SCANSPEED

INSTRUCTION MANUAL

PERSONAL MICRO CENTRIFUGE

ScanSpeed Model Mini

Revision : 01
Date : 2013.03.05
Cat. No. : 9.900.900.730

CE

Symbols used in this manual

☞	**Note**
	Used to direct attention to a special item.

	**Warning**
	Used in case of danger of a serious accident or lethal injury.

LaboGene ApS
Industrivej 6-8
Vassingerød
DK-3540 Lynge
Denmark

Phone No. +45 39 40 25 66
Fax No. +45 39 95 25 66

Mail info@labogene.com
Internet www.labogene.com

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1 Precautions

Before using, read this instruction manual to ensure correct usage and thorough understanding of the instrument. Incorrect handling could possibly result in personal injury or physical damage of the unit or its accessories. The manufacturer accepts no responsibility for any damage caused by mishandling that is beyond normal usage as defined in this manual. The manufacturer is only responsible for the security, reliability and performance of the instrument, if the unit is operated in accordance with the operating instructions. The installation, adjustments, changes or repairs must be performed by authorized personnel.

For your own safety, please review the following precautions:

- NEVER use a power source other than that designated for the instrument.
- NEVER operate the instrument, if it has not been installed or repaired properly. Repairs must be performed only by qualified personnel authorized by LaboGene.
- NEVER use unapproved rotors and associated components. Contact the manufacturer prior to such use to prevent possible damage to the instrument.
- NEVER attempt to open the lid or move the instrument unless the rotor is completely stopped.
- NEVER operate the instrument without a rotor installed correctly and secured to the motor shaft.
- NEVER centrifuge flammable, toxic, radioactive, explosive, or corrosive materials.

	Note
☞	When it is required to handle the Risk Group II materials that are known to be toxic, radioactive materials or pathogenic micro-organisms, as identified in the World Health Organization (WHO): “Laboratory Biosafety Manual,” the guidelines recommended by WHO should be followed to ensure the safety. (http://www.who.int/csr/resources/publications/biosafety/Labbiosafety.pdf)

- NEVER exceed the rated speed or specific gravity. Samples whose density is greater than 1.2 g/mL must have reduced maximum rotational speed to avoid rotor failure.
- ALWAYS load the rotor symmetrically with evenly weighted samples to avoid rotor imbalance. If necessary, use the water blank to counterbalance the unpaired sample.
- ALWAYS locate the instrument on a flat, level, rigid, and vibration free surface.
- ALWAYS mark a safety zone of 30 cm around the centrifuge to indicate that neither hazardous materials nor persons should be permitted within the area during operation, as safety regulations required.
- ALWAYS position the instrument with additional free space on each side of instrument to ensure proper ventilation.
- ALWAYS install the instrument within a temperature and humidity controlled environment.
- (Permissible ambient temperature: +5 °C – +35 °C, Relative humidity: ≤ 80 %)
- ALWAYS disconnect the power supply prior to maintenance and servicing to avoid electrical shock. Do not immerse.
- ALWAYS use proven disinfection procedures when centrifuging bio-hazardous materials.

2 Introduction

The Mini centrifuge is a bench top high-speed, multi-purpose micro-centrifuge designed to be used in medical, industrial, and scientific applications. Its user-friendly control features and compact, space-saving design delivers maximum solid performance for your daily centrifugation needs. The Mini is supplied with easily interchangeable rotors to accommodate micro-tubes and PCR strips.

