Addendum 1 to the LC Carousel Centrifuge 2.0 Operator's Manual, Version 3.0

July 2016

In the USA, the LC Carousel Centrifuge 2.0 is intended for laboratory use only.

Updated Information about the LC Carousel Centrifuge 2.0

Dear Valued User of the LC Carousel Centrifuge 2.0,

Please be informed that section **VII**, **Declaration of Conformity** in the LC Carousel Centrifuge 2.0 Operator's Manual Version 3.0 is replaced by the following section:

Approvals

The LC Carousel Centrifuge 2.0 Instrument meets the requirements laid down in:

- Directive 98/79/EC of the European Parliament and of the Council of 27 October 1998 on *in vitro* diagnostic medical devices.
- Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Compliance with the applicable directive(s) is provided by means of the Declaration of Conformity.

The following marks demonstrate compliance:

IVD	For *in vitro* diagnostic use.
CE	Complies with the provisions of the applicable EU directives.
C SA US	Issued by CSA Group for Canada and the US.
Equipment de Laboratoire/ Laboratory Equipment	'Laboratory Equipment' is the product identifier as shown on the type plate.

If you have any questions regarding the LC Carousel Centrifuge 2.0, please contact your Roche Diagnostics representative.

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Germany

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LC Carousel Centrifuge 2.0
Operator's Manual, Version 3.0

August 2012

CE

For USA the LC Carousel Centrifuge 2.0 is intended for laboratory use.

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Prologue

I Revision History

Manual Version	Revision Date
1.0	October 2003
2.0	March 2005
3.0	August 2012

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Every effort has been made to ensure that all the information contained in the LC Carousel Centrifuge 2.0 Operator's Manual is correct at the time of printing. However, Roche Diagnostics GmbH reserves the right to make any changes necessary without notice as part of ongoing product development.

II Contact Addresses

	Manufacturer	Roche Diagnostics GmbH Sandhofer Straße 116 68305 Mannheim Germany
	Distribution	Roche Diagnostics GmbH 68305 Mannheim Germany http://www.roche-applied-science.com
	Distribution in USA	Roche Diagnostics 9115 Hague Road PO Box 50457 Indianapolis, IN 46250 USA

III Warranty

Warranty Conditions

The LC Carousel Centrifuge 2.0 is guaranteed against defects in materials and workmanship as specified in the purchase contract made with the local Roche representative. This warranty is limited to defective materials and workmanship, and does not cover accidental or consequential damage and wear because of excessive use.

Roche will repair free of charge any instrument covered by this warranty. Warranty work is subject to our inspection of the unit. Costs of shipping the unit are not covered under the warranty. Please contact your Roche representative for authorization to return the instrument. No shipment of instruments, equipment or accessories will be accepted without this return authorization.

The warranty requires the user to follow the precautions and maintenance instructions in this manual and to ensure that all mounting, additions, settings, modifications or repairs are made only by authorized Roche Diagnostics personnel.

When returning instruments that may contain hazardous materials, the user must pack the instrument according to the regulations of International Carriers, and label it accordingly. All units must be decontaminated before return.

This warranty does not cover use of non-approved disposables or accessories with the LC Carousel Centrifuge 2.0.

IV Technical Service

Roche Diagnostics offers full service and technical support for all its products. For details please contact your local Roche representative.

V Trademarks

LC, LIGHTCYCLER, MAGNA LYSER and MAGNA PURE are trademarks of Roche.

All other product names and trademarks are the property of their respective owners.

VI Intended Use

The LC Carousel Centrifuge 2.0 is intended for centrifugation of LightCycler® Capillaries specific for the LightCycler® 2.0 Instrument and other LightCycler® Instrument versions. The Instrument must only be used with the specific rotor buckets supplied with the Instrument together with the LightCycler® 2.0 Sample Carousel (20 µl) or the LightCycler® 2.0 Sample Carousel (100 µl).

The LC Carousel Centrifuge 2.0 must be used exclusively by laboratory professionals trained in laboratory techniques and having studied this manual.

For USA the LC Carousel Centrifuge 2.0 is intended for laboratory use.

Any in vitro diagnostics (IVD) application using the LC Carousel Centrifuge 2.0 has to be evaluated with regard to the individual IVD parameter by the responsible manufacturer.

Limitations:

The user must define their own experimental criteria for the LC Carousel Centrifuge 2.0 and determine the performance of the specific assays they develop. The assay performance needs to be validated by the user. Roche therefore cannot take any responsibility for performance or interpretation of results obtained from such test, described by the authors or other users using a similar experimental approach.

VII Declaration of Conformity

CE

Declaration of Conformity
The LC Carousel Centrifuge 2.0 complies with the requirements of the European Directive 98/79/EC (*In vitro* diagnostic medical devices).

