

OMNI μ Hb

MICRO HOMOGENIZER USER MANUAL



OMNI
INTERNATIONAL

The Homogenizer Company™



P/N H258-H
REV. A

WARRANTY INFORMATION

This manual is a guide for the use of the Omni μ Hb, Micro Homogenizer and accessories.

Data herein has been verified and validated. It is believed adequate for the intended use of the instrument. If the instrument or procedures are used for purposes over and above the capabilities specified herein, confirmation of the validity and suitability should be obtained, otherwise Omni International does not guarantee results and assumes no obligation or liability. This publication is not a license to operate under, or a recommendation to infringe upon, any process patents.

Notes, cautions, and warnings within the text of this manual are used to emphasize important and critical instructions.

This Omni International product is warranted to be free from defects in material and workmanship for a period of ONE YEAR from the date of delivery. Omni International will repair or replace and return free of charge any part which is returned to its factory within said period, transportation prepaid by user, and which is found upon inspection to have been defective in materials or workmanship. For the first 90 days, both parts and service are without charge. For the balance of the period, parts will be provided but service will be charged at established labor rates. This warranty does not include normal wear from use; it does not apply to any instrument or parts which have been altered by anyone other than an employee of Omni International nor to any instrument which has been damaged through accident, negligence, failure to follow operating instructions, the use of electric currents or circuits other than those specified on the plate affixed to the instrument, misuse, or abuse. Omni International reserves the right to change, alter, modify, or improve any of its instruments without any obligation whatever to make corresponding changes to any instrument previously sold or shipped.

THE FORGOING OBLIGATION IS IN LIEU OF ALL OBLIGATIONS AND LIABILITIES INCLUDING NEGLIGENCE AND ALL WARRANTIES OF MERCHANTABILITY OR OTHERWISE, EXPRESSED OR IMPLIED IN FACT OR BY LAW, AND STATE OUR ENTIRE AND EXCLUSIVE LIABILITY AND BUYERS EXCLUSIVE REMEDY FOR ANY CLAIM OF DAMAGES IN CONNECTION WITH THE SALE OR FURNISHING OF GOODS OR PARTS, THEIR DESIGN, SUITABILITY FOR USE, INSTALLATION, OR OPERATION. OMNI INTERNATIONAL WILL IN NO EVENT BE LIABLE FOR ANY SPECIAL OR CONSEQUENTIAL DAMAGES WHATSOEVER, AND THEIR LIABILITY UNDER NO CIRCUMSTANCES WILL EXCEED THE CONTRACT PRICE FOR THE GOODS FOR WHICH LIABILITY IS CLAIMED.

IMPORTANT SAFEGAURDS

- READ ALL INSTRUCTIONS BEFORE USING.
- SAVE THIS OWNER'S MANUAL.

The Omni μ Hb has been engineered for economical functionality as well as safety; however, basic safety precautions and common sense must always be demonstrated when using any electrical product.

DO NOT attempt to modify any part of the Omni μ Hb. If you experience problems with or have questions about your Omni μ Hb, contact your authorized dealer or call Omni International at 800-776-4431 or 770-421-0058.

DANGER

- **DO NOT** allow the machine to be submerged in any liquid.
- **DO NOT** use in any setting other than an indoor laboratory.
- **DO NOT** plug power cord into an incorrect outlet.

WARNING

To reduce the risk of burns, electrocution, fire, or injury:

- Use this product only for its intended purpose as described in this booklet. **DO NOT** use attachments not recommended by the manufacturer.
- **DO NOT** operate the product if it is damaged in any way.
- Keep this product away from heated surfaces.

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SECTION 1 — Omni μ Hb, MICRO HOMOGENIZER

The Omni μ Hb, Micro Homogenizer is a variable speed, handheld, rechargeable homogenizer. It combines a high-speed, high-torque, variable-speed motor, interchangeable battery packs, and a choice of three autoclavable rotor-stator generator probes of various diameters, 7mm Hybrid probe or Omni Tip™ Plastic Probes.

