MagNA Lyser Instrument
Operator‘s Manual, Version 4.0

August 2012

CE

For USA the MagNA Lyser Instrument is intended for laboratory use.

Prologue

I. Revision History

Manual Version	Revision Date
1.0	December 2002
2.0	March 2005
3.0	December 2005
4.0	August 2012

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II. Contact Addresses

Manufacturer	Roche Diagnostics GmbH Sandhofer Straße 116 68305 Mannheim Germany
Distribution	Roche Diagnostics GmbH Sandhofer Straße 116 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 MagNA Lyser Instrument 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 kits and disposables with the MagNA Lyser Instrument.

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 PURE and MAGNA LYSER are trademarks of Roche.

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

VI. Intended Use

The MagNA Lyser Instrument is a bench top device that automatically disrupts cells or other biological materials. The instrument facilitates the production of a lysate containing nucleic acids (NA) and proteins suitable for subsequent purification, extraction or analysis.

The MagNA Lyser Instrument is to be used exclusively by laboratory professionals trained in laboratory techniques and having studied the *instructions for use* of the instrument.

For USA the MagNA Lyser Instrument is intended for laboratory use.

VII. Declaration of Conformity

CE

Declaration of Conformity

The MagNA Lyser Instrument complies with the requirements of the European Directive 98/79/EC (*in vitro* diagnostic medical devices).

VIII. Use of the MagNA Lyser Instrument Operator's Manual

Before setting up the MagNA Lyser Instrument, 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.

This Operator's Manual will help you operate the MagNA Lyser Instrument. It contains the following chapters:

Prologue	contains general information, warnings and precautions.
Overview	contains a short introduction to the operating mode of the MagNA Lyser Instrument.
Instrument Description	describes the instrument's components and gives instructions on the installation of the MagNA Lyser Instrument.
Operation	describes the operating procedure for the MagNA Lyser Instrument.
Maintenance and Care	describes the maintenance procedures that are required for the MagNA Lyser Instrument.
Appendix	lists all MagNA Lyser Instrument system messages, explains their meaning and indicates appropriate corrective measures.

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
	**Information note** Designates a note that provides additional information about the current topic or procedure.
	**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 Operator's Manual.
	**Biohazard** This symbol indicates that certain precautions must be taken when working with potentially infectious material.

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 actions which have to be taken.
	The CE mark on the instrument plate expresses conformity with essential requirements of the directive relevant for this instrument (see VII).
	CSA mark On the rear of the instrument (see Chapter *Overview, 2.2, General Specifications*)

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.

Correct Use

Use the MagNA Lyser Instrument only for preparing liquid samples with the provided Roche Diagnostics kits. Safety can be impaired if any other equipment or spare parts not recommended by Roche Diagnostics are used.

The MagNA Lyser Instrument must only be used by trained and skilled personnel.

Electrical Safety

The MagNA Lyser Instrument 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 warnings and 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.

Samples

Hazard from infectious sample material, which can cause severe illness. Avoid direct contact with sample material.

For your own safety, please regard all biological material as potentially infectious. Handling and disposal of such material should be performed according to local safety guidelines.

- Always wear protective disposable gloves, laboratory coats and eye protection when dealing with toxic, caustic or infectious materials.
- Do not let reagents from the reagent kit contact skin, eyes, or mucous membranes. If contact does occur, immediately wash the affected area with large amounts of water. Burns can occur if these areas are left untreated. If reagents are spilled, dilute the spill with water before wiping it up.
- Wash hands thoroughly after handling samples and test reagents.
- Do not eat, drink, or smoke in the laboratory work area.
- Do not pipet samples or reagents by mouth.
- All mammalian (especially human) material and all resulting sample waste is potentially infectious. After using these materials, thoroughly clean and disinfect all work surfaces with disinfectants, as recommended by the local authorities.
- Dispose unused reagents and waste in accordance with federal, state, and local regulations.
- If potentially infectious sample material is used, check the instrument forany visible droplets through the window in the lid prior to opening it. If sample material has escaped from the tubes or small drops are visible through the window, open the instrument in a laminar flow safety hood for disinfection purposes.
- For safety reasons, when working with potentially infectious material, we recommend opening the instrument at all times in a laminar flow safety hood, even if no contamination is visible.
- If toxins or pathogenic substances have spilled in the MagNA Lyser Instrument or any of its parts, disinfect these parts as described in the *Maintenance* chapter.

