

Ultrasonic Homogenizers



Enhance your disruptive power

Quality, reliability, versatility

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Introduction

For over five decades, BioLogics laboratory equipment has been setting new standards for design innovation, performance, and reliability. And the tradition continues, with the Ultrasonic Homogenizers and accessories shown within these pages.

Our Ultrasonic Homogenizers offer precision engineering with all the features necessary to create a total system for ultrasonic disruption. It can disintegrate most cells, bacteria, spores or tissue. It can prepare an emulsion down to 1/100 of a micron, homogenize “immiscible” liquids, accelerate enzymatic and chemical reactions, stimulate bacterial activity, disperse solids in liquids and degas liquids.

How Ultrasonic Homogenizers Work

The ultrasonic homogenizer GENERATOR transforms AC line voltage to 20 kHz high frequency electrical energy. Users have the ability to adjust generator functions allowing complete control of homogenization parameters.

The electrical energy from the generator is transmitted to the piezoelectric TRANSDUCER via high voltage cable and converted to mechanical energy causing longitudinal vibration.

The transducer vibrations are amplified by the PROBE when coupled. When the probe is immersed into a solution, the longitudinally vibrations are transmitted down the probe into the solution causing cavitation.

Cavitation is the result of microscopic vapor bubbles formed momentarily then imploding, causing powerful infinitesimal shock waves to radiate throughout the solution in proximity to the radiating face of the probe.

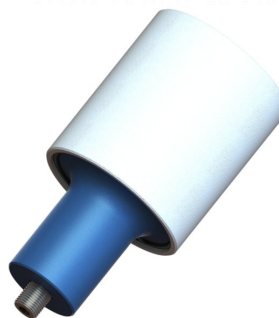
The amplitude is the total distance the probe travels from peak to peak (expanding and contracting) and is dependent on the power control selected by the user.

The probe diameter and design profile determines the sample volume which can be effectively processed. Larger diameter probes generate low intensity cavitation and are utilized when processing large sample volumes. Smaller diameter probes generate high intensity cavitation and are utilized when processing small sample volumes.

Our ultrasonic homogenizers employ a proprietary feedback system, insuring that the ultrasonic homogenizer is always working at its maximum efficiency regardless of the application. The percentage of ultrasonic power emitted is indicated by the output meter, enabling accurate, reproducible results.



GENERATOR



TRANSDUCER



PROBE

Contact vs. Non-Contact Homogenization Methods



The CONTACT homogenization is the most common method of processing a sample. The probe is immersed into the sample where the radiating face of the probe causes the sample to cavitate, quickly processing the sample.

Small diameter probes such as the Stepped and Tapered Micro tips generate high intensity cavitation and are utilized when processing small volume samples.

Large diameter probes such as the Solid and Tapped tips generate low intensity cavitation and are utilized when processing large volume samples.



The NON-CONTACT homogenization method is utilized when processing small volume samples where the probe does not contact the sample.

This method is sometimes referred to as a “high intensity ultrasonic bath”. The cavitation within the water processes the micro tubes or vessels which are suspended during processing.

Non-contact method is most effective for volumes less than 250 μ l as foaming or sample loss are eliminated. In addition, this method ensures that sterile or pathogenic samples are not aerosolized preventing cross contamination.

Model 150VT Ultrasonic Homogenizer



Shown with optional 5/32" (3.9 mm) diameter titanium stepped micro tip probe

CATALOG NO. VOLTAGE

0-121-0001 115 Volts/60 Hz

0-121-0002 230 Volts/50 Hz

*Titanium probes purchased separately

FEATURES

Processing Volume 250 μ l - 300 ml

Max. Probe Diameter 1/2" (12.7 mm)

Power Output 0-150 Watts

Output Frequency 20 kHz

Amplitude Control 0-100%

Automatic Tuning Yes

Microprocessor Control N/A

Duty Cycle (Pulsing) 10-90%

Timer Continuous / 1-15 min

Display LED

Sound Abating Chamber Optional

DIMENSIONS

Generator 12.0 in W x 10.0 in D x 4.0 in H

30.5 cm W x 25.4 cm D x 10.2 cm H

Transducer 3.5 in Dia. x 4.0 in L

8.9 cm Dia. x 10.2 cm L

Includes: generator, transducer, stainless steel transducer post, transducer clamps, power cord, and pin wrenches



The Model 150VT delivers up to 150 Watts of ultrasonic disruption and offers advanced engineering features necessary to create a total system for ultrasonic disruption. This model has a compact footprint and is cost effective, making it ideal for processing small sample volumes of 250 μ l to 300 ml.

