LABOGENE
Scandinavian by Design

INSTRUCTION MANUAL

HIGH SPEED REFREGIRATED CENTRIFUGE

ScanSpeed Model 2236R

Cat. No. : 9900900759

CE

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1 SAFETY PRECAUTIONS

- The instrument must be installed well-balanced way on a flat, stable, horizontal and solid floor.
- Do not place dangerous materials within 30cm distance around the instrument, which is also recommended by IEC 61010-2-020).
- Supply a proper voltage and power according to each instrument's power requirement.
- Only use rotors from LaboGene A/S with appropriate centrifugal tubes and often with suitable adaptors to embrace sample containers tightly enough inside rotors.
- The rotor must be fastened securely with a rotor coupling device for safety.
- Samples must be loaded weight-balanced way not to cause imbalance problem and damage.
- The density of sample material must not exceed 1.2g/ml at Max. RPM or RCF.
- Do not use hazardous, inflammable or radioactive materials as samples.
- Before operating the instrument, check if the rotor and the rotor lid are securely fastened.
- When it is necessary to use toxic or radioactive materials or pathogenic micro-organisms which belong to the Risk Group II of WHO: "Laboratory: Bio-safety Manual" should follow national regulations.
- Use the emergency door open function only when the door key on the control panel is dumb under the condition of complete stop of rotor running.
- Any improper handling or any usage of un-qualified accessories is not able to be protected.
- Never try to open or move the instrument if it is not completely stopped.

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2 PRODUCT FEATURES AND SPECIFICATIONS

2.1 Product features

- Floor-type, high-speed centrifuge
- Useful for a wide range of containers; from microtubes to 1,000 ml tubes
- Maximum capacity of 6 x 1,000 ml per single run
- Incremental and decrement setting of speed, time and temperature
- Simultaneous conversion and display rpm and rcf
- Temperature setting down to -20℃
- Environment friendly 404a refrigerant
- Automatic identification of a rotor and corresponding maximum rpm
- Automatic alarm system for imbalance, over-heat, and over-speed
- 10 acceleration and 10 deceleration ramps for handling sensitive samples
- “Hold“ or changing of time and temperature possible while running
- Program memory up to 100
- 7’’ LCD:touch screen and user friendly WinCE based operation
- User ID and protocol management with historical tracking
- USB connection for PC control

2.2 Specifications

Max. RPM	22,000
Max. RCF	54,111 x g
Max. capacity	S 15 ml x 36 / A 1000 ml x 6
Control	Microprocessor controlled
Range of temperature setting	-20 °C to ambient
Run time	≤99 h 59 m 59 s or continuous
Acceleration levels	9 ramps from 1 to 9
Deceleration levels	9 ramps from 1 to 9 additional zero setting for natural deceleration
Program memory	100
Rotor recognition	Automatic
Power & frequency	AC220V (110V optional), 50/60Hz
Dimension (WxDxH) mm	824 x 634 x 1049
Weight without rotor	180 Kg
CE Certification	Yes

2.3 Delivery check list

- Main body
- AC Power cable (3m), 1 ea
- Emergency door open tool, 1ea
- Magnetic Precision level 1ea
- Rotor (Optional)
- Rotor coupling device – T-tool (Optional)
- Rotor lid open/close tool (only for the lid containing rotors)
- User manual, 1ea
- Sheet of Installation report to issue effective date of warranty

2.4 Unpacking

- Untie the plastic banding over the paper box and get lid of box from the instrument main body.
- Unwrap the vinyl coat surrounding the main body and remove stuffing cushion from chamber.
- Place the instrument on a proper place by moving instrument’s wheel.

