Instruction Manual
HT Lysing Homogenizer, HOHTDG

Revision 3
02/22/2018

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Package Contents

HT Lysing Homogenizer
Sample Tube Kit, 14 Samples
Tube Rack
Allen wrench
Wrench
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Service Information

If the troubleshooting section does not resolve or describe your problem, contact your authorized OHAUS service agent. For service assistance or technical support in the United States call toll-free 1-800-672-7722 ext. 7852 between 8:00 AM and 5:00 PM EST. An OHAUS product service specialist will be available to provide assistance. Outside the USA, please visit our web site, www.ohaus.com to locate the Ohaus office nearest you.

Serial Number: _____

Date of Purchase: _____

Supplier: _____

Introduction

The Ohaus HT Lysing Homogenizer is a homogenizer specifically designed for high throughput sample processing in a microplate, deep well plate, or sample tube format. Animal tissue, seeds, tubers, leaf punches, soil and sediment samples, insects, and microbial cultures can all be effectively homogenized in a 96-well or microplate, deep well plate, or sample tube format. The high speed linear motion of the homogenizer allows for rapid sample processing; in most cases two (2) minutes or less.

Samples are placed in a tube, vial or well with a grinding media and extraction buffer (seeds can be ground dry), sealed with a cap or press-on mat, placed in the HT Lysing Homogenizer, and processed. Homogenized samples can be subsequently handled manually or in automated systems making use of the standard plate format. The HT Lysing Homogenizer is suitable for the isolation of protein, DNA, RNA, viruses, and any other biological components released during homogenization. The unit is also useful for pulverizing dry samples for chemical analysis and solubility studies.

Installation

Upon receiving the Ohaus HT Lysing Homogenizer, check to ensure that no damage has occurred in shipment. It is important that any damage that occurred in transport is detected at the time of unpacking. If you do find such damage the carrier must be notified immediately.

Turn unit on side to expose the bottom of the unit. Remove the bolts which hold the shipping plate to the bottom on the unit. Store the plate and bolts in a plastic bag incase the unit must be shipped to another location. **Running the unit with the plate attached can cause permanent damage**. **Also shipping the unit without the shipping items can also cause permanent damage.**

Clean bench or table top that the HT Lysing Homogenizer will be placed on and place in its permanent position on the bench. Always place the unit on a level, sturdy work surface. Press down on the unit housing to fasten suction cup feet to bench. Position unit so it is easy to reach and unplug the power cord from the back of the unit.

The HT Homogenizer is supplied with a power cord that is inserted into the IEC connector on the back of the unit first, then it can be plugged into a properly grounded outlet. The 120V unit plugs into a 120 volt, 50/60 Hz source. The 230V unit plugs into a 230 volt, 50/60 Hz source.

Intended Use

NOTE: The Ohaus HT Lysing Homogenizer is intended for General Laboratory Use. Safety cannot be guaranteed if used outside of the intended use.

Maintenance & Servicing

The HT Lysing Homogenizer is built for long, trouble-free, dependable service. No lubrication or other technical user maintenance is required. It needs no user maintenance beyond keeping the surfaces clean after each day's use. The unit should be given the care normally required for any electrical appliance. Avoid wetting or unnecessary exposure to fumes. Do not use a cleaning agent or solvent on the front panel which is abrasive or harmful to plastics, nor one which is flammable. Always ensure the power is disconnected from the unit prior to any cleaning. If the unit ever requires service, contact your Ohaus representative.

Environmental Conditions

Operating Conditions: Indoor use only.

Temperature:	5 to 40°C (41 to 104°F)
Humidity:	20% to 85% relative humidity, non-condensing
Altitude:	0 to 6,562 ft (2000 M) above sea level

Non-Operating Storage:

Temperature:	-20 to 65°C (-4 to 149°F)
Humidity:	20% to 85% relative humidity, non-condensing

Installation Category II and Pollution Degree 2 in accordance with IEC 664.

Equipment Disposal

This equipment must not be disposed of with unsorted waste. It is your responsibility to correctly dispose of the equipment at life-cycle-end by handing it over to an authorized facility for separate collection and recycling. It is also your responsibility to decontaminate the equipment in case of biological, chemical and/or radiological contamination, so as to protect the persons involved in the disposal and recycling of the equipment from health hazards.

For more information about where you can drop off your waste of equipment, please contact your local dealer from whom you originally purchased this equipment. By doing so, you will help to conserve natural and environmental resources and you will ensure that your equipment is recycled in a manner that protects human health.

Safety Instructions

Please read entire instruction manual before operating the units.

WARNING! DO NOT use the HT Lysing Homogenizer in a hazardous atmosphere or with hazardous materials for which the unit was not designed.

WARNING: DO NOT replace the cord with an inadequately rated main supply cord.

