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TissueLyser III User Manual

For disruption of up to 48 or 192 biological samples



REF 9003240

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1. Introduction

Thank you for choosing the TissueLyser III system. We are confident it will become an integral part of your laboratory.

Before using the TissueLyser III, it is essential you read this user manual carefully and pay particular attention to the safety information. The instructions and safety information in the user manual must be followed to ensure safe operation of the TissueLyser III and to maintain the TissueLyser III in a safe condition.

1.1. About this user manual

This user manual provides information about the TissueLyser III in the following sections:

- Introduction
- Safety Information
- General Description
- Installation Procedures
- Operating Procedures
- Maintenance
- Troubleshooting
- Technical Specifications
- Appendices

The appendices contain the following information:

- Appendix A
- Appendix B
- Appendix C
- Appendix D – Consignes de sécurité
- Appendix E – Sicherheitshinweise

1.2. General information

1.2.1. Technical assistance

At QIAGEN®, we pride ourselves on the quality and availability of our technical support. Our Technical Services Departments are staffed by experienced scientists with extensive practical and theoretical expertise in molecular biology and the use of QIAGEN products. If you have any questions or experience any difficulties regarding the TissueLyser III or QIAGEN products in general, do not hesitate to contact us.

QIAGEN customers are a major source of information regarding advanced or specialized uses of our products. This information is helpful to other scientists as well as to the researchers at QIAGEN. We therefore encourage you to contact us if you have any suggestions about product performance or new applications and techniques.

For technical assistance, contact QIAGEN Technical Services.

1.2.2. Policy statement

It is the policy of QIAGEN to improve products as new techniques and components become available. QIAGEN reserves the right to change specifications at any time. In an effort to produce useful and appropriate documentation, we appreciate your comments on this user manual. Please contact QIAGEN Technical Services.

1.3. Intended use of the TissueLyser III

The TissueLyser III is intended for molecular biology applications. This product is neither intended for the diagnosis, prevention, or treatment of a disease, nor has it been validated for such use either alone or in combination with other products. Therefore, the performance characteristics of the product for clinical use (i.e., diagnostic, prognostic, therapeutic, or blood banking) are unknown.

The TissueLyser III is designed for the stationary use in a dry and clean environment. The TissueLyser III is not designed for continuous operation, but for single 8 h shifts with 30% operating time.

1.3.1. Damage to the clamps of the TissueLyser III

The clamps of the TissueLyser III are designed for use with the following QIAGEN adapters and consumables:

- TissueLyser Adapter Set 2 x 24 (cat. no. 69982) containing standard 2 mL microcentrifuge tubes
- TissueLyser Adapter Set 2 x 96 (cat. no. 69984) containing Collection Microtubes (racked, 19 x 96) (cat. no. 19560) sealed with Collection Microtube Cap (120 x 8) (cat. no. 19566)
- Plate Adapter Set (cat. no. 11990)
- 5 mL Tube Adapter Set (cat. no. 11980)
- 2 mL Tube Holder Set (cat. no. 11993) only for use with Plate Adapter Set (not provided)
- 50 mL Tube Adapter Set (cat. no. 11960)
- Grinding Jar Set, Stainless Steel (2 x 10 mL, cat. no. 69985)
- Grinding Jar Set, Teflon (2 x 10 mL, cat. no. 69986)

QIAGEN adapters together with the recommended tubes form a component that is of an optimal thickness, allowing secure tightening of the clamps of the TissueLyser III without straining the clamping mechanism.

Damage to the clamps of the TissueLyser III will occur if other components of reduced thickness are installed. Therefore, the TissueLyser III must not be used with adapters from other suppliers or with QIAGEN adapters containing tubes not recommended by QIAGEN.

1.4. Requirements for TissueLyser III users

The table below covers the general level of competence and training necessary for transportation, installation, use, maintenance, and servicing of the TissueLyser III.

Task	Personnel	Training and experience
Transportation	No special requirements	No special requirements
Installation, routine use, and maintenance	Laboratory technicians or equivalent	Appropriately trained and experienced personnel
Servicing	QIAGEN or an authorized agent (service technicians)	

2. Safety Information

Before using the TissueLyser III system, it is essential that you read this user manual carefully and pay particular attention to the safety information. The instructions and safety information in the user manual must be followed to ensure safe operation of the instrument and to maintain the instrument in a safe condition.

The following types of safety information appear throughout the *TissueLyser III User Manual*.

WARNING The term **WARNING** is used to inform you about situations that could result in personal injury to you or others.

Details about these circumstances are given in a box like this one.

CAUTION The term **CAUTION** is used to inform you about situations that could result in **damage to an instrument** or other equipment.

Details about these circumstances are given in a box like this one.

The guidance provided in this manual is intended to supplement, not supersede, the normal safety requirements prevailing in the user's country.

Please be aware that you may be required to consult your local regulations for reporting serious incidents that have occurred in relation to the device to the manufacturer and/or its authorized representative and the regulatory authority in which the user and/or the patient is established.

2.1. Proper use

Perform the maintenance as described in Section 6. QIAGEN charges for repairs that are required due to incorrect maintenance.

WARNING **Risk of personal injury and material damage**

Improper use of the TissueLyser III may cause personal injuries or damage to the instrument. Do not attempt to move the TissueLyser III during operation.

The TissueLyser III should only be operated by qualified personnel who have been appropriately trained.

Servicing of the TissueLyser III should only be performed by QIAGEN or an authorized agent (service technicians). Do not carry out any modifications of the instrument.

QIAGEN shall not be held responsible for any injuries or damages resulting from non-observance of the instructions and safety information in this user manual.

The TissueLyser III should only be used for the applications described in the *TissueLyser Handbook*. The TissueLyser III should only be used in combination with accessories approved by QIAGEN (see "Features of the TissueLyser III system" on page 15). Do not continue to use the TissueLyser III or TissueLyser accessory if it is damaged.

WARNING The sound level may be high depending on the type of material, the number of balls used, the set grinding frequency, and the grinding time. Excess noise in terms of intensity and duration can lead to impairments or permanent damage to hearing. Wear hearing protection.



Excess noise can also lead to acoustic warning signals of other instruments not being heard. Add visual signals if necessary.

Perform the maintenance as described in “Maintenance”on page 41. QIAGEN charges for repairs that are required due to incorrect maintenance.

CAUTION **Damage to the instrument**



Use of adapters and plasticware other than those described in this user manual may lead to damage to the clamps of the TissueLyser III.

CAUTION **Damage to the instrument**



Operation of the TissueLyser III with the transport security device installed, or transport of the TissueLyser III without the transport security device installed, can lead to damage to the mechanical components of the instrument.

CAUTION **Damage to the instrument**



Avoid spilling water or chemicals onto the TissueLyser III. Damage caused by water or chemical spillage will void your warranty.

In case of emergency, switch off the TissueLyser III at the power switch and unplug the power cord from the power outlet.

WARNING **Risk of personal injury and material damage through falling of the instrument**



Improper handling of the TissueLyser III during transport and installation can lead to user injury. Particularly when lifting the instrument above head height, the instrument can fall and lead to serious injury.

Do not transport the instrument alone. Transport the instrument close to the floor and avoid lifting above the head.

Install the instrument on a sufficiently large, solid, and stable surface that is protected against oscillations. Ensure that all instrument feet are sitting stably and evenly on the surface.

2.2. Electrical safety

WARNING **Electrical hazard**



Any interruption of the protective conductor (earth/ground lead) inside or outside the TissueLyser III or disconnection of the protective conductor terminal is likely to make the TissueLyser III dangerous.

Intentional interruption is prohibited.

Take note of the values for voltage and frequency on the TissueLyser III type plate and only connect the TissueLyser III to a fitting power grid.

Only connect the TissueLyser III to the power grid with one of the enclosed power cables and to a power outlet with protective conductor (earth/ground).

Before each usage, check the power cord and the plug for damage. Never use the instrument with damaged power cord or plug.

Lethal voltages inside the TissueLyser III

When the TissueLyser III is connected to line power, terminals may be live and opening the TissueLyser III or removing parts is likely to expose live parts.

Install the instrument in a way that allows easy access to the power cord connector and the power switch.

WARNING **Risk of electric shock when replacing the fuses**



The replacement of the fuses without removal of the power cord can lead to life threatening electrical shock.

Pull the power cord before replacement of the fuses.

To ensure satisfactory and safe operation of the TissueLyser III, follow the advice below:

- The line power cord must be connected to a line power outlet that has a protective conductor (earth/ground).
- Do not adjust or replace internal parts of the TissueLyser III.
- Do not operate the TissueLyser III with any covers or parts removed.
- If liquid has spilled inside the TissueLyser III, switch off the TissueLyser III, disconnect it from the power outlet, and contact QIAGEN Technical Services.
- If the TissueLyser III becomes electrically unsafe, prevent other personnel from operating it, and contact QIAGEN Technical Services; the TissueLyser III may be electrically unsafe when:
    - It or the line power cord appears to be damaged.
    - It has been stored under unfavorable conditions for a prolonged period.
    - It has been subjected to severe transport stresses.

If the TissueLyser III is not in use, switch it off at the power switch. If the TissueLyser III will not be used for a prolonged period of time, unplug the power cord from the power outlet.

2.3. Environment

WARNING **Explosive atmosphere**



The TissueLyser III is not designed for use in an explosive atmosphere.

WARNING **Risk of explosion**



The TissueLyser III is intended for use with reagents and substances supplied with QIAGEN kits. Use of other reagents and substances may lead to fire or explosion.

CAUTION **Damage to the instrument**



Direct sunlight may bleach parts of the instrument and cause damage to plastic parts. The TissueLyser III must be located out of direct sunlight.

2.4. Biological safety

Specimens and reagents containing materials from humans or animals should be treated as potentially infectious. Use safe laboratory procedures as outlined in publications such as *Biosafety in Microbiological and Biomedical Laboratories*, CDC (1).

2.4.1. Samples

Samples may contain infectious agents. You should be aware of the health hazard presented by such agents and should use, store, and dispose of such samples according to the required safety regulations.

WARNING **Samples containing infectious agents**



Samples used with the TissueLyser III may contain infectious agents. Handle such samples with the greatest of care and in accordance with the required safety regulations.

Always wear safety glasses, gloves, and a lab coat.

The responsible body (for example, a laboratory manager) must take the necessary precautions to ensure that the surrounding workplace is safe, and that the instrument operators are suitably trained and not exposed to hazardous levels of infectious agents as defined in the applicable Material Safety Data Sheets (MSDSs) or the OSHA1,* ACGIH,† or COSHH‡ documents.

Venting for fumes and disposal of waste must be in accordance with all national, state, and local health and safety regulations and laws.

* OSHA — Occupational Safety and Health Organization (United States of America)
† ACGIH – American Conference of Government Industrial Hygienists (United States of America)
‡ COSHH – Control of Substances Hazardous to Health (United Kingdom)

2.4.2. Chemicals

WARNING **Hazardous chemicals**



Some chemicals used with the TissueLyser III may be hazardous or may become hazardous after completion of purification.

Always wear safety glasses, gloves, and a lab coat.

The responsible body (for example, a laboratory manager) must take the necessary precautions to ensure that the surrounding workplace is safe, and that the instrument operators are suitably trained and not exposed to hazardous levels of infectious agents as defined in the applicable Material Safety Data Sheets (MSDSs) or the OSHA1,* ACGIH,† or COSHH‡ documents.

Venting for fumes and disposal of waste must be in accordance with all national, state, and local health and safety regulations and laws.

* OSHA — Occupational Safety and Health Organization (United States of America)

† ACGIH – American Conference of Government Industrial Hygienists (United States of America)

‡ COSHH – Control of Substances Hazardous to Health (United Kingdom)

WARNING **Liquid nitrogen**



Works with liquid nitrogen pose risks due to oxygen displacement and cryogenic burns. Ensure proper ventilation of the room and air monitoring when handling or storing liquid nitrogen. Avoid spills by always keeping vessels upright and by not touching with bare skin the vessels that are or have been in exposed to liquid nitrogen. Wear appropriate protective equipment (safety glasses, gloves, lab coat, and safety shoes).

The low temperature of liquid nitrogen can change the mechanical properties of materials. Nitrogen-cooled plastic vessels can become brittle and break when used in the TissueLyser III. Only use liquid nitrogen with vessels that have been cleared for such use in the TissueLyser III.