Fire Risk

Keep all potentially flammable or explosive material (*e.g.* anesthetic gas) away from the instrument. Spraying liquid on the power supply parts can cause a short circuit and result in a fire. Do not use sprays in the vicinity of the instrument.

XI. Electrical Safety

The MagNA Lyser Instrument is designed in accordance with safety standards IEC/EN 61010-1, IEC/EN 6010-2-051 and IEC/EN 61010-2-101. 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 115V 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 interruption 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 MagNA Lyser Instrument must be treated as biologically contaminated hazardous waste. Decontamination (that is, a combination of process, including cleaning, disinfection, and/or sterilization) is required bevore reuse, recycling, or disposal.

Dispose of the instrument according to local and/or laboratory regulations.

For more information contact your local Roche Diagnostics personnel.

The MagNA Lyser Instrument 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.

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

A Overview

1. Introduction

The MagNA Lyser Instrument is a benchtop device that automatically disrupts cells or other biological materials. The instrument facilitates the production of a supernatant containing nucleic acids (NA) and proteins suitable for subsequent purification, extraction or analysis.

During a MagNA Lyser Instrument run, the rotor, which is filled with special tubes, rapidly oscillates. The oscillation of the instrument agitates the contents of the tubes (*i.e.* beads, cell material and lysing reagents) up and down at extremely high speed with a slight twisting motion.

The cells in the sample tubes are disrupted nearly instantaneously when they collide with the ceramic and/or glass beads. The rate of collision and energy of impact (both of which determine the effectiveness of the disruption process) depend on the shaking speed of the instrument and the specific gravity of the beads. By varying both of these parameters, you can ensure optimal disruption of a wide variety of cells. The time of the run can be also be varied to disrupt different types of sample material efficiently.

A

2. Specifications

2.1 Technical Specifications

Display	Programmable run time and speed; large LED readout
Time	Range: 10 – 99 seconds. Programmable in 1 second increments
Speed	Range: 2000 – 7000 rpm. Programmable in increments of 100 rpm
Acceleration	< 8 sec to maximum speed
Deceleration	< 8 sec to stop
Construction	Removable stainless steel rotor (sample holder) Anodized aluminum retention plate with red knobs
Dimensions	300 mm (H) × 315 mm (W) × 380 mm (D)
Weight	22 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 250V (5 × 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
Instrument internal temperature	Maximum: 5°C higher than room temperature
Transport and storage conditions	Temperature range: -25 to 60°C, relative humidity: 10% to 95% (no condensation)
Safety	Complies with safety standards EN 61010-1, EN 61010-2-051 and EN 61010-2-101, level of pollution 2, Overvoltage category II. CAN/CSA-C22.2 No 1010.1 and UL 61010A-1
C SA US	The safety mark has been issued by the CSA, Canada.

B Instrument Description

1. Instrument Installation

1.1 Unpacking

Unpack and move the instrument carefully, since rough handling can damage it. Always set the MagNA Lyser Instrument down very carefully. Never lift the instrument by its cover.
If you must move the instrument long distances or return it to Roche Diagnostics, place it upright in the original shipping box for transport.

When transporting the MagNA Lyser Instrument, consider its weight (see "Technical Specifications"). 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.

1.2 Inspection

To unpack the instrument, carefully remove it from the shipping carton. Make sure that all items listed below are included in the carton. If you notice any discrepancy or shipping damage please contact your local Roche representative.

Parts that should be present in the shipping carton include:

1. MagNA Lyser Instrument (Figure 1a)

2. Instrument Retention Plate (Figure 1b)

3. Two MagNA Lyser Rotors [If necessary, you may order additional rotors (Cat. No. 03 359 093 001).] (Figure 1c)

4. The MagNA Lyser Rotor Cooling Block. [If necessary you may order additional cooling blocks (Cat No. 03 359 085 001)] (Figure 1d)

5. Rotor Stand/Auxiliary Tool (Figure 1e)

Figure 1a – 1e:
Parts included in the shipping box

6. Operator's Manual
7. Emergency Release Tool
8. For Cat. No. 03 358 976 001 (European version): Power cable for European outlet
9. For Cat. No. 03 358 968 001 (US version): Power cable for US outlet

B

1.3 Set-up

To ensure safe operation and optimal results, read this manual in its entirety before operating the MagNA Lyser Instrument.

Selecting a location

The MagNA Lyser Instrument comes fully assembled and requires very little set-up. Install the MagNA Lyser Instrument on a clean, dry, level, stable surface within 2.0 m of a compatible electrical outlet. Place the MagNA Lyser Instrument on a solid surface so its vibration will not interfere with other devices in the same area. It is especially important that other PCR Workflow instruments, *e.g.* the LightCycler® Instrument, are isolated from such vibrations.