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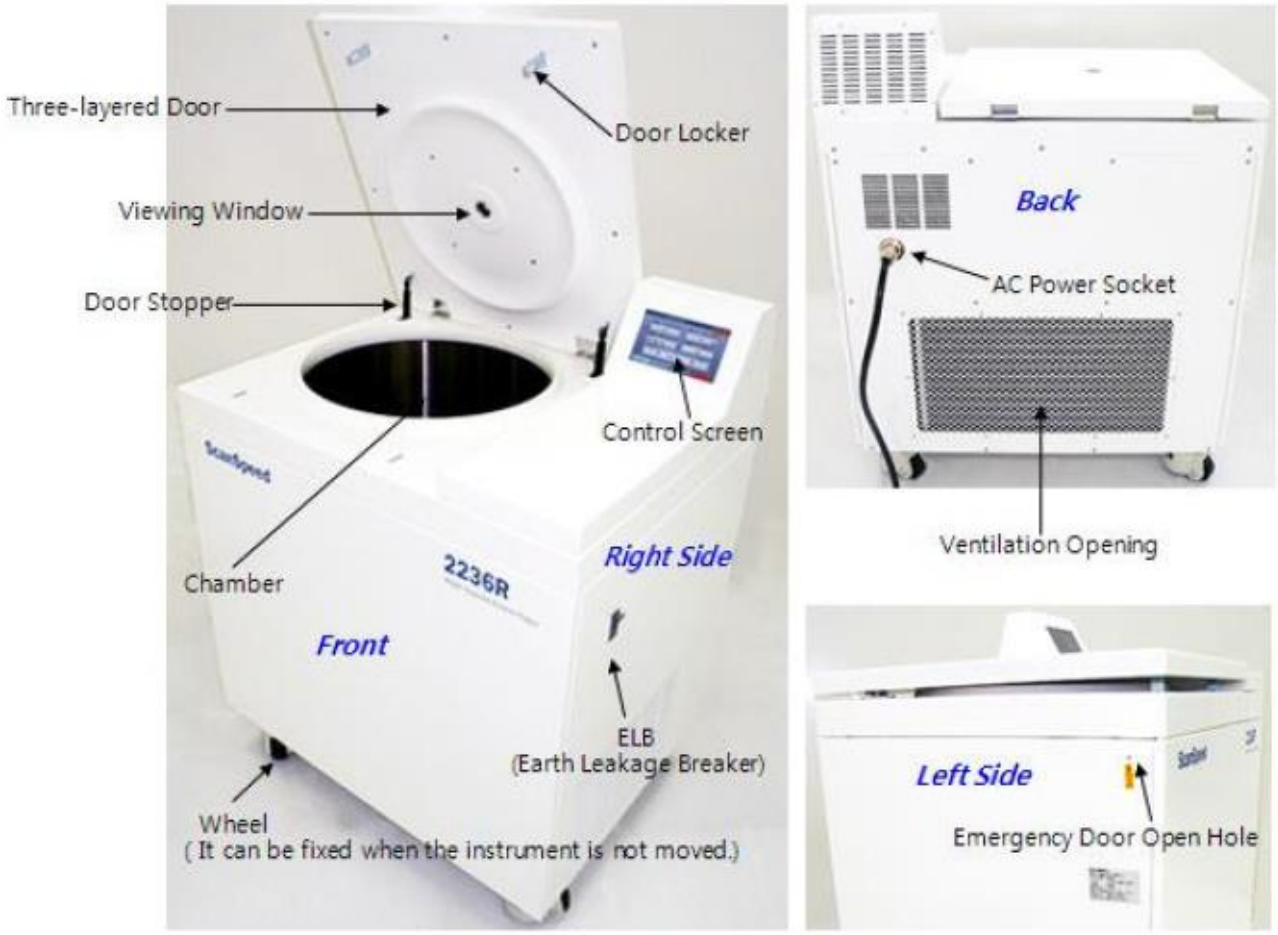
2.5 View of the unit

2.5.1 External view



2.5.2 Internal view

3 INSTALLATION

* 2236R is delivered with a main body which chamber is filled with safety padding. As the 2236R is rotor auto-recognizable model, the system unnecessarily tries to identify a rotor if you turn on the power before fixing a rotor, and 'Error 9' is appeared because of absence of the rotor. Therefore, you should open the door and remove the protection padding. The instrument is ready for operation rightly after you mount a rotor and turn the instrument on again.

3.1 Environmental Requirement

- Install the machine on the solid and horizontally flat floor. If you place the centrifuge at the slope, the axis of rotation is possibly changed by the weight and speed pressure from a rotor running.
- Install the machine about 30 cm departed from the wall for efficient air circulation, which minimize heat generation and unnecessary frictional force. It is also recommended to setup the machine at the dustless place.
- Install the machine in the place with appropriate temperature and humidity to maintain all functions and parts' conditions at maximum status.
- Install the machine at the place without any kinds of corrosive gases such as sulphurous acid or chloric acid.