The responsible body (e.g., laboratory manager) must take the necessary precautions to ensure that the surrounding workplace is safe and that TissueLyser III operators are not exposed to the dangers posed by liquid nitrogen as defined in the applicable Safety Data Sheets (SDSs) or the OSHA1,* ACGIH,† or COSHH‡ documents.

Venting for fumes and disposal of waste must be in accordance with all national, state, and local health and safety regulations and laws.

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† ACGIH – American Conference of Government Industrial Hygienists (United States of America)

‡ COSHH – Control of Substances Hazardous to Health (United Kingdom)

2.4.3. Toxic fumes

If working with volatile solvents, toxic substances, etc., you must provide an efficient laboratory ventilation system to remove vapors that may be produced.

WARNING **Toxic fumes**



Do not use bleach to clean or disinfect used labware, as bleach in contact with salts from the buffers can produce toxic fumes.

2.5. Waste disposal

Used labware, such as sample tubes, may contain hazardous chemicals or infectious agents from the sample disruption process. Such wastes must be collected and disposed of properly according to local safety regulations. For information on how to dispose of the TissueLyser III, see Waste Electrical and Electronic Equipment (WEEE) om page 49.

2.6. Mechanical and thermal hazards

WARNING **Moving parts**



Do not leave the TissueLyser III unattended during operation.

To ensure safety, the TissueLyser III will not operate until the hood is closed.

WARNING **Moving parts**



Damage or personal injury can occur if the TissueLyser Adapter Set or Grinding Jar Set is not securely attached.

Ensure that both adapters and grinding jars are of similar weight. Do not operate the TissueLyser III with only a single adapter or grinding jar installed.

WARNING **Danger of burns and scalds**



Depending on the sample and the disruption parameters, grinding jars and samples can heat up considerably during the disruption process. Only touch the grinding jars with protective gloves and wait for equilibration to room temperature before opening the jars.

2.7. Maintenance safety

WARNING **Risk of electric shock**



Do not open any panels on the TissueLyser III. Only perform cleaning with liquids after disconnecting the instrument from the power grid. Use liquids only on cloth, never free flowing.

Risk of personal injury and material damage

Only perform maintenance that is specifically described in the *TissueLyser III User Manual*.

CAUTION **Damage to the instrument**



Do not use bleach, solvents, or reagents containing acids, alkalis, or abrasives to clean the TissueLyser III.

Avoid spilling water or chemicals onto the TissueLyser III. Damage caused by water or chemical spillage will void your warranty.

2.8. Symbols on the TissueLyser III and its type plate

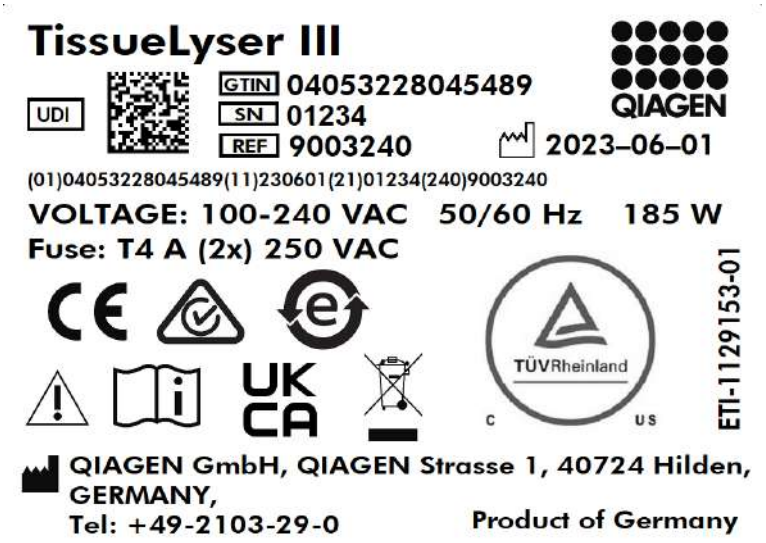


Figure 1. The TissueLyser III type plate.

Symbol	Location	Description
	Type plate on the back of the instrument	WEEE about the disposal of waste electrical and electronic equipment for Europe and rest of the world.
	Type plate on the back of the instrument	Legal manufacturer
	Type plate on the back of the instrument	Date of manufacture
	Type plate on the back of the instrument	Consult instructions for use.
	Type plate on the back of the instrument	CE mark for Europe
	Type plate on the back of the instrument	UKCA mark for the United Kingdom
	Type plate on the back of the instrument	Mark of the TÜV Rheinland
	Type plate on the back of the instrument	RCM (former C-Tick) for Australia (supplier identification N17965)
	Type plate on the back of the instrument	RoHS mark for China (the restriction of the use of certain hazardous substances in electrical and electronic equipment)
SN	Type plate on the back of the instrument	Instrument serial number

Symbol	Location	Description
GTIN	Type plate on the back of the instrument	Global trade identification number
UDI	Type plate on the back of the instrument	Unique device identifier
REF	Type plate on the back of the instrument	QIAGEN catalogue number
LOT	Type plate on the back of the instrument	Label number
	Type plate on the back of the instrument	See warnings and precautions
	On the back of the instrument	Wear hearing protection
	On the back of the instrument	Refer to user manual

3. General Description

The TissueLyser III is a flexible bead mill designed for rapid and efficient disruption of up to 48 or 192 samples at the same time. A wide variety of biological samples can be processed, including human, animal, and plant tissues as well as yeast and bacteria. Each sample is simultaneously disrupted and homogenized by high-speed shaking with a bead in a sealed tube (bead milling).

3.1. TissueLyser III principle

Efficient sample disruption is a prerequisite for nucleic acid and protein purification procedures. Incomplete sample disruption can lead to significantly reduced yields and can increase the risk of clogging when using purification columns or magnetic particles. The TissueLyser III thoroughly disrupts and simultaneously homogenizes biological samples in the presence of lysis buffer. Plant tissues can alternatively be disrupted and homogenized in the absence of lysis buffer.

Tubes containing sample and bead are placed in a TissueLyser Adapter Set and shaken at a very high speed, causing the samples to be disrupted and homogenized by the beating and grinding effect of the beads. The tubes can be discarded after use, which prevents cross-contamination and provides time savings, as there is no need to clean tubes after disrupting samples. In addition, there is no cross-contamination during sample disruption as each tube is securely sealed with its own lid.

The TissueLyser III can also disrupt and homogenize large samples when used in combination with a Grinding Jar Set. Samples are placed in a 10 mL jar containing a grinding ball and shaken at high speed.

3.2. Features of the TissueLyser III system

The TissueLyser III provides high-speed shaking with oscillation frequencies of 3–30 Hz (180–1800 oscillations per minute). Two clamps at the front of the instrument hold either a TissueLyser Adapter Set or a Grinding Jar Set (Figure 2 and Figure 3). A safety mechanism prevents the instrument from operating until the hood is lowered over the TissueLyser Adapter Set or Grinding Jar Set.

Power is switched on and off at the power switch located at the back of the instrument. The oscillation frequency can be adjusted in steps of 1 Hz using the integrated touchscreen (Figure 4) located on top of the instrument. Disruption time, from 10 seconds up to a maximum of 8 hours, can also be set using the touchscreen (Figure 4). The disruption parameters for a particular application (i.e., oscillation frequency and disruption time) can be stored in the memory of the TissueLyser III as a program or a program cycle.



Figure 2. TissueLyser III (closed). A TissueLyser Adapter Set is installed.

Note: The maximum oscillation frequency may drop down to 25 Hz, depending on local fluctuations in the mains voltage.



Figure 3. TissueLyser III (open). The hood is raised, and a TissueLyser Adapter Set is installed.



Figure 4. Touchscreen and rotary knob of the TissueLyser III.

3.3. Labels on the instrument



Figure 5. Labels on the back of the TissueLyser III.

Label	Component	Function
A	Wear hearing protection	During prolonged operation of the instrument, the wearing of hearing protection is recommended.
B	Read instruction manual	The instruction manual has to be read before usage of the instrument
C	Electrical hazard	Danger of electrical shock! Do not operate the instrument with any covers or parts removed. Unplug the power cord before performing any kind of maintenance.
D	Type plate	Information about the instrument

3.4. TissueLyser III accessories

3.4.1. Safe usage of adapters

Before performing a protocol, it is mandatory to load both arms of the TissueLyser III with the full adapter set.

If the adapters are not used at their maximum capacity, make sure that the weight difference between the two arms is not more than 20–30%. If necessary, balance can be achieved by using a fitting tube containing water. When using the 50 mL Tube Adapter Set, always use an even number of tubes. When using two instead of four tubes per adapter, place the two tubes in the outermost slots of the adapter.

3.4.2. TissueLyser Adapter Set 2 x 24

The TissueLyser Adapter Set 2 x 24 (cat. no. 69982) allows disruption of 48 samples in parallel using standard 2 mL microcentrifuge tubes (e.g., Eppendorf® Safe-Lock micro test tubes*). The adapter set contains two adapters, with each adapter comprised of a top plate, a bottom plate, and a tube holder for holding 24 microcentrifuge tubes (Figure 6). The adapter set can be cleaned with detergent, microbicides, or up to 96% ethanol. For more information, see the product sheet supplied with the adapter set.



Figure 6. TissueLyser Adapter Set 2 x 24. Each adapter consists of a top plate, a bottom plate, and a tube holder for holding 24 microcentrifuge tubes (2 mL).

*Use of other tubes in combination with 7 mm diameter beads may result in the beads getting lodged in the lids of the tubes.

3.4.3. TissueLyser Adapter Set 2 x 96

The TissueLyser Adapter Set 2 x 96 (cat. no. 69984) allows disruption of 192 samples in parallel using Collection Microtubes (racked, 10 x 96) and Collection Microtube Caps (120 x 8) (cat. nos. 19560 and 19566, respectively). The adapter set contains two adapters, with each adapter comprised of a top plate and a bottom plate for holding a rack of capped collection microtubes. The adapter set can be cleaned with detergent, microbicides, or up to 96% ethanol. For more information, see the product sheet supplied with the adapter set.



Figure 7. TissueLyser Adapter Set 2 x 96. Each adapter consists of a top plate and a bottom plate for holding a rack of capped collection microtubes.

3.4.4. Plate Adapter Set

The Plate Adapter Set (cat. no. 11990) is for use with two 96-well plates; it is compatible with the PowerBead Pro Plates (cat. no. 19311).



Figure 8. One side of the Plate Adapter Set.

3.4.5. 5 mL Tube Adapter Set

The 5 mL Tube Adapter Set (cat. no. 11980) is for use with 5 mL bead tubes (e.g., PowerWater® DNA Bead Tubes). Each set holds up to 16 tubes.



Figure 9. One side of the 5 mL Tube Adapter Set.

3.4.6. 2 mL Tube Holder Set

The 2 mL Tube Holder Set (cat. no. 11993) is for use with 2 mL tubes. It can only be used with the Plate Adapter Set (cat. no. 11990). Each holder can fit up to 48 tubes.



Figure 10. A 2 mL Tube Holder.

A complete list of TissueLyser III plate adapters and accessories can be found in Appendix C.

3.4.7. 50 mL Tube Adapter Set (cat. no. 11960)

The 50 mL Tube Adapter Set (cat. no. 11960) is for use with 50 mL tubes (e.g., 50 mL Falcon® tubes). Each adapter can hold up to 4 tubes.



Figure 11. The 50 mL Tube Adapter Set.

3.4.8. Grinding Jar Set, Stainless Steel

The Grinding Jar Set, Stainless Steel (cat. no. 69985), allows disruption of two large samples in parallel using stainless steel grinding balls (Figure 12). Sample disruption can be carried out at room temperature or after freezing the grinding jars in liquid nitrogen. For more information, see the product sheet supplied with the Grinding Jar Set.

WARNING **Liquid nitrogen**

Works with liquid nitrogen pose risks due to oxygen displacement and cryogenic burns. Ensure proper ventilation of the room and air monitoring when handling or storing liquid nitrogen. Avoid spills by always keeping vessels upright and by not touching with bare skin the vessels that are or have been in exposed to liquid nitrogen. Wear appropriate protective equipment (safety glasses, gloves, lab coat, and safety shoes).

The low temperature of liquid nitrogen can change the mechanical properties of materials. Nitrogen-cooled plastic vessels can become brittle and break when used in the TissueLyser III. Only use liquid nitrogen with vessels that have been cleared for such use in the TissueLyser III.