1.1 SPECIFICATIONS

Motor Speed:

Variable settings: 5,000-30,000 rpm

Capacity: 0.03-100 mL

Height (motor only): 14 cm (5.5 in.)

Weight (motor only): 312 g (11oz.)

Electrical Requirements:

Charger: 115V, 60Hz or 220V, 50Hz

Battery Pack: 8.75VDC, 1.6 amp-hr

Motor: 8.75VDC (max)

Standards Approval/Compliance:

115V: CSA Certified

220V: CSA & CE Certified

1.2 PARTS AND ACCESSORIES

Prior to operation, please remove all parts from the shipping container and inspect for damaged or missing parts. If any parts are found to be damaged or missing, please contact Omni International at 1-800-776-4431.

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1.2 PARTS AND ACCESSORIES (cont.)

The Omni μ Hb, Micro Homogenizer consists of the following:

Description	Part Number	Quantity
Motor Drive Unit	F2600	1
Battery Pack	H1160-B	1
Tool Kit	T1001	1
Instruction Manual	H258-H	1

Also available, but not supplied with the instrument:

Description	Part Number	Quantity
Stand Assembly*	S1000	1

*The stand assembly includes a base plate, 24" post, cross rod, and post clamp.

Stainless steel generator probes are also available for the Omni μ Hb, but are not supplied with the instrument.

Description	Part Number
5 mm x 75 mm Stainless Steel Generator Probe	B5-75
7 mm x 95 mm Stainless Steel Generator Probe	B7-95ST
10 mm x 110 mm Stainless Steel Generator Probe	B10-110ST

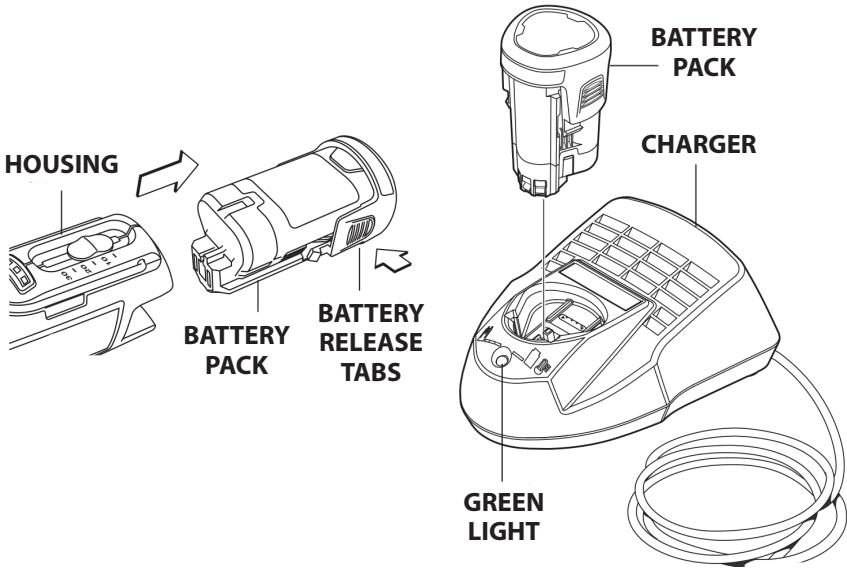
1.3 BATTERY PACK

The Omni μ Hb comes with a powerful 8.75 V, 1.6 amp-hour external, Nickel Cadmium battery pack. Battery life will vary as a function of load, speed, number of charges, etc. A fully charged battery is generally capable of 30 minutes of power with a 7 mm generator probe at 25,000 rpm in water. It may be convenient to purchase additional battery packs (P/N H1160-B) to keep the motor unit operational while battery packs are recharging.

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1.3 BATTERY PACK (cont.)

For optimal battery life, the battery should be completely discharged before recharging. It takes approximately 6 hours to recharge a completely spent battery pack.