Provide a safety zone of at least 30 cm around the MagNA Lyser Instrument. While the instrument is in operation, do not place hazardous substances within this zone.

To ensure proper ventilation, leave 10 cm of space at the back and 15 cm on each side of the MagNA Lyser Instrument.

Make sure the main switch is freely accessible. Incorrect location of the instrument can cause incorrect results and damage to equipment parts. Do not use the instrument under hazardous conditions or do not use hazardous material other than recommended.

It is possible to run the instrument in a laminar flow safety hood which is recommended when working with potentially infectious material.

Protect the MagNA Lyser Instrument from heat and excessive sunlight and always keep the room well ventilated. The instrument is for "indoor use only" and should not be operated in places that have excessive humidity or extremes of temperature. Detailed technical data for the instrument are given in the *Specifications* chapter of this manual.

Connecting to power

Before connecting the MagNA Lyser Instrument to an outlet, make sure that the voltage, frequency and amperage of the outlet are compatible with the instrument's specifications (as listed on the instrument plate on the back of the instrument).

Make sure there is no visible moisture (condensation) on the instrument before connecting the instrument to an outlet.

Use only a grounded power outlet and make sure the power cable meets your country's safety standards. Before plugging the instrument in, turn the main switch on the rear panel to off (position 0). Once you plug the instrument into the outlet, turn the main switch on (position I).

For the first few seconds after the instrument is turned on, the display will show the internal software check (initialization) sequence. When the yellow LED (Light emitting diode) comes on, open the MagNA Lyser Instrument by pressing the 'open' key on the front panel.

Make sure that the moving parts are properly mounted and oscillate freely. Before using the instrument for the first time, remove the MagNA Lyser Cooling Block. You may place it into a refrigerator (+2 to +8°C) overnight if the workflow you are following recommends cooling of samples.

Operation

Only use original parts with the MagNA Lyser Instrument.

2. Description of the Instrument

2.1 View from the front (see Figure 2)

Numerical Displays

Parameter		Range
Speed	(1)	2000–7000 rpm; in increments of 100
Time	(2)	10–99 seconds; in increments of 1

Keys

Key/Function		Action
+/-	(3,4)	Increases/decreases parameter (time, speed) settings
open	(5)	Opens lid
set	(6)	Places instrument in a mode that allows time and speed settings to be changed
start/stop	(7)	Starts or stops run

LEDs

LED		Light indicates
yellow	(8)	The instrument can now be opened
green/red	(9,10)	The instrument can now be started/stopped

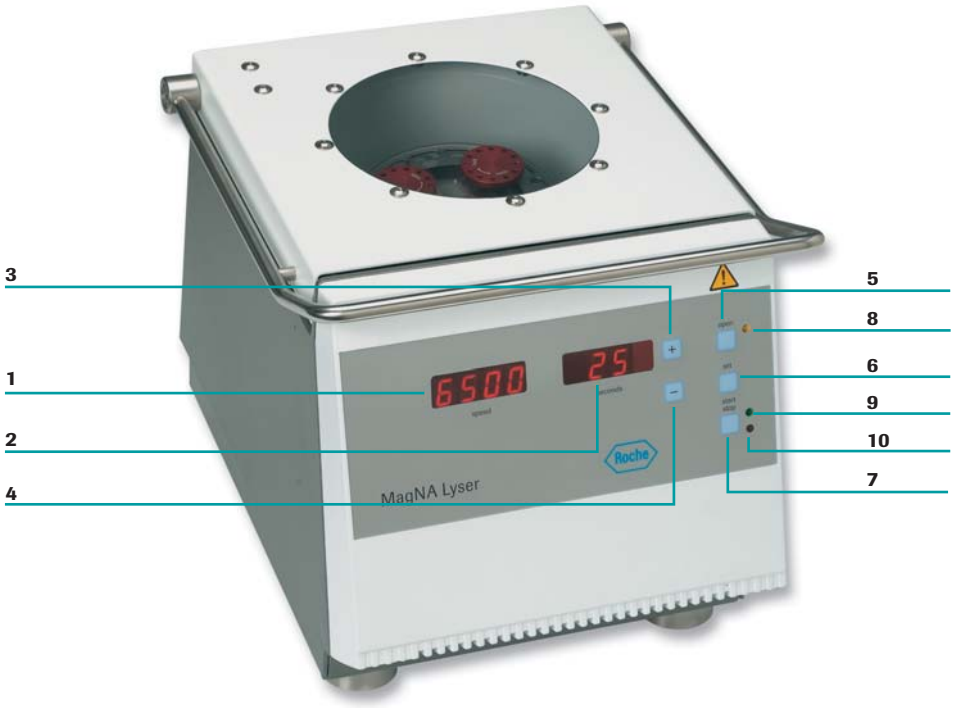

Figure 2: MagNA Lyser Instrument; view from the front

B

Control panel functions (see Figure 2)