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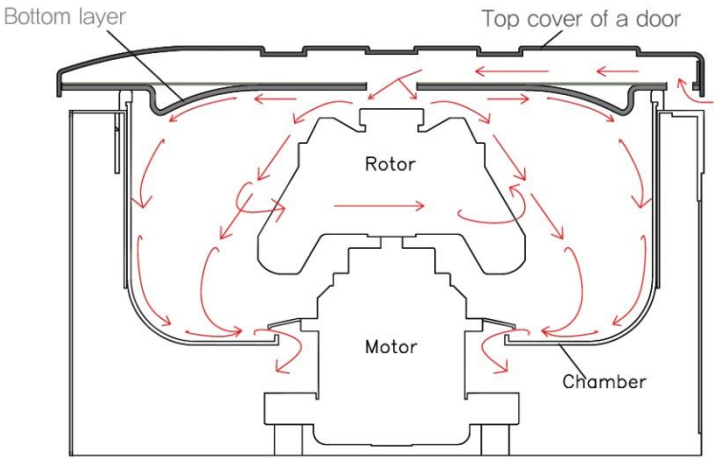
3 Product features

- Maximum centrifugation speed/force of 13,500 rpm / 12,300 x g.
- Compact and space saving design with a small foot print.
- Reduce operating time with fast acceleration (≤ 12 sec) / deceleration rates (≤ 16 sec).
- “Pulse” for quick runs.
- Highly visible LCD display (blue backlit with white text) and intuitive controls with a soft touch keypad.
- Automatic RPM/RCF conversion.
- Automatic detection system with audible alarm alerting the user when speed, heating and weight limit is exceeded.
- 3-layered stainless steel door with interlock system for safety and durability.
- Maintenance free and environmentally friendly high torque AC induction motor ensures quiet operation.
- Unique airflow design prevents overheating of samples.
- Supplied with autoclavable angle rotor with optional PCR rotor.



Schematic diagram of mini’s air flow design.

The patented, unique internal design circulates an efficient airflow inside the instrument, reduces spinning frictions, whilst minimizing both the motor temperature and the noise levels.

4 Specifications

	mini with Angle Rotor	mini with PCR Rotor
Maximum RPM	13,500 rpm	6,000 rpm
Maximum RCF	12,300 x g	1,850 x g 1,542 x g
Maximum Capacity	12 x 1.5/2.0 mL	4 x 8 x 0.2 mL PCR strips
Run Time	Timed ≤ 30 min	
Acceleration Time	≤ 12 seconds	
Deceleration Time	≤ 16 seconds	
Noise Level	≤ 60 dB	
Motor	High torque AC induction motor	
Power & frequency	110 V, 50/60Hz	
Power Requirement	2.0 KVA	
Weight	4.4 Kg (10 lb) for main body only	
Dimension (W x D x H)	208 x 245 x 145 mm (8.2 x 9.6 x 5.7 in)	
RPM/RCF Conversion	Automatic	
Imbalance Recognition	Automatic	
Safety lid lock	Automatic	
Certification	CE	

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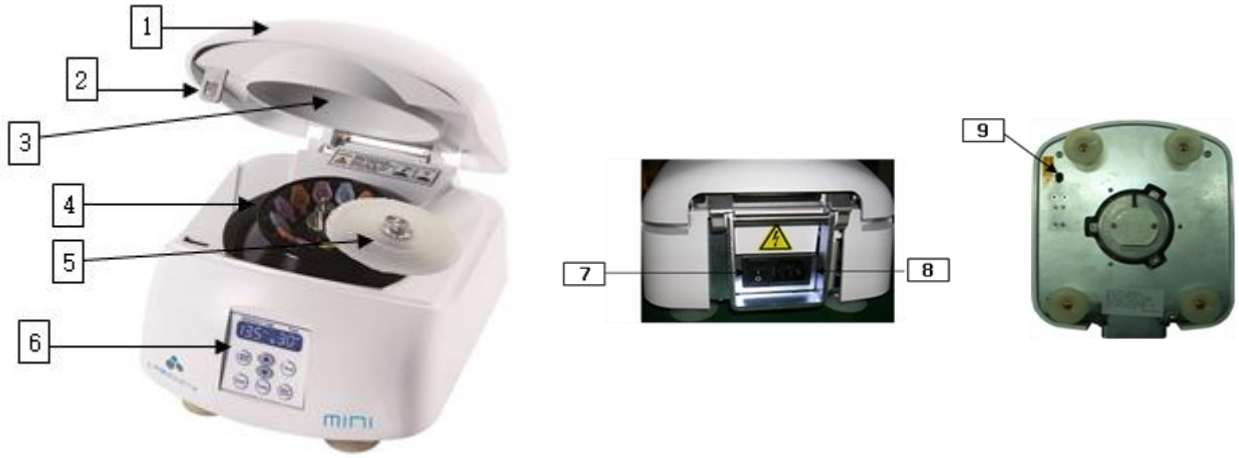
5 Package contents

