

Ultrasonic Homogenizer

LUH150/300

Maximum
output

20 kHz 50W
LUH150

20 kHz 300W
LUH300

Operational
functions

Continuous/Timer-controlled/Interval

This homogenizer, using ultrasonic oscillation, does not add any unreasonable stress on the sample because only a few of its elements apply mechanical impact on particles.



■ Principle

The homogenizer generates oscillation of 20,000 times/sec (20 kHz) in the liquid.

Ultrasonic oscillation produces bubbling called cavitation in the liquid. When broken, these bubbles cause impact to crush and shred surrounding particles. Maintenance can be minimized because of limited contamination and fewer eroding parts as compared with a mechanical homogenizer.

■ Applications

Emulsification, Dispersion, Shredding, Crushing, Homogenizing, Reaction acceleration, Extraction, Defoaming, Cleaning, Filtering

■ LUH150 (50W small handy type)

- Easy-to-handle, user-friendly small ultrasonic homogenizer
- Used mainly in receptacles (test tubes, tubes, etc.)
- ON/OFF possible with an oscillator hand switch
- AC 100 – 240V power supply (AC 100V cable attached)
- Compatible with 2, 3, 6 mm-dia. step-type microchips (3 mm-dia. step type microchip provided as standard)

■ LUH300 (300W medium type)

- Medium ultrasonic homogenizer
- Used mainly in test tubes, centrifugal tubes, and beakers
- Amplitude direct control mode with an oscillation sensor
- Compatible with various separately-available microchips and extenders in addition to 12 and 20 mm-dia. standard horns (12 mm-dia. horn provided as standard)
- Appropriate dispersion and crushing conditions ensured for the sample by varying the output over a wide range

■ Specifications

Product code		231507	231506
Model		LUH150	LUH300
Type		Externally-excited oscillation	Self-excited+externally-excited oscillation
Performance	Maximum output	50W	300W
	Oscillation frequency	20kHz \pm 0.5kHz	
	Operating ambient temperature range	5 to 45°C	
Functions	Auto-tuning mode	●	●
	Constant-power mode	●	●
	Constant-amplitude mode	●	●
	Oscillation sensor mode	—	●
	Timer-controlled operation	● 1 sec to 120 minutes	● 1 sec to 120 minutes
	Interval operation	● ON/OFF, each 1.0 to 60.0 sec	● ON/OFF, each 1.0 to 60.0 sec
	Operation with hand switch	●	—
Attached horn or chip		3 mm-dia. step type microchips made from titanium alloy	12 mm-dia. standard horn made from titanium alloy
Oscillator outside dimensions		W122×D270×H283mm	W142×D360×H303mm
Oscillator weight		4.1kg	7.2kg
Converter overall dimensions		φ 40×L171mm (not including chip)	φ 74×L170mm (not including chip)
Converter weight		530g	1.1kg
Power supply (50/60 Hz)		AC100V to 240V 1A Single phase	AC220V 3A Single phase with step-down transformer
Accessories		Power cable (for AC100V), Horn/Chip replacing tool, Attached horn/Chip	

*For the oscillation period during timer-controlled and interval operations, minimum three seconds will be recommended to ensure stability.

*The power cable attached to LUH150 is for AC 100V. A separate power cable is necessary for use at the different voltages.

■ Principle

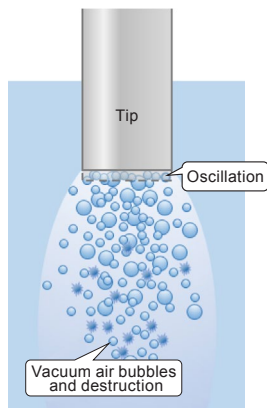
The converter generates oscillation of approx. 20 kHz (20,000times/sec).

This oscillation is converted to oscillation energy by the shape of horn and tip as an amplitude to be generated at the tip.

Cavitation which generates numerous air bubbles and oscillation is transmitted in the form of compressional waves based on the pressure difference in the liquid.

When these bubbles are collapsed, they create impact in the liquid, applying force from all sides to crush or fracture particles.