The responsible body (e.g., laboratory manager) must take the necessary precautions to ensure that the surrounding workplace is safe and that TissueLyser III operators are not exposed to the dangers posed by liquid nitrogen as defined in the applicable Safety Data Sheets (SDSs) or the OSHA1,* ACGIH,† or COSHH‡ documents.

Venting for fumes and disposal of waste must be in accordance with all national, state, and local health and safety regulations and laws.

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† ACGIH – American Conference of Government Industrial Hygienists (United States of America)

‡ COSHH – Control of Substances Hazardous to Health (United Kingdom)



Figure 12. Grinding Jar Set, Stainless Steel. Each 10 mL jar is made of stainless steel and contains a 20 mm diameter stainless steel grinding ball.

3.4.9. Grinding Jar Set, Teflon®

The Grinding Jar Set, Teflon (cat. no. 69986), allows disruption of two large samples in parallel using Teflon grinding balls (Figure 13). Sample disruption can be carried out at room temperature. For more information, see the product sheet supplied with the Grinding Jar Set.



Figure 13. Grinding Jar Set, Teflon. Each 10 mL jar is made of Teflon and contains a 20 mm diameter Teflon grinding ball.

3.4.10. TissueLyser Single-Bead Dispensers

TissueLyser Single-Bead Dispensers dispense individual beads into any sample container (Figure 14). They are available in two sizes:

- **TissueLyser Single-Bead Dispenser, 5 mm (cat. no. 69965):** Dispenses beads of 5 mm diameter, and contains a reservoir that can hold approximately 150 beads.
- **TissueLyser Single-Bead Dispenser, 7 mm (cat. no. 69967):** Dispenses beads of 7 mm diameter, and contains a reservoir that can hold approximately 45 beads.

The dispensers can be cleaned with water or detergent. For more information, see the product sheet supplied with the TissueLyser Single-Bead Dispenser.



Figure 14. TissueLyser Single-Bead Dispenser. The dispenser dispenses individual beads into any sample container.

3.4.11. TissueLyser Bead Dispensers, 96-Well

TissueLyser Bead Dispensers, 96-Well, dispense 96 beads in parallel into Collection Microtubes (racked) (Figure 15). They are available in two sizes:

- **TissueLyser 3 mm Bead Dispenser, 96-Well (cat. no. 69973)**: Dispenses beads of 3 mm diameter, and contains a reservoir that can hold approximately 1000 beads.
- **TissueLyser 5 mm Bead Dispenser, 96-Well (cat. no. 69975):** Dispenses beads of 5 mm diameter, and contains a reservoir that can hold approximately 300 beads.

The dispensers can be cleaned with water or detergent. For more information, see the product sheet supplied with the TissueLyser Bead Dispenser, 96-Well.

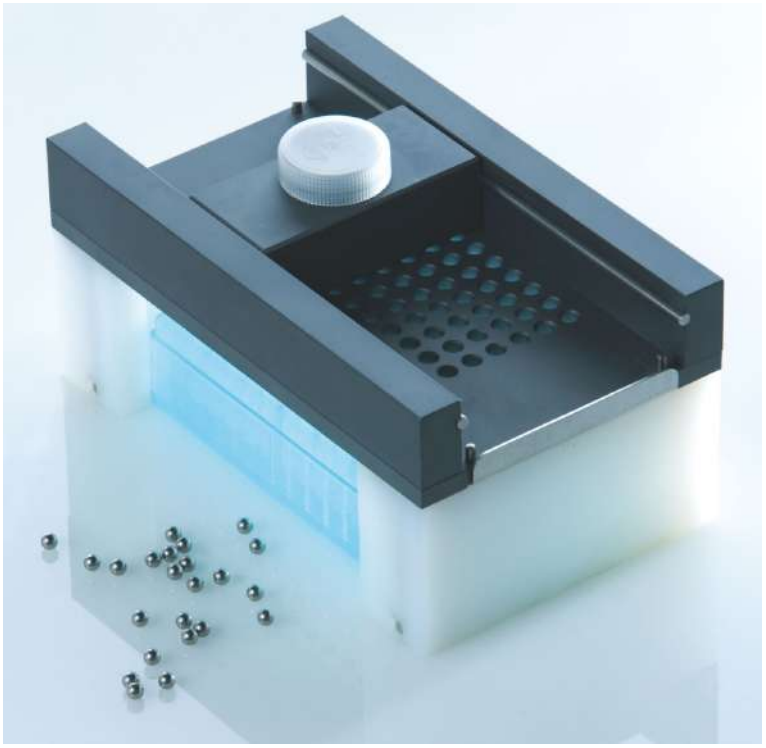


Figure 15. TissueLyser Bead Dispenser, 96-Well. The dispenser dispenses 96 beads into a rack of collection microtubes.

3.4.12. Beads

The following beads for the TissueLyser III are available from QIAGEN:

- Stainless Steel Beads, 5 mm (cat. no. 69989)
- Stainless Steel Beads, 7 mm (cat. no. 69990)

A complete list of TissueLyser III accessories can be found in Appendix C.

3.5. Applications

The TissueLyser III enables disruption and homogenization of:

- Human and animal tissues
- Human and animal cells
- Plant tissues
- Yeast
- Gram-positive and Gram-negative bacteria
- Fungi

For information about specific applications and protocols for sample disruption, see the *TissueLyser Handbook*.

4. Installation Procedures

4.1. Unpacking the TissueLyser III

Before unpacking the TissueLyser III, check whether the cardboard container is damaged. In case of damage, contact the transporter of the container. The TissueLyser III must not be knocked, shaken, or thrown during transport; otherwise, its electronic and mechanical components may be damaged.

Make a note of how the TissueLyser III is packed (Figure 16). If returning the instrument to QIAGEN for repair, it needs to be repacked using a packaging provided by QIAGEN. Pull the instrument out of the box and remove the top packaging material and any protective foil. Lift the TissueLyser III with two people out of the lower packaging material, placing both hands below the base of the instrument.

After unpacking the TissueLyser III, check that the following items are supplied:

- TissueLyser III
- Power cords for different countries
- *TissueLyser III Quick-Start Guide* (English, French, and German)
- Tool to remove the transport security device

If anything is missing, contact QIAGEN Technical Services.

Check that the TissueLyser III is not damaged. If anything is damaged, contact QIAGEN Technical Services. Make sure that the TissueLyser III has equilibrated to ambient temperature before operating it. The TissueLyser III should be stored dry when not in use.

Retain the original packaging during the warranty period of your TissueLyser III and the transport security devices in case you need to return the TissueLyser III to QIAGEN for repair. Using a packaging provided by QIAGEN minimizes damage during transportation of the TissueLyser III and avoids invalidation of your warranty. If you have no access to the original packaging, contact QIAGEN Technical Services.



Figure 16. The TissueLyser III and its packaging.

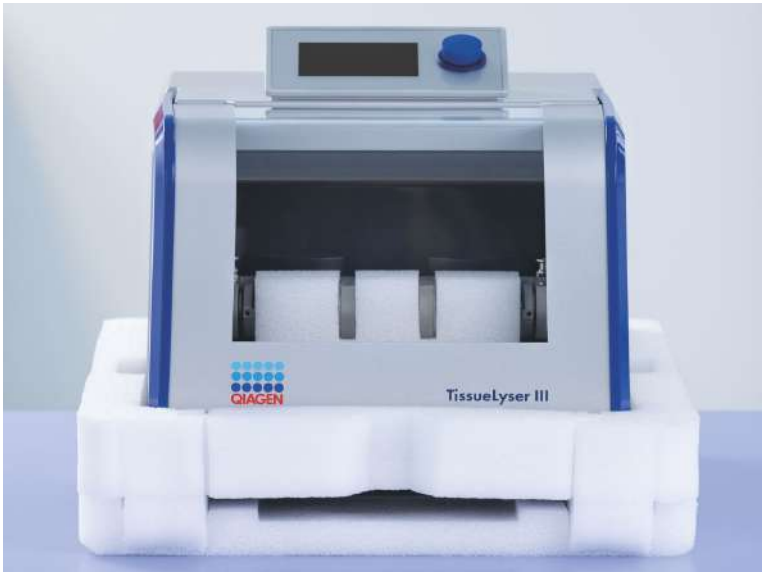


Figure 17. After removing the top packaging, carefully lift the TissueLyser III out of its lower packaging with two people.

4.2. Installation requirements

4.2.1. Removal of the transport security devices

To protect the TissueLyser III during transport, transport security devices are located on the underside of the instrument and around the clamps. It is important to remove the transport security devices before usage of the TissueLyser III to avoid damage to the instrument. The required tool (hexagon Allen key SW6) is delivered together with the TissueLyser III.

To remove the transport security devices, follow the following steps:

- On the underside of the instrument, an arrow marks the location of the transport security device (Figure 18).
- Rotate the TissueLyser III to the side and place it on a soft surface. Ensure that the instrument is protected against tilting at all times.
- Use the tool to remove the transport security device. It is a screw located in a recess at the center of the base plate.
- Rotate the TissueLyser III back onto its feet and remove the foam block fixing the clamps (Figure 19).
- Carefully store the transport security devices for future transport of the TissueLyser III.



Figure 18. Bottom transport security device. The first transport security device at the underside of the TissueLyser III is comprised of a screw that has to be removed with the tool delivered with the instrument. Ensure that the transport security device is removed as depicted in the figure before operating the TissueLyser III.



Figure 19. Inner transport security device. The second transport security device comprises of a foam block between the clamps. Remove the block.

CAUTION **Damage to the instrument**

Operation of the TissueLyser III with the transport security device installed, or transport of the TissueLyser III without the transport security device installed, can lead to damage to the mechanical components of the instrument.

4.2.2. Site requirements

Place the TissueLyser III on a flat, stable surface, and ensure that there is sufficient space around and under the instrument for ventilation. The TissueLyser III is for indoor use only under the following conditions:

- Ambient temperature within the range of 5–40°C (41–104°F)
- Up to 2000 m (6500 ft.) above mean sea level
- Maximum relative humidity of 80% for temperatures up to 31°C, linearly decreasing down to a relative humidity of 50% at 40°C

CAUTION **Damage to the instrument**



Operation of the TissueLyser III at temperature and humidity outside the range specified may lead to damage to its electronic and mechanical components as well as a reduction in instrument performance.

CAUTION **Damage to the instrument**



Avoid spilling water or chemicals onto the TissueLyser III. Damage caused by water or chemical spillage will void your warranty.

WARNING **Risk of personal injury and material damage through falling of the instrument**



Improper handling of the TissueLyser III during transport and installation can lead to user injury. Particularly when lifting the instrument above head height, the instrument can fall and lead to serious injury.

Do not transport the instrument alone. Transport the instrument close to the floor and avoid lifting above the head.

Install the instrument on a sufficiently large, solid, and stable surface that is protected against oscillations. Ensure that all instrument feet are sitting stably and evenly on the surface.

4.2.3. Power requirements

The power line to the TissueLyser III should be voltage regulated and surge protected. Make sure that the voltage rating of the TissueLyser III (see the plate on the back of the instrument) is compatible with the AC voltage available at the installation site.

4.2.4. Grounding requirements

To protect operating personnel, the National Electrical Manufacturers Association recommends that the TissueLyser III be correctly grounded (earthed). The instrument should be plugged into an AC power outlet that has a ground (earth) connection.

4.3. Transporting and repacking the TissueLyser III

Carry the TissueLyser III with two people and with both hands below the base of the instrument. Avoid shaking or throwing. When strong temperature differences are to be expected (e.g., during air transport), protect the instrument from condensation water. Allow the instrument to equilibrate to room temperature before usage.

Retain all original packaging for the duration of the warranty period. A charge may be incurred in the event of damage during shipment if any other packaging (not provided by QIAGEN) is used for the return of the TissueLyser III for repairs. If you have no access to the original packaging, contact QIAGEN Technical Services.

CAUTION **Damage to the instrument**

Transport of the TissueLyser III using packaging other than the original packaging may lead to instrument damage.

Before returning the TissueLyser III for repair, please contact QIAGEN to request a "Declaration of Decontamination" form. Clean and disinfect the instrument with the agents described on page 41. Thereafter, sign the Declaration of Decontamination and place it in an envelope, which should then be attached to the external surface of the instrument's cardboard container. In addition, place a copy of the form inside the container.

