LABOGENE
Scandinavian by Design

INSTRUCTION MANUAL

LOW SPEED CENTRIFUGE

ScanSpeed Model 416

Cat. No. : 9900900762

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.

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1 SAFETY PRECAUTIONS

	**Warning**
	Before using the 416, read this operation manual to ensure correct use and a thorough understanding of the instrument. Incorrect handling of this instrument could possibly result in personal injury or damage to 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 stationary.
- NEVER operate the instrument without a correctly installed rotor that is secured to the motor shaft.
- NEVER centrifuge samples that are flammable, toxic, radioactive, explosive, or corrosive.

	**Note**
	When it is required to handle the Risk Group II materials that are known to be toxic, radioactive 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.

- 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 a “water blank” to counterbalance an unpaired sample.
- ALWAYS locate the instrument on a flat, level, rigid and stable surface capable of withstanding the weight of the instrument (43 lbs) and that is vibration resistant.
- 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 required by safety regulations.
- 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: ≤ 85 %)
- ALWAYS disconnect the power supply prior to maintenance and servicing.
- ALWAYS use proven disinfection procedures when centrifuging biohazardous materials.

2 INTRODUCTION

The 416 Bench top low-speed centrifuge is specially designed to be used in clinical and research applications to separate components of biological samples, such as cells, blood, and urine. The 416 controls the speed accurately in order to separate the sample components into clear layers, whilst the smooth deceleration function minimizes disruption of the layers. With the highest level of

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quality, accuracy, and precision, the 416 is ideal for PRP (Platelet Rich Plasma) and PRF (Platelet Rich Fibrin) applications, achieving optimum separations. Its user-friendly control features and high quality separation technology delivers maximum reliable performance for your daily centrifugation requirements.

3 PRODUCT FEATURES

- Maximum centrifugation speed/force of 4,000 RPM / 2,700 x g.
- “SOFT” start/stop function for gentle and smooth acceleration / deceleration.
- Reduce operating time with fast acceleration (ACC ≤ 20 sec) / deceleration rates (DEC ≤ 25 sec).
- Automatic RPM/RCF conversion.
- User programmable memory stores up to 10 sets of operating parameters.
- Choice of Timed (up to 99 min 59 sec) or Continuous run modes.
- Automatic detection system with audible alarm, for imbalance, over-speed, and motor over-heat.
- Double 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 air flow design prevents overheating.
- Wide selection of autoclavable angle rotors and swing-out rotors are available to accommodate a variety of tube types and sizes from 3 mL up to 100 ml.

3.1 Specifications

	416 with Angle Rotor	416 with Swing Rotor
Maximum RPM	4,000 rpm	
Maximum RCF	2,700 x g	
Maximum Capacity	16 x 15 ml	4 x 100 ml
Run Time	Timed ≤ 99 minutes 59 seconds or continuous	
Acceleration Time	≤ 20 seconds	
Deceleration Time	≤ 25 seconds	
Program Memory	10 programs	
Noise Level	≤ 60 dB	
Motor	High torque AC induction motor	
Power & frequency	220 VAC, 50/60 Hz (110 VAC optional)	
Power Requirement	300 VA	
Weight	19,5 Kg for main body only	
Dimension (W x D x H)	375 x 480 x 260 mm	
RPM/RCF Conversion	Automatic	
Imbalance Recognition	Automatic	
Safety lid lock	Automatic	
Certification	CE	

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3.2 Package contents

- Main Body, 1 unit.
- Power Supply: AC Power Cable (3m), 1 off.
- Rotor Coupling Device (T-tool), 1 off.
- Emergency Door Open Tool, 1 off.
- Lubricant Grease, 25g.
- Operation Manual, 1 off.

3.3 Rotors & Accessories (Optional)

3.3.1 Rotors

Autoclavable fixed angle & swing rotors with rotor coupling device (T-tool) are available to customize your centrifuge.