VIII Use of the LC Carousel Centrifuge 2.0 Operator's Manual

Before setting up and working with the LC Carousel Centrifuge 2.0 it is important to read this Operator's Manual thoroughly and completely. Failure to observe instructions contained in this manual may lead to safety hazards.

Use this manual to get accustomed to your centrifuge and its accessories. The manual helps to avoid improper use. Make sure to always keep it close to the centrifuge.

This Operator's Manual contains the following chapters:

Prologue	contains general information and safety precautions.
Overview	describes briefly usage of the instrument.
Instrument Description	describes the instrument's components and gives instructions on the installation of the LC Carousel Centrifuge 2.0.
Operating Instructions	describes the operating procedure for the LC Carousel Centrifuge 2.0.
Troubleshooting	describes the emergency release procedure and lists all LC Carousel Centrifuge 2.0 system messages, explains their meaning and indicates appropriate corrective measures.
Maintenance and Care	describes the maintenance procedures that are required for the LC Carousel Centrifuge 2.0.

Questions or comments regarding the contents of this manual can be directed to your local Roche representative.

IX Conventions Used in this Manual

Text Conventions

To make information consistent and memorable, the following text conventions are used in this Operator's Manual:

Text Convention	Use
Numbered listing	Numbered working steps which have to be performed in the order listed
Italic type	Points to a different chapter in this Operator's Manual which should be consulted
Bold typeface	Emphasizes the importance of a term or component

Symbols

Certain symbols are used throughout this Operator's Manual to provide a convenient visual reference. These symbols are as follows:

Symbol	Used for
	**Important note** Designates an important note that must be reviewed and understood.
	**Warning** Indicates a possible hazardous situation, that, if not avoided, may result in serious injury (or even death) or in damage to the system. Consult the Operator's Manual.

The following symbols appear on the instrument

	Manufacturer of device On the instrument plate
	Warning On the front of the instrument. Meaning: Consult Operator's Manual in order to find out the nature of the potential hazard and any possible actions to be taken.
	The CE mark on the instrument plate expresses conformity with essential requirements of the directives relevant for this instrument (see VII).
	CSA mark On the instrument plate (see "General Specifications" on page 13)

X Warnings and Precautions

The safety precautions that are necessary when installing, operating, and servicing the instrument are summarized below. It is important that you carefully read and understand the safety statements contained in this section. This information should also be made available to new employees and kept for future reference.

Use the LC Carousel Centrifuge 2.0 only for centrifugation of LightCycler® Capillaries specific for the LightCycler® 2.0 System. Safety can be impaired if any other equipment or spare parts not recommended by Roche Diagnostics are used.

The LC Carousel Centrifuge 2.0 must only be used by trained and skilled personnel.

Electrical Safety

The LC Carousel Centrifuge 2.0 is an electromechanical instrument. There is potential danger of an electric shock or physical injury if the instrument is not used according to the instructions given in this manual.

- ▶ Follow all safety instructions printed on, or attached to the instrument.
- ▶ Observe all general safety precautions which apply to electrical instruments.
- ▶ Never touch switches or power cord with wet hands.
- ▶ Never clean the instrument without turning the instrument power switch off and disconnecting the power cord.

Only authorized service personnel should perform service or repairs required for this unit.

Handling precautions

During centrifugation, there must not be any person nor hazardous materials within a safety zone of 30 cm around the instrument. The centrifuge poses a danger to you, other persons or objects if you do not observe the following safety measures:

- ▶ Never operate the centrifuge unless the rotor is properly mounted.
- ▶ Never open the lid manually if the rotor is still in motion.
- ▶ Use only original spare parts for the centrifuge.
- ▶ Never operate the centrifuge if the paneling has been partially or totally removed.
- ▶ Only personnel authorized by Roche Diagnostics may modify mechanical or electrical components of the centrifuge.
- ▶ The centrifuge may only be operated with a properly loaded rotor.
- ▶ Should the rotor or the rotor bucket show visible signs of corrosion or wear, it must not be used.
- ▶ Strictly observe general laboratory safety rules and relevant local regulations for cleaning and disinfection.

Centrifugation of hazardous material

The centrifuge is neither inerted nor explosive-proof. Do not use the centrifuge in a hazardous environment.

Do not centrifuge explosive or flammable materials or substances prone to react with each other. Do not centrifuge toxic or radioactive materials or potentially pathogenic microorganisms.

Should toxins or pathogenic substances have entered the centrifuge or any of its part, proper disinfection measures must be taken (see Chapter "Maintenance and Care" on page 25”).

Strongly corrosive substances that may cause damage to materials and reduce the mechanical stressability of the rotor must not be centrifuged.