With Amplitude (Power) control, the operator can optimize the titanium probe's intensity to efficiently process the samples.

The timer and duty cycle (Pulser) functions increase precision to disintegrate most cells, bacteria, spores or tissue. Prepare emulsions down to 1/100 of a micron, homogenize "immiscible" liquids, accelerate enzymatic and chemical reactions, stimulate bacterial activity, disperse solids in liquids and degas liquids.

The Auto Tuning feature employs a proprietary feedback system, insuring that the power output and titanium probe are always working at maximum efficiency regardless of the application. The amplitude percentage of the titanium probe is reflected by the output meter, enabling accurate, reproducible results.

For the Model 150VT, select any of the titanium micro tips or up to 1/2" (12.7 mm) in diameter titanium probe, based on your sample processing volume. To help reduce the cavitation sound emitted during sample processing, use the SONABOX Sound Abating Chamber.

Model 300VT Ultrasonic Homogenizer



Shown with optional 1/2" (12.7 mm) diameter solid titanium probe

CATALOG NO.

0-122-0001

VOLTAGE

115 Volts/60 Hz

0-122-0002

230 Volts/50 Hz

*Titanium probes purchased separately

FEATURES

Processing Volume 250 μ l - 2000 ml

Max. Probe Diameter 1" (25.4 mm)/Cup Tip

Power Output 0-300 Watts

Output Frequency 20 kHz

Amplitude Control 0-100%

Automatic Tuning Yes

Microprocessor Control N/A

Duty Cycle (Pulsing) 10-90%

Timer Continuous / 1-15 min

Display LED

Sound Abating Chamber Optional

DIMENSIONS

Generator 12.0 in W x 10.0 in D x 4.0 in H
30.5 cm W x 25.4 cm D x 10.2 cm H

Transducer 3.5 in Dia. x 4.0 in L
8.9 cm Dia. x 10.2 cm L

Includes: generator, transducer, stainless steel transducer post, transducer clamps, power cord, and pin wrenches



The Model 300VT delivers up to 300 Watts of ultrasonic disruption and offers advanced engineering features necessary to create a total system for ultrasonic disruption. This model has a compact footprint and is cost effective, making it ideal for processing samples that range in volumes from 250 μ l to 3000 ml.

With 0-100% Amplitude (Power) control, the operator can optimize the titanium probe's intensity to efficiently process the sample. The timer and duty cycle (Pulser) functions increase precision to disintegrate most cells, bacteria, spores or tissue. Prepare emulsions down to 1/100 of a micron, homogenize "immiscible" liquids, accelerate enzymatic and chemical reactions, stimulate bacterial activity, disperse solids in liquids and degas liquids.

The Auto Tuning feature employs a proprietary feedback system, insuring that the power output and titanium probe are always working at maximum efficiency regardless of the application. The amplitude percentage of the titanium probe is reflected by the output meter, enabling accurate, reproducible results.

For the Model 300VT, select titanium probes based on your sample processing volume. To help reduce the cavitation sound emitted during sample processing, use the SONABOX Sound Abating Chamber.

Model 3000 Ultrasonic Homogenizer



CATALOG NO.

0-127-0001

0-127-0002

VOLTAGE

115 Volts/60 Hz

230 Volts/50 Hz

*Titanium probes purchased separately

FEATURES

| | |
|------------------------|-----------------------|
| Processing Volume | 250 μ l - 2000 ml |
| Max. Probe Diameter | 1" (25.4 mm)/Cup Tip |
| Power Output | 0-300 Watts |
| Output Frequency | 20 kHz |
| Amplitude Control | 0-100% |
| Automatic Tuning | Yes |
| Microprocessor Control | N/A |
| Duty Cycle (Pulsing) | 10-90% |
| Timer | Continuous / 1-15 min |
| Display | LED |
| Sound Abating Chamber | Integrated |

DIMENSIONS

| | |
|------------|--|
| Generator | 10.5 in W x 12.0 in D x 23.5 in H 26.7 cm W x 30.5 cm D x 59.7 cm H |
| Transducer | 3.5 in Dia. x 4.0 in L 8.9 cm Dia. x 10.2 cm L |

Includes: generator enclosure, transducer, power cord, and pin wrenches



The Model 3000 delivers up to 300 watts of ultrasonic disruption and includes an integrated Sound Abating Chamber to reduce cavitation sound emitted during sample processing. This model offers advanced engineering features necessary to create a total system for ultrasonic disruption. The small vertical footprint is ideal for processing samples that range in volumes from 250 μ l to 3000 ml.