3.3.2 Accessories

Steel sleeves, buckets, and adaptors are available. (See ordering information for details)

Main Body	Angle Rotor, GRA-G-15-16	Swing Rotor, GRS-G-50-4
		
	Swing Rotor, GRS-G-mw-2	**Swing Rotor, GRS-G-b100-4**
		
Sleeves & Buckets	**Rotor Coupling Tool**	**Emergency Door Open Tool**
		

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4 PHYSICAL DESCRIPTION

4.1 Front control panel description

1. Display FND: Displays set values and actual operating conditions.
2. Speed/Force display (RPM/RCF): Displays rotor speed/force in RPM/RCF.
   - Time display: Displays remaining time in minutes and seconds.
   - Also displays the program number to save/recall during program mode.
3. Arrow Buttons (▲,▼): Press to increase or decrease parameters. To rapidly change the num ber values, press and hold the buttons longer than 3 seconds.
4. RPM/RCF Button: Press to set run speed/force in RPM/RCF or to toggle between RPM and RCF display.
5. TIME Button: Press to set run time up to 99 min 59 sec. (00 for continuous run)
6. DOOR Button: Press to open the door.
7. SOFT START/STOP Button: Press to accelerate and decelerate smoothly
8. START/STOP Button: Press to start and stop operation.
9. PROG Button: Press to save/recall parameters to/from the program memory.

4.2 Installation

	Warning
⚠	• Safety regulations require a safety zone of 30 cm around the centrifuge which 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. • Do not install the instrument near areas containing corrosive and/or volatile gas.

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	• Install the instrument within a temperature and humidity controlled environment. • (Permissible ambient temperature: +5 °C – +35 °C, Relative humidity: ≤ 85%).

1. Physically inspect the shipping container for any signs of damage that might have occured during shipment, before unpacking the instrument.

☞	**Note**
	Any claims for damage must be filed within 24 hours with the transportation company or carrier.

2. Carefully unpack and inspect to ensure that all the components are received without concealed damage. (See Package Contents for details).

☞	**Note**
	If any of items appear to be damaged or missing, contact LaboGene Customer Care immediately.

☞	**Note**
	Retain and use the original packaging materials to store or transport, in order to protect against damage.

3. Place the instrument on a clean, flat, level, and vibration or noise free surface.

☞	**Note**
	Positioning on an out of level or uneven surface causes vibration, noise and error during operation.

☞	**Note**
	Maintain a minimum clearance of 30 cm clearance around the instrument to ensure air circulation/ventilation.

4. Plug the power cord into the appropriate power outlet.

⚠	**Warning**
	Check that the power supply corresponds with the manufacturer's electrical specified requirements.

5. Turn the power switch on. The switch is located on the right side near bottom front of the instrument.

6. Press the "Door" button on the control panel to open the door.

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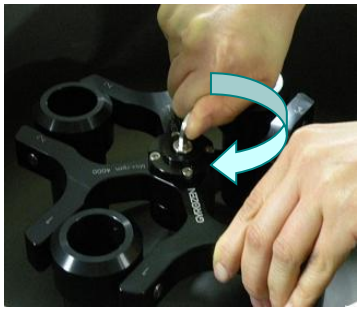
☞	**Note**
	The instrument should be delivered with the protective materials inside of the chamber. If the door is not opened with the “Door” button, use the Emergency Door Open function to unlock the door manually and remove the protective materials from the chamber. (See Troubleshooting for details).

7. Turn the power switch off, and carefully place the rotor onto the motor shaft. Hold the rotor with one hand and securely tighten the rotor locking nut on the shaft by turning clockwise. Use the door locking tool to tighten the swing rotor. Once the rotor installation is completed, turn the power switch on again.

☞	**Note**
	To disassemble the rotor, turn the rotor nut in a counter-clockwise direction.



Swing Rotor

Angle Rotor

4.3 Setting parameters

When the power is applied, the default or the set values of the last run appears on the display. Once operation begins, the display switches to view the actual operating conditions of the run. Preset values can be selected or changed prior to operation or anytime during operation.

To set or change parameters, follow the instruction below.

SPEED/FORCE (RPM/RCF)

- Parameter Display unit: 10 RPM / 1 RCF.
- Unit Increment: 10 RPM / 1 RCF.
- Selectable Range: 500 RPM – 4,000 RPM.
- Speed Controlling Accuracy: < ± 2% (at maximum speed).
- Default Set Speed: 4,000 RPM.