XI Electrical Safety

The LC Carousel Centrifuge 2.0 is designed in accordance with safety standard EN/IEC 61010-1. Grounding of the instrument and those surfaces the user can come into contact with is provided by a grounded cable in accordance with protection class I (IEC). For protection against electrical shock hazards, the instrument must be directly connected to an approved power source such as a 3-wire grounded receptacle for the 120V or 230V line. Where an ungrounded receptacle is encountered, a qualified electrician must replace it with a properly grounded receptacle in accordance with the local electrical code. An extension cord must not be used.

Any break in the electrical ground path, whether inside or outside the instrument, may create a hazardous condition. Under no circumstances should the user attempt to modify or deliberately defeat the safety features of this instrument.

If the power cable becomes cracked, frayed, broken, or otherwise damaged, it must be replaced immediately with the equivalent part from Roche Diagnostics.

User should not perform any servicing except as specifically stated in this manual.

XII Disposal of the Instrument

Disposal recommendations

All electrical and electronic products should be disposed of separately from the municipal waste system. Proper disposal of your old appliance prevents potential negative consequences for the environment and human health.

The LC Carousel Centrifuge 2.0 must be treated as biologically contaminated hazardous waste. Decontamination (that is, a combination of processes, including cleaning, disinfection, and/or sterilization) is required before reuse, recycling, or disposal.

Dispose of the instrument according to local and/or laboratory regulations. For more information contact your local Roche Support representative.

The LC Carousel Centrifuge 2.0 is covered by the European Directive 2002/96/EC on waste electrical and electronic equipment (WEEE) of the European Parliament and the Council of January 27, 2003.

The LC Carousel Centrifuge 2.0 must be disposed of via designated collection facilities appointed by government or local authorities.

For more information on disposing of your product, please contact your city authorities, waste disposal service, or your local Roche Diagnostic representative.

Overview

1 Introduction

The LC Carousel Centrifuge 2.0 is an easy-to-use centrifuge with a specially designed rotor that can hold one LightCycler® Sample Carousel 2.0 (either for the 20 µl or 100 µl capillaries) of the LightCycler® 2.0 Instrument (A). It is used to centrifuge PCR or RT-PCR reaction mixes in LightCycler® Capillaries (both 20 µl and 100 µl capillaries) to ensure that the reaction mix is in the tip of each capillary.

You may pipette the LightCycler® PCR reaction mixes into the polypropylene cups of the capillaries either manually or automatically using the post elution functionality of the MagNA Pure LC Instrument. To ensure maximum stability of the reaction mix components and to avoid extensive formation of primer-dimers, it is recommended to cool the capillaries until the LightCycler® Instrument run starts. If you use the MagNA Pure LC Instrument for automated filling, place the LightCycler® 2.0 Sample Carousel with capillaries inserted into the precooled MagNA Pure LC Cooling Block, LC Sample Carousel (B). If you perform manual filling of the capillaries, use either a precooled MagNA Pure LC Cooling Block, LC Sample Carousel or place the capillaries for filling into precooled LightCycler® Centrifuge adapters held in the appropriate cooling block (C). After filling transfer the capillaries to the LightCycler® 2.0 Sample Carousel. After you pipette the PCR reaction mix into the capillary cup, seal the capillaries with the appropriate stoppers (D). Place the LightCycler® 2.0 Sample Carousel within the blue centrifuge bucket into the LC Carousel Centrifuge 2.0 (E, F). After a preset centrifugation period of 30 seconds, immediately insert the LightCycler® 2.0 Sample Carousel containing the capillaries with PCR reaction mixes into the LightCycler® 2.0 Instrument and start the PCR run (G).

A) The LightCycler® 2.0 Instrument with the LightCycler® 2.0 Sample Carousel (20 µl) and the LightCycler® 2.0 Sample Carousel (100 µl).

B) The MagNA Pure LC Cooling Block, LC Sample Carousel with the LightCycler® Sample Carousel assembled.

C) The LightCycler® Centrifuge Adapters within cooling block.

D) The LightCycler® 2.0 Sample Carousel with filled and sealed capillaries inserted.

E) Inserting the LightCycler® 2.0 Sample Carousel within the centrifuge bucket into the LC Carousel Centrifuge 2.0.

F) The LightCycler® 2.0 Sample Carousel within the centrifuge bucket inserted in the LC Carousel Centrifuge 2.0.

G) Transferring the LightCycler® 2.0 Sample Carousel into the LightCycler® 2.0 Instrument.

