

## INSTRUCTION MANUAL

**Models:**

**6765-HS -- 120V US**

**6766-HS -- 230V EU**

**6767-HS -- 230V UK**

**6768-HS -- 100V JP**



## Warnings

The following precautions should be taken when operating or working near the Corning® LSE™ High Speed Microcentrifuge:

- NEVER** use the centrifuge in any manner not specified in these instructions.
- NEVER** operate the centrifuge without a rotor properly attached to the shaft.
- NEVER** tighten rotor nut by hand only.
- NEVER** fill tubes while they are in the rotor. Liquid spillage may harm unit.
- NEVER** put hands in the rotor area unless the rotor is completely stopped.
- NEVER** move the centrifuge while the rotor is spinning.
- NEVER** use solvents or flammables near this or other electrical equipment.
- NEVER** centrifuge flammable, explosive or corrosive materials.
- NEVER** centrifuge hazardous materials outside of a hood or proper containment facility.
- ALWAYS** load the rotor symmetrically. Each tube should be counter balanced by another tube of the same type and weight.
- ALWAYS** locate the centrifuge within easy access to an electrical outlet.
- ALWAYS** use only microcentrifuge tubes made from plastic and designed to withstand centrifugal forces of at least 16,500 xg.
- ALWAYS** use a wrench to tighten the rotor nut.

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## 1. General Information

This manual provides important safety information for the Corning® LSE™ High Speed Microcentrifuge. It should be kept near the centrifuge for quick and easy reference.

### 1.1 Description

The Corning LSE High Speed Microcentrifuge is a small benchtop centrifuge designed for separation of various research samples. The motor is brushless and requires no routine maintenance. The Corning LSE High Speed Microcentrifuge is supplied with a 24 x 1.5/2.0 mL rotor for micro samples. Adapters are available for tubes smaller than 1.5 mL. The Corning LSE High Speed Microcentrifuge reaches speeds of up to 13,300 rpm/16,300 x g.

### 1.2 Safety precautions

**Note: All users of the centrifuge must read the Safety Precautions section of this manual before attempting to operate the unit!**



**If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.**

DO NOT OPERATE the centrifuge IF any of the following conditions exist:

- The centrifuge has not been installed properly
- The centrifuge is partially dismantled
- Service has been attempted by unauthorized or unqualified personnel
- The rotor has not been installed securely on the motor shaft
- Rotors and accessories not belonging to the standard range are being used without permission being obtained from the manufacturer to use such rotors and/or accessories in the centrifuge

Exception: Microcentrifuge tubes made of plastic, normally available in the laboratory

- The centrifuge is located in an explosive atmosphere
- Materials to be centrifuged are combustible and/or explosive
- Materials to be centrifuged are chemically reactive
- The rotor load is not properly balanced
- The rotor nut was not tightened with a wrench

### 1.3 Technical data

#### Dimensions

Width	9.25 inches (23.5 cm)
Depth	11.5 inches (29.2 cm)
Height	8.5 inches (21.6 cm)
Maximum speed	13,300 rpm
Maximum RCF	16,300 x g
Maximum volume	24 x 1.5/2.0 mL
Admissible sample density	1.2 kg/dm <sup>3</sup>
Electrical/fuse rating	120V~, 50-60Hz, 1.9A, 2.5 A 230V~, 50-60Hz, 1.1A, 1.25 A 100V~, 50-60Hz, 2.0A, 2.5A
Operating temp./humidity	0°C to 40°C / 80%RH

### 1.4 Accessories supplied with centrifuge

Each unit is supplied with 1 instruction manual, 1 warranty card, 1 power cord, a standard rotor and a rotor removal tool.

### 1.5 Warranty

This centrifuge 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 centrifuge and the rotor. This warranty becomes invalid in the case of incorrect operation, use of nonstandard spare parts or accessories and unauthorized modification of the rotor or centrifuge.

Corning® reserves the right to make technical modifications. Please see the complete limited warranty statement on page 12

## 2. Installation

### 2.1 Unpacking the centrifuge

Before unpacking the centrifuge, inspect the outside of the carton for any shipping damage.