To repack the TissueLyser III, first reinstall the transport security devices using the original screw, installation tool, and the foam block supplied with the instrument, then place the TissueLyser III in its original packaging.

To install the transport security devices, follow the steps below:

- On the underside of the instrument, an arrow marks the location of the transport security device (Figure 18).
- Rotate the TissueLyser III to the side and place it on a soft surface.
- Use the tool supplied with the TissueLyser III to install the transport security device. It is a screw that has to be installed in a recess at the center of the base plate.
- Rotate the TissueLyser III back onto its feet and remove the foam block fixing the clamps (Figure 19).

4.4. Installation of a TissueLyser Adapter Set or Grinding Jar Set

The TissueLyser III is not supplied with any accessories. TissueLyser Adapter Sets and Grinding Jar Sets need to be ordered separately (to order the TissueLyser III or its accessories, visit **www.qiagen.com/TLIII**).



Figure 20. Left-hand clamp of the TissueLyser III. A Locking pin. **B** Handwheel. **C** Indentation in clamp.

Attach a TissueLyser Adapter Set or Grinding Jar Set to the TissueLyser III as follows:

- Pull the locking pin (A) upward out of its slot, and rotate it by 90 degrees (Figure 20). This releases the locking device.
- Turn the handwheel (B) counterclockwise until the maximum clamping range is reached.
- Rotate back the locking pin (A) by 90 degrees until it engages with its slot.

- Insert the adapter or grinding jar, and press it lightly into the indentation in the clamp (C).
- Turn the handwheel (B) clockwise with two fingers until the adapter or grinding jar is seated in the clamp and level and does not move freely. Continue to rotate the handwheel clockwise until six to eight easily audible clicks are heard; the locking pin (A) rises and falls with each audible click.
- The engaged locking pin prevents automatic opening of the adapter or grinding jar. If the locking pin cannot be pulled upward to release it, do not force it upward using a hammer or other tool, as damage may occur. To release the locking spin, turn the handwheel slightly clockwise: the locking pin should then be freely moveable.
- To remove the adapter or grinding jar, lift the locking pin (A) and turn the handwheel (B) in the opposite direction.

CAUTION **Damage to the instrument**



Use of adapters and plasticware other than those described in this user manual may lead to damage to the clamps of the TissueLyser III.

WARNING **Moving parts**



Damage or personal injury can occur if the TissueLyser Adapter Set or Grinding Jar Set is not securely attached.

Ensure that both adapters and grinding jars are of similar weight. Do not operate the TissueLyser III with only a single adapter or grinding jar installed.

4.5. Replacing the fuses

The fuses in the TissueLyser III can be replaced as follows:

- Unplug the power cord connected to the TissueLyser III.
- The fuse compartment is located between the power switch and the power cord socket. Press at the side of the fuse compartment to release it.
- Replace the fuses. The following are required: two 250 VAC, 4 A slow-blowing fuses.
- Reinsert the fuse compartment and lock it into place.

WARNING **Risk of electric shock when replacing the fuses**





The replacement of the fuses without removal of the power cord can lead to life threatening electrical shock.

Pull the power cord before replacement of the fuses.

5. Operating Procedures

This section describes how to operate the TissueLyser III system. Before proceeding, you should familiarize yourself with the features of the TissueLyser III (page 15) and have the instrument properly installed (page 25).

5.1. Instrument control

The instrument is controlled with the touch display in combination with the rotary knob. With these control elements, the parameters of sample disruptions can be set and the process can be started, paused, or stopped.

5.2. Functional areas of the user interface

The user interface is divided into the areas navigation, controls, and parameter input:

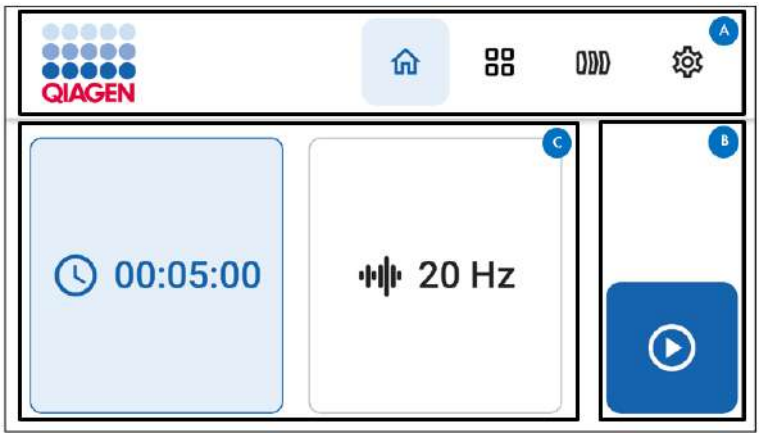


Figure 21. Functional areas of the user interface. **A** Navigation. **B** Controls. **C** Parameter input.

5.3. Functional elements of the user interface

Functional elements are selected on the touch display and configured with the rotary knob where applicable.

Table 1. User interface elements

Element	Description	Function
Navigation		
	Home	Return to the home screen
	Programs	Display the gallery of available programs
	Program cycles	Display the available program cycles
	Settings	Display the settings menu
Parameter input		
	Time	Indication of the set disruption time
	Frequency	Indication of the set disruption frequency
Controls		
	Start	Start a program or program cycle
	Pause	Pause a program or program cycle
	Stop	Abort a program or program cycle
	Edit	Edit a program or program cycle
	Confirm	Confirm a selection or save a set of parameters
	Cancel	Cancel and do not save changes
	Open hood	Open and close the hood of the TissueLyser III once to initiate the hood safety sensor
Program cycles		
	Number of cycles	Number of times the parameter sets of a program cycle are repeated

Table 1. User interface elements (continued)

Element	Description	Function
	Pause for plate rotation	This program cycle contains a pause for plate rotation
	Rotate the plate now	Rotate the plates by 180° in the vertical plane, re-insert into the holders, and press on Start to continue the program cycle
System settings		
	Sound	Sound on/off
	Brightness	Set the display brightness with the rotary knob
	Date/Time	Set the date and time with the rotary knob
	Update	Perform a software update from USB storage medium
	Resources	Display a QR code leading to the online documentation of the TissueLyser III
	Information	Display information about your instrument (software version, total runtime, serial number)

5.4. Menu navigation

A sample disruption run on the TissueLyser III can be performed in different ways (Figure 22):

- By entering time and frequency directly on the home screen and starting the run
- By starting a program from the program selection screen
- By starting a program cycle from the program cycle selection screen

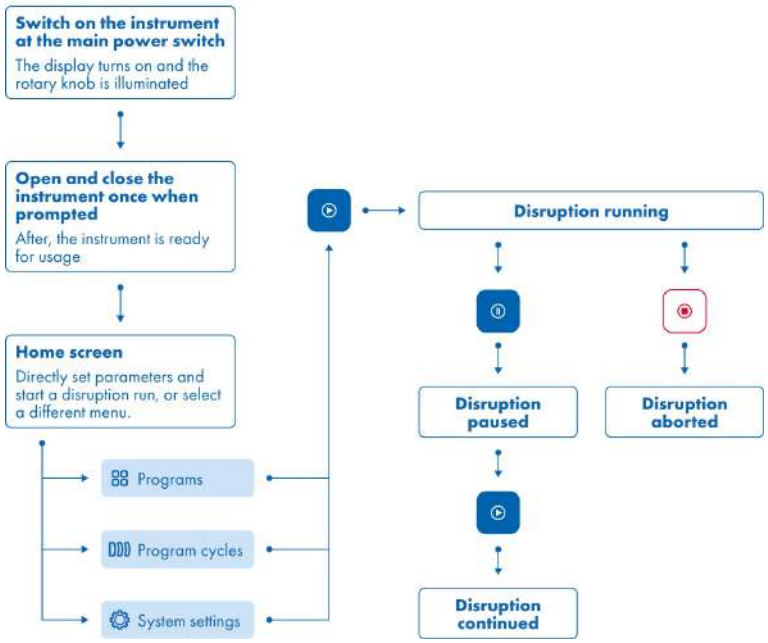


Figure 22. The menu navigation of the TissueLyser III.

5.5. Home screen

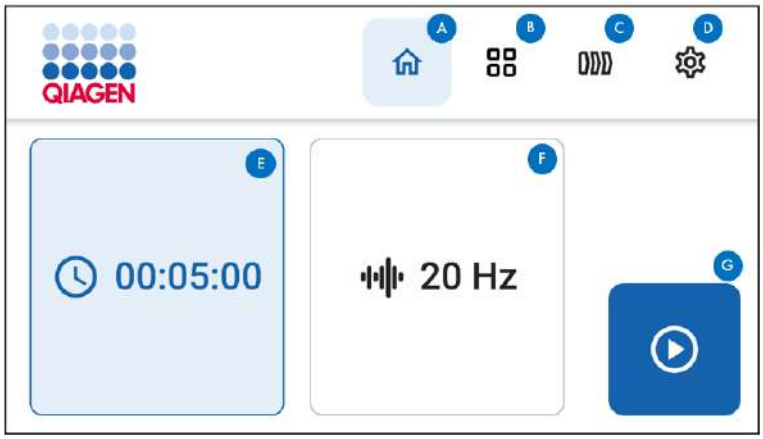


Figure 23. The home screen. A Home. **B** Programs. **C** Program cycles. **D** System settings. **E** Disruption time. **F** Disruption frequency. **G** Start disruption. After powering on the instrument, the user is prompted to open and close the hood once before a disruption run can be started.

On the home screen, a sample disruption run can be started directly by selecting and setting the parameters. Press the buttons for time and frequency for selection, then use the rotary knob to change the setting. The time can be set in the following steps:

Time range	Time set steps
10 s (minimum run duration) to 1 min	1 s
1–3 min	5 s
3–10 min	10 s
10–30 min	30 s
30–60 min	1 min
1–3 h	5 min
3–8 h	10 min

5.6. Program selection screen

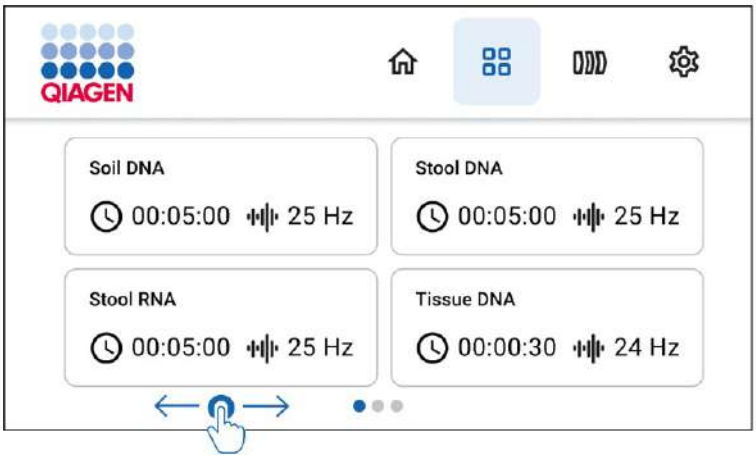


Figure 24. Program selection screen. In the program selection screen, pre-installed or custom programs can be selected. Swipe left or right to access the next page of the overview.

The TissueLyser III allows for the saving and loading of up to 12 disruption programs. A program is a set of time and frequency parameters. Several programs are pre-installed and cannot be edited, while others are user defined and can be changed. Every page of the program selection screen displays four of the available programs (Figure 24). Swipe left or right to cycle through the pages. Upon pressing onto a program, you have the option start the program, or edit it in case of a user-defined program.

5.7. Program cycles menu

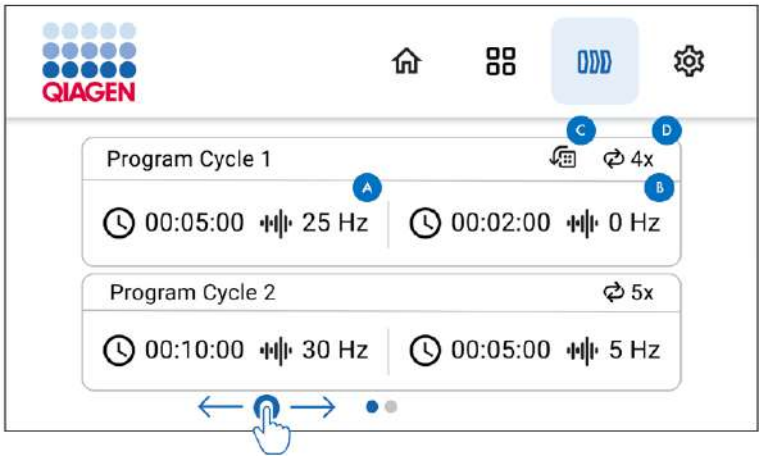


Figure 25. Program cycle selection screen. A Parameter set 1. **B** Parameter set 2. **C** Pause for plate turning. **D** Number of cycles of the parameter sets.