Main Body, 1 unit
Rotor: Autoclavable fixed angle rotor with 12 tube holes for 1.5 / 2.0 mL tubes, 1 unit
Rotor Lid: Autoclavable plastic rotor lid, 1 unit
Adapter: Adapters for 0.2 mL PCR tubes, 12 units
Power Supply: AC Power Cable (3m), 1 unit
Operation Manual, 1 unit

Main Body	Rotor & Lid, GRF-m2.0-12	Adapter for 0.2 mL tubes
		
		AC Cord
		

6 Physical description



1. Door
2. Door Lock
3. Ventilating Hole & Center Window
4. Rotor
5. Rotor Lid
6. Control Panel
7. Power Switch
8. Power Socket
9. Emergency Door Open Hole

7 Front control panel description

1. Display LCD control panel: Displays set values and actual operating conditions
   - Speed/Force (RPM/RCF): Displays rotor speed/force in RPM/RCF x 1000
   - Centrifugation: Sign"blinks" whilst spinning.
   - Status of door: Indicates door status as for open or for closed.
   - Time: Displays remaining time in min or sec.
2. Speed/force Setting Button: Press to set speed/force value and to switch between RPM and RCF.
3. Door Button: Press to open door.
4. Time Setting Button: Press to set run time between 1 min to 30 min.
5. Pulse Button: Press to use for quick separation.
6. Start & Stop Button: Press to start and stop operation.
7. Up & Down Arrow (▲, ▼) Buttons: Press to change input data.

8 Installation

⚠	**Warning**
	• Safety regulations require a safety zone of 30 cm around the centrifuge that needs to be marked to indicate that neither hazardous materials nor persons should be permitted within the area during operation. • Proper ventilation is necessary to prevent the overheating of samples.

1. Inspect the instrument and the parts for any visible signs of shipping damage.

☞	**Note**
	Any claims for damage must be filed within 48 hours with the transportation carrier.

2. Unpack the unit and verify the contents of the package.
3. Place the instrument on a clean, flat, level, and vibration free surface.
4. Plug the power cord into the appropriate power outlet.

☞	**Note**
	Check that the power supply corresponds with the manufacturer's specified electrical requirements.

5. Turn the power on. The switch is located on the rear side of the unit.
6. Once the power is applied, the door will be opened automatically.

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7. Carefully place the rotor onto the motor shaft. Hold the rotor with one hand and securely tighten the rotor nut to the shaft by turning clockwise.

☞	**Note**
	Turn the rotor nut counter clockwise to release the rotor from the shaft.

9 Operation

⚠	**Warning**
	• Check tubes and rotors for cracks and deformities before each use. • Do not attempt to open the lid unless the rotor has stopped completely. • Do not exceed safe rotor speed. • The operator should not leave the centrifuge until the full operating speed is attained and the machine appears to be running safely without vibration. • Stop the centrifuge immediately and unplug the power cord if an unusual condition (noise or vibration) begins. • If tube breakage occurs, turn centrifuge off immediately. Leave for 30 minutes to reduce the risk of aerosols. The operator should wear proper gloves, remove debris, clean and disinfect centrifuge interior and rotors. • Clean all spills immediately and decontaminate the instrument and rotor after use with biological or radioactive materials.

1. Turn the power switch to “ON” position. The switch can be found on the rear of the instrument.
2. Press the “Door” button on the control panel to open the door.
3. Load sample tubes into the rotor symmetrically with evenly weighted samples and securely close the rotor lid by pressing the snap connector on the rotor nut.

