## INSTRUCTION FOR USE

COOLING CENTRIFUGE TYPE: 154.RF...... NO: .....

**INSTRUMENTMAKERS ApS** 



- A Screws for securing cabinet sideplates
- B Thermometer showing temperature of cooling medium
- C Knob for adjusting temperature of cooling medium
- D Push button for release of manual lid-lock
- E Main switch with built-in control lamp
- K Condenser
- P Compressor
- S Control lamp for automatic lid-lock
- T Pressure point for manual locking of lid
- W Ventilator

154, RF. 1-GB

In order to utilize the COOLING CENTRIFUGE TYPE 154.RF to the best possible extent, it is very important also to read the instructions for use of the MICROCENTRIFUGE type 154.00.

If the cooling centrifuge cannot be made to function in a satisfactory manner without dismantling, kindly contact us or our agents.

We cannot be held responsible for any defects or damages arising during transport (despatch) as a result of poor or inadequate packing.

The factory guarantee will no longer apply if, during the guarantee period, the centrifuge is interfered with (dismantled) without our express consent or the consent of our agents.

### INSTRUCTIONS FOR USE

### 0.0.0 PREPARATION FOR USE

.1.0

Upon receipt, check the cooling centrifuge for possible transport damages and ensure that the operating voltage (see type-plate) conforms with the mains voltage to which it is to be connected.

### .2.0 <u>REMOVAL OF TRANSPORT SECURITY SCREWS</u>

- .1 In order to remove the centrifuge's transport security screws, as described in the Instructions for Use of the Microcentrifuge type 154.00, it is necessary to remove the the cabinet sideplates.
- .2 Screw out the bottom screws (A) and then remove the sideplates by pulling them downwards and free of the guides in the upper edge of the cabinet.

To avoid damage to the guides, the sideplates must only be pulled downwards.

- .3 The centrifuge's transport security screws can now be removed: See (H) fig.2 and instructions for use of type 154.00.
- .4 Remount the sideplates using the screws (A).

The cooling centrifuge cable can now be connected to the mains.

### .3.0 <u>POSITIONING OF CENTRIFUGE</u>

- .1 The ambient temperature must not be in excess of 35°c.
- .2 If the cooling centrifuge is required to be used at ambient temperatures higher than 35°c, kindly contact us or our agents.
- .3 There must be an ample circulation of air around the cabinet, and the openings in the cabinet must not be covered.

### 1.0.0 STARTING THE COOLING CENTRIFUGE

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154. RF. 2. GB

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The Microcentrifuge must not be used until the cooling unit has been started. Check: Light in control lamp (E).

- .2 If the centrifuge is started <u>without</u> the cooling unit having been started, the rotor will be overheated and the rotor system's bearings can be ruined.
- 1.1.0 The temperature in the rotor (samples) depends upon the temperature of the cooling medium, which is shown by the thermometer (B), but is almost independent of the rotor size and speed (g-value).
  - .1 The temperature of the cooling medium is adjusted by means of the knob (C) after the cooling unit has been started. Check: light in control lamp (E).
  - .2 The knob (C) can be turned a max. of 18 20 turns.
  - .3 The temperature of the cooling medium is reduced by turning the knob (C) <u>counter clockwise</u>.
  - .4 1 turn of the knob (C) will change the temperature of the cooling medium by approx.  $5^{\circ}c$ .
- 1.2.0 When starting the cooling centrifuge, a stable rotor temperature is achieved most quickly when the centrifuge is started at the lowest g-value in the cooling-down period.
  - .1 Stable rotor temperature is achieved at a max. of 20 minutes after starting the cooling centrifuge.

- 1.2.2 By inserting observed values in the following scheme, one is quickly able to reproduce correct rotor temperatures after rotor change etc.
  - .3
- The temperature we have stated in the scheme are those measured during testing of the apparatus.

