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HulaMixer™ Sample Mixer

USER GUIDE

Catalog Numbers 15920D

Publication Number MAN0014597

Revision B.0

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ThermoFisher SCIENTIFIC

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Revision history: Pub. No. MAN0014597

Revision	Date	Description
B.0	17 March 2022	Baseline for HulaMixer™ Sample Mixer user guide.

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1 Product information

Product description

The HulaMixer™ Sample Mixer is designed to mix samples through rotational movement of the platform in the vertical plane to provide effective mixing of biological liquids in tubes.

Operation of the HulaMixer™ Sample Mixer includes the following range of motions:

- Orbital rotational motion
- Reciprocal motion
- Vibrating motion of the platform in different planes

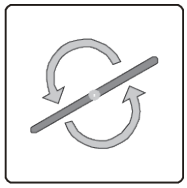
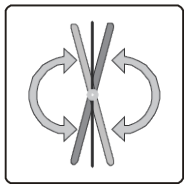
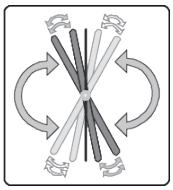
The microprocessor control allows the user to set a program which can deliver not only separate mixing motions, but also allows programming segments of different motion types consecutively in cycles of motions.

Applications

- The HulaMixer™ Sample Mixer is designed for mixing biological solutions, cell suspensions, Dynabeads™ magnetic beads as well as incubation and cultivation of biological liquids according to the operator set program.
- The device is applicable in all areas of laboratory research in biotechnology, microbiology, chemistry, and medicine.
- The HulaMixer™ Sample Mixer is designed for operation in closed laboratory rooms, cold rooms, and incubators at temperatures from 4°C to 40°C.

Types of motion

The HulaMixer™ Sample Mixer provides three types of motion, which can be used separately (except for vibration mode, which works in conjunction with reciprocal motion mode) and consecutively in a cycle:

Product	Quantity
Rotating motion (Orbital) 	Simple, even, circular motion used in rotators, with adjustable speed from 1–100 rpm.
Reciprocating rotating motion (Reciprocal) 	Vertical or horizontal rotation with changing direction of rotation. Adjustable turning angle (from 1–90° in 1° increments) with adjustable speed from 1–100 rpm. For reciprocal motion, there is a pause function (from 0–5 seconds, 1 second increments); this can be set in the Vibration/pause mode.
Vibration mode (Vibro) 	Intensive vibration/vortex function with small amplitude (from 1–5°) is performed during pause of reciprocal motion. Intensive vibration requires that the pause time is activated (see “Program motion cycles” on page 11). Setting the vibration angle to 0° will abolish all vibration (including the weak vibration associated with reciprocal motion), but only if the pause time is activated.

Mixer settings

- Speed (rpm) and time (seconds) of rotational motion (360°) of the platform for program segments from 0–250 seconds, or non-stop (continuous rotation) at 1–100 rpm.
- Speed (rpm), turning angle (1–90°), and time (0–250 seconds for program segments, or non-stop) of reciprocal motion when the direction of the platform’s rotational motion is changing in turns within the limits of the turning angle.
- Program segments of vibrating motion of the platform (turning angle 1–5°, duration 1–5 seconds) run on the borders of reciprocal motion segment. It is available only when the reciprocal motion is ON.
- Switch between vertical and horizontal reciprocal mixing by holding the Select key for 4 seconds.
- Pauses of short duration (1–5 seconds), for temporary platform motion stops, may be programmed on the borders of reciprocal motion segments by setting the vibrating motion turning angle to zero. It is available only when the reciprocal motion is ON.
- Operating time from 1 minute to 24 hours, or non-stop.

Product contents

The components of the HulaMixer™ Sample Mixer are listed in the following table. See page 14 for product specifications.

Product	Quantity
HulaMixer™ Sample Mixer	1
HulaMixer™ Platforms	2
External AC/DC adapter (100–240 V, 1.25 A)	1
User Guide	1
Quick Reference Card	1

Upon receipt of the HulaMixer™ Sample Mixer

Examine the unit carefully for any damage incurred during transit. File any damage claims with the carrier. The warranty does not cover in-transit damage.