2 Specifications

2.1 Technical Specifications

Display	Centrifugation speed in rounds per minute [rpm] and remaining centrifugation time in seconds [sec]; large LED readout
Time	Fixed centrifugation operating time of 30 sec.
Maximum speed nmax	3000 rpm
Maximum RCF value at nmax	735x *g*
Maximum kinetic energy	0.49 kNm
Loudness at maximum speed	< 59 dB (A)
Dimensions	285 mm (H) x 315 mm (W) x 380 mm (D)
Weight	20.6 kg
Power	115 V AC, 60 Hz, 2.2 A 230 V AC, 50 Hz, 1.5 A
Line Voltage Variation	+/- 10%
Instrument fuse socket connection	2 x T4A 250 V (5 x 20 mm)

2.2 General Specifications

Environmental conditions	Designed for indoor use only. Altitude up to 2000 m M.S.L. Max. relative humidity (non condensing) 80% up to 32°C
Permissable ambient temperature	+15 to +32°C
Environmental conditions during transport/storage/ packaging	Temperature range: -25 to 60°C, relative humidity: 10% to 95% (no condensation)
Safety	Complies with safety standards EN 61010-1, EN 61010-2-020 and EN 61010-2-101, level of pollution 2, overvoltage category II, CAN/CSA-C22.2 No. 1010.1-92 as well as UL 61010A-1
Quality certificates	ISO 9001, EN ISO 9001, registered by Lloyd's Register Quality Assurance, certificate no. LRQ0964332
C US	The safety mark has been issued by the CSA, Canada.

3 Instrument Description

3.1 Transport and Unpacking of the Instrument

The centrifuge is packed in a special box. Before opening it, inspect the container carefully for damage. Report any damage to your local Roche Diagnostics office before accepting the unit.

If you must move the centrifuge long distances or return it to Roche Diagnostics, place it upright in the original box for transport. Cut the box open and remove the protective padding. The instrument weights approx. 21 kg.

When transporting the centrifuge, consider its weight (see "Technical Specifications" on page 13). Make sure to pick up the instrument with both hands. Ensure to have some help around. Do not lift the instrument using the lid handle.

Shocks during transport and rough handling cause damage to the centrifuge!

Transport the centrifuge in an upright position only in the special box provided and secure it properly. Put the centrifuge down carefully.

Do not lift the centrifuge by the lid grip!

Check all items listed below are included. If you notice any discrepancy or shipping damage please call your local Roche representative.

Included in the instrument package are:

1	The LC Carousel Centrifuge 2.0 unit consisting of the centrifuge and the blue rotor together with the blue rotor bucket for the LightCycler® 2.0 Sample Carousel inside
2	Tool: Emergency release
3	Operator´s Manual
4	German power cable, CEE 7/7
5	US power cable, NEMA 5 – 15P
6	Socket wrench for removing and tightening the fastening nut of the rotor

The LC Carousel Centrifuge 2.0.

Blue Rotor 2.0 together with blue rotor bucket for the LightCycler® 2.0 Sample Carousel.

Note: The LightCycler® 2.0 Sample Carousels (for 20 µl or 100 µl capillaries) are not part of the unit!

3.2 Setting up the Instrument

Selecting a Location

Make sure the main switch is freely accessible. Incorrect location of the instrument can cause incorrect results and damage to the equipment parts.

Use the LC Carousel Centrifuge 2.0 only indoors. The instrument site must meet the following requirements:

- Always maintain a safety zone of no less than 30 cm around the centrifuge. Keep away any hazardous substances from this zone during centrifugation.
- Place the instrument on a stable and resonance-free stand. A plane laboratory bench or a large laboratory carriage with casters that can be locked in position are suitable.
- To ensure sufficient air circulation, keep a minimum distance between wall and centrifuge of no less than 10 cm in the rear and no less than 15 cm at each side.
- Protect the centrifuge from heat and strong solar radiation.
- Always keep the site well ventilated.
- Do not operate the instrument in areas of excessive humidity or extremes of temperature. Read the detailed technical data for the instrument in the chapter about specifications.
- Do not use the instrument under hazardous conditions.

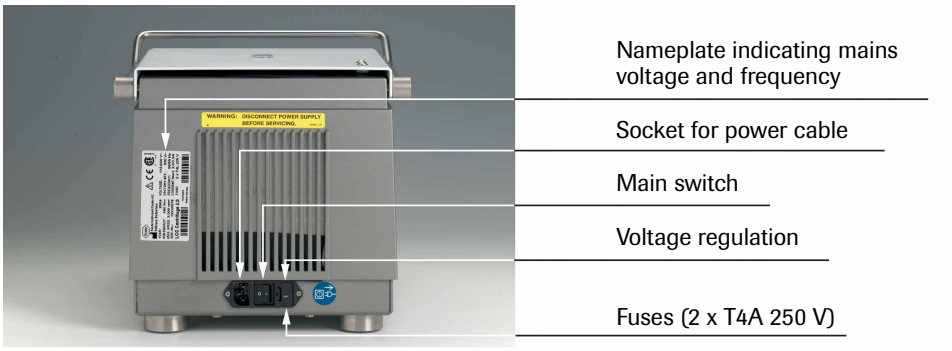
Place the LC Carousel Centrifuge 2.0 on a solid surface to prevent vibration interfering with other devices in the same area. It is especially important that other instruments (*e.g.*, the LightCycler® Instrument) are isolated from any such vibration.