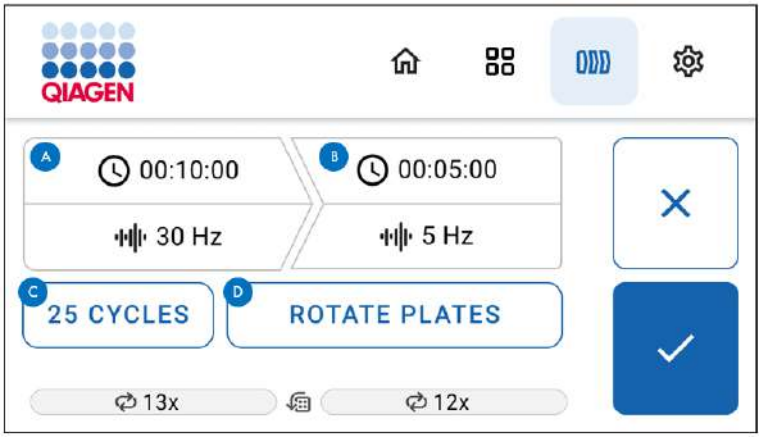


Figure 26. Edit program cycle. A Parameter set 1. **B** Parameter set 2. **C** Number of cycles. **D** Pause for plate turning.

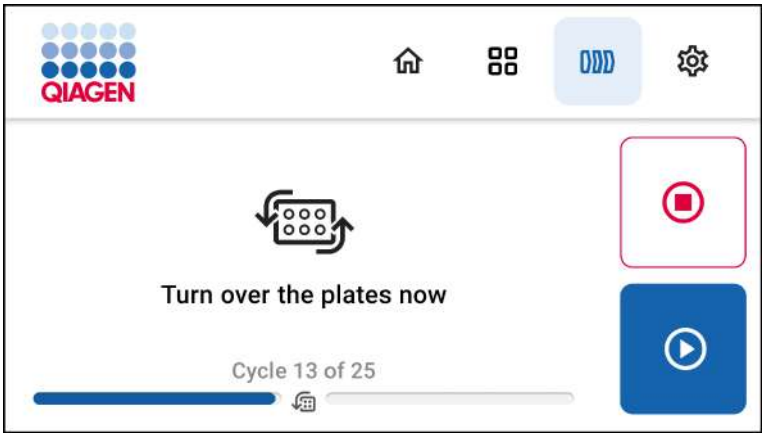


Figure 27. Turn plates screen. This screen prompts the user to turn the adapter plates by 180 degrees in the vertical plane to ensure homogeneous disruption of the sample.

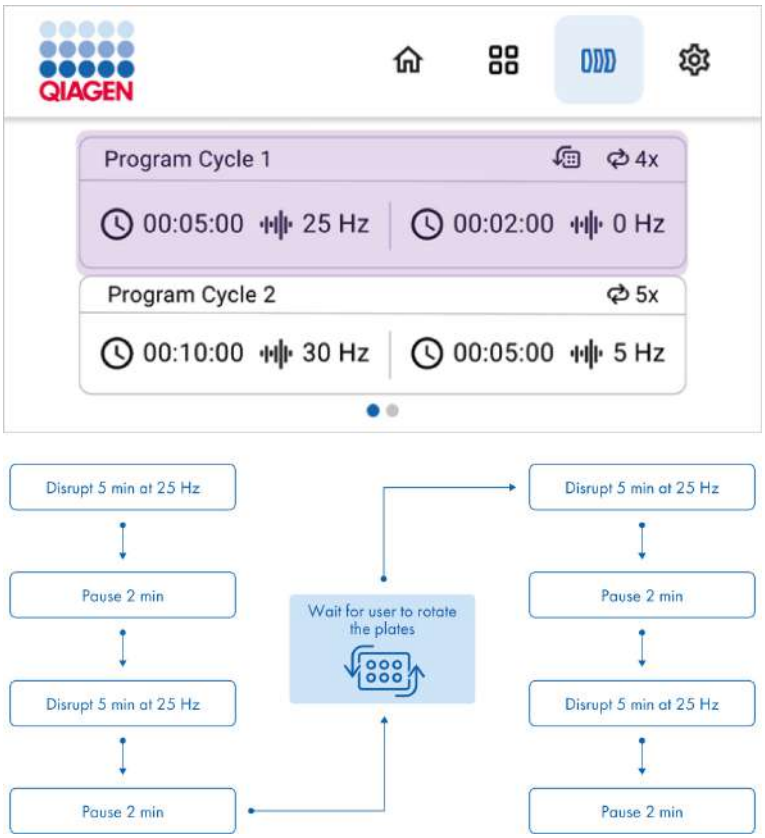


Figure 28. Example of the execution sequence of the highlighted program cycle. Program cycles contain two parameter sets, which are repeated in pairs for the specified number of cycles. If set in the program cycle, the execution stops after half of the number of cycles to allow the user to rotate the plates. Periodic pauses can be introduced by setting 0 Hz as frequency, as in the displayed example.

The TissueLyser III allows for the saving of up to four disruption program cycles (Figure 25). A program cycle contains two parameter sets that are repeated in pairs for the specified number of cycles. It is possible to introduce a forced pause after half of the number of cycles (Figure 26). In this case, the instruments halts the program cycle execution, giving the user the opportunity to rotate the adapter plates by 180 degrees to achieve homogeneous sample disruption (Figure 27). The execution only continues upon user confirmation. Automatic periodic pauses can be introduced by setting 0 Hz as frequency in one of the parameter sets (Figure 28).

5.8. Sample disruption

The procedure below describes how to disrupt samples using the TissueLyser III. For detailed information about sample disruption and protocols, see the TissueLyser Handbook.

1. Make sure that the TissueLyser Adapter Set or Grinding Jar Set is securely installed on the clamps of the TissueLyser III (page 29) and that the transparent hood is lowered.

WARNING **Moving parts**



Damage or personal injury can occur if the TissueLyser Adapter Set or Grinding Jar Set is not securely attached.

Ensure that both adapters and grinding jars are of similar weight. Do not operate the TissueLyser III with only a single adapter or grinding jar installed.

WARNING



The sound level may be high depending on the type of material, the number of balls used, the set grinding frequency, and the grinding time. Excess noise in terms of intensity and duration can lead to impairments or permanent damage to hearing. Wear hearing protection.



Excess noise can also lead to acoustic warning signals of other instruments not being heard. Add visual signals if necessary.

2. Make sure that the TissueLyser III is connected to a power outlet.
3. Switch on the TissueLyser III using the power switch.
4. Open and close the hood once to initiate the safety sensor.
5. Choose one of the following methods to disrupt the sample:
   - Direct parameter entry on the home screen
   - Selection of a disruption program
   - Selection of a disruption program cycle

   For the optimal oscillation time and frequency for your application, see the *TissueLyser Handbook*.
6. Press the **START** key on the touchscreen. The TissueLyser III will now run with the specified settings. If a program cycle with pause is run, the instrument will automatically pause the run after half of the cycles and allow the user to rotate the adapter plates. It will only continue the disruption when **START** is pressed again.

WARNING **Moving parts**



Do not leave the TissueLyser III unattended during operation.

7. To pause the TissueLyser III before reaching the end of the run, press the **PAUSE** key on the keypad. To continue operation of the TissueLyser III from the time remaining, press the **START** key.

   To cancel operation of the TissueLyser III, press the **STOP** key.

WARNING **Danger of burns and scalds**



Depending on the sample and the disruption parameters, grinding jars and samples can heat up considerably during the disruption process. Only touch the grinding jars with protective gloves and wait for equilibration to room temperature before opening the jars.

8. When the TissueLyser III is no longer in operation or in case of emergency, switch it off with the power switch.

5.9. Settings menu

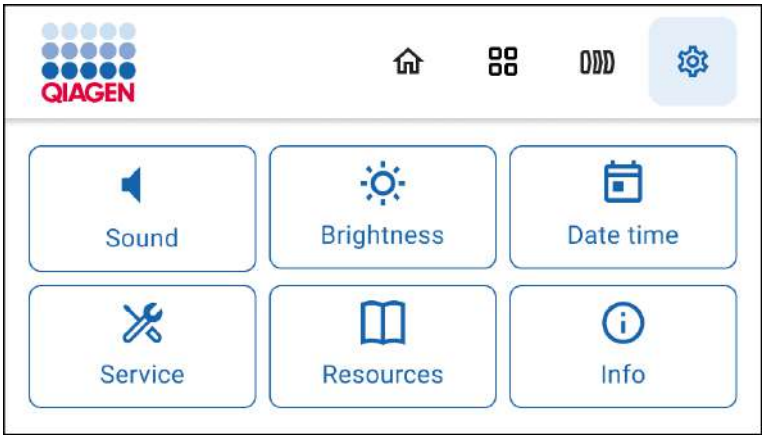


Figure 29. The settings menu.

The Settings menu allows for the customization of the instrument and gives access to instrument information. The following functions are available:

- System sounds on/off
- Set display brightness. Use the rotary knob to change the value.
- Set date and time. Use the rotary knob to change the values.
- Perform service functions, including software updates.
- Access the online resources, such as the handbook. Scan the QR with a mobile device to open the TissueLyser III page.
- Display instrument information:
  - Software version
  - Operating hours
  - Serial number

5.10. System update

The TissueLyser III software can be updated through a USB storage device. Download the update from the QIAGEN website and copy the file to a USB 2.0 device formatted in FAT32 format (USB 3.0 is not supported). The update file has to be the only file on storage. Plug the USB device into the USB port of the TissueLyser III and trigger the update in the service menu. If the USB storage device is not recognized, plug it into the USB port and restart the instrument. Then trigger the update from the service menu.

6. Maintenance

Perform the following regular maintenance procedures (i.e., after each daily use) to ensure reliable operation of the TissueLyser III.

Note: Only use spare and other parts supplied by QIAGEN.

CAUTION **Damage to the instrument**



Do not use bleach, solvents, or reagents containing acids, alkalis, or abrasives to clean the TissueLyser III.

Avoid spilling water or chemicals onto the TissueLyser III. Damage caused by water or chemical spillage will void your warranty.

If solvents or saline, acidic, or alkaline solutions are spilled on the TissueLyser III, wipe them away immediately.

Do not autoclave any part of the TissueLyser III, TissueLyser Adapter Set, or Grinding Jar Set.

WARNING **Risk of electric shock**



Do not open any panels on the TissueLyser III. Only perform cleaning with liquids after disconnecting the instrument from the power grid. Use liquids only on cloth, never free-flowing.

Risk of personal injury and material damage

Only perform maintenance that is specifically described in the *TissueLyser III User Manual*.

6.1. Servicing

The TissueLyser III is supplied with a warranty that lasts for 12 months, starting from the date of shipment. The warranty includes all repairs due to mechanical breakdown.

6.2. Regular maintenance

The TissueLyser III should be wiped after use using a soft cloth moistened with a suitable cleaning agent (see below). To remove residual cleaning agent and avoid instrument damage, the TissueLyser III should then be immediately wiped with a soft cloth moistened with water. Be sure to switch off the TissueLyser III at the power switch and unplug the power cord from the power socket before cleaning.

The components of the TissueLyser Adapter Set or Grinding Jar Set should be cleaned after use using a suitable cleaning agent (see hereafter), rinsed with distilled water, and then dried using paper towels.

If the TissueLyser III is contaminated with infectious material, it should be decontaminated. The TissueLyser III should also be decontaminated before shipping, and a decontamination certificate must be completed to certify that the instrument has been decontaminated. To request a decontamination certificate, contact QIAGEN Technical Services.

6.2.1. Cleaning agents

The following disinfectants and detergents are recommended for cleaning the TissueLyser III, TissueLyser Adapter Sets, and Grinding Jar Sets.