The centrifuge is delivered in a carton with protective foam cushioning. Remove the centrifuge from the carton. Retain the carton and cushioning until it has been established that the centrifuge is working properly.

Inspect the centrifuge for any visible signs of shipping damage. Shipping damage is the responsibility of the transportation carrier. Any claims for damage must be filed within 48 hours with the carrier that delivered the centrifuge.

The accessories supplied with the centrifuge should be kept with the instruction manual near the centrifuge's place of installation.

## 2.2 Required space

The centrifuge should be installed on a rigid, even surface such as a stable laboratory bench, countertop, etc. To guarantee sufficient ventilation, ensure that the centrifuge has at least 15 cm (6 inches) of free space on all sides, including the rear.

The centrifuge should not be located in areas subject to excessive heat such as in direct sunlight or near radiators or the exhaust of a compressor, as a buildup of heat may occur within the chamber.

## 2.3 Installation

Before operating the centrifuge, check that the power source (electrical outlet on the wall) corresponds to that on the manufacturer's rating label, then connect the power cord to the centrifuge and the power source.

## 3. Installation of rotors and rotor maintenance

### 3.1 Rotors and accessories

The following accessories are included or available for the Corning® LSE™ High Speed Microcentrifuge:

Included:

Angle rotor for 24 x 1.5 mL tubes

Tube measurement	1.5 mL / 2.0 mL (10 x 40 mm)
Max. speed	13,300 rpm
Centrifuging radius	8.23 cm
Max/ RCF (g-value)	16,276 x g

Rotor Wrench

Rotor Lid

Rotor Securing Screw

Available by contacting Corning Customer Service:

#### **Adapter for 0.5 mL tubes (pk/6) (pk/6)**

Tube measurement 8 x 30 mm  
Max. speed 13,300 rpm  
Centrifuging radius 7.53 cm  
RCF (g-value) 14,892 x g

#### **Adapter for 0.4 mL tubes**

Tube measurement 6 x 47 mm  
Max. speed 13,300rpm  
Centrifuging radius 8.23 cm  
RCF (g-value) 16,276 x g

#### **Adapter for 0.2ml tubes (pk/6)**

Tube measurement 6 x 21mm  
Max. speed 13,300 rpm  
Centrifuging radius 7.03 cm  
RCF (g-value) 13,903 x g

### 3.2 Rotor maintenance

The rotor should be cleaned thoroughly after each use. **Thorough cleaning must be performed when spinning samples containing phenol or phenol chloroform.** Periodically inspect the rotor for dents, dings, scratches, discoloration and cracks. If any damage to the rotor is found, discontinue use of the rotor immediately and replace.

### 3.3 Removing and installing the angle rotor

The Corning® LSE™ High Speed Microcentrifuge comes complete with a standard 24 place rotor installed. To remove the rotor for cleaning, remove the rotor securing screw from the motor shaft by turning the screw counterclockwise, using the rotor wrench. Lift the rotor directly upward in a straight vertical motion.

To replace rotor, first make sure the motor shaft and rotor mounting hole are clean. Place the rotor on the motor shaft. Reinstall the rotor securing screw on the motor shaft by turning it clockwise. Hold the rotor with one hand and **tighten the rotor securing screw, using the rotor wrench.**



Figure 1. Loading the rotor to achieve balance

### 3.4 Loading the rotor

Tubes to be loaded should be filled equally by eye. The difference in the weight between the tubes should not exceed 0.1 gram. Tubes should always be loaded so that there is equal spacing between all tubes. One or two additional loaded tubes may need to be added to achieve this. Refer to Figure 1. to see one typical balancing scheme.