Unpacking the HulaMixer™ Sample Mixer

Remove packing materials carefully, and retain for future shipment or storage of the unit.

IMPORTANT! Before using this product, read and understand the Safety appendix (page 15) in this document. Operation of the HulaMixer™ Sample Mixer is subject to the conditions described in this user guide. The protection provided by the equipment may be impaired if the equipment is used in a manner not specified by Thermo Fisher Scientific.

Set up the HulaMixer™ Sample Mixer

Store and transport the unit in a horizontal position.

1. Place the unit on a horizontal, even work surface.
2. Plug the external power supply connector into the 12 V socket at the rear side of the unit.

Change a HulaMixer™ Platform

1. Loosen the two fixing screws and remove the platform.
2. Install the new platform and secure it with the screws.
3. Tighten the two fixing screws.

2 Methods

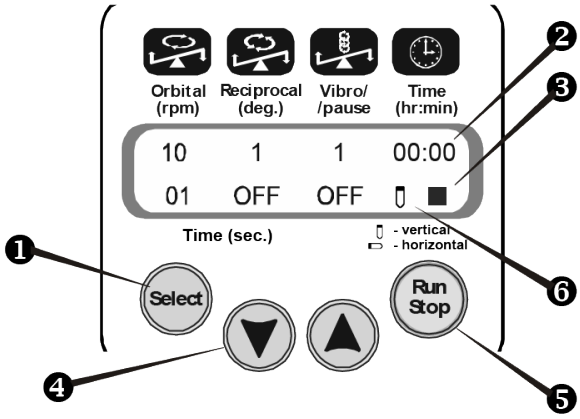
Using the HulaMixer™ Sample Mixer

This section provides instructions for using the HulaMixer™ Sample Mixer.

A Quick Reference Guide is included with the HulaMixer™ Sample Mixer for experienced users, particularly for use with Dynabeads™ products.

Control panel overview

The components of the HulaMixer™ Sample Mixer are listed in the following figure. See page 14 for product specifications.



① **Select** key
② Timer indicator
③ Run/Stop indicator
④ **Up(▲)/Down (▼)** arrow keys
⑤ **Run/Stop** key
⑥ Vertical/Horizontal indicator

Operate the HulaMixer™ Sample Mixer

1. Connect the AC/DC adapter to the main power supply.
2. Place tubes on one of the platforms.

   IMPORTANT! When loading samples, use an even number of tubes arranged symmetrically to the rotation axis to balance the unit during operation.

3. Set the appropriate program and operation time (see “Program the HulaMixer™ Sample Mixer” on page 10).
4. Press the Run/Stop key ❺ to start the program.
5. The platform motion begins and the corresponding indication [RUN] ❸ and the changing time values are displayed.
6. If the operation time is not set and the timer indicator ❷ shows [0:00], pressing the Run/Stop key causes continuous operation of the unit until the Run/Stop key is pressed again.
7. If the operation time is set then the unit stops after the set time interval has elapsed, (flashing STOP on the display) and a sound signals the end of the operation (press the Run/Stop key to stop the signal).
8. For repeat operation of the previous program press the Run/Stop key.
9. If necessary, the HulaMixer™ Sample Mixer can be stopped at any time during operation by pressing the Run/Stop key. Platform motion stops when the platform achieves horizontal position. Pressing the Run/Stop key again starts the program from the beginning (countdown timer restarts).

   Note: A stepper motor is used in this model. This allows the user to stop the platform with their hand for a moment, without causing damage to the unit. If the platform is stopped by hand during the operation, the program does not stop and the platform motion automatically resumes after the platform is released.

10. To turn off the unit, unplug the AC/DC adapter from the outlet.

Program the HulaMixer™ Sample Mixer

Enter program segments

See “Control panel overview” on page 8 for location and identification of the indicated keys.