With 0-100% Amplitude (Power) control, the operator can optimize the titanium probe's intensity to efficiently process the sample. The timer and duty cycle (Pulser) functions increase precision to disintegrate most cells, bacteria, spores or tissue. Prepare emulsions down to 1/100 of a micron, homogenize "immiscible" liquids, accelerate enzymatic and chemical reactions, stimulate bacterial activity, disperse solids in liquids and degas liquids. The Auto Tuning feature employs a proprietary feedback system, insuring that the power output and titanium probe are always working at maximum efficiency regardless of the application. The amplitude percentage of the titanium probe is reflected by the output meter, enabling accurate, reproducible results.

The clear door permits viewing of the sample while processing. An access port for cables and tubing is also provided for use with Cup Tips and the Continuous Flow Chamber.

Model 3000MP Ultrasonic Homogenizer



CATALOG NO.

VOLTAGE

| | |
|------------|-----------------|
| 0-128-0001 | 115 Volts/60 Hz |
| 0-128-0002 | 230 Volts/50 Hz |

*Titanium probes purchased separately

FEATURES

| | |
|------------------------|-----------------------|
| Processing Volume | 250 μ l - 2000 ml |
| Max. Probe Diameter | 1" (25.4 mm)/Cup Tip |
| Power Output | 0-300 Watts |
| Output Frequency | 20 kHz |
| Amplitude Control | 0-100% |
| Automatic Tuning | Yes |
| Microprocessor Control | Yes |
| Duty Cycle (Pulsing) | 1 sec to 1 hour |
| Timer | 1 sec to 99 hours |
| Display | LCD |
| Sound Abating Chamber | Integrated |

DIMENSIONS

| | |
|------------|--|
| Generator | 10.5 in W x 12.0 in D x 23.5 in H 26.7 cm W x 30.5 cm D x 59.7 cm H |
| Transducer | 3.5 in Dia. x 4.0 in L 8.9 cm Dia. x 10.2 cm L |

Includes: generator, transducer, stainless steel transducer post, transducer clamps, and pin wrenches



The Model 3000MP delivers up to 300 watts of ultrasonic disruption and includes an integrated Sound Abating Chamber to reduce cavitation sound emitted during sample processing. This model offers advanced engineering features necessary to create a total system for ultrasonic disruption. The compact vertical footprint is ideal for processing samples that range in volumes from 250 μ l to 3000 ml.

The microprocessor driven graphical user interface with large LCD display provides intuitive controls and a user friendly experience. This model utilizes an auto tuning feature with proprietary feedback circuitry insuring that the titanium probe intensity is always working at maximum efficiency regardless of the application.

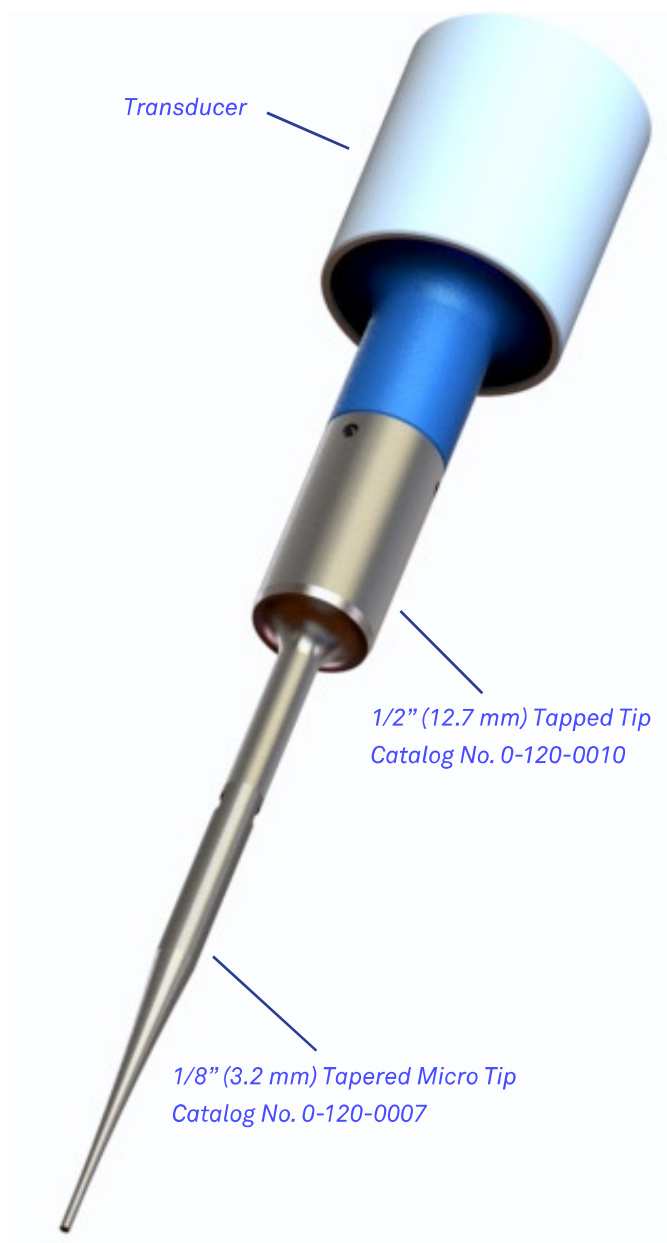
Features:

- Amplitude control from 0-100% allows optimized titanium probe's intensity for efficient sample processing
- Programming parameters for processing times, pulser mode, timer intervals, and amplitude control can be stored in memory for future retrieval
- Pulser function can be enabled to reduce heat transfer in temperature sensitive samples
- Temperature controller provides the ability to monitor sample temperature during sample processing. The user defined temperature window prevents the sample from overheating
- Sequence programming enables the user to combine multiple stored programs to run in succession with user defined intervals

Micro Tip Probes

300 μ l to 25 ml Sample Volumes

Micro Tips are narrow and long probes which generate high intensity cavitation for processing small sample volumes. The Stepped Micro Tip probe is coupled directly to the Transducer. The Tapered Micro Tip probes are threaded to the 1/2" (12.7 mm) Tapped Tip probe (0-120-0010) then coupled to the Transducer.

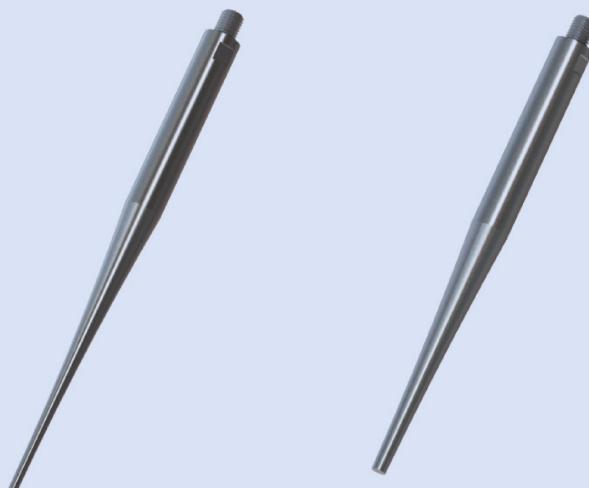


Stepped Micro Tip Probe



Catalog No. . . . 0-120-0005
Tip Diameter . . 5/32" (3.9 mm)
Processing Vol 300 μ l - 15 ml
Intensity Very High
Amplitude . . . 225 μ m
Type Stepped

Tapered Micro Tip Probes



Catalog No. . . . 0-120-0007
Tip Diameter . . 1/8" (3.2 mm)
Processing Vol 250 μ l - 10 ml
Intensity Very High
Amplitude . . . 240 μ m
Type Tapered

Catalog No. . . . 0-120-0008
Tip Diameter . . 3/16" (4.8 mm)
Processing Vol 750 μ l - 25 ml
Intensity High
Amplitude . . . 200 μ m
Type Tapered



Solid Tip Probes

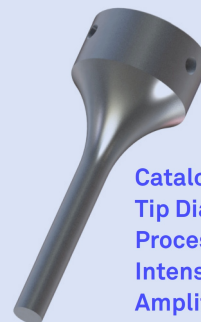
5 ml to 2000 ml Sample Volumes

Solid Tip probes are manufactured from a titanium alloy and machined to a specific diameter and shape. When coupled to the Transducer, the probe is driven to its resonant frequency, causing the probe to expand and contract longitudinally. When the probe is immersed into a liquid sample, the cavitation formed processes the sample.