WARNING! The protection provided by the HT Lysing Homogenizer may be impaired if it is used with accessories not provided or recommended by the manufacturer or used in a manner not specified by the manufacturer.

This unit is designed for intermittent use only. Always operate unit on a level surface for best performance and maximum safety.

DO NOT lift unit by the lid. **DO NOT** run the unit with the lid open, this will create hazardous conditions. **DO NOT** run the unit without the rubber suction cup feet firmly attached.

CAUTION! To avoid electrical shock, completely cut off power to the unit by disconnecting the power cord from the unit or unplug from the wall outlet. Disconnect unit from the power supply prior to maintenance and servicing. Spills should be removed promptly. **DO NOT** immerse the unit for cleaning.

DO NOT operate the unit if it shows signs of electrical or mechanical damage.

The HT Lysing Homogenizer is designed to be operated in dry conditions.

Use of Hearing Protection is strongly advised when using this product.

Earth Ground - Protective Conductor Terminal

Alternating Current

Standards & Regulations

Compliance to the following standards and regulations is indicated by the corresponding mark on the product.

Mark	Standards and Regulations
CE	The HT Homogenizer complies with directives EN 61010-1:2010-10, EN 61010-2-051:2015-04 The full text of the EU declaration of conformity is available at the following address www.Ohaus.com/WEEE
	This product complies with directive 2012/19/EU. Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment. For disposal instructions in Europe, refer to www.ohaus.com/weee.
	EN 61326-1
TÜV SÜD c US	CAN/CSA C22.2 No. 61010-1:2012-05 CAN/CSA C22.2 No. 61010-2-051:201510 UL 61010-1:2012-05 Supplemented by EN 61010-1:2010-10, EN 61010-2-051:2015-04

Global Notice
Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

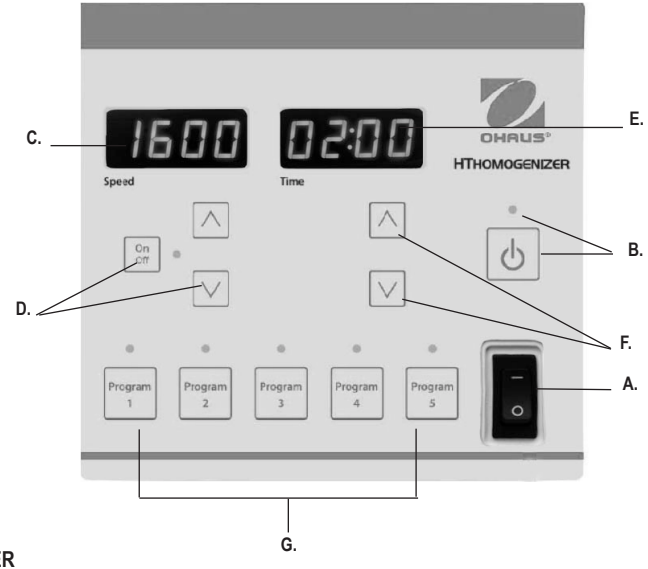
Canada Notice
This Class A digital apparatus complies with Canadian ICES-003.

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

Changes or modifications not expressly approved by Ohaus Corporation could void the user's authority to operate the equipment.

SPECIFICATIONS

Overall dimensions (L x W x H):		17.5 x 11.5 x 20.5” (44.3 x 28.8 x 51.8cm)
Electrical (50/60 Hz):	120 volts AC:	3.2 amps, 450 watts
	230 volts AC:	2.1 amps, 450 watts
Fuses:	120 volts,	5mm x 20mm, 6.3 amp slo-blow fuse (250V Rated)
	230 volts,	5mm x 20mm, 3.15 amp slow blow fuse (250V Rated)
Speed range:		300 to 1600rpm (in 1 rpm increments)
Timer:		1 second to 10 minutes (1 second increments)
Reciprocal strokes:		1.2” (3.1cm)
Capacity:		1 deep well plate, 4 stacked standard well plates; 300 gram maximum; any matrix that will fit in the 4 x 5 x 2.5” (10.2 x 12.7 x 6.4 cm) holder
Controls:		ON/OFF Switch, Standby, Speed UP/DOWN, Speed ON, Time UP/DOWN, Program Buttons
Ship weight:	120 volts,	104lbs (47.2kg)
	230 volts,	120lbs (54.4kg)
Net weight:	120 volts,	59lbs (26.8kg)
	230 volts,	75lbs (34.0kg)



Control Panel - HT Lysing Homogenizer

The front panel of the HT Lysing Homogenizer contains all the controls and displays needed to operate the unit

A. Power Switch: This is the main switch for the system. The unit will not function unless this switch is in the on position. Switch to the on (-) position to power the unit. Switch to the off position (o) to remove power from the internal electronic components

B. Standby button/standby indicator light: The standby indicator light will illuminate when the main power switch is in the ON position. Press the standby button to take the unit out of "Standby Mode". The standby indicator light will shut off. Press the standby button again and the unit will once again be in standby mode.