During the centrifugation, the actual rotor speed in RPM or force in RCF will be shown on the display.

1. Press the “RPM/RCF” button to select or change the speed value in

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RPM.

2. While RPM LED blinks on the control panel, press the arrow buttons (▲,▼) to select or change the speed value within the selectable range.
3. Press the “RPM/RCF” button once again to enter or change the force in RCF or convert speed in RPM to RCF.

☞	For the formula to convert between RPM and RCF, see RPM/RCF Conversion in Appendix.

TIME (MIN:SEC)

- Parameter Display Format: MM or SS.
- Unit Increment: 1 MIN / 1 SEC.
- Selectable Range: 99 minutes and 59 seconds or continuous.
- Default Set Time: 10 minutes and 10 seconds.

Time is displayed in minutes and seconds and the run time can be selected with the choice of Timed (up to 99 min 59 sec) or Continuous run modes.

During centrifugation, the time remaining will be shown on the display.

- **SET TIME RUN**

1. Press the “TIME” button to select the desired length of run time in minutes.
2. While the “MIN” LED blinks on the control panel, use the arrow buttons (▲,▼) to select desired length of run time in minutes up to 99 minutes.
3. When complete, press the “TIME” button again to confirm the “minutes” setting and move on to the “seconds” setting.
4. While the “SEC” LED blinks on the control panel, use the arrow buttons (▲,▼) to select desired length of run time in seconds up to 59 seconds.

- **CONTINUOUS RUN**

Press the “TIME” button and use the arrow buttons (▲,▼) to set the time to 00.

4.4 Program memory

Centrifugation parameters can be saved or retrieved to/from the program memory.

4.4.1 Save or edit parameters to the program memory

1. Once the desired centrifugation parameters have been selected, press the “PROG” button longer than 2 seconds and the program numbers appears on the time display.
2. Use the arrow buttons (▲,▼) to select a program number that is not in use or needs to be edited.

☞	**Note**
	During the saving process, the “SAVE” LED will continuously flash until the process is completed.

When complete, press the “PROG” button to confirm the selection and exit the program mode.

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4.4.2 Recall a previously saved program

Press the “PROG” button quickly to display the program numbers on the time display. Use the arrow buttons (▲,▼) to select the program number to recall the previously saved parameters.

☞	**Note**
	During the retrieval process, the “CALL” LED will continuously flash until the process is completed.

When complete, press the “PROG” button to confirm the selection and exit the program mode.

5 OPERATION

⚠	**Warning**
	• Check tubes and rotors for any 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 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 the “ON” position. The switch is located on the right side near bottom front of the instrument.

☞	**Note**
	Once the power is applied, the last run or default parameters appears on the display.

2. Press the “Door” button on the control panel to unlock and open the door.
3. Turn the power switch off and install or change the rotor as instructed in the Installation section. Once the rotor has been installed properly, turn the power switch on again.

☞	**Note**
	Skip this step, if the desired rotor has been previously installed.

4. Load evenly weighted samples into the rotor symmetrically.

☞	**Note**
	Do not attempt to exceed the maximum load of rotor. The maximum allowable speed needs to be reduced, if sample solution has a density greater than 1.2 g/ml.

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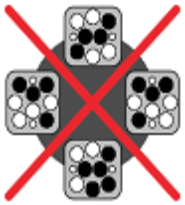
☞	**Note**
	The load must be distributed evenly with the evenly weighted samples to avoid rotor imbalance. If necessary, use the water blank to counterbalance any unpaired sample.



5. Close the rotor lid and securely tighten the lid knob. (Angle Rotor ONLY)
6. Close the centrifuge door by pressing down firmly until the latch handle is fully retracted.

☞	**Note**
	The instrument will not operate if the door is not closed and locked properly.

7. Enter the desired run parameters manually or select a program number to retrieve a specific set of parameters from the program memory.