☞	**Note**
	Do not attempt to exceed the maximum load or speed of the rotor. The maximum allowable speed needs to be reduced to spin solutions with a density greater than 1.2 g/ml (see Appendix for details).

4. To set or change the centrifugation parameters, follow the instruction below.
   a. Speed/Force: Press the “RPM/RCF” button and press the arrow buttons (▲,▼) to select or change speed in increments of 100 RPM from 1200-13500 RPM.

☞	**Note**
	Press the “RPM/RCF” button once again to enter or change the force in RCF or convert speed in RPM to RCF.

   b. Time: Press the “Time” button and press the arrow buttons (▲,▼) to adjust the desired length of spin time from 1 ~ 30min. The remaining operation time will be displayed.
   c. Pulse: Press the “Pulse” button on the control panel for quick spin cycle. Press and hold the button for desired length of time and release to deactivate it.

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☞	**Note**
	The parameters can be adjusted during the centrifugation.

5. Close the centrifuge door by press down firmly until the latch handle is fully retracted.

☞	**Note**
	The instrument will not operate if the door is not properly latched.

6. Press the “Start/ Stop” button to start the centrifuge, and at any time, press the button again to stop the operation.
7. The door opens automatically at the completion of the run and the rotor stops fully.

☞	**Note**
	In the event of a power failure or malfunction, the door can be opened manually with Emergency Door Open function. (See Troubleshooting for details).

8. Remove the samples. Clean the instrument and rotor thoroughly.

10 Maintenance and care

	**Warning**
	• Do not immerse the instrument in liquid or pour liquids over it. • Before cleaning or maintenance, always isolate and disconnect the power supply to eliminate the risk of electric shock. • Do not use any volatile chemicals such as alcohol, benzene, acetone, and etc. • Liquids must not come into contact with the motor. • Always use a soft lint-free cloth and non-corrosive, neutral cleaning agents with pH value 6-8 to clean all parts. Rinse thoroughly with distilled water and dry completely.

10.1 Rotor

- Preparation for the cleaning
  - Remove any rotor adapters and tubes from the rotor prior to cleaning.
  - Remove the rotor securing nut from the motor shaft by turning counterclockwise,
  - To remove the rotor from the motor shaft, carefully lift the rotor directly upward in a straight vertical motion.
- Keep the rotor clean and dry at the end of each work day, and immediately after any spill.
- Periodically inspect the rotor for dents, dings, scratches, discoloration and cracks. If any of these signs are evident, discontinue use and replace the rotor immediately.
- Always use non-metallic, soft brush to wash rotors to prevent corrosion that can emanate from scratches.
- Remove adapters after use and inspect for corrosion.
- Alternatively, the rotor and the rotor lid can be cleaning in an autoclave.

10.2 Centrifuge body (External surfaces and the Chamber)

- All parts should be wiped down periodically to prevent corrosives or contaminants from drying on component surfaces.
- In case of glass tube breakage, all parts must be thoroughly cleaned and all broken particles must be removed immediately.

- Abrasions or scratches should not be made on the surfaces, as corrosion may result.

10.3 Transport

- Avoid impacts during transportation and do not drop the unit as damage will result.
- Always remove the rotor and pack the inside of the chamber with protective packaging before transporting the instrument. This prevents damage and minimizes any impact to the shaft.

10.4 Return

- Before returning the unit and/or associated accessories, for any reason, prior permission must be obtained from LaboGene, Inc.
- All parts MUST be shipped along with “Return Merchandise Authorization (RMA) number” and “Certificate of Decontamination.” Please contact LaboGene, Inc. to obtain the forms.

	Note
☞	In order to protect our personnel, Certificate of Decontamination needs to be filled out completely to ensure that all parts are free from pathogens, chemical hazards, and/or radioactivity. Sterilization and decontamination MUST be done prior to returning the parts.

- Failure to attach the forms will result in return or disposal of the items without review of the reported problem.