Note: If you want to use disinfectants different from those recommended, ensure that their compositions are similar to those described below.

General cleaning

- Mild detergents
- Ethanol, 70%

Disinfection

- Ethanol-based disinfectants can be used for disinfection of surfaces: for example, 25 g ethanol and 35 g 1-propanol per 100 g liquid or Mikrozid® Liquid (Schülke & Mayr GmbH, cat. no. 109160).
- Disinfectants based on glyoxal and quaternary ammonium salt can be used for submerging the TissueLyser Adapter Sets and Grinding Jar Sets: for example, 10 g glyoxal, 12 g lauryl dimethyl benzyl ammonium chloride, 12 g myristyl dimethyl benzyl ammonium chloride, and 5–15% nonionic detergent per 100 g liquid (Lysetol® AF (Gigasept® Instru AF in Europe, cat. no. 107410, or DECON-QUAT® 100, Veltek Associates, Inc., in the USA, cat. no. DQ100-06-167-01).

Removal of RNase contamination

- RNaseZAP (Sigma, cat. no. R2020) can be used for cleaning surfaces and spraying the TissueLyser Adapter Sets and Grinding Jar Sets

Removal of nucleic acid contamination

- DNA-ExitusPlus™ (AppliChem, cat. no. A7089,0100) can be used for cleaning surfaces and submerging the TissueLyser Adapter Sets and Grinding Jar Sets.

General instructions

- Do not use spray bottles to spray cleaning or disinfectant liquids onto surfaces of the TissueLyser III. Spray bottles should be used only for the TissueLyser Adapter Sets and Grinding Jar Sets.
- If solvents or saline, acidic, or alkaline solutions are spilled on the TissueLyser III, wipe the spilled liquid away immediately.
- Follow manufacturer's safety instructions for handling cleaning agents.
- Follow manufacturer's instructions for soaking time and concentration of cleaning agents: exposure for longer than the recommended soaking time can damage the TissueLyser III, TissueLyser Adapter Sets, and Grinding Jar Sets.

WARNING **Toxic fumes**



Do not use bleach to clean or disinfect used labware, as bleach in contact with salts from the buffers can produce toxic fumes.

CAUTION **Damage to the instrument**



Do not use bleach, solvents, or reagents containing acids, alkalis, or abrasives to clean the TissueLyser III.

Avoid spilling water or chemicals onto the TissueLyser III. Damage caused by water or chemical spillage will void your warranty.

6.3. Regular safety checks

Every 6 months, the limit switch and the brake should be checked for correct operation.

To check the limit switch and the brake:

- Install a TissueLyser Adapter Set or Grinding Jar Set in the instrument according to instructions.
- Switch on the TissueLyser III.
- Set the oscillation frequency to 30 Hz.
- Press the **START** key.
- Raise the hood. The drive motor should switch itself off, and "E50 SECURITY CIRCUIT" should appear in the display.
- Lower the hood. The drive motor should not switch itself on again.

If there is a defect, contact QIAGEN Technical Services to request repair of the instrument.

TissueLyser Adapter Sets and Grinding Jar Sets may become worn, depending on the frequency of use and the samples disrupted. This may lead to damage to the clamps of the TissueLyser III. Check the TissueLyser Adapter Sets and Grinding Jar Sets regularly for wear and tear, and replace if necessary.

7. Troubleshooting

This section provides information about what to do if an error occurs when using the TissueLyser III system.

If further assistance is required, contact QIAGEN Technical Services using the contact information below:

Website: **support.qiagen.com**

When contacting QIAGEN Technical Services about an error with the TissueLyser III, note the steps leading up to the error and any information appearing in any dialog boxes. This information will help the QIAGEN Technical Services solve the problem.

When contacting QIAGEN Technical Services about errors, please have the following information ready:

- TissueLyser III serial number
- Software version
- Timepoint when the error occurred for the first time
- Frequency of error occurrence (i.e., intermittent or persistent error)
- Detailed description of the error situation
- Photo of the error, if possible

This information will help you and your QIAGEN Technical Service Specialist to deal most efficiently with your issue.

Note: Information about the latest software and protocol versions can be found at **www.qiagen.com**. In some cases, updates may be available for addressing specific problems.

7.1. Error codes displayed by the TissueLyser III

Error messages inform the user about detected device or program errors. In the event of an error message, a fault has occurred, in which the operation of the device or the program is automatically interrupted. Such faults must be resolved before next startup. If the error cannot be fixed with the measures listed below, contact QIAGEN Technical Services.

Error Code	Description	Measures
E10	Overload	The drive can withstand brief overloads. In the event of prolonged overload, self-protection is activated. This can happen in particular with high loads (heavy grinding jars, hard samples, large grinding balls, high frequency). • Check whether the load on the machine is too high. • Check whether there are any foreign objects in the interior. • Check whether the rockers can be moved easily by hand. • Check if the grinding process can be run at a reduced frequency. • Turn off the main switch and wait 30 seconds before turning the device on again.
E13	Drive overheated	Turn off the main switch and wait at least 30 seconds before turning the device on again. Allow the engine to cool before restarting.

Error Code	Description	Measures
E20	Control error	Turn off the main switch and wait 30 seconds before turning the device on again.
E23	Fan error	The fan is blocked and does not run. • Check whether the fan is blocked by a foreign object. • Turn off the main switch and wait 30 seconds before turning the device on again.
E25	Display error	The connection to the display is interrupted. • Turn off the main switch and wait 30 seconds before turning the device on again.
E41	Speed sensor error	The target and actual speed of the drive differ from each other. • Turn off the main switch and wait 30 seconds before turning the device on again.
E50	Safety circuit error	A safety function has been interrupted. Turn off the main switch and wait 30 seconds before turning the device on again.
E51	Error safety switch (interlock)	The opening status of the hood of the device is not correctly detected by the switches. • Turn off the main switch and wait 30 seconds before turning the device on again.
E52	Hood switch error	Faulty state of the left hood switch. • Turn off the main switch and wait 30 seconds before turning the device on again.
E53	Hood switch error	Faulty state of the right hood switch. • Turn off the main switch and wait 30 seconds before turning the device on again.
E88	Net error	There is a voltage deviation. • Turn off the main switch and wait 30 seconds before turning the device on again.

8. Technical Specifications

QIAGEN reserves the right to change specifications at any time.

8.1. Environmental conditions

8.1.1. Operating conditions

Description	Requirement
Power	100–240 V AC, 50/60 Hz, 185 W Mains supply voltage fluctuations are not to exceed 10% of nominal supply voltages
Overvoltage category	II
Air temperature	5–40°C (41–104°F)*
Relative humidity	Maximum 80% (for temperatures up to 31°C; linearly decreasing down to a relative humidity of 50% at 40°C)
Altitude	Up to 2000 m (6500 ft.)
Place of operation	For indoor use only
Pollution level	2

* The instrument can also be operated at 4°C under noncondensing conditions.

8.1.2. Transportation conditions

Description	Requirement
Air temperature	–25°C to 60°C (–13°F to 140°F) in manufacturer's package
Relative humidity	Maximum of 75% (noncondensing)

8.1.3. Storage conditions

Description	Requirement
Air temperature	5–40°C (41–104°F) in manufacturer's package
Relative humidity	Maximum of 85% (noncondensing)

8.2. Mechanical data

Description	Requirement
Dimensions	**Height**: 350 mm (up to 640 mm with the hood raised) **Width**: 385 mm **Depth**: 470 mm
Mass	approx. 27.5 kg (without TissueLyser Adapter Set or Grinding Jar Set installed)
Oscillation frequency	3–30 Hz
Noise characteristic values	The noise characteristic values are also influenced by the properties of the sample to be disrupted. Sound power level LWA = 71.4 dB(A) Emission value related to workplace LpAeq = 61 dB(A)

Reference

1.Meechan PJ, Hatcher B, Potts J. Biosafety in Microbiological and Biomedical Laboratories (BMBL). 6th ed. Centers for Disease Control and Prevention; 2020. **https://www.cdc.gov/labs/BMBL.html**

Appendix A

Waste Electrical and Electronic Equipment (WEEE)

This section provides information about disposal of waste electrical and electronic equipment by users.

The crossed-out wheeled bin symbol (see below) indicates that this product must not be disposed of with other waste; it must be taken to an approved treatment facility or to a designated collection point for recycling, according to local laws and regulations.

The separate collection and recycling of waste electronic equipment at the time of disposal helps to conserve natural resources and ensures that the product is recycled in a manner that protects human health and the environment.



Recycling can be provided by QIAGEN upon request at additional cost. In the European Union, in accordance with the specific WEEE recycling requirements and where a replacement product is being supplied by QIAGEN, free recycling of its WEEE-marked electronic equipment is provided.

To recycle electronic equipment, contact your local QIAGEN sales office for the required return form. Once the form is submitted, you will be contacted by QIAGEN either to request follow-up information for scheduling collection of the electronic waste or to provide you with an individual quote.

Declaration of Conformity

Name and address of the company

QIAGEN GmbH
QIAGEN Strasse 1
40724 Hilden
Germany

An up-to-date Declaration of Conformity can be requested from QIAGEN Technical Support.

California Proposition 65 Warning

This product contains chemicals known to the State of California to cause cancer, birth defect or other reproductive harm.

Appendix B

Liability Clause

QIAGEN shall be released from all obligations under its warranty in the event repairs or modifications are made by persons other than its own personnel, except in cases where the Company has given its written consent to perform such repairs or modifications.

All materials replaced under this warranty will be warranted only for the duration of the original warranty period, and in no case beyond the original expiration date of original warranty unless authorized in writing by an officer of the Company. Read-out devices, interfacing devices, and associated software will be warranted only for the period offered by the original manufacturer of these products. Representations and warranties made by any person, including representatives of QIAGEN, which are inconsistent or in conflict with the conditions in this warranty shall not be binding upon the Company unless produced in writing and approved by an officer of QIAGEN.

Appendix C

Ordering information

Note: Only use accessories supplied by QIAGEN.

Product	Contents	Cat. no.
TissueLyser III	TissueLyser III instrument for sample disruption	9003240
Accessories		
TissueLyser Adapter Set 2 x 24	Two sets of adapter plates and 2 racks for use with 2 mL microcentrifuge tubes on the TissueLyser III	69982
TissueLyser Adapter Set 2 x 96	Two sets of adapter plates for use with Collection Microtubes (racked) on the TissueLyser III	69984
Plate Adapter Set	Two sets of adapter plates for use with two 96-well plates on the TissueLyser III, compatible with the PowerBead Pro Plates	11990
5 mL Tube Adapter Set	For sample homogenization using 5 mL bead tubes on a TissueLyser III	11980
50 mL Tube Adapter Set	Two tube adapters for disruption in 50 mL bead tubes on a TissueLyser III only.	11960
2 mL Tube Holder Set	For sample homogenization in 2 mL bead tubes on a TissueLyser III	11993
Grinding Jar Set, Stainless Steel (2 x 10 mL)	2 Grinding Jars (10 mL), 2 Stainless Steel Grinding Balls (20 mm)	69985
Grinding Jar Set, Teflon (2 x 10 mL)	2 Grinding Jars (10 mL), 2 Teflon Grinding Balls (20 mm)	69986
TissueLyser Single-Bead Dispenser, 5 mm	For dispensing individual beads (5 mm diameter)	69965
TissueLyser Single-Bead Dispenser, 7 mm	For dispensing individual beads (7 mm diameter)	69967
TissueLyser 3 mm Bead Dispenser, 96-Well	For dispensing 96 beads (3 mm diameter) in parallel	69973
TissueLyser 5 mm Bead Dispenser, 96-Well	For dispensing 96 beads (5 mm diameter) in parallel	69975
Stainless Steel Beads, 5 mm	200 stainless steel beads (5 mm diameter), suitable for use with TissueLyser systems	69989
Stainless Steel Beads, 7 mm	200 stainless steel beads (7 mm diameter), suitable for use with TissueLyser systems	69990

For up-to-date licensing and product-specific disclaimers, see the respective QIAGEN kit handbook or user manual. QIAGEN kit handbooks and user manuals are available at **www.qiagen.com** or can be requested from QIAGEN Technical Services or your local distributor.