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

8. Press the START/STOP button to start centrifugation, and, at any time, press the button again to stop the run.

☞	**Note**
	When working with delicate and sensitive samples, press the “SOFT START/STOP” button to start/stop the centrifugation. The “SOFT” start/stop function ensures gentle and smooth acceleration/deceleration to protect delicate samples and minimize disruption of layers from rapid speed changes.

9. The lid opens automatically once the run has been completed and the rotor stops fully.

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

10. Carefully remove samples. Clean the instrument and the rotor thoroughly.

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6 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 soft, lint-free cloths and non-corrosive neutral cleaning agents with pH value 6-8 to clean all parts. Rinse thoroughly with distilled water and dry completely.

6.1 Rotor

- Preparation for cleaning
  - Remove any rotor adapters and tubes from the rotor prior to cleaning.
  - Remove the rotor locking nut from the motor shaft by turning counter clockwise,
  - To remove the rotor from the motor shaft, carefully lift the rotor upward in a straight vertical motion.
- Keep the rotor clean and dry at the end of each work day, and immediately after any spillages.
- 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 a non-metal soft brush to wash rotors to prevent corrosion that can emanate from scratches.
- Remove adapters after use and inspect for any corrosion.
- Alternatively, the rotor and the rotor lid can be cleaned/decontaminated in an autoclave.

6.2 Centrifuge body (External surfaces and the Chamber)

- All parts should be wiped down periodically to prevent corrosion or contamination from dried-on materials on the component surfaces.
- In case of glass tube breakage, all parts must be thoroughly cleaned and all broken particles must be removed immediately.
- Scratches to the surfaces should be avoided, as eventual corrosion may result.

6.3 Transport

- Avoid impacts during transportation and do not drop the unit as equipment damage will result.
- Always remove the rotor and pack the inside of the chamber with protective materials before transporting the instrument. This prevents damage and minimizes any impact to the shaft.
- Allow sufficient time to dry any condensation that may have occurred inside the centrifuge chamber, before operating the centrifuge.

6.4 Return

- Before returning the instrument and/or associated components for any reason, prior permission must be obtained from LaboGene.
- All parts MUST be shipped along with “Return Good Authorization form” and the “Certificate of Decontamination.” Please contact LaboGene to obtain these forms.

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	Note
☞	In order to protect our personnel, Certificate of Decontamination needs to be completed fully, to ensure that all parts are free from pathogens, chemical hazards, and/or radioactivity. Sterilization and decontamination MUST be done prior to returning any items or accessories.

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

7 TROUBLESHOOTING

In the event of a malfunction, an 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 operating run cannot be restarted until the error is cleared. After the problem is corrected, reset the instrument to check if the error occurs again.

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Error indication	Possible reason	Corrective action
No display or power: Power failure during operation; display screen is blank	Instrument is powered up incorrectly.	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.	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.	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.	Perform the recommended corrective action as listed in E1 and/or E9.
	Door is not closed completely.	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.	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.	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.	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 latch is not operating properly.	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		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 switch or sensor error	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 latch is not operating properly	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	Perform the recommended corrective action as listed in E8. If problem cannot be resolved, call LaboGene for Service.
	Mechanical failure or damage	Turn the power off immediately and call LaboGene for Service.

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Error code	Problem	Possible reason	Corrective action
E1	RPM Sensor Error: Failure to reach to 200 rpm within 2 sec.	Temporary system error	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.	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 °C.	Ventilation inlet opening is blocked and obstruction of required air flow.	1. Clean the ventilation inlet opening or remove any objects blocking the vent. 2. Turn 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.	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.	Use Automatic Voltage Regulator to provide proper voltage.
E5	Overvoltage.	Supply voltage is higher than specification allows.	Use Automatic Voltage Regulator to provide proper voltage.
E6	Overspeed: Detected actual speed value in rpm is 1,000 rpm higher than set speed value.	Temporary system error	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 adjust revision.
E7	Control system failure.	Temporary system error.	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 adjust revision.
E8	Rotor Imbalance.	Instrument is not positioned on a flat, level, and vibration free surface.	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.	1. Make sure if samples are evenly weighted and distributed symmetrically around the centre of rotation. 2. Turn the power switch off and back on to reset.