The 'start/stop' key (7) on the lower right allows the operator to start or stop a run. A green light emitting diode (LED) (9) indicates that the MagNA Lyser Instrument is ready for use and pressing the 'start/stop' key will start the run. The red LED (10) indicates that the MagNA Lyser Instrument is in operation and pressing the 'start/stop' key will abort the run.

Pressing the 'open' key (5) will open the MagNA Lyser Instrument cover, if a run has finished and the yellow LED (8) is lit. Opening the cover extinguishes the yellow LED.

Two displays indicate the settings chosen for the current run; one shows the speed (1) chosen and the other shows the time (2) chosen. To set or change the run parameters, press the 'set' key (6) until the numbers in the appropriate display blink. Then adjust the parameter value by increasing (3) or decreasing (4) it with the '+/-' keys. If the software generates an error message, the message will appear on the speed display (1). The MagNA Lyser Instrument speed/status display always indicates the current status of the instrument.

2.2 View from the rear

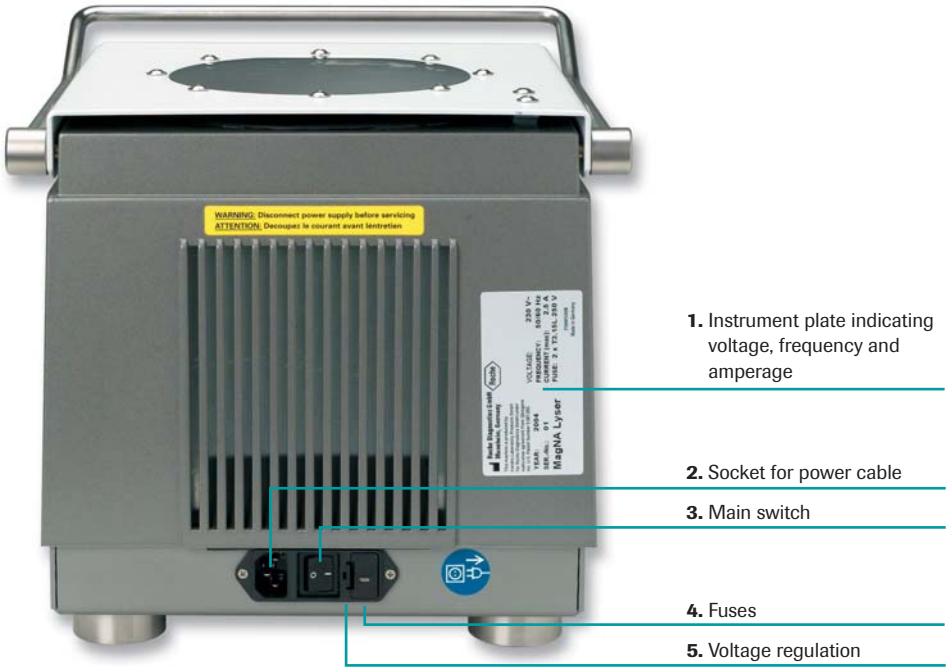

Figure 3: MagNA Lyser Instrument, view from the rear

Functions (see Figure 3)

To switch the MagNA Lyser Instrument on, turn the main switch (3) to position I. Turning it to position 0 shuts the instrument off. Attach the power cable to the socket (2) before using the instrument for the first time. Before connecting the instrument to the power outlet, make sure the power supplied by the outlet agrees with the power requirements (voltage, frequency and amperage) on the instrument plate (1).

Do not replace fuses (4). Should a fuse be blown, contact your local Roche representative.

C Operating Instructions

1. How To Make a Run

1.1 Programming time and speed of a run

Before programming the run, always check the pack insert of the kit for the recommended settings.