1.4 BATTERY PACK AND BATTERY CHARGER

SAFETY INFORMATION

General Information

- Battery powered equipment is always in the ON position. Keep the motor unit switch in the OFF position when not in use, during recharging, or plugging in the unit.
- Keep batteries away from heat or fire, they may explode.
- Batteries may leak under extreme use or temperature conditions. If any liquid comes in contact with skin, wash immediately with soap and water, and consult a physician. If liquid comes in contact with eyes, flush them with clean water for a minimum of 10 minutes and seek immediate medical attention.

1.4 BATTERY PACK AND BATTERY CHARGER

SAFETY INFORMATION (cont.)

The Battery Charger

- Use only the charger supplied with your Omni μ Hb.
- Before using the battery charger, read all instructions and cautionary markings on the charger and the motor unit.
- **DO NOT** use an attachment that is not recommended or sold by the battery charger manufacturer. Such use may result in fire, electric shock, or injury.
- **DO NOT** operate the charger if it is damaged in any way, such as receiving a sharp blow or being dropped. Return it to Omni International for repair or replacement.
- To reduce the risk of electric shock, unplug the charger from the outlet before attempting any maintenance or cleaning. Turning off the controls will not reduce risk.
- **DO NOT** disassemble the charger, incorrect assembly may result in fire or electric shock. Return it to Omni International when service or repair is required.

Recharging The Battery Pack

- **DO NOT** recharge the battery pack in a damp or wet environment.
- Never recharge the unit in an environment where the temperature is less than +40°F or more than +140°F.
- Improperly charging Nickel Cadmium batteries can cause batteries to explode, causing personal injury.

Cords

- To reduce risk of damage to the electrical plug and the cord, unplug the charger or motor unit by the plug rather than by the cord.
- Make sure the charger cord is located so that it will not be stepped on, tripped over, or otherwise subjected to stress or damage.

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1.4 BATTERY PACK AND BATTERY CHARGER

SAFETY INFORMATION (cont.)

Cords (cont.)

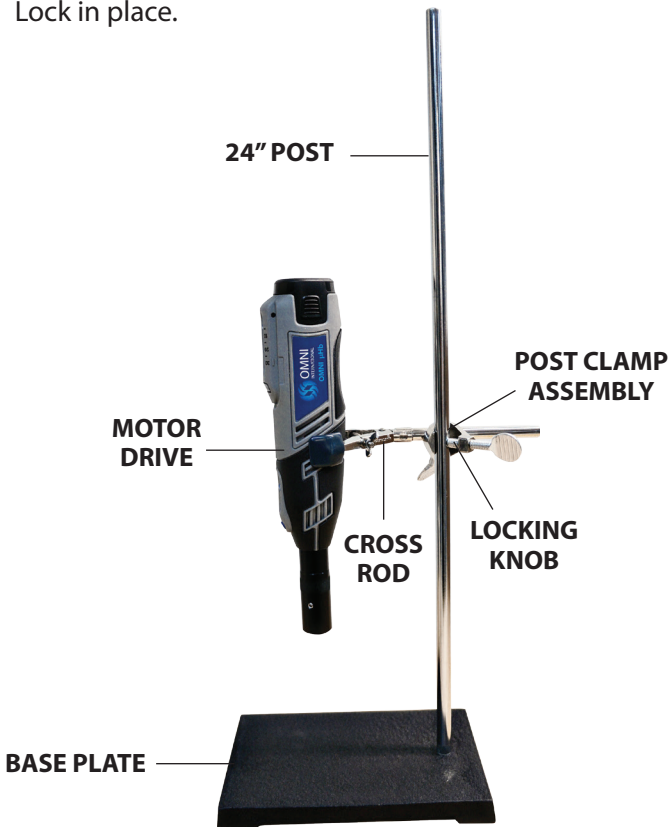
- **DO NOT** operate the charger with a damaged cord or plug. Have them replaced immediately.
- An extension cord should not be used unless absolutely necessary. Use of an extension cord could result in risk of fire or electric shock. If an extension cord must be used, be sure:
 - That pins on plug of extension cord are the same number, size and shape as those of the plug on the charger.
 - That the extension cord is properly wired and in good electrical condition.
 - That the wire size is large enough for AC ampere rating of the charger as specified.