1. Press the **Select** key ❶ to choose the parameter to change (the active parameter is flashing). Use the ▲ and ▼ keys ❹ to set the necessary value.

   Press **Select** key for 4 seconds tp switch between horizontal and vertical planes.

   Note: Pressing the ▲ or ▼ key for more than 2 seconds changes the display rapidly.

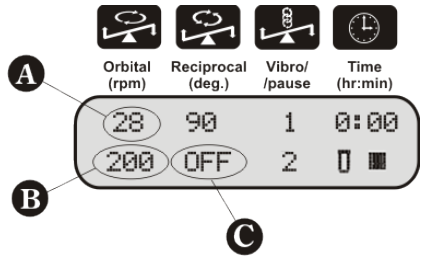
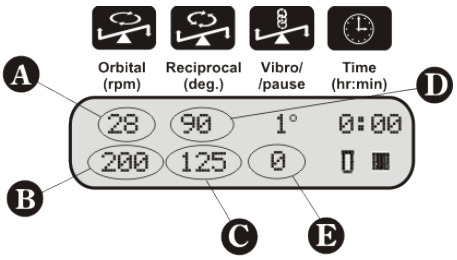
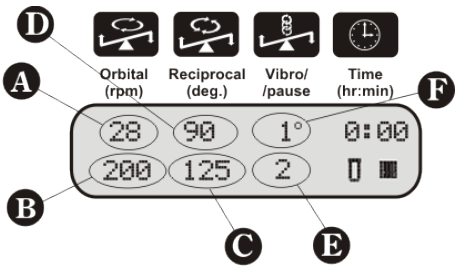
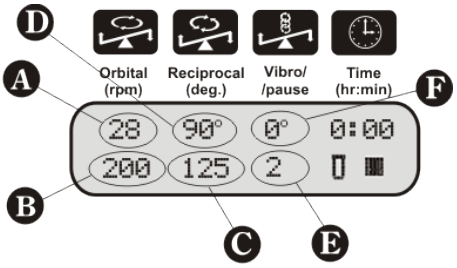
2. The program can be changed during operation. The last settings are automatically remembered and will display when starting the operations again.

3. The countdown timer is used to control the operation time of programmed motion cycles. The timer can be set for a period from 1 minute to 24 hours (in 1 minute increments).

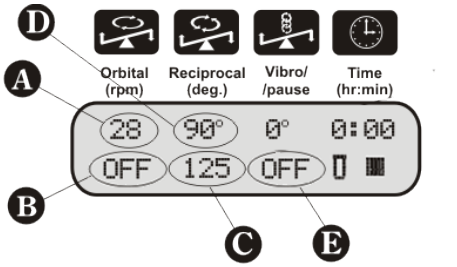
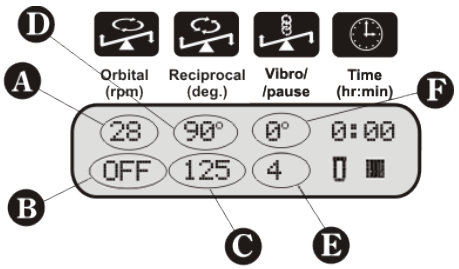
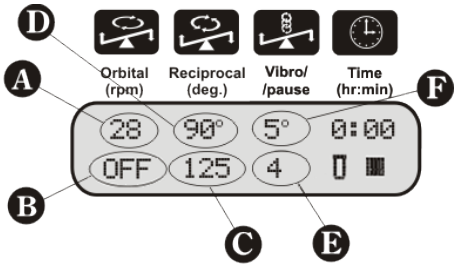
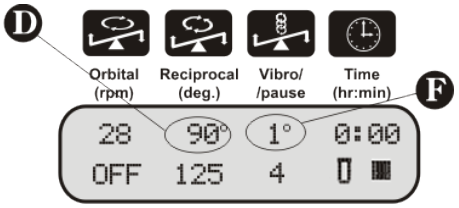
   Note: When setting program parameters for operation with higher loads, the HulaMixer™ Sample Mixer may not perform at highest settings in reciprocal and vibration modes. The recommended load is indicated in “Product specifications” on page 14.