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11 Troubleshooting

In the event of a malfunction, the error message with code number appears to indicate the probable causes and the instrument will be in the stop mode. If other malfunctions without error code indication occur, turn off the power immediately, identify the causes and follow the corrective actions as recommended below. For any problems not covered here or you are unable to correct the malfunction, contact LaboGene for assistance.

If the instrument stops due to an error indication, the run cannot be restarted until the error is cleared. After the problem is corrected, reset the instrument to check if the error occurs again.

Error Indication	Possible Reason
No display or power: Power failure during operation; display screen is blank	• Instrument is powered up incorrectly **Corrective Action** 1. Plug the power cord into the appropriate power outlet. 2. Turn the power switch off and back on to reset. • Instrument is not connected to the power outlet **Corrective Action** 1. Make sure to securely connect the power cord to the power outlet. 2. Turn the power switch off and back on to reset. • Temporary system error **Corrective Action** Turn the power switch off and back on to reset. * If problem cannot be resolved, use the Emergency Door Open function to open the door manually to save samples. Call LaboGene for Service.
Operation cannot start	• Rotor recognition or sensor error **Corrective Action** Perform the recommended corrective action as listed in E1 and/or E9. • Door is not closed completely **Corrective Action** 1. Make sure to press down the door firmly until the latch handle is fully retracted. 2. Turn the power off and back on to reset. • Door switch or sensor error **Corrective Action** Turn the power off and back on to reset. * If problem cannot be resolved, use the Emergency Door Open function to open the door manually to save samples. Call LaboGene for Service. • Temporary system error **Corrective Action** Turn the power switch off and back on to reset. * If problem cannot be resolved, call LaboGene for Service
Door does not open	• Door switch or sensor error • Door latch is not operating properly **Corrective Action** Turn the power off and back on to reset. * If problem cannot be resolved, use the Emergency Door Open function to open the door manually to save samples. Call LaboGene for Service.
Door does not close	• Door switch or sensor error • Door latch is not operating properly **Corrective Action** Turn the power off and back on to reset. * If problem cannot be resolved, use the Emergency Door Open function to open the door manually to save samples. Call LaboGene for Service.
Instrument is vibrating excessively or making unusual noise	• Rotor is not balanced **Corrective Action** Perform the recommended corrective action as listed in E8. • Mechanical failure or damage **Corrective Action** Turn the power off immediately and call LaboGene for Service. * If problem cannot be resolved, call LaboGene for Service.

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Error Code	Problem	Possible Reason
E1	RPM Sensor Error: Failure to reach to 200 rpm within 2 sec.	• Temporary system error **Corrective Action** Turn the power switch off and back on to reset. If problem cannot be resolved, it is possible that • RPM Sensor is defective or damaged; or • RPM sensor cable or wire is not connected. Call LaboGene for Service
E2	Door Open Error: Door opens during operation	• Door was opened by the emergency door open function • Temporary system error **Corrective Action** Close the door and turn the power switch off and back on to reset. If problem cannot be resolved, it is possible that • Door sensor or latch is defective or damaged. Call LaboGene for Service
E3	Motor Overheated: Detected internal temperature is higher than 110℃	• Ventilation inlet opening is blocked and obstruct required air flow. **Corrective Action** 1. Clean the ventilation inlet opening or remove any objects are blocking the vent. 2. Tun the power switch off and wait approximately 1 hour with the door open to cool down the motor. 3. Turn the power switch back on to reset. • Temporary system error **Corrective Action** Turn the power switch off and back on to reset. If problem cannot be resolved, it is possible that • Temperature sensor is defective or damaged. Call LaboGene for Service
E4	Undervoltage	• Supply voltage is lower than specification requires **Corrective Action** Use Automatic Voltage Regulator to provide proper voltage.
E5	Overvoltage	• Supply voltage is higher than specification allows **Corrective Action** Use Automatic Voltage Regulator to provide proper voltage.