CENTRIFUGING TIME				AFTER STANDSTILL ROTOR TEMPERA							PERAT	URES	
ROTOR							S	ЕΤ	TIN	G	(B)		
TYPE		4	↓	¥	-15	-10	-5	0	+5	+10			
										•			
	19												

1.2.4

20

62

54.RF. 3 - GB

The temperature of cooling medium must be within  $-20^{\circ}c$  and  $+15^{\circ}c$ .

- 1.3.0 When the centrifuge and the cooling unit have been stopped, the lid must be left open until any frost which may have formed during the centrifuging has disappeared.
  - .1 To prevent the unnecessary formation of frost, the lid must be fully closed as soon as the cooling unit has been started.
- 1.4.0 The lid of the type 154.00 cooling centrifuge is provided with an extra manual lock for holding the lid down against a gasket in the edge of the rotor chamber.
  - .1 When the lid is closed, it must be pressed completely down until the button (D) can clearly be heard to spring out.

Press on the round, black disk (T) on the top of the lid at the release button (D).

.2 The lid is unlocked by pressing the button (D) immediately after the control lamp (S) for "lid open" is lit.

### MAINTENANCE

- 2.0.0 Maintenance of microcentrifuge part (upper part).
  - With the exception of section 6, the instructions for use of the MICROCENTRIFUGE 154.00 apply to the microcentrifuge part of the cooling centrifuge.
  - .1 The rotor chamber must always be kept dry and clean and free of possible condensed water.

Moreover, in accordance with sections 1.3.0 - 1.3.1 .

- 3.0.0 Maintenance of cooling unit (lower part).
  - 1.0 If the type 154.RF is used in dust-filled surroundings, the cooling unit must be inspected and cleaned at least twice a year and possibly more frequently.
    - .1 The cooling centrifuge's cable must be removed from the supply socket so that connection with the mains is completely broken.
    - .2 Remove the cabinet sideplates. See point 0.1.2 .

Carefully clean all dust and dirt from the following parts:

The condensator's (K) segments

The compressor (P)

The ventilator (W) and its blades

- Use a soft brush together with a vacuum cleaner. .1
- .2 In order to achieve maximum performance from the cooling centrifuge, it is very important that the segments of the condenser (K) are completely clean and free of dust.



#### PACKING AND DISPATCH 4.0.0

The following instructions must be carefully observed in order to avoid damage to the centrifuge during transport.

- Remove the cooling centrifuge sideplates .1.0 (see points 0.2.0 - 0.2.2).
  - Fit the securing screws for the centrifuge part . 1 (see instructions for type 154.00, points 6.0.2 and 6.0.3 and fig.12).
  - Remount the sideplates. .2
- 4.2.0 PACKING

124. RI-4-CB

- Protect the cooling centrifuge with plastic foil. . 1
- Place the cooling centrifuge in a special wooden box and secure it .2 firmly with 10 angular packing blocks (see drawing above).
- Ensure that the cooling centrifuge is held securely in all directions . 3 before nailing down the lid of the box.
- Bind the box with at least 2 steel or plastic bands. .4

E DICH INSTRUMENTMAKERS ApS

3.2.0

# TYPE 154.00

### INSTRUCTION FOR USE

In order to utilize the MICROCENTRIFUGE type 154.00 to the best possible extent, it is absolutely essential that these instructions be read before taking the centrifuge into use.

After the actual instructions for use, guidance is provided in the rectification of minor operational failures together with instructions for the despatch (transport) of the centrifuge.

If the centrifuge cannot be made to function in the normal manner without dismantling, please contact us or our agents.

If the centrifuge is to be shipped or transported to another place of use, or returned for service (repair), it is essential that the packing instructions are followed carefully.

If the transport security is not carried out as described, the motor and rotor system can give rise to internal damage to the centrifuge.

B-0-L

We cannot be held responsible for any failure or damage arising during transport (depatch) as a result of poor packing and inadequate transport security not conforming with section 6.