Connecting to Power

The instrument is provided with switchable mains input (115 / 230 V – 50 / 60 Hz).

The set-up procedure and the country-specific settings may be performed exclusively by specially trained service personnel.
Before connecting the instrument to an outlet, check that voltage, frequency and amperage are compatible with the instrument´s specifications as indicated on the label on the rear.
Install the instrument in an upright position.

Plug the centrifuge only into a grounded power outlet. Check whether the cable meets your country's safety requirements. Make sure that the mains voltage corresponds to the voltage set at the power input.
Switch the main switch on the back panel off (press "0"), only then connect the instrument to the mains.



The LC Carousel Centrifuge 2.0; view from the rear.

Do not replace fuses.
Should a fuse be blown, contact your local Roche representative.

Remove Shipping Brace

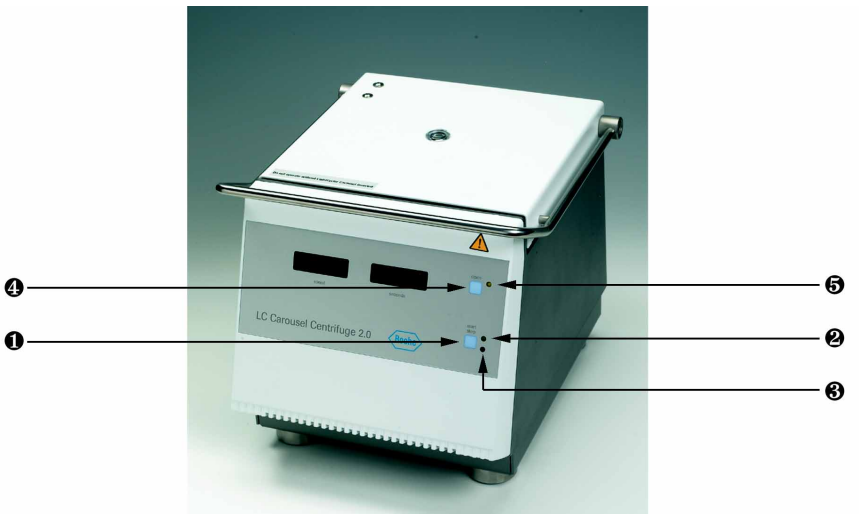
After connecting the instrument to the mains, switch the main switch to "I". The internal software check sequence appears on the display for a few seconds.

Open the centrifuge lid by pressing the "open" key now and remove the rotor shipping brace.

Check whether the rotor moves freely by rotating it slightly and make sure that the rotor is bolted down.

After placing the sample carousel into the rotor bucket (see "Loading and inserting the rotor bucket into the rotor" on page 19) the centrifuge is ready for operation.

3.3 Description of the LC Carousel Centrifuge 2.0



The LC Carousel Centrifuge 2.0; view from the front.

The ”start/stop” key ❶ on the lower right allows the operator to start or stop the centrifugation. A green light emitting diode ❷ indicates that the LC Carousel Centrifuge 2.0 is ready for use and pressing the ”start/stop” key initiates operation. The red LED ❸ indicates that the instrument is in operation and pressing the ”start/stop” key aborts centrifugation.

Pressing the ”open” key ❹ opens the lid of the LC Carousel Centrifuge 2.0 after a centrifugation is completed and the yellow LED ❺ shines. Opening the lid extinguishes the yellow LED.

Two displays show the centrifugation speed in rounds per minute (rpm) and the remaining centrifugation time in seconds (sec).

4 Operating Instructions

Please ensure that the instrument does not show any evidence of deformations, corrosion or other damages. Please check on a regular basis.

Switch on the Centrifuge

Switch the main switch on at the back of the instrument.

After a short initiating phase due to an internal software check the display shows the actual value mode:

Speed: 0000
Seconds: 00

Open the lid

Press the “open” key (for emergency lid release in case of trouble and power failure see chapter "Troubleshooting" on page 21).

Loading and inserting the rotor bucket into the rotor

Inadmissible or incorrectly assembled accessories can cause severe damage of the centrifuge!

Only operate the LC Carousel Centrifuge 2.0 with the blue rotor and blue rotor bucket supplied together with the instrument. If you need to use the LC Carousel Centrifuge 2.0 Bucket 2.1 (silver) to centrifuge the sample carousel of LightCycler® 1.5 Instrument and previous versions, operate the silver rotor bucket together with the blue rotor. (See "Appendix" on page 27 for details.)