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Error Code	Problem	Possible Reason
E6	Overspeed: Detected actual speed value in rpm is 1,000 rpm higher than set speed value	• Temporary system error **Corrective Action** Turn the power switch off and back on to reset. If problem cannot be resolved, it is possible that • software has not been updated. Call LaboGene for Service to update the software and tune revision
E7	Control system failure	• Temporary system error **Corrective Action** Turn the power switch off and back on to reset. If problem cannot be resolved, it is possible that •softmware has not been updated. Call LaboGene for Service to update the software and tune revision
E8	Rotor Imbalance	• Instrument is not positioned on a flat, level, and vibration free surface **Corrective Action** 1. Relocate instrument to a flat, level, and vibration free surface. 2. Turn the power switch off and back on to reset. • Rotor is not balanced **Corrective Action** 1. Make sure if samples are evenly weighted and distributed symmetrically around the center of rotation. 2. Turn the power switch off and back on to reset. • Rotor is not securely attached to the shaft **Corrective Action** 1. Make sure the rotor and/or rotor lid is securely attached to the shaft. 2. Turn the power switch off and back on to reset. • Instrument has been moved or temporary system error **Corrective Action** Turn the power switch off and back on to reset. • Temporary system error **Corrective Action** Turn the power switch off and back on to reset. If problem cannot be resolved, it is possible that • Imbalance sensor is defective or damaged. Call LaboGene for Service
E9	Rotor recognition error	• Rotor has not been installed properly **Corrective Action** 1. Install the rotor as instructed in the manual and make sure the rotor is aligned correctly. 2. Turn the power switch off and back on to reset. • Incorrect rotor has been installed **Corrective Action** 1. Install the appropriate rotor. 2. Turn the power off and back on to reset. • Temporary system error **Corrective Action** Turn the power switch off and back on to reset. If problem cannot be resolved, it is possible that • Rotor recognition sensor is defective or damaged Call LaboGene for Service.

*The instrument MUST only be opened by a service engineer who is authorized by LaboGene.

11.1 Door lock failure (Emergency Door Open Function)

In case of power failure or any malfunction, the door will remain locked as designed. Though, the door can be manually opened with the Emergency Door Open Function.

- Disconnect the power cord from the wall socket and allow the instrument to come to a complete stop before opening.
- Insert small screwdriver into the hole by 