Program motion cycles

The following program examples show separate motion types and their available combinations as cycles. Set motion parameters as indicated to achieve the motion cycle desired.

Settings	Display
Orbital rotation • Orbital rotation **A**: 1–100 rpm • Orbital rotation time **B**: 1–250 seconds • Reciprocal motion time **C**: OFF	
Orbital + Reciprocal Rotation • Orbital rotation **A**: 1–100 rpm • Orbital rotation time **B**: 1–250 seconds • Reciprocal motion time **C**: 1–250 seconds • Reciprocal motion turning angle **D**: 1–90° • Vibrating motion **E**: [0] OFF	
Orbital + Reciprocal Rotation + Vibration • Orbital rotation **A**: 1–100 rpm • Orbital rotation time **B**: 1–250 seconds • Reciprocal motion time **C**: 1–250 seconds • Reciprocal motion turning angle **D**: 1–90° • Vibrating motion **E**: 1–5 seconds • Vibrating motion turning angle **F**: 1–5° **Note:** If the set time of Reciprocal motion **C** is shorter or equal to the set time of Vibrating motion **E** then the Reciprocal motion will be omitted (Orbital + Vibration).	
Orbital + Reciprocal Rotation + Pause • Orbital rotation **A**: 1–100 rpm • Orbital rotation time **B**: 1–250 seconds • Reciprocal motion time **C**: 1–250 seconds • Reciprocal motion turning angle **D**: 1–90° • Vibrating motion (pause duration) **E**: 1–5 seconds • Vibrating motion turning angle **F**: 0° **Note:** If the set time of Reciprocal motion **C** is shorter or equal to the set time of Vibrating motion/pause mode **E**, the Reciprocal motion will be omitted (Orbital + Pause).	

(continued)

Settings	Display
Reciprocal rotation • Orbital rotation **A**: 1–100 rpm • Orbital rotation time **B**: [0] OFF • Reciprocal motion time **C**: 1–250 seconds • Reciprocal motion turning angle **D**: 1–90° • Vibrating motion **E**: [0] OFF	
Reciprocal rotation + Pause • Orbital rotation **A**: 1–100 rpm • Orbital rotation time **B**: [0] OFF • Reciprocal motion time **C**: 1–250 seconds • Reciprocal motion turning angle **D**: 1–90° • Vibrating motion (pause duration) **E**: 1–5 seconds • Vibrating motion turning angle **F**: 0°	
Reciprocal rotation + Vibration • Orbital rotation **A**: 1–100 rpm • Orbital rotation time **B**: [0] OFF • Reciprocal motion time **C**: 1–250 seconds • Reciprocal motion turning angle **D**: 1–90° • Vibrating motion **E**: 1–5 seconds • Vibrating motion turning angle **F**: 1–5°	
Intensive vibration (Vortexing) • Orbital rotation **A**: 1–100 rpm • Orbital rotation time **B**: [0] OFF • Reciprocal motion time **C**: 1–250 seconds • Reciprocal motion turning angle **D**: 1–90° • Vibrating motion **E**: 1–5 seconds • Vibrating motion turning angle **F**: 1°	

Maintenance

Operating conditions

Operation of the HulaMixer™ Sample Mixer is subject to the following conditions:

- Indoor use
- Altitude below 2000 meters
- Temperature range: 4ºC to 40ºC
- Maximum relative humidity: 80% for temperatures up to 31ºC, decreasing linearly to 50% relative humidity at 40ºC

Cleaning and decontamination

CAUTION! Use only the cleaning and decontamination methods specified in the manufacturer's user documentation. It is the responsibility of the operator (or other responsible person) to ensure the following requirements are met:

- The instrument is properly decontaminated a) if hazardous material is spilled onto or into the equipment, and/or b) prior to having the instrument serviced at your facility or sending the instrument for repair, maintenance, trade-in, disposal, or termination of a loan (decontamination forms may be requested from customer service).
- Before using any cleaning or decontamination methods (except those recommended by the manufacturer), users should confirm with the manufacturer that the proposed method will not damage the equipment.
- Clean the unit only with a damp cloth; do not use chemical cleaning agents.