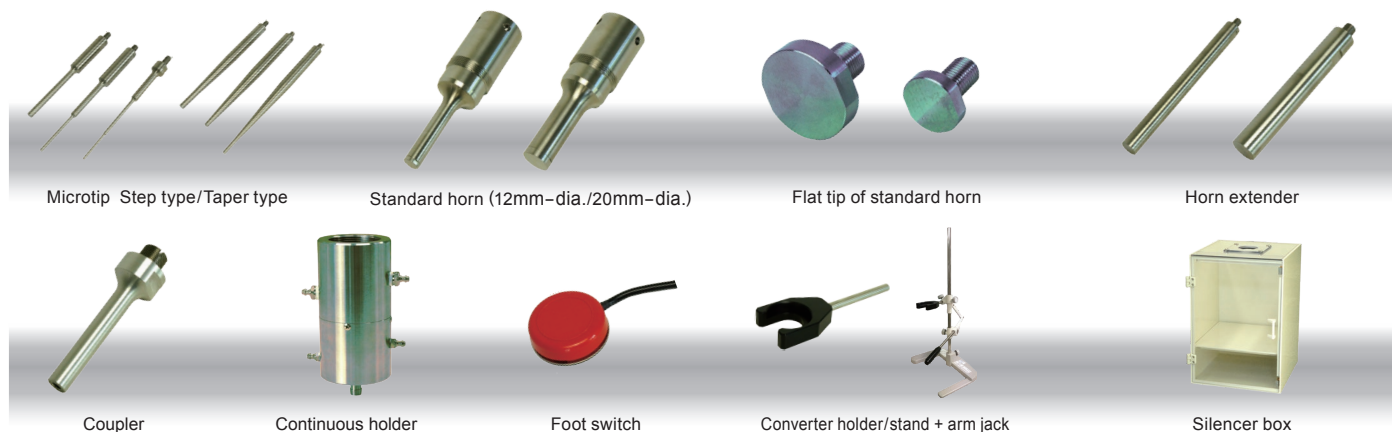
Compared to a mechanical homogenizer, the ultrasonic homogenizer has only a limited number of elements that apply mechanical impact on particles. Particles are not flattened readily in this condition, so that the particle size distribution appears characteristically sharp.



■ Operation and functions

- **Auto tuning**
Initial adjustment before operation can be done by a single touch of TUNE button. Frequency sweep method enables automatic adjustment.
- **Output adjustment**
Selectable either POW mode which keeps the constant of the power or PWM mode which uniformly control the oscillation amplitude. Furthermore, LUH300 comes with SEN mode which enables feedback control of amplitude by the vibration sensor. The most applicable mode enables the safety operation corresponding to the viscosity or alteration characteristic of the sample.
- **Timer operation**
In this mode, the oscillation is performed only within the set period, and it will be stopped automatically.
Timer setting range : 1 sec. to 120 min.
- **Interval operation**
This is an intermittent mode which repeats on and off oscillation. Compared to continuous operation, this mode can prevent heat generated from the oscillator while having a long time oscillation.
Interval setting range : ON/OFF period 1.0 to 60.0 sec.

■ Optional Items



Applicable model	Description	Application	Model	Throughput	Dimension (mm)	Product code
LUH150/LUH300	Microtip, step type	Microtubes, test tubes, centrifuge tubes	OLU10 (2.2mm-dia.)	0.1 to 10ml	12.8mm-dia.×118.6	231560
			OLU12 (3mm-dia.)	0.25 to 25ml	12mm-dia.×134.6	231561
			OLU14 (6mm-dia.)	2 to 50ml	12mm-dia.×111	231562
LUH300	Standard horn	Beakers/Centrifuge tubes	OLU16 (12mm-dia.)	25 to 250ml	38mm-dia.×133	231563
			OLU18 (20mm-dia.)	50 to 250ml	38mm-dia.×119.5	231564
LUH300 12mm-dia. standard horn	Microtip, taper type	Microtubes, test tubes, centrifuge tubes	OLU20 (3.5mm-dia.)	1 to 10ml	12mm-dia.×164.6	231565
			OLU22 (5mm-dia.)	3 to 20ml	12.8mm-dia.×150.6	231566
			OLU24 (6.6mm-dia.)	5 to 50ml	12mm-dia.×145.3	231567
	Flat tip of standard horn	Replacement tip for standard horn	OLU26 (12mm-dia.)	—	12mm-dia.	231568
	Horn extender	Flasks/Filtration bottle/Measuring cylinder	OLU28 (12mm-dia.)	25 to 250ml	12mm-dia.×124	231569
	Continuous holder	External circulation for continuous sample treatment	OLU30 (12mm-dia.)	For continuous processing	52mm-dia.×115	231570
LUH300 20mm-dia. standard horn	Coupler	Used to connect the taper type micro tip to the 12mm-dia. standard horn	OLU32	—	28mm-dia.×87.6	231571
	Flat tip of standard horn	Replacement tip for standard horn	OLU34 (20mm-dia.)	—	20mm-dia.	231572
	Horn extender	Flasks/Filtration bottle/Measuring cylinder	OLU36 (20mm-dia.)	50 to 250ml	20mm-dia.×127	231573
LUH150/LUH300	Continuous holder	External circulation for continuous sample treatment	OLU38 (20mm-dia.)	For continuous processing	52mm-dia.×115	231574
	Footswitch	Ultrasonic wave generating while stepping	OLU40	—	76mm-dia.×H23	231575
	Stand	For holding the converter	OLU42	—	W420×D290×H837	231576
LUH150	Arm jack	For up and down the converter	JK200	—	—	255080
	Converter clamp	For holding the converter	OLU44	—	—	231577
LUH300	Converter holder	For holding the converter	OLU46	—	W90×D270×H30	231578
LUH300	Silencer box	For shielding of operating noise	OLU48	—	W350×D350×H500	231579
LUH150/300	Laboratory jack	For Up/Down of the sample container (beaker)	OLU50	—	Stage W148×D148	231580