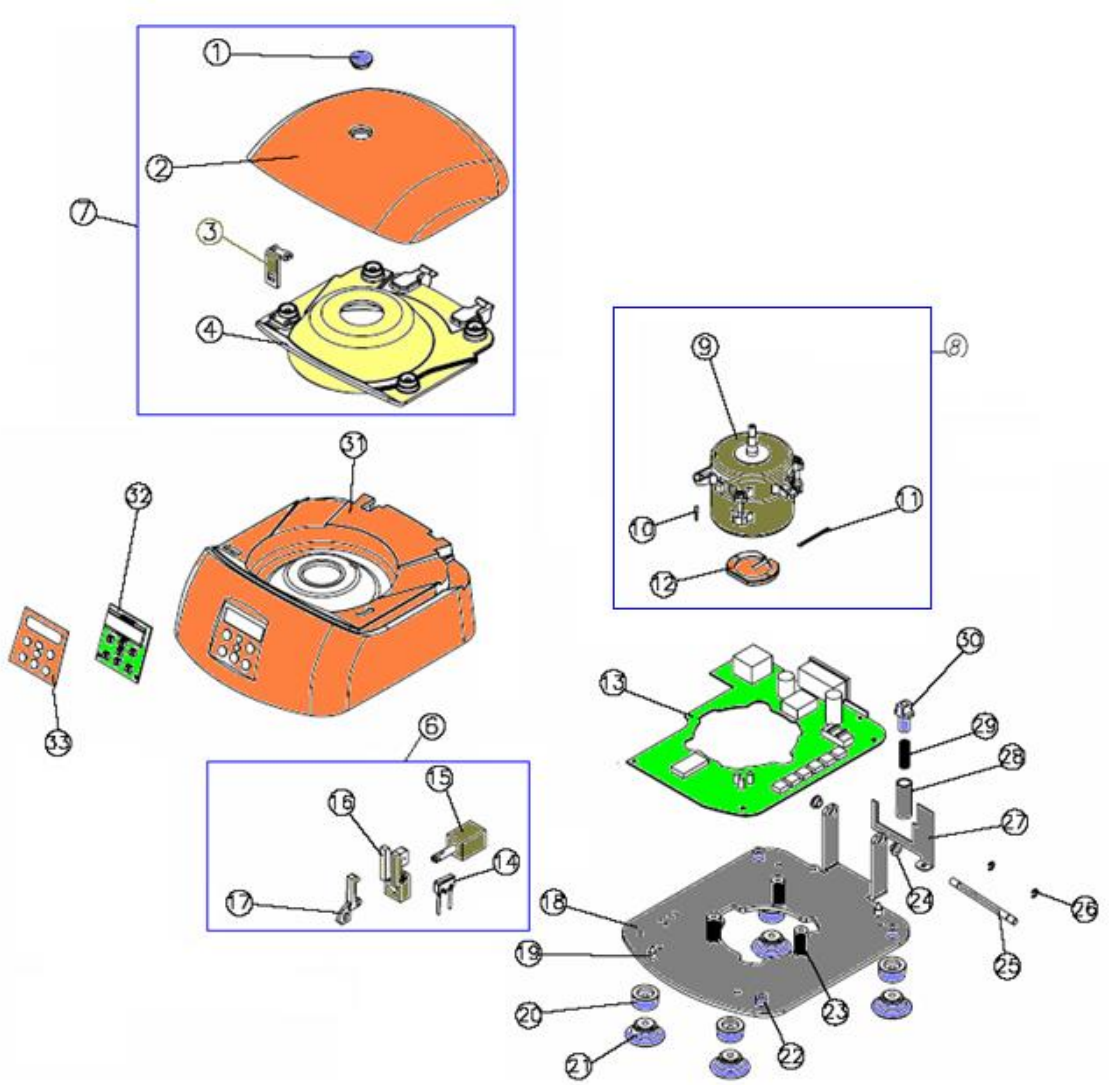
sign on the bottom plate of the instrument and move downwards to operate the door latch.

12 Order information

Cat No.	Product	Capacity	Max. Speed (rpm)	Max RCF (x g)
GZ-1312	**mini, Microcentrifuge (220V, 50/60Hz)**		**13,500**	**12,300**
	includes Fixed Angle Rotor GRF-m2.0-12 & 12 adaptors for 0.2 mL			
Rotors for mini				
GRF-m2.0-12	Fixed Angle Rotor, GRF-m2.0-12 with lid	12 x 1.5/2.0 mL	13,500	12,300
GRA-s0.2-32	PCR Rotor, GRA-s0.2-32 for PCR strips, 4-rows 	32 x 0.2 mL	6,000	1,850
Adaptors for mini				
GAS-m0.2(2)	0.2 mL Adaptor	0.2 mL/ea		
GAS-m0.5(2)	0.5 mL Adaptor	0.5 mL/ea		

LaboGene also offers many other types of centrifuge to meet your needs. For complete details, please contact your local LaboGene sales representative or visit our website at www.labogene.com