### 3.5 Overloading rotors

The maximum load of the rotor and the maximum speed have been established by the manufacturer. Do not attempt to exceed these values. The maximum speed of the rotor has been established for liquids having a homogeneous density of 1.2 g/ml or less. It is necessary to reduce the speed in order to centrifuge liquids with a higher density. **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:

$$\text{Reduced speed } (n_{\text{red}}) = \sqrt{\frac{1.2}{\text{higher density value}}} \times \text{max speed } (n_{\text{max}})$$

Example:

Where the density of the liquid is 1.7, the new maximum speed would be calculated as follows:

$$n_{\text{red}} = \sqrt{\frac{1.2}{1.7}} \times 13,300 = 11,174 \text{ rpm}$$

If in doubt concerning maximum speeds, please contact the manufacturer for assistance.

## 4. Operation

**ATTENTION: Never attempt to operate the centrifuge with rotors or adapters that show signs of corrosion or mechanical damage. Never centrifuge strongly corrosive materials that may damage the rotors, accessories, or bowl of the unit.**

### 4.1 Attaching rotor lid

After the rotor has been properly secured and loaded, attach the rotor lid to the rotor. Always use the rotor lid for safety and to allow the rotor to reach proper speed. Make sure that the rotor lid snaps securely into place, by pressing down on center catch.

### 4.2 Closing the lid

Close the centrifuge lid. The Corning® LSE™ Microcentrifuge has a lid lock that activates only when a run is started.

### 4.3 Lid release

The lid will remain locked during a centrifuge run. Once the run has been completed and the rotor has come to a stop, a beep will indicate the end of a run, and the lid will unlock automatically.



**WARNING: Do not attempt to open the lid of any centrifuge until the rotor has come to a complete stop.**

In the event of a power failure or malfunction, it may be necessary to open the lid manually.

1. Disconnect the power cord from the wall socket.
2. Remove the plastic plug, located on the left side of the unit.
3. Pull the wire (attached to the plug) to open the lid lock manually.

#### 4.4 Lid lock

The centrifuge can be started only with the lid securely closed. When a run is started, the lid lock automatically activates. Do not attempt to open the lid during a centrifuge run. At the end of the run, the lid will automatically unlock.

Never attempt to override the lid lock mechanism. Doing so is dangerous and could damage the centrifuge.

#### 4.5 Speed selection (see Figure 2.)

The speed (rpm or g-force) can be selected from 500 to 13,300 rpm in 100 rpm increments or from 100 to 16,300 x g with the knob on the right. “g-force” or “rpm” display is set by pressing the knob. Turn the knob to increase or decrease the value.

#### 4.6 Selection of operating time, momentary operation, Start/Stop

Operating time can be selected from 0.5 minutes to 30 minutes by turning the timer knob on the left. The time can be set in 0.5 minute increments from 0 to 10 minutes and in 1 minute increments from 10 to 30 minutes. After 30 minutes, the display shows “--” which indicates continuous run. In this mode, the centrifuge will run until manually stopped. **To start a run, press the timer knob.**

When the preselected time expires, the centrifuge will stop automatically. **To stop the centrifuge prior to the expiration of set time, press the timer knob.**

The centrifuge may be operated for a short run by pressing and holding the timer knob. The centrifuge will continue to run as long as the timer knob is depressed and the time, in seconds will count up on the time display.

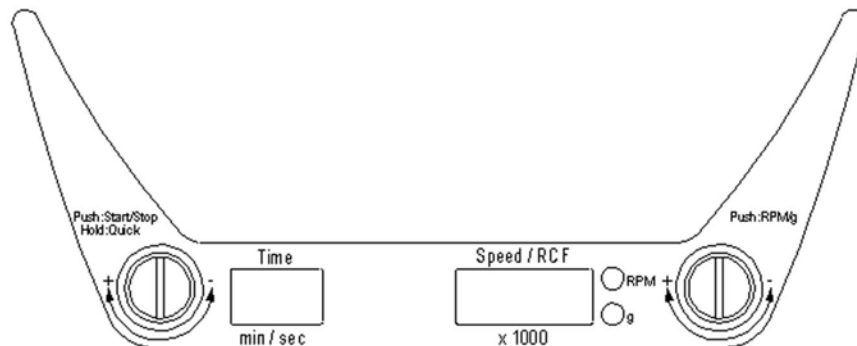


Figure 2. Corning® LSE™ High Speed Microcentrifuge control panel layout

## **5. Service and Maintenance**

### **5.1 Centrifuge service**

The brushless motor in the Corning® LSE™ High Speed Microcentrifuge requires no routine maintenance. Any required service should be performed by authorized, qualified personnel only. Repairs performed by unauthorized personnel may void the warranty.