Do use the LightCycler® 2.0 Sample Carousels for the LightCycler® 2.0 Instrument only. To centrifuge the sample carousel of the LightCycler® 1.5 Instrument and previous versions, you will need the silver LC Carousel Centrifuge 2.0 Bucket 2.1 in addition. (See "Appendix" on page 27 for details.)

1. Before inserting the rotor bucket with the LightCycler® Sample Carousel into the rotor make sure that the rotor is in correct position and that the fastening nut is tightened. (For correct hadling of the rotor please refer to Chapter "Maintenance and Care" on page 25).

2. Load the LightCycler® 2.0 Sample Carousel with the capillaries and place it into the rotor bucket. Capillaries have to be sealed with plastic stoppers to avoid spilling of the PCR mix during centrifugation.

3. 

Inserting the loaded rotor bucket into the rotor.

Fit the loaded rotor bucket with the crip at the top into the rotor. The Roche Logo must point upwards and the LightCycler® 2.0 Sample Carousel will point to the axis of rotation.

4. 

After you inserted the roter bucket with the loaded sample carousel properly into the rotor, you may close the lid of the centrifuge.

Close the lid

Close the centrifuge by lightly pressing down the lid on the front edge of the LC Carousel Centrifuge 2.0. Now you can start the centrifugation.

Centrifugation

Press the Start/Stop key on the control panel.

The LC Carousel Centrifuge 2.0 accelerates according to a specified program. During this procedure the ”Speed” display shows the actual speed of the rotor and the ”Seconds” display shows the time remaining in seconds until deceleration.

The centrifugation cycle ends automatically. Deceleration starts after 30 seconds of centrifugation at 3000 rpm. During the braking phase the display for the time remaining shows ”00”.

It is impossible to open the lid of the centrifuge during operation.

You can end the centrifugation by pressing the ”Start/Stop” key at any time.

In case of severe unbalance, which shows up at less than 300 rpm (*e.g.* if rotor bucket has not been inserted), the error code ”E-21” appears on the display after a few seconds.
The centrifugation will be interrupted. After balancing (check load) you can start the centrifuge again.

Removing the LightCycler® 2.0 Sample Carousel

After the centrifuge has come to a halt, it can be opened by pressing the “open” key.

Take care that the bucket is always in a vertical position when removing it from the centrifuge. Place the bucket onto a table and remove the LightCycler® 2.0 Sample Carousel.

Shut Down

To shut down the LC Carousel Centrifuge switch the main switch at the back of the instrument.

5 Troubleshooting

5.1 Emergency Release

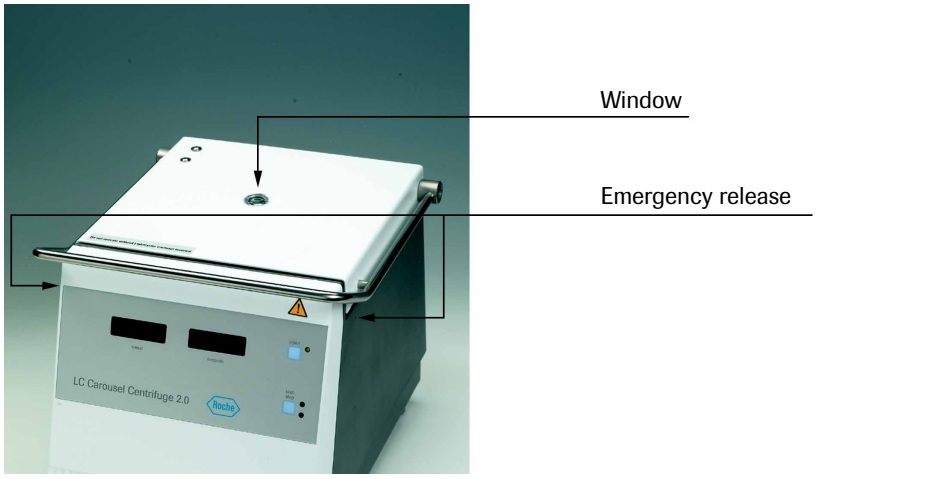
In case of a power failure the centrifuge lid cannot be opened with the normal electrical lid release. To permit removing the samples in any case, the centrifuge is equipped with a manual lid release. However, this is to be used only in case of emergency.

The rotor can run at high speeds!
Touching it can cause severe injuries!
Please always wait for a few minutes when you use the emergency lid release option until the rotor has come to a standstill without aid of brake. The brake does not operate without power supply. In this case it takes longer than usual for the instrument to come to a standstill!

Proceed as follows:

1	Make sure the rotor is at standstill by looking through the window on the top of the instrument. Never attempt to stop or slow down the rotor using your hands or any tools!
2	Pull the mains plug.
3	Lift the centrifuge lid slighty by the lid grip. Then insert the auxiliary tool supplied with the unit into the bore holes at each side of the housing. Pressure will thereby be applied to the lock bolts causing the lid to click open. Remove the auxiliary tool and open the lid.