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Error code	Problem	Possible reason	Corrective action
		Rotor is not securely attached to the shaft.	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.	Turn the power switch off and back on to reset.
		Temporary system error.	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.	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.	1. Install the appropriate rotor. 2. Turn the power off and back on to reset.
		Temporary system error.	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, ApS.			

8 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 the Emergency Door Open Tool into the hole by 

sign on the left side of the instrument and push firmly until the lock releases.

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9 ORDER INFORMATION

Product No.	Cat No.	Product	Capacity	Max. Speed (rpm)	Max RCF (x g)
GZ-0416	**7617514201**	**416, Low-Speed General Centrifuge without Rotor (220V, 50/60Hz)**			
GZ-0416-110	**7617514802**	**416, Low-Speed General Centrifuge without Rotor (110V, 50/60Hz)**			
Rotors for 416					
GRS-S-50-4	7601111140	Four-wing Swing 50 ml Rotor of 416 for holding 50 ml bucket, GLB-50-50 or twin 15 ml bucket, GLB-d15-50 GLB50-50	4 x 50 ml	4,000	2,700
GRS-S-b100-4		Four-wing Swing b100 ml rotor of 416 for holding 100 ml bio-seal bucket, GLB-b100-100	4 x 100 ml	4,000	2,700
GRS-S-mw-2	7601111180	Two-wing Swing Rotor of 416 for holding microplates	2 MTPs	4,000	1,986
GRA-S-15-16	7601111130	An Angle rotor of 416 including 16 of 15 ml Steel Sleeve, GLB-15-FA	16 x 15 ml	4,000	2,700
Steel Sleeve & Buckets for 416					
GLB-15-FA	7601111040	15 ml Steel Sleeve of Angle Rotors, GRA-15-6, GRA-S-15-16, & GRA-G-15-24 for holding 15 ml round or conical tubes	15 ml		
GLB-d15-50	7601111171	2 x 15 ml Bucket of Swing Rotor, GRS-S-50-4	2 x 15 ml	4,000	2,700
GLB-50-50	7601111100	50 ml Bucket of Swing Rotor, GRS-S-50-4	50 ml	4,000	2,700
GLB-b100-100		100 ml Bio-seal Bucket with of Swing Rotors, GRS-S-b100-4 & GRS-G-b100-6 incl bio-seal cap	100 ml		
GBL-b100	7601111195	Bucket Cap for Bucket GLB-b85-b50 (for Biosafety), autoclavable			
Adaptors and Multi-tube Racks for 416					
GAS-3(15)	7601113030	3 ml Adaptor of 15 ml Steel Sleeve, GLB-15-FA	3 ml		
GAS-4(15)	7601113035	4 ml Adaptor of 15 ml Steel Sleeve, GLB-15-FA	4 ml		
GAS-5(15)	7601113040	5 ml Adaptor of 15 ml Steel Sleeve, GLB-15-FA	5 ml		
GAS-u15(50)	7601113045	15 ml Round & Conical Adaptor of Bucket GLB-50-50	15 ml round or conical		
GAS-c50(50)	7617113030	50 ml Conical Adaptor of Bucket GLB-50-50	50 ml conical		
GAS-c15(b100)		15 ml Conical Adaptor of Bucket GLB-b100-100	15 ml conical		
GAS-50(b100)		50 ml Adaptor of Bucket GLB-b100-100	50 ml adaptor		
GAS-c50(b100)		50 ml Conical Adaptor for Bucket GLB-b100-100	50 ml conical		
GAS-85(b100)		85 ml Adaptor for Bucket GLB-b100-100	85 ml adaptor		
GAS-100(b100)		100 ml Adaptor for Bucket GLB-b100-100	100 ml adaptor		
GAM-m2.0-6 (b100)		6x 1.5/2.0ml MicrotubeMulti-Tube Rack for Bucket GLB-b100-100	6 x 1.5/2.0 ml		
GAM-7-5 (b100)		5x 7ml Multi-Tube Rack for Bucket GLB-b100-100	5 x 7 ml		
GAM-10-5 (b100)		5x 10ml Multi-Tube Rack for Bucket GLB-b100-100	5 x 10 ml		
GAM-15-3 (100)		3x 15ml Multi-Tube Rack for Bucket GLB-b100-100, not applicable with bio-seal cap	3 x 15 ml		
GAM-c15-3 (100)		3x 15ml Conical Multi-Tube Rack for Bucket GLB-b100-100, not applicable with bio-seal cap	3 x 15 ml conical		