### **5.2 Cleaning the centrifuge**

Always keep the centrifuge housing, rotor chamber, rotor and rotor accessories clean. All parts should be wiped down periodically with a soft cloth. For more thorough cleaning, use a neutral cleaning agent (pH between 6 and 8) applied with a soft cloth. Excessive amounts of liquid should be avoided. Liquid should not come into contact with the motor. After cleaning, ensure that all parts are dried thoroughly by hand or in a warm air cabinet (maximum temperature 50°C).

### **5.3 Cleaning the rotor**

The rotor should be cleaned after each use. When spinning samples containing phenol or phenol chloroform, the rotor should be cleaned immediately after use.

### **5.4 Disinfection**

Should a spill of infectious materials occur within the rotor or chamber, the unit should be disinfected. This should be performed by qualified personnel with proper protective equipment.

### **5.5 Replacing fuses**

Check the fuse when it is recommended in the Troubleshooting Guide located in this manual. The fuse holder is located in the power inlet on the rear of the unit. Disconnect the power cord from the power inlet. Open the fuse holder drawer by inserting a small screwdriver under the tab and prying it open. Remove the innermost (operative) fuse from its retaining tabs and replace the fuse if necessary. A spare fuse is located in the outermost chamber of the fuse drawer. Replace only with a fuse of exactly the same value as the original. (Fuse type may be found in the Technical data section of this manual.)

## 6. Troubleshooting Guide

Please refer to this guide before calling for service.

### Centrifuge will not start

Possible reason:	No power supply
Solution:	Check that power is being supplied to the outlet Check that the power cord is plugged into both the wall outlet and the back of the centrifuge Check that power cord is not damaged

### Lid lock will not release

Possible reason:	Defective lid lock
Solution:	Open manually and have unit serviced

Possible reason:	No power from PC board
Solution:	Call for service

Possible reason:	Lid lock is jammed
Solution:	Call for service

Possible reason:	Centrifuge is not receiving power
Solution:	See "Centrifuge will not start"

### Centrifuge cannot be started, although power is on

Possible reason:	Lid not closed correctly
Solution:	Close lid correctly

Possible reason:	No speed or time has been selected
Solution:	Set speed and/or time

### **bAL: Error Message**

Possible Reason:

Solution:

### **Indicates imbalance**

Tubes not inserted symmetrically in rotor holes  
Load tube symmetrically  
(see Section 3.4 on Loading the rotor)

Possible reason:	Sample liquid in tubes not balanced
Solution:	Make sure the same volume of liquid is in each tube

Possible reason:	Defective or improperly adjusted balance sensor
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Solution:	Call service
<b>Lid: (Error message)</b>	<b>Lid not closed</b>
Possible reason:	Lid not closed completely
Solution:	Close lid
Possible reason:	Lid lock or sensor defective
Solution:	Call service
<b><u>Other Error Messages</u></b>	<b>Er on Display</b>
Solution:	Press time or speed knob to clear error Call service

## 7. Where to call

If you have a question about the Corning® LSE™ High Speed Microcentrifuge or have a service inquiry, contact Corning Customer Service immediately at:

- 1.800.492.1110 (for toll-free calling within the U.S. and Canada)
- 1.978.442.2200 (outside the U.S.), or
- Contact your local Corning support office listed in the back of this manual.

Before returning any unit for service, a Return Authorization (RA) number must first be obtained. Equipment sent in without out prior authorization will be returned at the customer's expense. When returning a unit to Corning for service, it should be sent in the original packaging. If this is not possible, be sure that the unit is sufficiently packed. Any damage resulting from improper packaging is the responsibility of the customer. A written explanation should accompany the unit along with the RA number and a decontamination form.