The factory guarantee will no longer apply if, during the guarantee period, the centrifuge is interfered with (dismantled) without our express consent or the consent of our agents.

TAARNFALKEVEJ 18 DK-2650 HVIDOVRE · DENMARK TELEPHONE: + 451784185

NSTRUMENTMAKERS APS





Accessories	MICRUCENTRIFUGE						
1 mains lead 1 three-hole ko 1 hexagon key 1	ey for changing rotor for emergency opening of cover						
1.	Rotor-flange						
2.	Lamp which indicates that the cover can be opened.						
3.	Rotor radius in cm from 3.5 to 8.0						
4.	Setting of g-value 200 - 20.000 g.						
5.	Acceleration and braking time maximum/minimum.						
6.	Setting of centrifuging time min. secs. (max. 30 minutes).						
7.	Display for check on centrifuging time.						
8.	Start with indication of activated start function.						
9.	Servo-lamp which indicates that the set g-value has been reached and maintained.						
10.	Stop with indication that braking has commenced.						
11.	Hole for key for emergency opening.						
12.	Guide pins.						

13. Main switch

14. Mains cable

15. 3,15 amp. fuse type FF

### General

2

5-8-1

Check the centrifuge for possible transport damage. The red transport securing screw in the bottom of the centrifuge must be removed first, after which the 3 yellow screws can be removed, see fig. 12.

1

The centrifuge must only be connected to 220V AC, and is protected with a 3,15 amp. fuse.

The mains connection (14), the main switch (13) and the fuse (15) are located on the back of the cabinet.

The cover is <u>always</u> locked upon receipt, and no attempt must be made to open it by force. In the event of an emergency, it can be opened with the hexagon key 154.02.50 provided.

The cover can always be opened when the centrifuge is connected to the mains and the main switch (13) is on. Check: Light in display.

Open the cover and press the start button (8). The last figure in the display (7) should now light constantly.

If, upon receipt, the centrifuge is not provided with a rotor, mount the rotor as described under "Changing the rotor".

The centrifuge is now ready for use.

### Centrifuging

The rotor's number disc is marked with the radius and the max. g value, for example; R-6.3

20.000 g max.

Adjust the rotor knob (3) to the correct setting (for example 6.3) corresponding to the radius indicated on the number disc.

Set the centrifuge to the desired g value by means of the knob (4), though never higher than the max. value indicated on the rotor.

The repetition accuracy of the set g-value is  $\frac{1}{2}$  1% within the voltage range of 190-240V.

Results of incorrect setting:

Incorrect g effect on samples. Unnecessary heating-up of motor.

The acceleration and braking times are set with control (5). The centrifuging time (max. 30 mins.) is set with control (6) and is shown by the read-out display (7).

The time is calculated from start (including acceleration) to the beginning of the braking time.

After the start button (8) has been pressed, the clock shows the time remaining, and the servo-lamp (9) lights up when the desired g-value has been reached.

The cooling holes in the cover of the centrifuge <u>must not</u> be covered, as this will result in unnecessary heating of the samples.

When the time has expired, the centrifuge will start braking automatically, and the cover can be opened when the lamp (2) lights up.

Should it be desired to stop the centrifuge before the expiry of the time at which it has been set, press the stop button (10).

Check: Light in lamp over pushbutton.

If the mains voltage fails, or should a malfunction arise, the cover can be opened with the accompanying hexagonal key 154.02.50, which is inserted in the lock (11) and turned clockwise.

The motor and the drive shaft of the centrifuge are provided with a special suspension, and the sample glasses therefore need only to be balanced visually.

In the event of <u>excessive</u> unbalance or a strong shock, an unbalance switch will cut off the motor and the centrifuge is braked with max. effect.

If, for one reason of another, the centrifuge stops before the clock has been . at zero (current failure, unbalance or shock), the last figure in the display (7) will blink as an indication that the samples have not been centrifuged for the set period of time.