A

Specifications

Product specifications

Specification	HulaMixer™ Sample Mixer
Dimensions (W × D × H)	365 mm × 195 mm × 155 mm
Weight	<1.8 kg
Power (external)	12 V, 1.25 A
Program timer	0–24 hours (in 1 minute increments) or non-stop
Maximum load	0.5 kg
PRS-26 platform capacity	
Microcentrifuge tubes, vacutainers, and 15-mL tubes	26 pcs
PRS-5/12 platform capacity	
50-mL tubes	5 pcs
Microcentrifuge tubes and vacutainers	12 pcs
Vertical and reciprocal rotation modes	
Speed range	1–100 rpm
Timer	0–250 seconds
Vertical rotation movement	360°
Reciprocal rotation mode	
Turning angle	1–90° (in 1° increments)
Timer	0–250 seconds
Vibration/pause mode	
Turning angle	0–5° (in 1° increments)
Timer	0–5 seconds
Pause	0–5 seconds

B

Safety

Before starting

- Do not operate the unit in environments with aggressive or explosive chemical mixtures.
- Do not operate the unit if it is faulty or has been incorrectly installed.
- For indoor use only.
- Do not place a load exceeding the maximum loading mentioned in the “Product specifications” section.
- When power is restored after interruption the unit turns on automatically and resumes operation (the timer is restarted).

General safety

The HulaMixer™ Sample Mixer complies with the requirements of the RoHS directive, 2002/95/EC

- Low Voltage Directive (LVD) 2014/35/EU
- ROHS Directive 2011/65/EU (including 2015/863)
- Electrical Equipment (Safety) Regulations 2016
- The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

WARNING! Using this product in a manner not specified in the user documentation may result in personal injury or damage to the instrument or device. Ensure that anyone using this product has received instructions in general safety practices for laboratories and the safety information provided in this document.

- Before using an instrument or device, read and understand the safety information provided in the user documentation provided by the manufacturer of the instrument or device.
- CAUTION! The unit should be saved from shocks or drops.
- CAUTION! After transport or storage in humid conditions, allow the unit to completely dry for 2–3 hrs before connecting to the supply voltage.
- CAUTION! Do not modify the design of the unit.
- CAUTION! Place the unit on a stable surface that can withstand the shaking or rotational movement of the unit during operation.

Explanation of symbols and warnings

Symbol and description	
⚠ **CAUTION!** Risk of danger. Consult the manual for further safety information.	
	WEEE (Waste Electrical and Electronic Equipment) symbol indicates that this product should not be disposed of in unsorted municipal waste. Follow local municipal waste ordinances for proper disposal provisions to reduce the environmental impact of WEEE. This instrument meets European requirement WEEE Directive 2012/19/EU.
CE	The CE mark symbolizes that the product conforms to all applicable European Community provisions for which this marking is required. Operation of the HulaMixer™ Sample Mixer is subject to the conditions described in this manual. The protection provided by the device may be impaired if the instrument is used in a manner not specified by the manufacturer.
c UL us	This product conforms to UL 61010-1, CAN/CSA C22.2 No.61010-1 “Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part I: General Requirements.” Instruments bearing the UL symbol are certified by Underwriters Laboratories to be in conformance with the applicable safety standard for the US and Canada.
UK CA	The UKCA mark symbolizes that the product conforms to all applicable provisions in Great Briitain (England, Wales, and Scotland) for which this marking is required. Operation of the HulaMixer™ Sample Mixer is subject to the conditions described in this manual. The protection provided by the device may be impaired if the instrument is used in a manner not specified by the manufacturer.
	Regulatory Compliance Mark indicates conformity with Australian standards for electromagnetic compatibility.