Appendix D – Consignes de sécurité

Avant d'utiliser le TissueLyser III, il est impératif de lire attentivement ce manuel et de porter une attention particulière aux consignes de sécurité. Afin de garantir un fonctionnement de l'appareil en toute sécurité et de maintenir l'appareil en bon état de marche, il est impératif de suivre les instructions et consignes de sécurité fournies dans le présent manuel d'utilisation.

Les types d'informations de sécurité suivants sont fournis tout au long du manuel.

AVERTISSEMENT



Le formule **AVERTISSEMENT** est utilisée pour avertir des situations pouvant occasionner des dommages corporels à l'utilisateur ou à d'autres personnes. Les détails sur ces circonstances sont données dans un encadré semblable à celui-ci.

ATTENTION



Le terme **ATTENTION** signale des situations risquant d'entraîner des détériorations d'un instrument ou de tout autre équipement.

Les détails concernant ces circonstances sont donnés dans un encadré identique à celui-ci.

AVERTISSEMENT **Risque d'accident corporel et de détérioration du matériel**



L'utilisation inappropriée du TissueLyser III peut provoquer des accidents corporels ou une détérioration de l'appareil. Ne pas essayer de déplacer le TissueLyser III pendant qu'il est en marche.

Le TissueLyser III ne doit être utilisé que par du personnel qualifié ayant été convenablement formé.

L'entretien du TissueLyser III doit être effectué exclusivement par QIAGEN ou un agent autorisé (techniciens d'entretien). Ne pas effectuer de quelconques modifications sur l'appareil.

QIAGEN ne sera pas responsable des accidents ou des détériorations dus au non-respect des instructions et des informations de sécurité mentionnées dans ce manuel d'utilisation.

AVERTISSEMENT





Le niveau de bruit peut être élevé en fonction du type de matériel, du nombre de billes utilisées, de la fréquence de broyage définie et de la durée du broyage. Un bruit excessif en termes d'intensité et de durée peut entraîner des altérations ou une détérioration permanente de l'audition. Portez un équipement de protection auditive.

Un bruit excessif peut également empêcher d'entendre les signaux sonores d'avertissement d'autres appareils. Ajoutez des signaux visuels si nécessaire.

ATTENTION **Détérioration de l'instrument**



L'utilisation d'adaptateurs et matériel en plastique autres que ceux décrits dans le manuel d'utilisation du TissueLyser III peut entraîner des détériorations des pinces de fixation du TissueLyser III.

ATTENTION **Détérioration de l'instrument**



Faire fonctionner le TissueLyser III alors que le dispositif de sécurité pour le transport est installé, ou transporter le TissueLyser III alors que le dispositif de sécurité pour le transport n'a pas été installé, peut entraîner des détériorations des composant mécaniques de l'appareil.

ATTENTION **Détérioration de l'instrument**



Évitez de renverser de l'eau ou des produits chimiques sur le TissueLyser III. La détérioration due à la projection d'eau ou de produits chimiques annulera la garantie.

ATTENTION **Détérioration de l'instrument**



Le transport du TissueLyser III dans un emballage différent de l'emballage d'origine peut endommager l'instrument.

AVERTISSEMENT **Risque de dommages corporels et matériels résultant de la chute de l'instrument**



Une manipulation incorrecte du TissueLyser III pendant le transport et l'installation peut entraîner des blessures physiques. En particulier lorsque l'instrument est soulevé au-dessus de la hauteur de tête, il peut tomber et entraîner des blessures graves.

Ne transportez pas l'instrument seul. Transportez l'instrument près du sol et évitez de le soulever au-dessus de la tête.

Installez l'instrument sur une surface suffisamment large, solide et stable protégée contre les oscillations. Assurez-vous que tous les pieds de l'instrument reposent à la surface de manière ferme et homogène.

AVERTISSEMENT **Danger électrique**



Toute interruption du conducteur de protection (conducteur de terre/de masse) à l'intérieur ou à l'extérieur du TissueLyser III ou toute déconnexion de la borne du conducteur de protection est susceptible de rendre le TissueLyser III dangereux.

Toute interruption intentionnelle est interdite.

Tenir compte des valeurs de tension et de fréquence indiquées sur la plaque signalétique du TissueLyser III et ne brancher le TissueLyser III que sur un réseau électrique approprié.

Ne raccorder le TissueLyser III au réseau électrique qu'avec l'un des câbles d'alimentation fournis et à une prise de courant avec conducteur de protection (terre/masse).

Avant chaque utilisation, vérifier que le cordon d'alimentation et la fiche ne sont pas endommagés. Ne jamais utiliser l'instrument avec un cordon d'alimentation ou une fiche endommagés.

Tensions mortelles à l'intérieur du TissueLyser III

Lorsque le TissueLyser III est relié à l'alimentation, les bornes peuvent être sous tension et l'ouverture du TissueLyser III ou le retrait de pièces risque d'exposer des éléments sous tension.

Installez l'instrument de manière à faciliter l'accès au connecteur du câble d'alimentation et à l'interrupteur d'alimentation.

AVERTISSEMENT **Risque de choc électrique lors du remplacement des fusibles**



Le remplacement des fusibles sans retirer le cordon d'alimentation peut entraîner un choc électrique potentiellement mortel.

Veuillez retirer le cordon d'alimentation avant de remplacer les fusibles.



AVERTISSEMENT **Atmosphère explosive**



Le TissueLyser III n'est pas conçu pour être utilisé dans une atmosphère explosive.

AVERTISSEMENT **Risque d'explosion**



Le TissueLyser III est conçu pour être utilisé avec les réactifs et substances fournis avec les kits QIAGEN. L'utilisation d'autres réactifs et substances présente des risques d'incendie ou d'explosion.

AVERTISSEMENT **Échantillons contenant des agents infectieux**



Certains échantillons utilisés avec le TissueLyser III peuvent contenir des agents infectieux. Manipulez ces échantillons avec la plus grande précaution et conformément aux règles de sécurité nécessaires.

Portez toujours des lunettes de protection, 2 paires de gants et une blouse de laboratoire.

La personne responsable (par exemple, le directeur du laboratoire) doit prendre les précautions nécessaires afin de garantir que le lieu de travail environnant est sûr et que les opérateurs du TissueLyser III sont convenablement formés et ne sont pas exposés à des niveaux dangereux d'agents infectieux comme cela est défini dans les fiches techniques santé-sécurité (SDS) ou dans les documents de l'OSHA,* de l'ACGIH,† or ou du COSHH‡ applicables.

L'évacuation des vapeurs et la mise au rebut des déchets doivent être effectuées conformément à toutes les réglementations et lois nationales, régionales et locales relatives à la santé et à la sécurité.

* OSHA — Occupational Safety and Health Organization (United States of America)
† ACGIH – American Conference of Government Industrial Hygienists (United States of America)
‡ COSHH – Control of Substances Hazardous to Health (United Kingdom)

AVERTISSEMENT **Produits chimiques dangereux**



Certains produits chimiques utilisés avec le TissueLyser III peuvent être dangereux ou le devenir après l'exécution du processus de broyage d'échantillon.

Toujours porter des lunettes de protection, des gants et une blouse de laboratoire.

La personne responsable (par exemple, le directeur du laboratoire) doit prendre les précautions nécessaires afin de garantir que le lieu de travail environnant est sûr et que les opérateurs du TissueLyser III ne sont pas exposés à des niveaux dangereux de substances (chimiques ou biologiques) toxiques comme cela est défini dans les fiches techniques santé-sécurité (MSDS) ou dans les documents de l'OSHA,* de l'ACGIH,† or ou du COSHH‡ applicables.

L'évacuation des vapeurs et la mise au rebut des déchets doivent être effectuées conformément à toutes les réglementations et lois nationales, régionales et locales relatives à la santé et à la sécurité.

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‡ COSHH – Control of Substances Hazardous to Health (United Kingdom)

AVERTISSEMENT **Azote liquide**



Les travaux avec de l'azote liquide posent des risques dus à un déplacement d'oxygène et à des brûlures cryogéniques. Veillez à la bonne ventilation de la salle et de l'air pour la manipulation ou le stockage de l'azote liquide. Évitez les déversements en maintenant toujours les récipients à la verticale et en ne touchant pas avec la peau nue les récipients qui sont ou ont été exposés à l'azote liquide. Portez un équipement de protection approprié (lunettes de sécurité, gants, blouse de laboratoire et chaussures de sécurité).

La basse température de l'azote liquide peut modifier les propriétés mécaniques des matériaux. Les récipients en plastique refroidis à l'azote peuvent se dégrader et se casser lorsqu'ils sont utilisés dans le TissueLyser III. Utilisez uniquement de l'azote liquide avec les récipients ayant été approuvés pour une telle utilisation dans le TissueLyser III.

La personne responsable (par exemple le chef de laboratoire) doit prendre les précautions nécessaires pour s'assurer que l'espace de travail environnant est sûr et que les opérateurs travaillant sur le TissueLyser III ne sont pas exposés aux dangers causés par l'azote liquide décrits dans les fiches de données de sécurité (FDS) ou dans les documents de l'OSHA,* de l'ACGIH,† or ou du COSHH‡ applicables.

* OSHA — Occupational Safety and Health Organization (United States of America)
† ACGIH – American Conference of Government Industrial Hygienists (United States of America)
‡ COSHH – Control of Substances Hazardous to Health (United Kingdom)

AVERTISSEMENT **Vapeurs toxiques**



N'utilisez pas de javellisant pour nettoyer ou désinfecter le matériel de laboratoire. Le contact d'un produit à base d'eau de Javel avec des sels provenant des tampons utilisés peut produire des vapeurs toxiques.

AVERTISSEMENT **Pièces mobiles**



Ne pas laisser le TissueLyser III sans surveillance lorsqu'il fonctionne.

AVERTISSEMENT **Pièces mobiles**



La fixation incorrecte du jeu d'adaptateurs TissueLyser Adapter Set ou de l'ensemble de broyage Grinding Jar Set peut détériorer le matériel ou provoquer des accidents corporels.

S'assurer que les deux adaptateurs ou les deux cylindres de broyage ont un poids similaire. Ne pas faire fonctionner le TissueLyser III avec un seul adaptateur ou un seul cylindre de broyage.

AVERTISSEMENT **Risque de brûlures et d'échaudures**





Les cylindres de broyage et les échantillons peuvent chauffer considérablement pendant le processus de broyage, en fonction de l'échantillon et des paramètres de broyage. Ne toucher les cylindres de broyage qu'avec des gants de protection et attendre un équilibrage à température ambiante avant d'ouvrir les cylindres.

AVERTISSEMENT **Risque d'électrocution**



N'ouvrez pas les panneaux du TissueLyser III. N'effectuez le nettoyage avec des liquides qu'après avoir débranché l'instrument de la grille d'alimentation. Utilisez les liquides uniquement sur un chiffon, ne mélangez jamais librement.

Risque de dommages corporels et matériels

Effectuez uniquement les opérations de maintenance spécifiquement décrites dans le Manuel d'utilisation du TissueLyser III.

ATTENTION **Détérioration de l'instrument**



La Ne pas utiliser de produit à base d'eau de Javel, de solvants ou de réactifs contenant des acides, des agents alcalins ou des produits abrasifs pour nettoyer le TissueLyser III.

Évitez de renverser de l'eau ou des produits chimiques sur le TissueLyser III. La détérioration due à la projection d'eau ou de produits chimiques annulera la garantie.

Les conseils donnés dans ce manuel ont pour but de venir compléter les exigences de sécurité habituelles en vigueur dans le pays de l'utilisateur, et non de s'y substituer.

Appendix E – Sicherheitshinweise

Lesen Sie dieses Handbuch sorgfältig durch, bevor Sie den TissueLyser III benutzen. Beachten Sie dabei insbesondere die Sicherheitshinweise. Die Gebrauchsanweisungen und Sicherheitshinweise im Handbuch müssen befolgt werden, um einen sicheren Betrieb des Geräts zu gewährleisten und das Gerät in einem sicheren Zustand zu erhalten.

In diesem Handbuch werden die folgenden Kategorien von Sicherheitshinweisen verwendet:

WARNUNG Warnung weist auf Situationen und Umstände hin, die zu einer Verletzung des Benutzers oder anderer Personen führen können.

Nähere Angaben zu der Art der Gefährdung und der Vermeidung solcher Situationen werden in einem Textfeld wie diesem neben der Warnung gemacht.

VORSICHT Der Begriff VORSICHT wird verwendet, um Sie über Situationen zu informieren, in denen die Gefahr einer Beschädigung eines Geräts oder anderer Gegenstände besteht.