The indication of failure is cancelled by pressing the start button (8) while the cover is open.

A current limiter built into the centrifuge ensures that the motor is not ruined, even in the event of gross misuse.

Changing the rotor.

When changing the rotor, the accompanying rotor key 154.08.20 must be used.

The rotor shaft is provided with a right-hand thread.

The nut must be turned anti-clockwise until the rotor has been drawn completely free of the flange (1).

Before fitting a new rotor, check that the rotor and the flange are clean.

When fitting the rotor, the pins (12) in the flange (1) must engage the holes in the rotor before the thread can take hold. The nut must be turned <u>clockwise</u> until it stops (tighten well). The centrifuge is ready to start. Remember correct setting of rotor switch and g-value.

- 1.0.0 Operational failures. Testing and fault-finding without dismantling.
  - 1.0 There is no light in the display or control lamps. Check the following points:
    - .1 Main power supply 220v 50Hz.
    - .2 The mains cable (14) must be pushed right into the centrifuge's supply socket.
    - .3 The main switch (13) is on (I).
    - .4 The 3.15 amp fuse (15) has not blown.
    - .5 Check the mains cable (14) for periodic failure, for example by bending it at the plugs.
- 1.2.0 There is light in the display and control lamps, but the centrifuge does not function in the normal manner. Check the following:
  - .1 That the electronic clock (6) and (7) is set at, at least 10 secs. The centrifuge cannot be started if the clock shows 00.00.
  - .2 That the lid is completely closed.
  - .3 Both microswitches 154.10.02 must be activated when the cover is opened and closed (can be heard).
  - .4 When the main switch (13) is switched on, the lid is normally able to be opened. The lid can always be opened with the hexagonal key, which is inserted in the hole (11) in the right-hand side of the centrifuge and turned clockwise.
  - .5 When the power supply is switched off, the lid must be locked.
  - .6 The lid must be able to be opened a few seconds after connecting the mains voltage by means of the main switch (13).

If the centrifuge does not function after all the points under the main section 1.0.0 have been checked, please contact us or our agent.

- 2.0.0 <u>Testing of the centrifuge without dismantling</u>.
  - 1.0 Unbalance switch.
    - .1 The last figure in the display (7) must blink when the side of the centrifuge cabinet is hit with the flat of the hand.
    - .2 The indication of failure (blink) <u>must always</u> be able to be annulled by briefly pressing START (8).

### 2.0 Lid-locking system.

.1 The locking system with opto-tacho unit is tested by turning the rotor shaft (1) quickly with the fingers, whereby the locking system must shift. This can be heard and observed in the locking-pin holes (C) in the cabinet.