## 8. Determination of g-values

The centrifuging radius of the 1.5/2.0 mL rotor is 8.23 cm. The Corning High Speed Microcentrifuge has an automatic g-force conversion program, so g-values are automatically calculated and can be displayed on the control panel, for this centrifuging radius. If adapters or smaller tubes are used, the centrifuging radius changes as does the g force.

G- force can be calculated with a new measured radius and rpm using the following formula:

$$\text{g-force} = 11.18 \times r \times \left( \frac{n}{1000} \right)^2$$

r = radius in centimeters

n = speed in rpm

## Warranty Statement

Corning Incorporated (Corning) warrants that this product will be free from defects in material and workmanship for a period of one (1) year from date of purchase. CORNING DISCLAIMS ALL OTHER WARRANTIES WHETHER EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE. Corning's sole obligation shall be to repair or replace, at its option, any product or part thereof that proves defective in material or workmanship within the warranty period, provided the purchaser notifies Corning of any such defect. Corning is not liable for any incidental or consequential damages, commercial loss or any other damages from the use of this product. This warranty is valid only if the product is used for its intended purpose and within the guidelines specified in the supplied instruction manual. This warranty does not cover damage caused by accident, neglect, misuse, improper service, natural forces or other causes not arising from defects in original material or workmanship. This warranty does not cover motor brushes, fuses, light bulbs, batteries or damage to paint or finish. Claims for transit damage should be filed with the transportation carrier.

In the event this product fails within the specified period of time because of a defect in material or - workmanship, contact Corning's Customer Service at the following numbers: USA: 1-800-492-1110; Canada: 1-978-442-2200. For other regions of the world, please visit [www.corning.com/lifesciences](http://www.corning.com/lifesciences) or see the included instruction manual for a list of World Wide Support Offices.

Corning's Customer Service team will help arrange local service where available or coordinate a return authorization number and shipping instructions. Products received without proper authorization will be returned. All items returned for service should be sent postage prepaid in the original packaging or other suitable carton, padded to avoid damage. Corning will not be responsible for damage incurred by improper packaging. Corning may elect for onsite service for larger equipment.

Some states do not allow limitation on the length of implied warranties or the exclusion or limitation of incidental or consequential damages. This warranty gives you specific legal rights. You may have other rights which vary from state to state.

No individual may accept for, or on behalf of Corning, any other obligation of liability, or extend the period of this warranty.

For your reference, make a note of the serial number, date of purchase and supplier here.

Serial No. \_\_\_\_\_ Date Purchased \_\_\_\_\_

Supplier \_\_\_\_\_

**Declaration of Conformity**



Corning Life Sciences hereby confirms that the product

Corning® LSE™ High Speed Microcentrifuge

Is in accordance with the following directives and standards:

2006/95/EC	Low Voltage Directive
2004/108/EC	EMC Directive
98/37/EC	Machine Directive
2002/95/EC	RoHS
2006/96/EC	WEEE

EN 61010-1  
EN 61010-2-020  
EN 61326-1:2006

Quality Manager

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to both Part 15 of the FCC Rules and the radio interference regulation of the Canadian Department of Communications. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference which case the user will be required to correct the interface at his own expense.

## Product Disposal



This symbol, if present on the product, indicates that the product was planned for use in a country complying with the Waste Electrical and Electronic Equipment EU Directive, 2002/96/ED. This symbol indicates that this equipment must not be disposed of with unsorted municipal waste. It is the product user's responsibility to correctly dispose of waste equipment by handing it over to an authorized facility for separate collection and recycling. It is the product user's responsibility to decontaminate waste equipment from biological, chemical, and/or radiological hazards prior to disposal. Additional information pertaining to the disposal of Corning per the WEEE Directive can be obtained at [www.corning.com/weee](http://www.corning.com/weee).

Please register your warranty online at  
<http://www.corning.com/lifesciences/warranty>

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