C. Speed display: Displays the speed of the homogenizer **D. Up/down arrows:** For set-point control. ON/OFF button starts/stops reciprocal motion function.

E. Time Display: Displays the set time (before the unit is started) or remaining time (once unit is running or if the unit is paused). The display range is from 00:00 to 10:00 minutes in 1 second increments. The display indicates minutes and seconds. This unit can be only be used in timed (countdown) mode only.

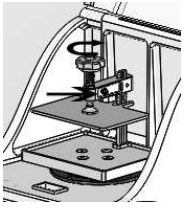
F. Up/Down Buttons: For Set-point control Up/Down Arrows for set point control.

G. Program Buttons: Factory set buttons for common time and speed combinations based on sample type. See page 7 for details. When a preset button is active, the corresponding settings cannot be changed.

Operating Instructions

IMPORTANT: This unit is designed for intermittent use only. After every 10 minute cycle it must have at least 1 minute cool down period. Before processing any samples, it is advisable to perform a dry run with your plates or tubes with appropriate grinding material to determine whether they are durable for your homogenization process.

1. **Getting ready:**
   a. Place unit on a sturdy surface.
      i. If this surface is permanent, you can remove the plastic covers from the inner rubber feet. These will adhere to the surface.
      ii. If this is not the permanent location for the unit, simply leave the plastic on the rubber feet.
   b. Plug cord into a properly grounded outlet.
   c. Switch the power switch to the ON position by pressing the side of the switch labeled with a dash (-).
   d. Press the STANDBY button:
      i. An LED will light over the button and the LED screens will illuminate.
2. **Load plate:**
   a. Turn the lid latch counter clock wise to unlock the lid.
   b. Open lid.
   c. Loosen the sample clamp by pushing the black clamp lock knobs and turning the handle counter clock wise until the clamp is fully up.



   d. Place sample under the clamp.
   e. Tighten by turning the handle clockwise until tight.
      i. You will hear the clicking of the screw lock. If the lock does not click, pull the black lock knobs forward to engage the lock.
   f. Close the lid and lock it in place.
      i. Turn the lid latch clockwise to secure lid.

IMPORTANT: If the locking arm is at the wrong height for the sample, it can be adjusted up or down by removing the black hex head screw with Allen wrench included and, with the lock screw loose, repositioning it to a different hole on the vertical arm. **DO NOT** run the unit without the black hex head screw through one of the holes in the vertical arm.

3. **Setting unit:**

THE LID MUST BE CLOSED AND LOCKED FOR UNIT TO BE SET OR TO FUNCTION.

   a. Standard Set:
      i. Press the speed up or down buttons to reach the desired speed.
         1. Note: Hold down the speed buttons for quick setting.
      ii. Press the time up or down buttons to reach the desired time.
         1. Note: Hold down the time buttons for quick setting.
      iii. Once the desired speed and time is set, press the speed ON/OFF button to start unit function.
      iv. Timer must be set in order for unit to run. If time is set to 00:00, unit will not function.

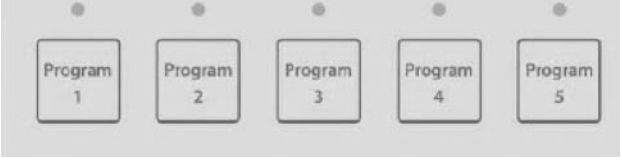
NOTE: IF THE LID IS OPENED AT ANY TIME DURING OPERATION, THE UNIT WILL STOP AND REQUIRES THE USER TO PRESS START AGAIN TO RESTART FUNCTION.

Operating Instructions

	Tube Color	Sample Type	Tube Size	Speed	Time
Program 1	White Yellow Blue	Bacteria Fungi Yeast	2mL	1500rpm	5 minutes
Program 2	Orange	Soft Sample	2mL	1500rpm	2 minutes
Program 3	Red Green	Animal Tissue Plant Material	2mL	1300rpm	3 minutes
Program 4	Brown	Soil and Environmental Samples	2mL	1500rpm	4 minutes
Program 5		Cryogenically Frozen Samples	Polycar-bonate 4mL & 15mL	1600rpm	1 minute

***The preset programs are not limited to the tubes listed. You should run a test to determin the optimal settings for other size tubes.**

b. Factory Preset Program buttons:



i. The Program buttons have been designed to effectively grind various types of samples and cannot be re-programmed.

1. To enter a program, press any of the program buttons.
   a. An LED indicator will light over the selected program.
2. To exit program, press any other button.
3. Press the speed ON/OFF button to start program.
4. When the selected program has finished, the unit will turn off.
5. When the program is over, the display will reset itself to the beginning of the program.

