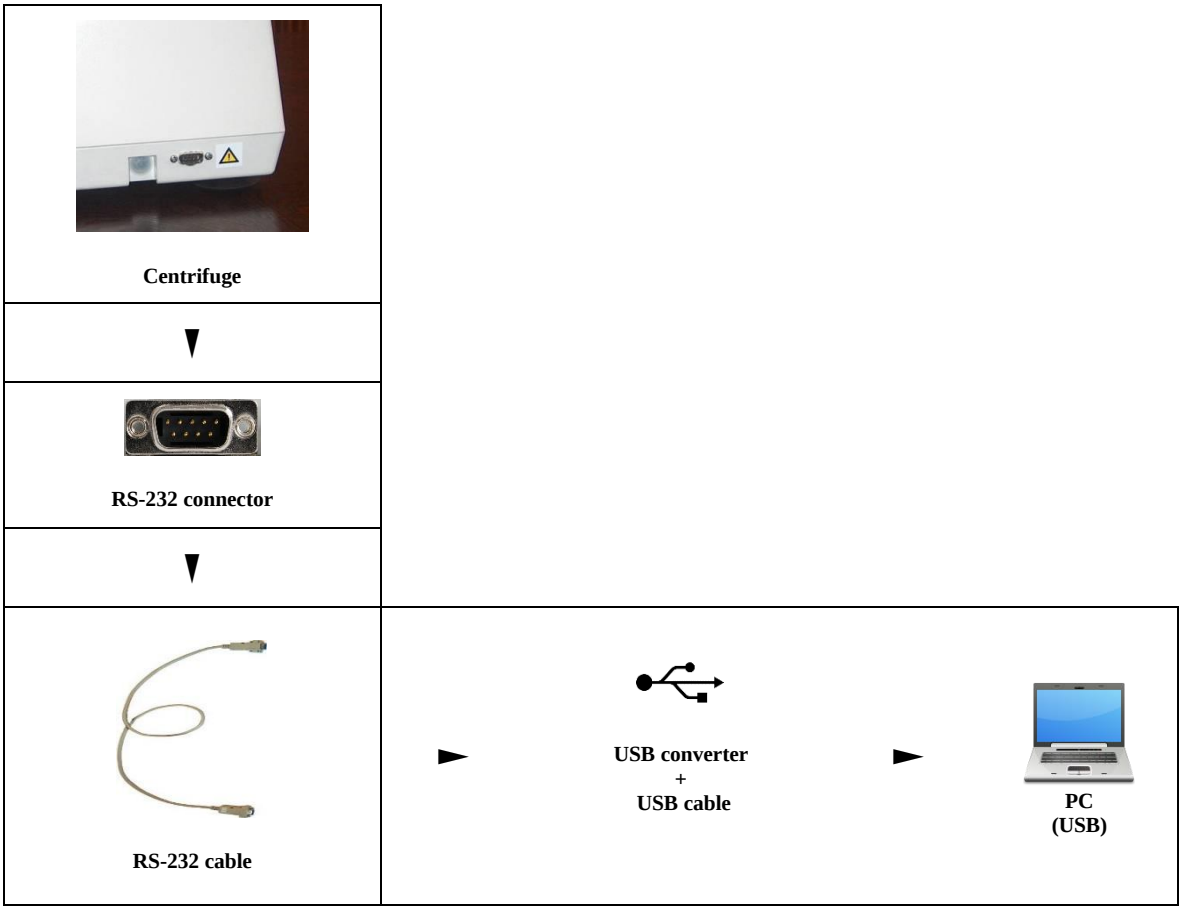
When centrifuging process is completed, report will appear. Save report (File/Save us or print it (File/Print).

In order to get another report, press **New test.**

RS-232 connection scheme



USB connection scheme



DECLARATION OF CONFORMITY

Product	**Laboratory centrifuge**
Model	**MPW-251**
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

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SPÓŁDZIELNIA PRACY
w Warszawie

Warsaw, 13.11.2014

„MPW MED. INSTRUMENTS"
SPÓŁDZIELNIA PRACY
Warsaw, 46 Boremlowska Street
Quality policy in line with ISO 9001:2008
Certifying authority

Management System
TÜVRheinland CERTIFIED
www.tuv.com ID 0000023838

nr 10.251.03

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** ……