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

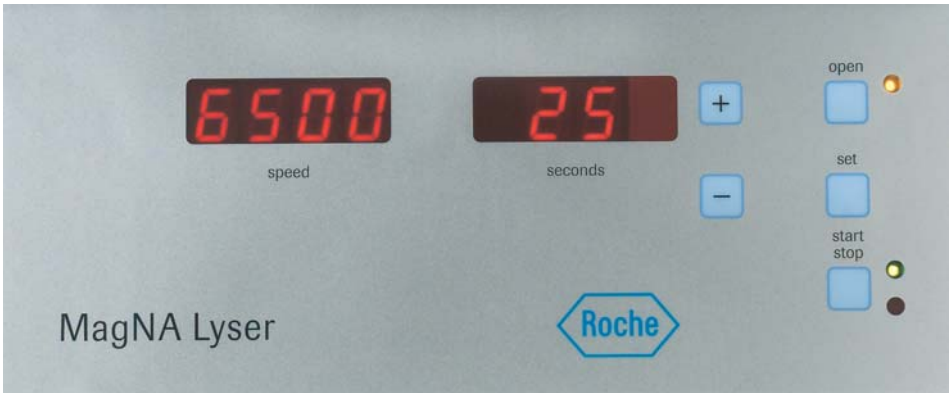

Figure 4: MagNA Lyser Display

1	Select desired speed As shown in Figure 4, speed is displayed in revolutions per minute (rpm); the setting may be adjusted between 2000 and 7000 rpm, in increments of 100. To reset the speed, press the 'set' key once, until the number in the speed display blinks. To increase the speed by 100 rpm, press the '+' key once; to decrease it by 100 rpm, press the '-' key once. Repeat until you reach the desired speed.
2	Select desired time of run After resetting the speed, press the 'set' key a second time, until the number in the time display blinks. To reset the time, use the '+/-' keys (as in Step 1). As shown in Figure 4, time is displayed in seconds (s); the setting may be adjusted between 10 and 99 s, in increments of 1.
3	After setting both parameters, press the 'set' key a third time to return to operating mode (without blinking numbers).

1.2 Loading the samples

1. You must turn the main power switch on (position I) before you can open the MagNA Lyser Instrument cover. After a time, the yellow LED will light. You may now press the 'open' key to unlock and open the cover. When the cover lock is released, the speed/status display will read "Open".
2. Loosen the three red knobs that secure the retention plate by turning them as far as possible counterclockwise (in the direction of the arrow indicating "Open"; see Figures 5 and 6). As you rotate them, the red knob heads move downward.
3. Rotate the retention plate counterclockwise as far as it will go, from the closed position (see Figure 5) to the open position (see Figure 6). The direction of rotation is indicated by the arrow on the plate. In the open position, the curved marks on the retention plate do not align with the corresponding curved arrows on the red knobs.

Figure 5: Retention plate in closed (secured) position. The curved lines on the retention plate align with the curved marks in the center on the shaft.

Figure 6: Retention plate in open (unsecured) position. The curved lines on the retention plate do not align with the curved marks in the center on the shaft.

4. Lift the retention plate away from the rotor and place it beside the instrument. Remove the rotor from the MagNA Lyser Shaft.

Figure 7: MagNA Lyser Removable Rotor

1.3 Setting up the tubes for a run

1	Put the MagNA Lyser Rotor on the stand (Figure 8).
2	Place the desired number of sample tubes (MagNA Lyser Green Beads) in the MagNA Lyser Rotor Stand.
3	Pipet the reagents and samples into the sample tubes as described in the reagent kit pack insert. Load the sample tubes into the rotor. Whenever possible, arrange the sample tubes symmetrically.

Figure 8: MagNA Lyser Rotor on stand

Make sure you close the screw caps properly. Loose screw caps will lead to spilled liquid inside the MagNA Lyser Instrument.

Especially when working with hazardous or potentially infectious sample materials follow all relevant national safety regulations.

To make sure no sample material or aerosols escape from the tubes during a MagNA Lyser Instrument run, always take the following precautions.

- Ensure that the cap contains an O-ring and that it is correctly seated inside the cap.
- Do not overtighten the cap on the tube.
- Do not jam the cap onto the tube improperly. (See Figures 9a and 9b)

Refer to the package insert of your reagent kit to determine the correct filling level.