13 Spare parts



NO	Cat. No. LaboGene	Description	Q'ty	NO	Cat. No. LaboGene	Description	Q'ty
7	7.601.000.001	Door ass'y	1	18	7.601.000.018	Case (BOTTOM)	1
1	7.601.000.002	Center window	1	19	7.601.000.019	Bolt Support	1
2	7.601.000.003	Door (Top)	1	20	7.601.000.020	Absorber Space	4ea/set
3	7.601.000.004	Striker	1	21	7.601.000.021	Absorber	4ea/set
4	7.601.000.005	Door (Bottom)	1	22	7.601.000.022	Board Space	3ea/set
8	7.601.000.006	Motor Final Ass'y	1	23	7.601.000.023	Cushion Rubber	3ea/set
9	7.601.000.007	Motor Ass'y (220V)	1	24	7.601.000.024	Pin Bushing	2ea/set
9	7.601.000.008	Motor Ass'y (110V)	1	25	7.601.000.025	Hinge Pin	1
10	7.601.000.009	Temp. Sensor Ass'y	1	26	7.601.000.026	E-Ring	2ea/set
11	7.601.000.010	RPM Sensor Ass'y	1	27	7.601.000.027	Panel (back)	1
12	7.601.000.011	RPM Sensor Holder	1	28	7.601.000.028	Tension Bar Holder	1
13	7.601.000.012	Main Board Ass'y	1	29	7.601.000.029	Spring	1
6	7.601.000.013	Door Lock Ass'y	1	30	7.601.000.030	Tension Bar	1
14	7.601.000.014	Door Sensor Ass'y	1	31	7.601.000.031	Case (Top)	1
15	7.601.000.015	Solenoid	1	32	7.601.000.032	Display Board Ass'y (Blue)	1
16	7.601.000.016	Latch Body	1	33	7.601.000.033	Overlay	1
17	7.601.000.017	Latch	1				

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14 Warranty

Mini has been subjected to thorough testing and quality control. In the unlikely event of a manufacturing fault, our one year warranty (from the date of delivery) covers the instrument, accessories and individual components. This warranty becomes invalid in the case of incorrect operation, use of nonstandard spare parts or accessories and unauthorized modification of the rotor or instrument.

LaboGene reserves the right to make technical modifications. Please see the complete limited warranty statement supplied separately.

15 Appendix - Allowable maximum speed

The maximum allowable speed needs to be reduced when centrifuging a solution with a density greater than 1.2 g/ml. **Failure to reduce the speed may result in damage to the rotor and centrifuge.** The revised maximum speed can be calculated with the following formula.

$$\text{Reduced speed } (n_{red}) = \sqrt{\frac{1{,}2}{\text{Higher density value}}} \times \text{Maximum speed } (n_{max})$$

Example:

Where the density of the liquid is 1,9, the new allowable maximum speed would be calculated as follows:

$$\text{Reduced speed } (n_{red}) = \sqrt{\frac{1{,}2}{1{,}9}} \times 13500 = 10729 \text{ rpm}$$

16 Appendix - RPM to RCF conversion

RPM can be converted in RCF with the following calculation.

$$\mathbf{RCF = 11.2 \times r\ (RPM/1000)^2 \text{ or } RCF = 1.12 \times 10^{-5} \times r \times (RPM)^2}$$

Example:

Where the RPM is 12,000 RPM and radius of rotor is 6 cm, Rcf would be calculated as follows:

$$RCF = 1.12 \times 10^{-5} \times (6) \times (12{,}000)^2 = 9{,}651 \times g$$

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Declaration of conformity

We declare under our responsibility, that the following product:

Model: ScanSpeed Mini Micro Centrifuge

to which this declaration relates is in conformity with the following standard(s), directives or other normative document(s):

In compliance with:

EN 61010-1 - Safety requirements for electrical equipment for measurement, control and laboratory use - General requirements

EN 61010-2-020 - Safety requirements for electrical equipment, control and laboratory use - Particular requirements for laboratory centrifuges

EN 61000-6-1 - Electromagnetic compatibility - Generic immunity/emission standard

EN ISO 11201 – Acoustics – Noise emitted by machinery and equipment

Following the provisions of:

2006/42/EC - Machinery Directive, as amended

2006/95/EC - Low Voltage Directive, as amended

2004/108/EC - EMC Directive, as amended

2011/65/EU - RoHS Directive

2012/19/EU - WEEE Directive

Lynge, January 2013

Rasmus Sørensen
QA Manager
LaboGene ApS, Industrivej 6-8, Vassingerød, 3540 Lynge, Denmark

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