Electromagnetic compatibility (EMC) standards

The HulaMixer™ Sample Mixer conforms to the requirement of the following directives:

- EMC Directive 2014/30/EU
- Electromagnetic Compatibility Regulations 2016

Electrical safety

The HulaMixer™ Sample Mixer conforms to the requirement of the following directive:

Low Voltage Directive 2006/95/EC

- Connect only to a power supply with a voltage corresponding to that on the serial number label.
- Use only the external power supply connector provided with this product.
- Ensure that the external power supply connector is easily accessible during use.
- Before moving the unit, disconnect the external power supply from the power outlet.
- If liquid is spilled inside the unit, disconnect it from the external power supply and have it checked by a competent person.

Chemical safety

WARNING! GENERAL CHEMICAL HANDLING. To minimize hazards, ensure laboratory personnel read and practice the general safety guidelines for chemical usage, storage, and waste provided below. Consult the relevant SDS for specific precautions and instructions:

- Read and understand the Safety Data Sheets (SDSs) provided by the chemical manufacturer before you store, handle, or work with any chemicals or hazardous materials. To obtain SDSs, see the "Documentation and Support" section in this document.
- Minimize contact with chemicals. Wear appropriate personal protective equipment when handling chemicals (for example, safety glasses, gloves, or protective clothing).
- Minimize the inhalation of chemicals. Do not leave chemical containers open. Use only with sufficient ventilation (for example, fume hood).
- Check regularly for chemical leaks or spills. If a leak or spill occurs, follow the manufacturer cleanup procedures as recommended in the SDS.
- Handle chemical wastes in a fume hood.
- Ensure use of primary and secondary waste containers. (A primary waste container holds the immediate waste. A secondary container contains spills or leaks from the primary container. Both containers must be compatible with the waste material and meet federal, state, and local requirements for container storage.)
- After emptying a waste container, seal it with the cap provided.
- Characterize (by analysis if needed) the waste generated by the particular applications, reagents, and substrates used in your laboratory.
- Ensure that the waste is stored, transferred, transported, and disposed of according to all local, state/provincial, and/or national regulations.
- **IMPORTANT!** Radioactive or biohazardous materials may require special handling, and disposal limitations may apply.

WARNING! HAZARDOUS WASTE (from instruments). Waste produced by the instrument is potentially hazardous. Follow the guidelines noted in the preceding General Chemical Handling warning.

Biological hazard safety

WARNING! Potential Biohazard. Depending on the samples used on this instrument, the surface may be considered a biohazard. Use appropriate decontamination methods when working with biohazards.

WARNING! BIOHAZARD. Biological samples such as tissues, body fluids, infectious agents, and blood of humans and other animals have the potential to transmit infectious diseases. Conduct all work in properly equipped facilities with the appropriate safety equipment (for example, physical containment devices). Safety equipment can also include items for personal protection, such as gloves, coats, gowns, shoe covers, boots, respirators, face shields, safety glasses, or goggles. Individuals should be trained according to applicable regulatory and company/ institution requirements before working with potentially biohazardous materials. Follow all applicable local, state/provincial, and/or national regulations. The following references provide general guidelines when handling biological samples in laboratory environment.

- U.S. Department of Health and Human Services, *Biosafety in Microbiological and Biomedical Laboratories (BMBL)*, 6th Edition, HHS Publication No. (CDC) 300859, Revised June 2020
  https://www.cdc.gov/labs/pdf/CDC-BiosafetymicrobiologicalBiomedicalLaboratories-2020-P.pdf
- Laboratory biosafety manual, fourth edition. Geneva: World Health Organization; 2020 (Laboratory biosafety manual, fourth edition and associated monographs)
  www.who.int/publications/i/item/9789240011311

C Documentation and support

Customer and technical support

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  - User guides, manuals, and protocols
  - Certificates of Analysis
  - Safety Data Sheets (SDSs; also known as MSDSs)

  Note: For SDSs for reagents and chemicals from other manufacturers, contact the manufacturer.

Limited product warranty

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