NOTE: IF THE LID IS OPENED AT ANY TIME DURING OPERATION, THE UNIT WILL STOP AND REQUIRES THE USER TO PRESS START AGAIN TO RESTART FUNCTION.

c. To interrupt a timing cycle, press Speed ON/OFF power button to OFF. **IMPORTANT:** To completely cut off power to the unit, disconnect the power cord from the unit or unplug from the wall outlet. If your unit does not shut off when the lid is opened, switch the unit off and contact your Ohaus representative for repairs.

d. When the unit is not being used flip the ON/OFF power switch to the OFF position.

NOTE: IF RUNNING LESS THAN A FULL RACK OF SAMPLES, IT IS IMPORTANT TO HAVE SAMPLES BALANCED STARTING FROM THE CENTER OF THE RACK.

IMPORTANT: To prevent unnecessary wear on the HT Lysing Homogenizer, microwell plates and vial sample should not exceed 300 grams. A typical deep well plate with grinding media, sample, and extraction buffer will weigh less than 200 grams.

Using sample tubes in a small tube rack with the HT Lysing Homogenizer is essentially the same as using deep well plates. The amount of head space is very important for efficient sample homogenization. Generally the harder the substance to be ground, the less can be added to each tube or well. The samples must be firmly locked into the homogenizer prior to grinding, as described under 'Operating Instructions' (see above).

Grinding times and speeds must be determined empirically.

IMPORTANT: The 4 center positions must always have tubes in them.

Operating Instructions

OPERATING TIPS

Many protocols, especially with RNA isolation, call for up to 1mL of extraction buffer with as little as 20mg of tissue. When using 96 deep well plates, this volume is impractical. In such situations, it is suggested that the homogenizing be performed in a smaller volume initially and then the balance of the buffer being added after the homogenization.

The plate holder can accommodate one (1) deep well plate, four (4) stacked standard well plates or any matrix that will fit in the 4 x 5 x 2.5" (10.2 x 12.7 x 6.4 cm) holder. Do not run unit with any cracked or broken sample tubes or lids. In all cases, the durability of the sample container should be tested prior to processing samples. Many brands of polypropylene microwell plates are constructed of very thin plastic which may not tolerate full speed with some types of grinding media.. Most deep well plates are sufficiently durable for standard homogenizing applications.

To move the HT Lysing Homogenizer, lift it from one side until the rubber suction cup foot on that side comes off the surface. Continue lifting on this side until all four (4) feet have separated and the homogenizer is lying completely on its side. The homogenizer is now ready to mount in a new location. Never run the homogenizer without the rubber suction cup feet firmly attached. If damaged, replacement feet are available from your Ohaus representative.

TROUBLESHOOTING

Error	Cause of Error	How to fix
E1	The circuit board does not "see" any speed input. This could be caused by a complete motor stoppage, a mechanical issue that causes the mechanism not to pass through the sensor or by an electrical issue such as a sensor malfunction.	1. Check to make sure there is no mechanical obstruction causing the mechanism to become stuck. The tray should move up and down with little resistance. **NOTE:** At the top and bottom of the "stroke" there will be a point where the mechanism will be difficult to move when stopped. This is not a problem for the motor. 2. Cycle power by turning the ON/OFF switch to the Off position, leaving it for 30 seconds and then switching it back to the ON position. 3. If this does not fix your issue, contact your Ohaus representative.
E2	This Error code means that the unit "sees" a speed that is different than the set speed, or that the unit cannot maintain a consistent speed. This could be caused by the unit being overloaded or jammed, by an inconsistent or low power source or by an internal electrical issue.	1. Check that the power source that the unit is plugged into matches the electrical requirements of the unit. 2. Check to make sure there is no mechanical obstruction causing the mechanism to become stuck. The tray should move up and down with little resistance. **NOTE:** At the top and bottom of the "stroke" there will be a point where the mechanism will be difficult to move when stopped. This is not a problem for the motor. 3. Cycle power by turning the ON/OFF switch to the Off position, leaving it for 30 seconds and then switching it back to the ON position. 4. If this does not fix your issue, contact your Ohaus representative.
Unit has no power	Blown Fuse	1. Replace the fuse with the supplied spare. If issue reoccurs, see # 2 2. Check to make sure there is no mechanical obstruction causing the mechanism to become stuck. The tray should move up and down with little resistance. **NOTE:** At the top and bottom of the "stroke" there will be a point where the mechanism will be difficult to move when stopped. This is normal. 3. If this does not fix your issue, contact your Ohaus representative.
Unit will not run	Lid is not latched properly	1. Unsecure and re-secure lid latch 2. If this does not fix your issue, contact your Ohaus representative.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