AWG Size of Cord:	18	18	18
Length of Cord (feet):	25	50	100

1.5 STAND-MOUNTING THE OMNI μ Hb (Optional)

To mount the Omni μ Hb Micro Homogenizer to the stand assembly, refer to the figure and follow these steps:

1. Secure the 24" post by twisting it into the base plate until securely tightened.
2. Loosen the locking knob and slide the post clamp assembly down over the end of the post until the clamp is at the desired height and lock in place.
3. Twist the cross rod into the back of the motor housing until tight.
4. Loosen the second knob on the post clamp assembly and insert the cross rod with motor attached (approximately 1" of the cross rod should protrude from the back of the post clamp).
5. Lock in place.



2.1 MOTOR DRIVE UNIT

The Motor drive housing should be wiped off after use, especially when concentrated and potentially damaging liquids are used during processing. Never use solvents to clean motor unit or power base.

2.2 MOTOR BEARINGS

The Omni μ Hb Micro Homogenizer motor is equipped with sealed ball bearings. Under normal use they require no additional lubrication.

WARNING: Keep all housings in place and in working order.

WARNING: Remove all tools from the generator probe before turning the motor on.

WARNING: DO NOT use the motor in a dangerous environment.

WARNING: Disconnect the motor when changing the generator probe.

2.3 GROUNDING INSTRUCTIONS

In the event of a malfunction or breakdown, grounding provides a path of least resistance for electric current, reducing the risk of electric shock. This instrument is equipped with an electric cord and housing which is double insulated. The unit must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.

WARNING: DO NOT modify the plug or cord that is provided. If the plug will not fit the outlet, have the proper outlet installed by a qualified electrician.

WARNING: Reduce the risk of unintentional starting; make sure the speed switch is in the OFF position before plugging in the motor.

WARNING: Damaged or worn power cords should be repaired or replaced immediately by a qualified electrician.

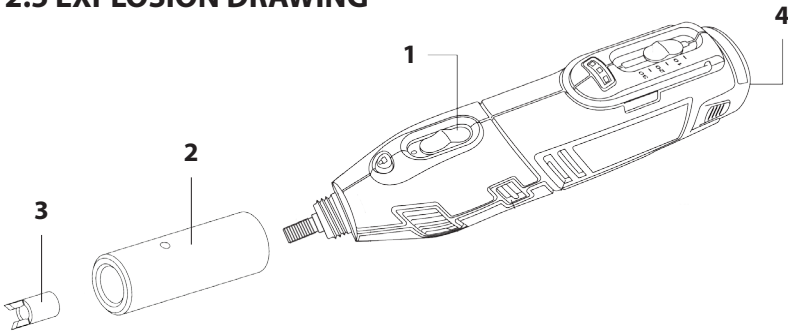
WARNING: Improper connection of the equipment can result in a risk of electric shock.

SECTION 2 — MOTOR MAINTENANCE

2.4 STORAGE

The unique design of the Omni μ Hb allows the handheld unit to stand vertically on a bench-top or shelf so that it can be stored in less than six square inches of space.

2.5 EXPLOSION DRAWING



NO.	DESCRIPTION	ORDER NO.
1	μ Hb motor	F2600
2	B-Style Probe Adaptor	F3000
3	μ Hb Drive Connect	H11513
4*	Battery Pack	H1160-B

**Part also included as assembly number F2600*

3.1 INSTALLING ROTOR-STATOR GENERATOR PROBES

Rotor-stator generator probes are easily installed to the Omni μ Hb, Micro Homogenizer motor by means of a quarter-turn bayonet mount. Simply push the generator probe into the motor housing as far as possible, turn clockwise, and release. Remove the blue protective cap from the tip of the generator probe and the Omni μ Hb is ready to operate.