3.2 Balance Adjustment

The imbalance of the machine causes not only momentary troubles of vibration, noise and error during operation but also ultimate damage on the instrument. Be recommended to check the balanced status of a rotor with a magnetic precision level included.

Mount the rotor and place the magnetic precision level on the middle of a rotor.

Confirm the air bubbles of all three windows of the magnetic precision level being placed within the black lines.

To adjust the balanced position, rotate the red colored ring at the wheel caster counterclockwise until well balanced. This adjustment of rubber leg also fixes the instrument by holding the wheel caster.

3.3 Electricity Requirement

- 2236R model uses 110V or 220V. Check proper voltage of your instrument and connect to adequate power outlet.
- If there is a power fluctuation above and below 10% of the recommended voltage or varies too frequently, it may create abnormal functions or errors.
- When the instrument will be used at other voltage range, should contact LaboGene A/S.

3.4 Connection of Power Cord

The 2236R uses its specific power plug as below. It is supplied together with the wall socket. It requires single phase current and 4.5KVA.

3.5 Power On/Off and Door Release

- The power-on and off is controlled by the earth leakage breaker switch on the right side of the machine. Connect the power cord properly and turn on the earth leakage breaker for the power-on.
- Press the ‘Door’ button on the control screen to open the door.

3.6 Rotor Coupling and Disassembly

* When mount or change the rotor, it is recommended to turn the instrument off first and turn on after completing the fixation of a rotor. It helps automatic rotor recognition functioning and safest usage of the instrument.

- Turn off the power and mount the proper rotor into the motor shaft.
- Grasp the rotor with one hand, and place rotor coupling device (T-tool) at the central groove of rotor. Rotate the T-tool clockwise until tightly assembled.
- To disassemble the rotor, rotate the T-tool counterclockwise.

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3-6-4. To open or close of rotor lid, grasp the rotor with one hand and rotate the rotor lid nut counterclockwise for opening, and clockwise for closing. Or the rotor lid open/close tool can be used as follows.

[Rotor lid open/close tool]

① Place the rounded hole of tool at the rotor lid nut.
② Rotate:the:tool's:handle:counterclockwise:for:opening:and:clockwise:for:closing ·

3.7 Additional Notification

- 3-7-1. Positioning Sample Tubes: The Sample Tubes should be placed in the rotor with an exactly balanced amount of samples at the symmetrical position. Imbalance may cause the damage of the rotor, distortion of the rotation axis, and eventual failure of the instrument. Also recommended special care for swing rotors; all places of swing rotors should be placed with proper buckets even without sample containers in order to minimize any distortion of rotor wings.
- Power Failure: If there is any power failure during operation, door will be locked and the spinning will be stopped under natural gravity force. The door can be disclosed by emergency door open tool.
- Door Lock: The LaboGene centrifuge is scheduled not to run if the door is open. Likely also, the door is completely locked during operation by the activation of solenoid door lock.

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- Emergency Door Open: In any cases necessary for emergency opening, you can use the emergency door open tool as long as the machine is idle. Insert the emergency tool into the emergency door open hole at the left-upside of the unit.

4 OPERATION

4.1 Operating Sequences

4-1-1. Connect the AC power cord to the appropriate voltage.
4-1-2. Turn on the ELB (Earth Leakage Breaker) on the right side of the machine.
4-1-3. You can see the loading message during the system is power on.
4-1-4. After the loading message, the user ID selection window is appeared. Choose the ID and touch the OK button, and then the control display screen is appeared.
4-1-5. Set the appropriate running conditions on the control display screen and be ready for operation.