Before next centrifugation connect the instrument to the power supply and switch it on again.



Location of manual lid release.

5.2 Error Messages

The following error messages may appear on the centrifuge's display:

Error message	Centrifuge performance	Possible causes and solutions
Displays remain dark	The drive stops. The rotor comes to an eventual standstill without aid of brake. The lid cannot be opened.	Power failure. 1. Is the mains switch switched on? 2. Check the mains connection. 3. If there is voltage supply, contact the Roche customer service.
Displays fail temporarily	The drive suddenly stops. The rotor comes to a standstill with aid of brake.	Temporary power failure. 1. Switch the mains switch off. 2. Check whether the mains plug is plugged in properly.
"OPEN" appears on the display, although lid is closed.	Start impossible.	A) Lid is not properly locked. Open lid and lock it again by pressing it down on both sides. B) Excess temperature fuse of the motor has blown. 1. Pull the mains plug. 2. Check the ventilation openings located under the instrument and clean them if necessary. 3. Wait approx. 20 min before starting the instrument again. Should the safety circuit go off again, contact the Roche service.
Message "Lid" appears on the display	The drive stops. Rotor comes to an eventual standstill without aid of brake.	A) The lid was manually opened during operation. 1. Press the lid shut. The instrument comes to an eventual standstill without aid of brake. 2. To continue centrifugation, switch the instrument off and on again. B) Excess-temperature fuse of the motor has blown. 1. Pull the mains plug. 2. Check the ventilation openings located under the instrument and clean them if necessary. 3. Wait approx. 20 min before starting the instrument again. Should the safety circuit go off again, contact the customer service.
E-00	Motor does not start.	Motor or rotor blocked. 1. Switch instrument off and on again by using the mains switch. 2. Check whether the rotor rotates freely. If you cannot fix the fault, contact the Roche service.
E-02	Rotor comes to an eventual standstill without aid of brake. Operation of the instrument is not possible.	Error in the program memory. Switch the instrument off and on again by using the mains switch. If error persists, call the Roche service.

Error message	Centrifuge performance	Possible causes and solutions
E-03	Rotor comes to an eventual standstill without aid of brake. Operation of the instrument is not possible.	Defective speed sensing. Switch the instrument off and on again by using the mains switch. If error persists, call the Roche service.
E-06	Rotor comes to an eventual standstill without aid of brake. Operation of the instrument is not possible.	Communication error between keyboard and CPU. Switch the instrument off and on again by using the mains switch. If error persists, call the customer service.
E-08	Rotor comes to an eventual standstill without aid of brake. Operation of the instrument is not possible.	Converter overvoltage. Supply voltage out of tolerance. Defective braking resistor. Contact the Roche service.
E-10	During selftest after switching on the centrifuge.	NV-RAM; error in the program memory. Switch the instrument off and on again by using the mains switch. If error persists, contact the Roche service.
E-15	Rotor comes to an eventual standstill without aid of brake. Operation of the instrument is not possible.	Error in NV-RAM checksum. Switch the instrument off and on again by using the mains switch. If error persists, contact the Roche service.
E-17	Lid does not open.	Lid is blocked or jammed. 1. Press the front side of the lid down in the middle and press the “open” key again. 2. Otherwise see Section "Emergency Release" on page 21. If error persists, contact the Roche service.
E-19	During selftest after switching on the centrifuge.	Wrong NV-RAM or keyboard. Switch the instrument off and on again by using the mains switch. If error persists, contact the Roche service.
E-21	Centrifuge does not accelerate. (Rotor comes to an eventual standstill without aid of brake.)	Severe unbalance Sample Carousel not inserted or Rotor blocked (Rotor shipping brace not removed) 1. Check whether the rotor is properly loaded. 2. Check whether the rotor rotates freely. 3. Switch the instrument off and on again by using the mains switch. If error persists, call the Roche service.
E-22	During selftest after switching on the centrifuge.	**NV-RAM parameter** does not match the processor. Switch the instrument off and on again by using the mains switch. If error persists, contact the Roche service.