	ØDxLmm	ml.	MATERIALE	LEVERANDØR	ORDRE NR.	
A	8 x 30	0,5	GLAS	OLE DICH	A/8 x 30	
В	10 x 30	1	GLAS	OLE DICH	B/10 x 30	
. в2	9 x 30	1,5	GLAS	OLE DICH	B2/9 x 50	
С	12 x 35	2	GLAS	OLE DICH	C/12 x 35	
D	10,8 x 39	1,5	POLYPROPYLEN	SARSTEDT	72.690	
 F	13 x 50	Λ	POLYPROPYLEN	NUNC	341 378	
<u>1</u>	15 x 50	-1	POLYSTYREN	NUNC	361 239	
F	11 x 70	3,5	POLYETHYLEN	NUNC	466 982	
G	10 x 75	3,9	POLYSTYREN	SARSTEDT .	55.480	
Н	12,5 x 38	2,5	POLYPROPYLEN	NUNC	349 638	
I	·		F.EKS.	SARSTEDT	CB.300	
K	5,8 x 29	0,25	POLYETHYLEN	MILIAN INSTRUMENTS	ETH-26	
L	7 x 50	0,8	POLYSTYREN	SPEC. HOLLAND		
M	8,2 x 41	1	POLYPROPYLEN	MILIAN INSTRUMENT		
N	5,8 x 47,5	0,55	POLYPROPYLEN	MILIAN INSTRUMENT	PAT-22	
0	15 x 65	6	POLYSTYREN	NUNC	341 440	
P	7,8 x 30	0,75	POLYPROPYLEN	SARSTEDT	, 72.699	
R	11 x 56	3	POLYSTYREN	ELLERMANN		
			POLYPROPYLEN	MILIAN INSTRUMENT	PRO-22	
ç	5 8 v 47 5	0.4	POLYETHYLEN	MILIAN INSTRUMENT	EET-23	
5	5,0 × 47,5		POLYETHYLEN	SARSTEDT	72.700	
			POLYPROPYLEN	SARSTEDT	72.701	
	13 x 75	7	POLYPROPYLEN	SARSTEDT	55.525	
1	15 . 75		POLYSTYREN	SARSTEDT	55.475	
W	13 x 46	2	POLYPROPYLEN	NUNC	341 173	
X	16 8 x 67	10	POLYPROPYLEN	SARSTEDT	55.533	
21	10,0 % 0,		POLYSTYREN	SARSTEDT	55.481	
Z	20 x 47	8,5	POLYPROPYLEN	SPEC. BELGIEN		
01	8 x 45	0,8	POLYPROPYLEN	MILIAN INSTRUMENT		
02	25 x 55	14	POLYPROPYLEN	OLE DICH 01/25		



OLE DICH

		g × 1000 3 2 1 1 5 15							
		20.000	10.000	.2. 5.000	2.000	1.000	500	200	
	3,5	22.608	15.986	11.305	7.150	5.055	3.575	2.261	
	4	21.148	14.954	10.574	6.688	4.729	3.344	2.115	
ROTOR	4,5	19.938	14.098	9.969	6.305	4.458	3.153	1.994	
5, 5	5	18.915	13.375	9.458	5.981	4.230	2.991	1.891	
ITY 7	5,5	18.035	12.753	9.017	5.703	4.033	2.852	1.803	
	6	17.267	12.210	8.634	5.460	3.861	2.730	1.727	
4 14 8	6,5	16.590	11.731	8.295	5.246	3.710	2.623	1.659	
	7	15.986	11.304	7.993	5.055	3.574	2.528	1.598	
	7,5	15.444	10.920	7.722	4.884	3.453	2.442	1.544	
	8	14.954	10.574	7.477	4.729	3.343	2.364	1.495	