4.2 Key Functions of Control Panel

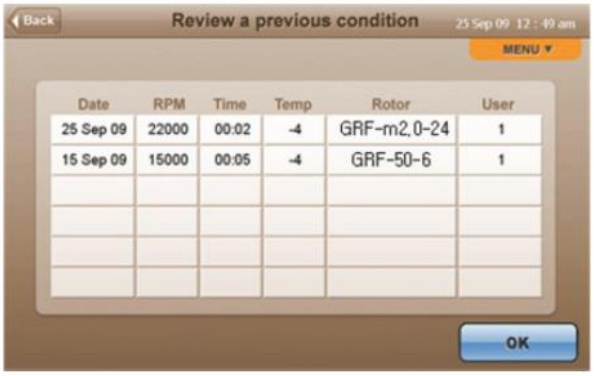
- RPM/RCF: Uses to set & display of operating speed and relative centrifugal force
- TIME: Uses to set & display of operating time (00:00:00 - continuous operating)
- TEMP: Uses to set & display of setting temperature
- Accel / Decel: Uses to set & display of acceleration/deceleration steps
- Rotor: Display of mounted rotor name by automatic identification
- START: Uses to start spinning
- HOLD: Uses to interrupt the operation temporarily or change the setting value of time & temperature
- STOP: Uses to stop the operation
- DOOR: Uses to open the door
- MENU: Shows sub functions of History, Program Save/Call, Option, Rotor & Information

4.3 Edition of Various Functions

- User ID registration

Usually this screen appears before main display function. Register (or Apply) individual specific ID on the ID registration window. by pressing the numeric keypad shown. Complete the registration by entering “OK” key.

- History tracking: All Operating information is automatically saved under the identified ID. It can be retrieved on the menu, history section on the right top of the screen. If it is connected to personal computer, it can be saved and printed.

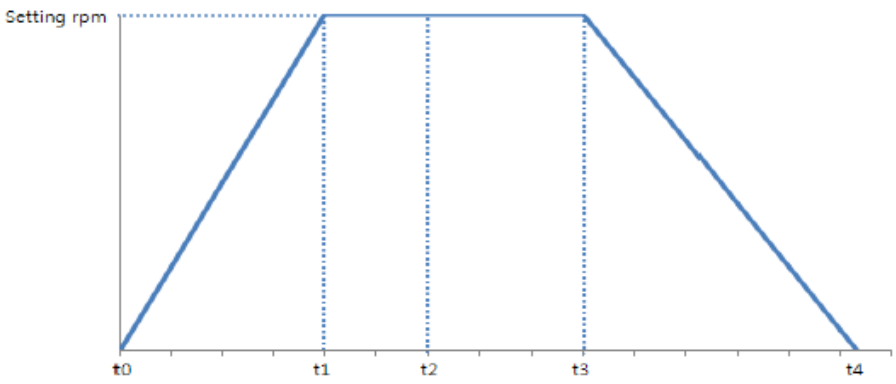


- RPM/RCF: Touch the RPM/RCF section on the screen to input the required speed. The numeric keypad is appeared to enter the values – press numbers separately or use the arrow buttons to change the value gradually. Press:'OK' button to complete the input 'Set XXXXX' is blinking 3 times to confirm the input value and the corresponding RCF value is automatically converted and displayed. As the 2236R identifies the mounted rotor automatically, a warning message is displayed if input values are over Max speed and under Min speed of the equivalent rotor.

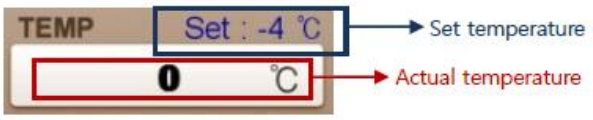
Speed display unit: 1 rpm & Speed setting unit: 10 rpm

- TIME: Touch the TIME section on the screen to input required running time. Input the time by using the numeric keypad and press the 'OK' button. Touch the 'Section' or 'Normal' button to change the method of time counting. The "Normal" timer counts from start to stop. The"Section" timer counts the running time only at the set speed.

Normal: from Start to Stop (t0~t3).
Section: from reaching the setting rpm to Stop (t1~t3)



- TEMP: Touch the TEMP section on the screen to input the required running temperature. Input the temperature value using:the:numeric:keypad:and:press:the:'OK' button. It can go down -20℃ but no heating functions.



- Acceleration and Deceleration: Touch the Accel / Decel section on the screen to input the required acceleration and/or deceleration ramp. Input the proper level by using the numeric keypad and press the 'OK' button(1~9 for acceleration / 0~9 for deceleration. The zero means natural deceleration forced only by gravity.