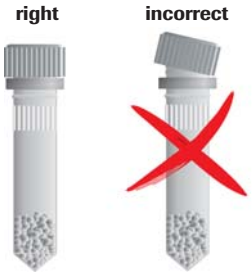

Figure 9:
Proper handling of tubes to prevent escape of sample material or aerosols
Figure 9a Proper handling
Figure 9b Incorrect handling

1.4 Securing the samples and the Retention Plate

1. When all the samples are loaded, place the rotor on the MagNA Lyser Shaft. Turn the rotor until the projections on the shaft fit exactly into the center hole of the rotor. Make sure the rotor sits stably on the shaft. Never operate the instrument without the rotor.
2. Put the retention plate loosely on top of the rotor. Rotate the plate until the clamp bolts (on the back of the three red knobs) drop into the rotor keyholes. Turn the retention plate clockwise as far as it will go (to the "locked" position, as indicated by the arrow on the plate).
3. Tighten the three red securing knobs clockwise to their closed position (as indicated by the arrow on each knob). The red knobs will move upward as you turn them. In the closed position the curved lines on the retention plate align with the curved marks in the center on the shaft. (see Figure 5).

   To tighten the knobs appropriately, one should hold the knob using 3 fingers only (thumb, forefinger and middle finger). Tightening this way (and not with the heel of the hand) is by far enough since: the thread itself has a flat helix angel and ii) the diameter of the knob is a multiple of the screws thread. Both factors lead to strong enough tightened knobs even using the 3 finger method only.
4. Finally, close and lock the cover of the MagNA Lyser Instrument. The displays will now show the programmed parameters.

   Always make sure the retention plate is secured correctly. Otherwise the instrument and the samples may be damaged! Before closing the cover, always perform a safety check: Lift the retention plate and make sure it is secured tightly to the rotor. If it is not tightly secured, either the retention plate is not turned to the locked position or the red knobs are not tightened.

Press on both sides of the cover to close it. The instrument will not run if the cover is not fully closed and the speed/status display still reads "Open".

1.5 Running the instrument

1.5.1 Performing a disruption cycle

1. Start the procedure by pressing the 'start/stop' key. As a safety feature, the MagNA Lyser Instrument will not run unless the cover is firmly locked. After the run starts, the speed/status display shows the accelerating speed (in rpm) and the time display shows the time remaining in the run (in seconds).
2. At the end of a run, the motor brakes to a stop automatically, and the speed/status display reads "End" to indicate that the run has ended. As soon as the yellow LED comes on, you can press the 'open' key to open the cover.

   Before opening the instrument, see if small drops are visible through the window in the lid. If sample material has escaped the tubes or small drops are visible through the window, move the instrument to a laminar flow safety hood before opening it, especially when working with potentially infectious sample material. Follow the disinfection instructions as described in the Maintenance chapter.
3. Lift the cover and remove the retention plate and the rotor.

   If you cannot open the screws of the retention plate manually after a run, use the auxiliary tool to open them. (See below.)
4. At the end of the disruption procedure, finish your protocol as described in the package insert for your kit.

If required by the application, put the rotor into the cooling block for about 90 seconds, immediately after the run.

The lifetime of the spring is limited. If the spring breaks, the rotor will bump against the rubber stops and tear off small rubber fragments, which will be visible in the instrument housing after a run. If you see these rubber fragments, please do not operate the instrument again and call Customer Service. (See the Maintenance chapter).

Do not operate the instrument for longer than 90 seconds. Samples will become extremely hot. Best results are obtained by extending operating times using repeated short intervals interrupted by cooling the samples on ice between operating times.

If you are making multiple runs within a short time, the rotor parts of the instrument may begin to heat up. To prevent the MagNA Lyser Instrument from overheating in such cases, please leave the cover open between runs and allow the instrument to cool down for several minutes.

Stopping a run early

You should always stop the run immediately if irregularities occur. If the red LED (beside the 'start/stop' key) is lit, you can stop the run by pressing the 'start/stop' key. If you stop the run before its programmed end, the time remaining will be displayed and the speed/ status display will read "Stop". As soon as the yellow LED comes on, you can open the cover. When you close the cover again, you can continue the run (for the time remaining) by pressing the 'start/stop' key again.

You cannot continue the run until you open and close the cover at least once.

Shut Down

To shut down the MagNA Lyser Instrument turn the main switch to position 0. To locate the main switch refer to Chapter *B*, section *B-2.2* in this manual.

Using the Auxiliary Tool

The retention plate (Figures 1b, 5 and 6) holds the tubes in the rotor during the homogenization run. To secure or release the plate, you must turn the three red screws on the plate manually.

In very rare cases after a run, the screws may be too tight to be opened manually. In this case use the auxiliary tool (Figure 1e and 10) to open the screws.