Nähere Einzelheiten über diese Situationen werden in einem Textfeld wie diesem beschrieben.

WARNUNG **Verletzungsgefahr und Gefahr der Beschädigung des Geräts**

Die unsachgemäße Bedienung des TissueLyser III kann zu einer Verletzung des Benutzers oder zur Beschädigung des Geräts führen. Der TissueLyser III darf auf keinen Fall während des Betriebs bewegt werden.

Die Bedienung des TissueLyser III darf nur durch qualifiziertes, entsprechend geschultes Personal erfolgen.

Wartungsarbeiten am TissueLyser III sollten nur durch QIAGEN oder durch autorisierte Vertreter (Servicetechniker) erfolgen. Nehmen Sie keine eigenhändigen Veränderungen am Gerät vor.

Für Sach- und Personenschäden, die durch Nichtbeachtung der Anweisungen und Sicherheitshinweise in diesem Handbuch entstehen, schließt QIAGEN Schadensansprüche in jeglicher Form aus.

WARNUNG Der Geräuschpegel kann, je nach Materialtyp, der Anzahl der verwendeten Kugeln, der eingestellten Mahlfrequenz und der Mahldauer, u. U. hoch sein. Eine in Bezug auf Intensität und Dauer übermäßige Geräuschbelastung kann zu Beeinträchtigungen des Hörsinns oder dauerhaften Gehörschäden führen. Tragen Sie einen Gehörschutz.

Ein zu hoher Geräuschpegel kann auch dazu führen, dass akustische Warnsignale anderer Geräte nicht gehört werden. Verwenden Sie bei Bedarf zusätzlich visuelle Signale.

VORSICHT **Beschädigung des Geräts**

Der Betrieb des TissueLyser III bei installierter Transportsicherung oder der Transport des TissueLyser III ohne installierte Transportsicherung können zu einer Beschädigung der mechanischen Komponenten des Geräts führen.

VORSICHT **Beschädigung des Geräts**

Verschütten Sie kein Wasser und keine Chemikalien auf dem TissueLyser III. Durch verschüttetes Wasser oder verschüttete Chemikalien verursachte Schäden führen zum Erlöschen der Garantie.

VORSICHT **Beschädigung des Geräts**

Der Transport des TissueLyser III in einer anderen Verpackung als der Originalverpackung kann zur Beschädigung des Instruments führen.

WARNUNG **Gefahr von Personen- und Sachschäden durch Herabfallen des Geräts**



Die unsachgemäße Handhabung des TissueLyser III während des Transports und der Installation kann zu einer Verletzung des Benutzers führen. Insbesondere, wenn das Gerät über Kopfhöhe angehoben wird, kann das Gerät herunterfallen und zu einer schweren Verletzung führen.

Transportieren Sie das Gerät nicht alleine. Transportieren Sie das Gerät nahe am Boden und vermeiden Sie ein Anheben über den Kopf.

Installieren Sie das Gerät auf einer ausreichend großen, stabilen und vor Schwingungen geschützten Fläche. Vergewissern Sie sich, dass alle Gerätefüße stabil und gerade auf der Aufstellfläche stehen.

WARNUNG **Stromschlaggefahr**



Jede Unterbrechung des Schutzleiters (Erdungs-/Masseleiter) im Inneren oder außerhalb des TissueLyser III und jede Abtrennung des Schutzleiters am Anschluss der Netzleitung erhöht die Gefahr eines Stromschlags.

Eine absichtliche Unterbrechung der Schutzleiterverbindung ist verboten.

Beachten Sie die Werte für Spannung und Frequenz auf dem TissueLyser III Typenschild und verbinden Sie den TissueLyser III nur mit einem dazu passenden Stromnetz.

Verbinden Sie den TissueLyser III nur mit einem der beiliegenden Netzkabel an das Stromnetz und an einer Steckdose mit Erdung.

Prüfen Sie das Netzkabel und den Netzstecker vor jeder Benutzung auf Schäden. Benutzen Sie den TissueLyser III niemals mit beschädigtem Netzkabel oder beschädigtem Netzstecker.

Tödliche Spannungen im Inneren des TissueLyser III

Wenn der TissueLyser III an die Stromversorgung angeschlossen ist, sind die Anschlüsse spannungsführend. Durch das Öffnen des TissueLyser III oder das Entfernen von Teilen können spannungsführende Komponenten freigelegt werden.

Installieren Sie das Gerät so, dass der Netzkabelanschluss und der Netzschalter leicht zugänglich sind.

WARNUNG **Stromschlaggefahr beim Austauschen der Sicherungen**



Das Austauschen der Sicherungen ohne gezogenen Netzstecker kann zu lebensbedrohlichen Stromschlägen führen.

Ziehen Sie vor Austausch der Sicherungen den Netzstecker.



WARNUNG **Explosionsfähige Atmosphäre**



Der TissueLyser III ist nicht für den Betrieb in einer explosionsfähigen Atmosphäre ausgelegt.

WARNUNG **Explosionsgefahr**



Der TissueLyser III ist ausgelegt für den Betrieb zusammen mit den Reagenzien und Substanzen, die im Lieferumfang der QIAGEN-Kits enthalten sind. Die Verwendung anderer Reagenzien und Substanzen kann unter Umständen einen Brand oder eine Explosion auslösen.

WARNUNG **Proben, die Infektionserreger enthalten**



Einige der mit dem TissueLyser III verwendeten Proben können Infektionserreger enthalten. Gehen Sie beim Umgang mit derartigen Proben mit der größtmöglichen Vorsicht und gemäß den erforderlichen Sicherheitsbestimmungen vor.

Tragen Sie immer eine Schutzbrille, zwei Paar Laborhandschuhe und einen Laborkittel.

Die verantwortliche Person (z. B. der Laborleiter) muss alle erforderlichen Vorsichtsmaßnahmen treffen, um sicherzustellen, dass die unmittelbare Umgebung des Arbeitsplatzes sicher ist und die Bediener des Geräts ausreichend geschult sind. Außerdem dürfen die Grenzwerte in Bezug auf Infektionserreger, die in den entsprechenden Sicherheitsdatenblättern (SDS) oder den Vorschriften der OSHA*, ACGIH,† oder COSHH COSHH‡ festgelegt sind, nicht überschritten werden.

Beim Betrieb eines Abzugs und bei der Entsorgung von Abfallstoffen müssen alle Bestimmungen und Gesetze zu Gesundheitsschutz und Sicherheit am Arbeitsplatz auf Bundesebene, Landesebene und kommunaler Ebene eingehalten werden.

* OSHA — Occupational Safety and Health Organization (United States of America)
† ACGIH – American Conference of Government Industrial Hygienists (United States of America)
‡ COSHH – Control of Substances Hazardous to Health (United Kingdom)

WARNUNG **Gefährliche Chemikalien**



Einige der mit dem TissueLyser III verwendeten Chemikalien können unter Umständen gefährlich sein oder nach Abschluss des Probenaufschlusses gefährlich werden.

Tragen Sie immer eine Schutzbrille, Laborhandschuhe und einen Laborkittel.

Die verantwortliche Person (z. B. der Laborleiter) muss alle erforderlichen Vorsichtsmaßnahmen treffen, um sicherzustellen, dass die unmittelbare Umgebung des Arbeitsplatzes sicher ist. Auch dürfen die Grenzwerte in Bezug auf infektiöse Erreger, die in den entsprechenden Sicherheitsdatenblättern (SDS) oder den Vorschriften der OSHA*, ACGIH,† oder COSHH COSHH‡ festgelegt sind, nicht überschritten werden.

Beim Betrieb eines Abzugs und bei der Entsorgung von Abfallstoffen müssen alle Bestimmungen und Gesetze zu Gesundheitsschutz und Sicherheit am Arbeitsplatz auf Bundesebene, Landesebene und kommunaler Ebene eingehalten werden.

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† ACGIH – American Conference of Government Industrial Hygienists (United States of America)
‡ COSHH – Control of Substances Hazardous to Health (United Kingdom)

WARNUNG **Flüssigstickstoff**



Bei Arbeiten mit Flüssigstickstoff bestehen Gefahren durch Sauerstoffverdrängung und Kälteverbrennungen. Achten Sie bei der Handhabung und Lagerung von Flüssigstickstoff auf eine ausreichende Belüftung des Raums und Luftüberwachung. Vermeiden Sie Verschüttungen, indem Sie Gefäße stets aufrecht halten, und berühren Sie Gefäße, die mit Flüssigstickstoff in Berührung sind oder waren, nicht mit bloßen Händen. Tragen Sie eine geeignete Schutzausrüstung (Schutzbrille, Laborhandschuhe, Laborkittel und Sicherheitsschuhe).

Die niedrige Temperatur von Flüssigstickstoff kann die mechanischen Eigenschaften von Materialien verändern. Stickstoffgekühlte Kunststoffgefäße können bei Verwendung im TissueLyser III spröde werden und zerbrechen. Verwenden Sie Flüssigstickstoff nur mit Gefäßen, die für eine solche Verwendung im TissueLyser III vorgesehen sind.

Die verantwortliche Person (z. B. der Laborleiter) muss alle erforderlichen Vorsichtsmaßnahmen ergreifen, um sicherzustellen, dass der Arbeitsbereich sicher ist und dass die Bediener des TissueLyser III Gefahren durch Flüssigstickstoff, wie in den entsprechenden Sicherheitsdatenblättern (Safety Data Sheets, SDS) oder den Vorschriften der OSHA*, ACGIH,† oder COSHH COSHH‡ angegeben, nicht ausgesetzt werden.

* OSHA — Occupational Safety and Health Organization (United States of America)
† ACGIH – American Conference of Government Industrial Hygienists (United States of America)
‡ COSHH – Control of Substances Hazardous to Health (United Kingdom)

WARNUNG **Giftige Dämpfe**



Verwenden Sie zur Reinigung oder Desinfektion von gebrauchten Labormaterialien keine Chlorbleiche. Die Chlorbleiche kann bei Kontakt mit Salzen aus den verwendeten Puffern giftige Dämpfe bilden.

WARNUNG **Sich bewegende Geräteteile**



Lassen Sie den TissueLyser III während des Betriebs nicht unbeaufsichtigt.

WARNUNG **Sich bewegende Geräteteile**



Wenn das TissueLyser Adapter Set oder das Grinding Jar Set nicht sicher montiert ist, kann es zu Sach- und Personenschäden kommen.

Achten Sie darauf, dass beide Adapter bzw. Mahlbecher etwa gleich viel wiegen. Betreiben Sie den TissueLyser III nie, wenn nur ein einzelner Adapter oder Mahlbecher eingebaut ist.

WARNUNG **Gefahr von Verbrennungen und Verbrühungen**





Abhängig von Mahlgut und Mahlparametern können sich Mahlbecher und Mahlgut bei der Vermahlung stark aufheizen. Fassen Sie Mahlbecher nur mit Schutzhandschuhen an und warten Sie auf das Abkühlen auf Raumtemperatur vor dem Öffnen der Mahlbecher.

WARNUNG **Gefahr durch Stromschlag**



Öffnen Sie keine der Abdeckplatten des TissueLyser III. Führen Sie Reinigungsarbeiten mit Flüssigkeiten nur aus, wenn das Gerät vom Stromnetz getrennt wurde. Verwenden Sie Flüssigkeiten nur auf Tüchern, niemals frei fließend.

Gefahr von Personen- und Sachschäden

Führen Sie nur Wartungsarbeiten durch, die ausdrücklich im TissueLyser III Benutzerhandbuch beschrieben sind.

VORSICHT **Beschädigung des Geräts**



Verwenden Sie zum Reinigen des TissueLyser III keine Bleichmittel, Lösungsmittel oder Reagenzien, die Säuren, Laugen oder Abrasivstoffe enthalten.

Verschütten Sie kein Wasser und keine Chemikalien auf dem TissueLyser III. Durch verschüttetes Wasser oder verschüttete Chemikalien verursachte Schäden führen zum Erlöschen der Garantie.

Die in diesem Handbuch enthaltenen Hinweise stellen eine Ergänzung und keinen Ersatz der üblichen Sicherheitsanforderungen dar, die im jeweiligen Land gelten.

Document Revision History

Revision	Description
December 2024	Added 50 mL Tube Adapter Set
May 2023	Initial release

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