Touch the Accel / Decel section on the screen to input the required acceleration and/or deceleration ramp. Input the proper level by using the numeric keypad and press the 'OK' button (1~9 for acceleration / 0~9 for deceleration. The zero means natural deceleration forced only by gravity.

- Program SAVE / Program CALL: After setting all the required operation conditions on the main display screen, it can be saved as an individual program number on the "MENU > Program" section. Touch the Program Save: No section and input preferred number to save. Press 'OK' button to complete saving. It can be also used when editing.

When recall the program, it can be found and seected from all program archive as shown below.

- “Shift” function: This is the function that makes possible to combine any 10 different running conditions in single operation. It can be useful in density gradient centrifugation or complex cell separation procedeure. Input the required basic running conditions on the main screen. In this case, the time setting should be ‘Normal Then, press MENU-Program-Save and press: ‘YES’ on the selection of the ‘Shift Programming’The: consequent window shows ten successive steps to input or edit for speed, temperature, and accel/decal values.

Press ‘OK’ button to complete setting. The ’shift’ program is displayed on the main: operational screen as ‘1/1:0H:0M:0S:(S)’ on the top of TIME display.

When remove the shift running conditions, select MENU-Program-Program CALL and press the ‘Shift’part to:delete Press ‘Clear all’ button at the setting window of shift running to delete all steps.

- Additional Controls: Besides the main functions of spinning operation, many auxiliary functions are incorporated for userfriendly usage of the instrument. Each of these functions can be found and edited on the ”Menu” section one the right top of the screen.

[Option Items]

COLOR: select background color of the screen, Four choices available, Grey, Blue, Gold, Green.
VOLUME: adjust the sound volume of touch keypad.
TOUCH CAL: calibrate touch positioning of touch screen.
KEYPAD TYPE: select whether using built-in touchscreen or external USB-connected computer keyboard.

[Rotor Information]

All available rotor information with sample applications are listed up for reference.

[Radius]

To change the default radius of a rotor. It can be used when a tube adaptors or tube racks are used, and accurate speed calculation is required. However, it cannot be saved permanently.

[Information]

To check the firmware version and contact information. The firmware version is shown on the first line of the left top of the screen and the display control version on the second line. The contact information for after-service or inquiries are displayed on the center.

4.4 Running Set Operation

- Press:‘START’ button to start spinning. The pop-up window for the confirmation of running conditions will be appeared. Then, press OK’ to start operating or press ‘cancel’ button to return to the main display.
- A circled arrow on the left top of the display screen will be rotating while spinning.
- The RPM/RCF shows actual momentary speed during the operation.
- TIME counting comes downward for the set time value or upward for the continuous set.
- To change time and/or temperature during spinning,“HOLD” button can be selected and modified valued right away. However, if there is no action during 5 seconds after pressing ‘HOLD’ button, the operation returns to restart at the stop point□:(The:‘HOLD’:key is

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working only during the period of set-value running. It is not activated during acceleration or deceleration period).

5 MAINTENANCE

5.1 Outer part of instrument

- Clean the outside of the machine with dry soft cloths. If necessary, dip the cloth in neutral detergent and clean contaminated area. Keep completely dry after cleaning.
- Do not use any volatile chemicals such as alcohol, benzene, etc.
- Be careful not to make scratches on a surface of the machine. The scratches can cause corrosion on the surface of the machine.
- If any rust appears, clean it with neutral detergents and keep dry

5.2 Inner part of instrument

- Keep dry inside the chamber after every usage.
- Always make special attention to clean the motor shaft to avoid any imbalance from the contaminants.
- If any part is contaminated, clean it immediately with neutral detergents and keep dry.

5.3 Rotor

- Clean the rotor if any parts are contaminated with samples.
- Keep dry after usage.
- Be careful not to make scratches inside or on the surface of rotors. Any small scratches can cause corrosion of a rotor and big damage on the instrument.

5.4 Moving or shipping of the instrument

- If you need to move or ship the instrument, be cautious to protect the shaft from any physical impact or turbulence.
- Do not include rotors in any cases of movement. Fill inside the chamber with proper materials to keep the shaft on place and not to be influenced by physical pressure.