The auxiliary tool is also the MagNA Lyser Stand:

1	Hold the MagNA Lyser Stand/auxiliary tool by its base.
2	Insert the pins on the top of the tool into two holes on opposite sides of the red screw (Figure 10). Choose the holes that are most convenient for you.
3	Turn the red screw counterclockwise (using the white arrows as a guide) with the Auxiliary Tool.

Figure 10: Place the pins of the auxiliary tool into the holes on the screw and open the screw.

2. Using Disposable Tubes and the MagNA Lyser Cooling Block

The MagNA Lyser Rotor can process up to 16 reaction tubes simultaneously. You can operate the instrument with any number of samples between 1 and 16. Reaction tubes must be distributed in the rotor fairly symmetrically, but it is possible to perform runs with uneven numbers of tubes.

The MagNA Lyser Cooling Block provides space for 2 × 16 reaction tubes as well as 4 tubes containing reagents. Thus the operator may use the cooling block not only for cooling between runs, but also as a pipetting tray.

For some applications cooling of samples before, after, or in between the runs may be required (see instructions in package insert of respective reagent kit).

The cooling block can be stored at +2 to +8°C.

Use only sample tubes (MagNA Lyser Green Beads) recommended by Roche Diagnostics. Only these tubes have been validated for safe use and consistent results in the instrument. Other tubes may not meet the requirements of the MagNA Lyser Instrument and could cause damage to the instrument.

D Maintenance and Care

1. Maintenance

The MagNA Lyser Instrument requires no scheduled maintenance.

However the spring may wear out and need to be replaced. Please call your local Roche representative if you need a replacement spring.

Only personnel authorized by Roche Diagnostics may modify mechanical or electrical components of the instrument.

2. Disinfection

In general the MagNA Lyser Instrument should be cleaned with a lint free cloth moistened with deionized water. If a spill occurs, the instrument should be cleaned with 70% ethanol solution.

Use 70% ethanol to clean up spills of potentially infectious materials. Remove all internal parts of the instrument (*i.e.*, rotor and the retention plate) and wipe all internal surfaces and the window.

Consider the following important notes:

- Wear protective disposable gloves.
- Use only a soft cloth/tissue to clean/disinfect the instrument.
- Do not spray liquid inside the instrument housing. Do not leave excess liquid in or on the housing.
- Do not put any part of the instrument into a dishwasher.
- Do not use other organic solvents (*e.g.*, petroleum, benzene or other solvents) because they can damage plastic parts of the instrument.
- Do not use an alcohol solution with a concentration greater than 70% because this may damage the transparent viewing window in the cover.
- Do not use bleach.

Unplug main power cord before cleaning instrument.

Make sure liquid does not leak into the internal parts of the instrument.

E Appendix

1 Troubleshooting

1.1 Troubleshooting the MagNA Lyser Instrument

Problem	Instrument performance	Possible causes and solutions
Displays remain dark.	The drive stops.	**Power failure.** 1. Is the power switched on? 2. Check the connection to the power supply. 3. Is the supply voltage o.k.? If so, please contact your local Roche representative.
Displays fail temporarily.	The drive suddenly stops.	**Temporary power failure.** 1. Turn the power off. 2. Is the power cable properly connected to both the back of the instrument and the power outlet?
Lid cannot be opened.	Lid “open” key does not respond.	**Lid not properly locked in place or lid warped.** 1. Make sure the instrument is connected to the power outlet and the power is on (displays are lit). 2. Press down on both sides of the lid (near the front), then press the “open” key again. 3. If the lid cover still remains closed, open it by using the Emergency Interlock Override.
	Instrument runs noisily.	1. Stop the instrument by pressing the “stop” key or (in an emergency) pull the power plug. 2. Wait until the instrument has completely stopped. 3. Make sure the rotor is properly loaded. 4. Make sure the retention plate is properly secured. 5. If you cannot find or fix the problem, contact Customer Service.
“OPEN” appears on the display, even though lid is closed.	Instrument cannot be started.	**A) Lid is not properly locked.** Open lid, then close it again. Lock it securely by pressing down on both its sides. **B) Excess temperature fuse of the motor has blown.** 1. Pull the power supply 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. If the safety circuit turns the instrument off again, contact Customer Service.
Message “Lid” appears on the display.	The drive stops.	**A) The lid was manually opened during the run.** 1. Press the lid closed. 2. To continue the run, turn the instrument off, then on again. **B) Excess-temperature fuse for the motor has blown.** 1. Pull the power supply 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. If the safety circuit turns the instrument off again, contact Customer Service.
Message “Fail” appears on the display.	The drive stops.	**The instrument did not reach the programmed speed.** 1. Make sure the rotor is properly loaded and secured. 2. Make sure the rotor oscillates freely. 3. Turn the instrument on, then off again, using the main switch. If the error persists, call Customer Service.