Further Troubleshooting

Problem	Centrifuge performance	Possible causes and solutions
Lid cannot be opened	“Lid open” key does not respond.	Lid not properly locked in place or lid warped. 1. Check whether the instrument is connected to the mains and the power is on (displays are lit). 2. Press both front sides of the lid down and press the “open” key again. 3. If this does not work, open the lid by using the manual emergency lid release.
–	Centrifuge runs noisily.	1. Stop the instrument by pressing the ”stop” key or pull the mains plug in case of emergency. 2. Wait until the centrifuge has come to a standstill. 3. Check whether the rotor is properly loaded. 4. Check whether a broken bucket, a damaged rotor or motor could have caused the running noise. If you cannot find or fix the fault, contact the Roche service.
Capillaries not closed prior to centrifugation	Contamination of the instrument, loss of sample	1. Check before centrifugation if all capillaries are closed correctly. 2. Clean centrifuge according to cleaning instructions in Chapter "Maintenance and Care" on page 25.
Maximum speed is not reached	Incomplete centrifugation, no result.	Low voltage. Check before centrifugation that the required voltage is provided to the centrifuge.
Loading of wrong rotor bucket/ sample carousel combination	Unbalance	Make sure that correct rotor bucket/ sample carousel combination have been used: Sample carousels for LightCycler® 2.0 Instrument must be centrifuged with the blue rotor bucket only.

6 Maintenance and Care

6.1 Maintenance

The LC Carousel Centrifuge 2.0 requires no scheduled maintenance.

6.2 Cleaning

We recommend cleaning/desinfection of all visible parts with 70% ethyl alcohol if cleaning is necessary.

Clean the instrument with a soft cloth/cleenex only. Do nor spray in the inside of the instrument or leave excessive liquid in or on the housing. Do not put any parts of the instrument into a dishwasher.

Pull mains plug before cleaning.

Cleaning agents or disinfection methods not suitable may damage the instrument or the accessories. Before using a different cleaning or disinfection method than recommended in this operator´s manual, the user has to consult the manufacturer.

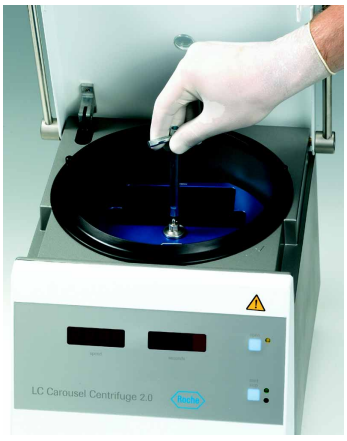
Liquid should be prevented from leaking into the instrument´s internal parts.

6.3 Removing and Installation of the Rotor

For efficient cleaning of the instrument it may be necessary to remove the rotor.

For removing and re-installation of the rotor proceed as follows:

1. The rotor is fixed by a fastening nut. For removal of the rotor unplug the fastening nut using the socket wrench supplied with the instrument



Removing/tightening the fastening nut.

2. Remove the rotor

3 Insert the rotor. Make sure that the notch on the rotor rests accurately on the driving pin.

Inserting the rotor into the LC Carousel Centrifuge 2.0.

4 Press the rotor down gently until the thread is visible.

5 If you have inserted the rotor properly, the fastening nut can be tightened without much effort by the socket wrench supplied with the instrument.

Do not press the rotor down by force. If the nut cannot be moved, remove the rotor carefully and put it in place again.

7 Ordering Guide

For latest information on the MagNA Pure System Family for automated nucleic acid isolation (incl. MagNA Pure LC Instrument, MagNA Pure Compact Instrument, and MagNA Lyser Instrument), please visit us at:

http:\\www.magnapure.com

For latest information on the LightCycler® System (including instruments, reagents, accessories and other related products), please visit us at:

http:\\www.lightcycler-online.com

To order, solve technical queries, find product information or contact local sales representative, visit us at:

http:\\www.roche-applied-science.com

Appendix

For customers already working with the LC Carousel Centrifuge [Cat. No. 03709582001 (230 V) and Cat. No. 03709507001 (115 V)] Roche Applied Science provides the LC Carousel Centrifuge 2.0 Rotor Set (Cat. No. 03 724 697 001) which contains a blue rotor and two rotor buckets.

The LC Carousel Centrifuge 2.0 Rotor Set.

The silver rotor bucket has to be used for centrifugation of the LightCycler® Sample Carousels provided together with the LightCycler® 1.5 Instrument or instrument versions below.

The blue rotor bucket has to be used for centrifugation of the LightCycler® 2.0 Sample Carousels provided together with the LightCycler® 2.0 Instrument.

To upgrade your LC Carousel Centrifuge install the blue rotor according to Chapter "Removing and Installation of the Rotor" on page 25. Both rotor buckets (blue and silver) are assembled directly into the blue rotor.

For customers working with the LC Carousel Centrifuge 2.0 and the need to centrifuge the LightCycler® Sample Carousel of the LightCycler® 1.5 Instrument and previous versions, Roche Applied Science provides the LC Carousel Centrifuge 2.0 Bucket 2.1 (Cat. No. 03 724 689 001). This silver rotor bucket is to be placed directly into the blue rotor of the LC Carousel Centrifuge 2.0.

Both former versions and upgraded former versions of the centrifuge are not compliant with European directive 98/79/EEC and can only be used in general laboratory applications.

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For USA the LC Carousel Centrifuge 2.0 is intended for laboratory use.