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6 ORDERING INFORMATION

Cat. No.	Product	Capacity	Max. Speed (rpm)	Max RCF (x g)
GZ-2236HR	**2236HR, High-Speed Centrifuge without Rotor (220V, 50/60Hz)**			
Rotors for 2236HR				
GRS-r250-4-2236	Swing Rotor, GRS-r250-4, includes 4 Rectangular Buckets, GLB-r250 & 4 Tube Racks (customer's choice)	4 x 250 mℓ	6,000	7,051
GRF-m2.0-24-2236	Fixed Angle Rotor, GRF-m2.0-24 with lid	24 x 1.5/2.0 mℓ	22,000	45,616
GRF-m2.0-30-2236	Fixed Angle Rotor, GRF-m2.0-30 with lid	30 x 1.5/2.0 mℓ	18,000	34,919
GRF-50-6-2236	Fixed Angle Rotor, GRF-50-6 with lid	6 x 50 mℓ	22,000	55,111
GRF-c50-6-2236	Fixed Angle Rotor, GRF-c50-6 with lid	6 x 50 mℓ conical	17,000	33,280
GRF-50-8-2236	Fixed Angle Rotor, GRF-50-8 with lid	8 x 50 mℓ	22,000	55,735
GRF-100-6-2236	Fixed Angle Rotor, GRF-100-6 with lid	6 x 100 mℓ	20,000	49,192
GRF-250-6-2236	Fixed Angle Rotor, GRF-250-6 with lid	6 x 250 mℓ	12,000	22,861
GRF-500-6-2236	Fixed Angle Rotor, GRF-500-6 with lid	6 x 500 mℓ	10,000	17,664
GRF-1000-4	Fixed Angle Rotor, GRF-1000-4 with lid	4 x 1000 mℓ	9,000	15,848
GRF-1000-6	Fixed Angle Rotor, GRF-1000-6 with lid	6 x 1000 mℓ	8,000	14,310
Microplate Holder & Bucket for 2236HR				
GLP-mw	Microplate Holder for Rotor GRS-r250-4 & GRS-mw-4	96 P		
GLB-r250	Rectangular Bucket for Rotor GRS-r250-4	250 mℓ/1ea		

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Adaptors for 2236HR		
GAS-m0.2(2)	0.2 mℓ Adaptor	0.2 mℓ/1ea
GAS-m0.5(2)	0.5 mℓ Adaptor	0.5 mℓ/1ea
GAS-15(50)	15 mℓ Adaptor for Rotor GRF-50-8	15 mℓ/1ea
GAS-c15(50)	15 mℓ Conical Adaptor for Rotor GRF-50-8	15 mℓ conical/1ea
GAS-15(100)	15 mℓ Adaptor for Rotor GRF-100-6	15 mℓ/1ea
GAS-c15(100)	15 mℓ Conical Adaptor for Rotor GRF-100-6	15 mℓ conical/1ea
GAS-50(100)	50 mℓ Adaptor for Rotor GRF-100-6	50 mℓ/1ea
GAS-c50(100)	50 mℓ Conical Adaptor for Rotor GRF-100-6	50 mℓ conial/1ea

Tube Racks for 2236HR		
GAM-5-12	Tube Rack, GAM-5-12 for Bucket, GLB-r250	12 x 3 or 5 mℓ
GAM-15-12	Tube Rack, GAM-15-12 for Bucket, GLB-r250	12 x 10 or 15 mℓ
GAM-c15-9	Tube Rack, GAM-c15-9 for Bucket, GLB-r250	9 x 15 mℓ conical
GAM-50-4	Tube Rack, GAM-50-4 for Bucket, GLB-r250	4 x 50 mℓ
GAM-c50-3	Tube Rack, GAM-c50-3 for Bucket, GLB-r250	3 x 50 mℓ conical
GAM-85-2	Tube Rack, GAM-85-2 for Bucket, GLB-r250	2 x 85 & 15 mℓ
GAS-250(r250)	Tube Rack, GAS-250 (r250) for Bucket, GLB-r250	1 x 250 mℓ

7 DECLARATION OF CONFORMITY

Declaration of conformity

We declare under our responsibility, that the following product:

Model: ScanSpeed 2236R Refrigerated High Speed 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

Allerød, November 2018

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