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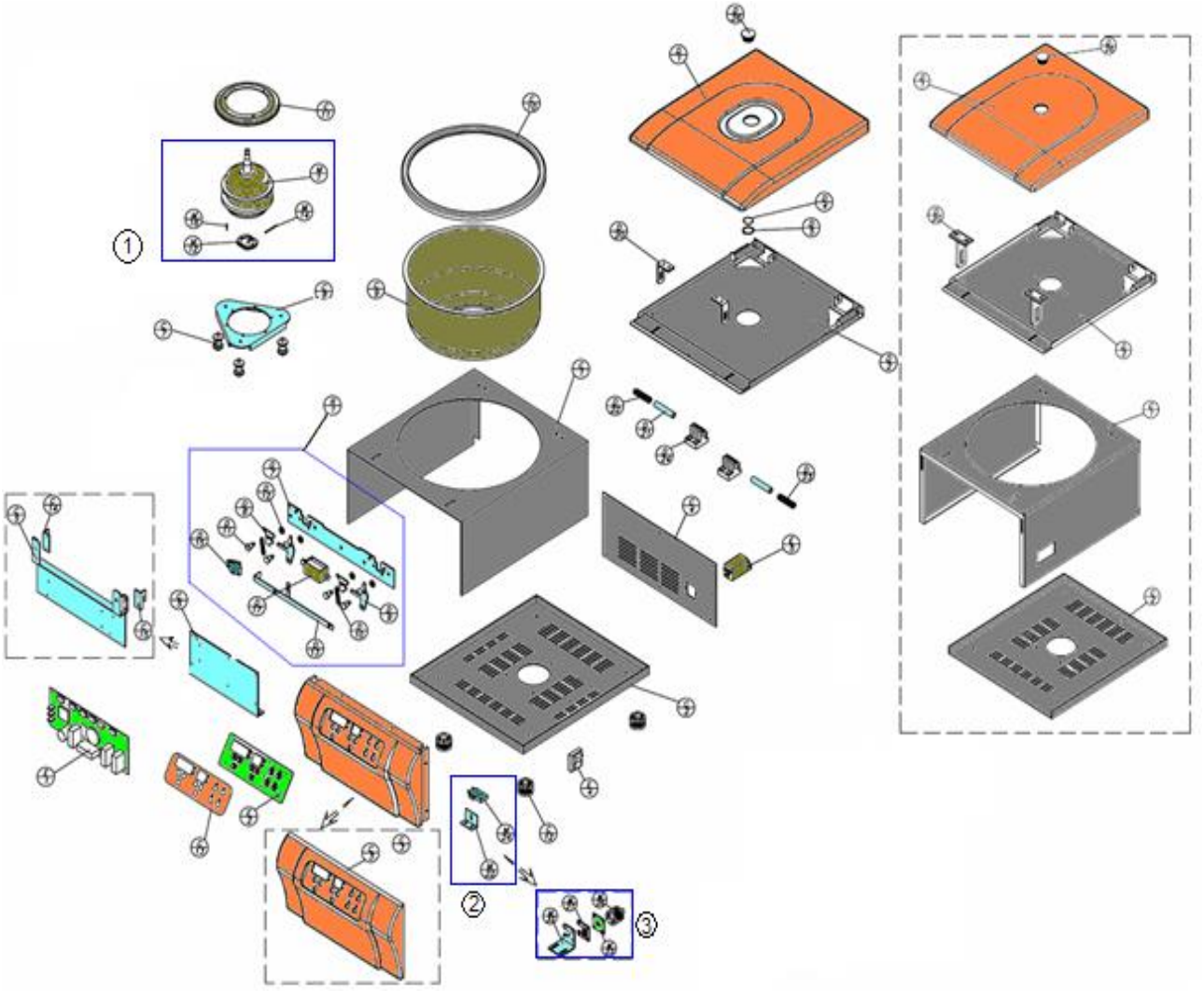
10 SPARE PARTS