CAUTION: Replace the blue protective cap on the end of the generator probe when the generator probe is not being used.

WARNING: The tip of a saw tooth generator probe is sharp.

3.2 THEORY OF OPERATION

The rotor shaft is coupled directly to the drive motor, via the drive pin. When attached to the homogenizer motor, the rotor shaft can spin up to 30,000rpm. This assembly makes up the rotor portion of the rotor-stator generator probe. The tube/collar assembly is attached to the motor housing, but does not spin. This is the stator portion of the rotor-stator generator probe. As the rotor knife spins within the tube and collar assembly, it creates a pumping action, pulling the sample into the open end of the generator probe and forcing the sample out through the windows in the tube. The interaction of the rotor knife with these windows sets up a shearing action, reducing the particle size of the sample. The speed differential between the rapidly moving portion and the relatively stationary portion of the sample sets up a second force called cavitation which pulls the sample apart, further reducing the particle size.

The processing efficiency can be affected by:

- Amount of material processed vs. size and speed of the generator probe.
- Container geometry and size (round vessels encourage swirling, while fluted or cornered vessels disrupt flow patterns for more effective mixing/ processing).
- Processing speed vs. optimal speed.
- Size and type of material and flow characteristics (material particles must be small enough to be carried into the generator head for optimal processing).

3.2 THEORY OF OPERATION (cont.)

The upper hole of the tube and collar assembly should be left unblocked to allow the sample to circulate through the generator probe.

NOTE: For optimal sample recovery during processing, reduce the motor speed and completely remove the generator probe from the sample. Then turn off the motor drive unit.

3.3 OPERATION

Insert the generator probe into the Omni μ Hb motor and remove the blue protective cap from the end of the generator probe. The depth of the generator probe in the sample vessel can significantly affect flow patterns within the vessel. This also affects processing efficiency. As a rule of thumb, the generator probe usually operates most efficiently at a depth of 1/3 (to 1/2) of the liquid height. Heavy sediments may require deeper immersion, and this processing depth can be optimized by observing flow patterns and related processing results. While processing, liquid can circulate through the two holes at the bottom of the generator probe. The top hole should not be immersed in the sample. Blocking the upper hole could result in liquid being drawn into the lower motor bearing.

CAUTION: When using glass-filled Teflon lower bearings, do not operate the unit for extended periods of time without immersing the bottom of the generator probe in liquid or the sample being processed in order to avoid premature failure of the lower bearing.

WARNING: Reduce the risk of unintentional starting; make sure that the variable speed switch is in the OFF position prior to plugging in the unit.

WARNING: DO NOT process pathogenic material in an open container, since aerosols created during normal processing could be inhaled by the operator. Please call for assistance in processing pathogens or other material which require sealed enclosures.

4.1 ASSISTANCE

Should this product ever require service, please contact Omni International at 1-800-776-4431.

4.2 DECONTAMINATION

Should an instrument or component that has been used with radioactive or pathogenic material require factory or field service, comply with the following procedure to ensure the safety of service personnel:

- Clean the parts to be serviced of all encrusted material and decontaminate them. There must be no radioactivity detectable by survey equipment.
- Obtain a Decontamination Certificate from Omni International. Complete the certificate and attach to the instrument or parts being returned.

If no Decontamination Certificate is attached, and a potential radioactive or biological hazard is detected or suspected by Omni International, the equipment will not be serviced until proper decontamination and certification is complete. The sender will be contacted for instructions as to the disposition of the equipment. Disposition costs will be borne by the sender.

WARNING: It is a violation of federal law to transport biologically hazardous or radioactive materials without proper packaging, labeling, and appropriate warnings.

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