1.2 Software Error Messages

Problem	Instrument performance	Possible causes and solutions
E-00	Motor does not start.	**Motor or rotor blocked.** 1. Turn the instrument off, then on again, using the main switch. 2. Make sure the rotor oscillates freely. If you cannot fix the problem, contact Customer Service.
E-02	Drive stops. Operation of the instrument is not possible.	**Error in the program memory.** Switch the instrument off, then on again, using the main switch. If error persists, call Customer Service.
E-03	Operation of the instrument is not possible.	**Spring breakage.** Turn the instrument off, then on again, using the main switch. If error persists, call Customer Service.
E-06	Operation of the instrument is not possible.	**Communication error between keyboard and CPU.** Turn the instrument off, then on again, using the main switch. If error persists, call Customer Service.
E-08	Operation of the instrument is not possible.	**Converter overvoltage.** Supply voltage outside tolerable limits. Defective braking resistor. Call Customer Service if necessary.
E-10	Error occurs during self-test (after the instrument is turned on).	**NV-RAM; error in the program memory.** Turn the instrument off, then on again, using the main switch. If error persists, call Customer Service.
E-15	Operation of the instrument is not possible.	**Error in NV-RAM checksum.** Turn the instrument off, then on again, using the main switch. If error persists, call Customer Service.
E-17	Lid does not open.	**Lid is blocked or jammed.** Press down on the front of the lid (near the middle), then press the “open” key again.
E-19	Error occurs during self-test (after the instrument is turned on).	**Wrong NV-RAM or keyboard.** Turn the instrument off, then on again, using the main switch. If error persists, call Customer Service.
E-21	Instrument does not accelerate.	Make sure the rotor is properly loaded. Make sure the rotor oscillates freely. Turn the instrument off, then on again, using the main switch. If error persists, call Customer Service.
E-22	Error occurs during self-test (after the instrument is turned on).	**NV-RAM parameter does not match the processor.** Turn the instrument off, then on again, using the main switch. If error persists, call Customer Service.

1.3 Emergency Interlock Override

If a general electrical power failure should occur while the MagNA Lyser Instrument is in use, the lid will remain locked. The lid may also remain locked if an error code appears on the display. In such cases, you can open the lid (to gain access to the samples) by using the emergency interlock override:

1	Turn the instrument off, unplug the power cord and pull the instrument to the front of the lab bench.
2	Carefully lift the MagNA Lyser Instrument lid slightly using the handle bar.
3	Insert the Emergency Release tool (supplied with the instrument) into the two holes located at the side of the cover (see Figure 11).
4	Apply gentle pressure with the tool to open the emergency interlock. There will be an audible click, and the cover latch will release.
5	Remove the Emergency Release tool and open the lid.
6	Unlock the retention plate and remove samples.
7	Slide the MagNA Lyser Instrument back to its previous location.
8	Reconnect the power cord.

Figure 11: Emergency Interlock Override

2 Ordering Information

Roche Applied Science offers a large selection of isolation reagents and systems for life science research.

For a complete overview of related products and guides, please visit our home page, http://www.roche-applied-science.com, and visit our special interest sites for:

- The MagNA Pure 96 System:
  http://www.magnapure96.com
- The MagNA Pure Compact System and the MagNA Pure LC Systems:
  http://www.magnapure.com
- The LightCycler® 480 System:
  http://www.lightcycler480.com
- The LightCycler® Carousel-Based System:
  http://www.lightcycler.com
- Redefining Real-Time qPCR Assays with in silico tested UPL probes:
  http://www.universalprobelibrary.com

The following products are intended for general laboratory use.

Kit	Pack size	Cat. No.
MagNA Lyser Instrument	115V	03 358 968 001
MagNA Lyser Instrument	230V	03 358 976 001
MagNA Lyser Green Beads	100 tubes	03 358 941 001
MagNA Pure LC DNA Isolation Kit II (Tissue)	192 isolations	03 186 229 001
MagNA Pure LC DNA Isolation Kit III (Bacteria, fungi)	192 isolations	03 264 785 001
MagNA Pure LC RNA Isolation Kit III (Tissue)	192 isolations	03 330 591 001

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

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

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For USA the MagNA Lyser Instrument is intended for laboratory use.