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Model 416 Centrifuge

NO	Cat. No. LaboGene	Description	Quantity	NO	Cat. No. LaboGene	Description	Quantity
C1	7617000001	Case (TOP) - A	1	M22	7617000034	Imbalance Bracket	1
C2	7617000002	Case (Bottom) - A	1	M24	7617000035	Imbalance sensor assembly	1
C3	7617000003	Case (Front) - A	1	M27	7617000036	Packing(Imbalance)	1
C4	7617000004	Case (Back) - A	1	M26	7617000037	Packing(magnet)	1
C1	7617000005	Case (TOP) - B	1	D1	7617000038	Door (TOP)	1
C2	7617000006	Case (Bottom) - B	1	D2	7617000039	Door (BOTTOM)	1
C3	7617000007	Case (Front) - B	1	D1	7617000040	Door (TOP) - moulding	1
C4	7617000008	Case (Back) - B	1	D2	7617000041	Door (BOTTOM)	1
C1	7617000009	Case (TOP) - C	1	D26	7617000042	Centre window	1
C5	7617000010	Bracket (board) - A	1	D26	7617000043	Centre window - B	1
C5	7617000011	Bracket (board) - B	1	D4	7617000044	O-ring of centre window	1
C7	7617000012	Cushion rubber	3 ea/set	D5	7617000045	Snap-ring of centre window	1
C8	7617000013	Bracket (Motor) - A	1	R1	7617000046	Door lock assembly	1
C8	7617000014	Bracket (Motor) - B	1	D7	7617000047	Latch holding bracket	1
C9	7617000015	Chamber	1	D8	7617000048	Latch (Top)	2 ea/set
C9	7617000016	Chamber	1	D9	7617000049	Latch (Bottom)	2 ea/set
C10	7617000017	Packing (chamber)	1	D10	7617000050	Latch spring	2 ea/set
C11	7617000018	Cover (Motor)	1	D13	7617000051	Load	1
C12	7617000019	Foot	4 ea/set	D11	7617000052	Latch holding pin	4 ea/set
C13	7617000020	Overlay_416G-B	1	D12	7617000053	Latch holding washer	4 ea/set
C14	7617000021	Bracket (Front) - R	1	D17	7617000054	Solenoid - 220 V	1
C15	7617000022	Bracket (Front) - L	1	D17	7617000055	Solenoid - 110 V	1
1	7617000023	Motor Assembly	1	D15	7617000056	Door sensor	1
M12	7617000024	RPM sensor holder	1	D20	7617000057	Striker-A	2 ea/set
M14	7617000025	RPM sensor assembly	1	D20	7617000058	Striker-B	2 ea/set
M18	7617000026	Temp sensor assembly	1	D21	7617000059	Hinge pin	1
2	7617000027	Imbalance Final assembly	1	D22	7617000060	Hinge spring (left)	1
M22	7617000028	Imbalance Bracket	1	D23	7617000061	Hinge spring (right)	1
M24	7617000029	Imbalance sensor assembly	1	D24	7617000062	Hinge	2 ea/set
2	7617000030	Imbalance Final assembly	1	E1	7617000063	Main Board Assembly	1
M22	7617000031	Imbalance Bracket	1	E2	7617000064	Display board Assembly	1
M24	7617000032	Imbalance sensor assembly	1	E4	7617000065	Noise filter	1
3	7617000033	Imbalance Final assembly	1	E5	7617000066	Power switch	1

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11 Warranty

The 416 has been subjected to thorough testing and quality control protocols. 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.

12 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:

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

13 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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14 DECLARATION OF CONFORMITY

Declaration of conformity

We declare under our responsibility, that the following product:

Model: ScanSpeed 416 Low 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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08012013QA

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