Umdrehungen | Omdrejninger / Minute Revolutions

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# ROTORS

### Rotor types marked with \*\* cannot be used in cooling centrifuge type 154.RF

**INSERTS** 

		and a loss of them as to be the to be the state of the st	Contraction Constitution of the	promition officers	See State	No. 1 Million		Const Longel -		Topologie May Mahaga Avenue	and the state of the state of the state of the state	Alexandre Barresser, Barresse
			and the Context of Figure 1 was not been a	1996.0.044	SUPPORT OF		Г <sup></sup>		Leoka Char			CAPACITY
POLYSTYRENE												ANGLE ROTOR
GLASS												SLIDE ROTOR
TYPE		ØD×Lmm	ml	4	4	+	+	+	4	Rcm	g max.	TYPE
	A	8×30	0,5	0			12		•	4,4	20.000	154.099.A
	B	10×30	1				10		•	4,5	20.000	154.099.B
-	B2	9×50	1.5	0			20		•	6.1	15.000	**154.150.B2
-	C	12×35	2		-		6	-	0	4.3	20.000	154.099.C
		12/00		-		0	6		0	5.3	20,000	154,120,E
	-	12×50	1				12			6.7	20,000	154 140 F
	-	13×50	-				14	-		0,1	20.0001	10
		1470	0.5	-			10			70	15 000	**154 150 F
	F	11×70	3,5			•	0			7,2	15.000	**154 150 G
	G	10×75	3,9				8			1,2	15.000	154.000 H
D	н	12,5×38	2,5			•	6		•	4,4	20.000	154.099.11
	1	7~50	0.9		•		16		0	5,3	20.000	154.119.L
	L	7×50	0,0		0							
		0.0:41	4			•	12		•	4,9	20.000	154.105.M
	M	8,2×41	1			•						
			1.		•		6		0	6,5	15.000	154.137.0
	0	16×65	6		•							
					0		6		0	5.6	20.000	154.119.R
	R	11×56	3	-	0					0,0		
	T	13×75	7				8		0	72	15,000	**154.150.T
	-	10/10			0		6		0	6.5	15,000	154 139 X
	X	17×67	10	-			0		-	0,0	10.000	104.100.7
					-		0			6.2	15.000	15/ 125 7
	Z	20×47	8,5	-			8	-		0,3	15.000	154.155.2
				-		•		-	-	0.4	00.000	**154 145 01
	01	8×45	0,8			•	24		0	.6,1	20.000	**154.145.01
	02	25×55	14			0	6		-	6,6	10.000	154.140.02
						•	8		0	5,0	20.000	154.110.D
			1,5			•	12		0	6,2	20.000	154.130.D
					-	0	20		•	5,4	15.000	154.137.D
	D	10,8×39			-	0	24		0	6,1	15.000	**154.150.D
						•	18	0		6,2	9.000	**154.012.02
124						•	18	0		6,2	17.200	**154.012.23
						•						
b b						•	12		•	4,3	20.000	154.099.P
L		7.000	0.75		- 34	•	24	0		5,3	11.000	**154.012.02
	Р	7,8×30	0,75			0	24	0		5,3	14.700	**154.012.23
						0	24		0	5,1	20.000	154.127.P
				1	-	•	16		•	5,0	20.000	154.119.N
				-		0	48	0		5,3	10.000	**154.012.02
	К	5,8×29	0,25	-		•	48	0	1	5.3	14.700	**154.012.23
				-				1	-			1
				-	-	0	16		0	5.5	20.000	154,119.N
D			0,4		-		48		+	72	7 000	**154.012.02
L	S	5,8×47,5		-			19		+	70	20,000	**154 012 23
-				-			+0	-	+-	1,2	20.000	104.012.20
				+		-	10	+-	-	EF	20.000	154 110 N
				-			10			5,5	20.000	104.119.IN **154.010.00
۲ <u>ــــــــــــــــــــــــــــــــــــ</u>	N	5,8×47,5	0,45	-		0	48	0		1,2	7.000	**154.012.02
D		in in its Martin		-		0	48	0		1,2	20.000	**154.012.23
L						0			-			
					-	0	6		0	5,3	20.000	154.120.E
( <b>D</b>	W	13×46	2		_	0	12		•	6,7	20.000	154.140.E
						•						
Bm					1	0	6	_	0	4,7	20.000	154.114.1
D	1	11×45				۰	12		0	6,1	20.000	154.140.I
		21				•						

## ROTORS

For OLE DICH MICROCENTRIFUGES there is a wide selection of standard inserts of glass, polypropylene, polystyrene etc.

For the most popular inserts we can offer a large programme of standard rotors, as shown on the next page.

The type designations (order numbers) of the rotors are stated in the right-hand column opposite the relevant inserts.

All rotors are of aluminium and produced with great precision. Rotors, holders and slides are anodized.





SLIDE ROTOR type 154.012.23 has a max. capacity of 6 slides (holders) of the type 154.21.xxx. Type designations (order numbers) for standard slides for different inserts are stated in the table.

TYPE	INSERTS	CAPACITY			
154.21.KS.5	K N S	5			
154.21.KS.8	K N S	8			
154.21. D.3	· D	3			
154.21. P.4	Р	4			

TYPE 154.012.02 is SLIDE ROTOR 154.012.23 without the closed two-part casing (part A and B).