Solid Tip probes should be utilized when processing liquids containing organic solvents or high surface tension samples. In addition, Solid Tip probes are machined from one solid titanium piece and less likely to cause sample cross contaminations.

Sample volume is determined by the tip diameter. Smaller diameter probes generate high intensity cavitation in a small focused area, ideal for small sample volumes. Larger diameter probes generate low intensity cavitation in a broader area, ideal for larger sample volumes.

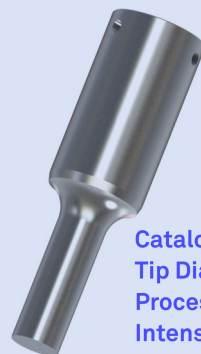
The radiating face or flat portion of the probe will pit or erode in time and should be replaced when worn. Probe performance degrades in proportion to the degree of erosion or pitting which occurs at the tip surface, until a point is reached where the level of energy transmitted in the sample is significantly lessened.



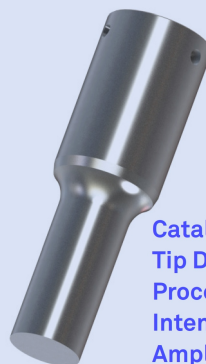
Catalog No. . . . 0-120-0009
Tip Diameter . . 3/8" (9.5 mm)
Processing Vol 5 ml -200 ml
Intensity High
Amplitude . . . 170 µm
Type Solid



Catalog No. . . . 0-120-0011
Tip Diameter . . 1/2" (12.7 mm)
Processing Vol 10 ml -300 ml
Intensity Medium High
Amplitude . . . 140 µm
Type Solid



Catalog No. . . . 0-120-0013
Tip Diameter . . 3/4" (19.1 mm)
Processing Vol 25 ml -600 ml
Intensity Medium
Amplitude . . . 70 µm
Type Solid



Catalog No. . . . 0-120-0015
Tip Diameter . . 1" (25.4 mm)
Processing Vol 50 ml -2000 ml
Intensity Low
Amplitude . . . 40 µm
Type Solid



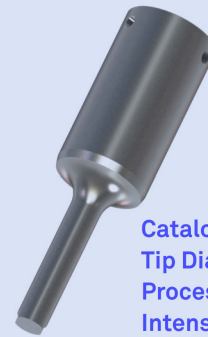
Tapped Tip Probes

10 ml to 2000 ml Sample Volumes

Tapped Tip probes are a 2 piece design comprised of the Body and Flat Tip, both manufactured from a titanium alloy and machined to a specific diameter and shape.

The body has a threaded end allowing the flat tip to be replaced. The flat tip or radiating face will pit or erode in time and should be replaced when worn. Probe performance degrades in proportion to the degree of erosion or pitting which occurs at the tip surface, until a point is reached where the level of energy transmitted in the sample is significantly lessened.

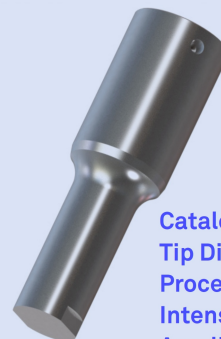
Tapped Tip probes are NOT recommended when processing liquids containing organic solvents or high surface tension samples. Utilizing Tapped Tip probes with such samples are likely to cause sample cross contaminations.



Catalog No. . . . 0-120-0010
Tip Diameter . 1/2" (12.7 mm)
Processing Vol 10 ml -300 ml
Intensity Medium High
Amplitude . . . 140 μ m
Type Tapped



Catalog No. . . . 0-120-0012
Tip Diameter . 3/4" (19.1 mm)
Processing Vol 25 ml -600 ml
Intensity Medium
Amplitude . . . 70 μ m
Type Tapped



Catalog No. . . . 0-120-0014
Tip Diameter . 1" (25.4 mm)
Processing Vol 50 ml -2000 ml
Intensity Low
Amplitude . . . 40 μ m
Type Tapped



Extender Tip Probes

Solid and Tapped

Extender Tips are utilized to extend the length of a probe to reach into long necked vessels. They attach to the corresponding diameter Tapped Tip probes and generally increase the overall length by 5" (127 mm). Extender Tips offer the same sample volume and amplitude as their corresponding diameter Tapped Tip probes.

Extender Tips are available in Solid to Tapped configurations. Tapped Extender Tips use the corresponding diameter replacement Flat Tips.

1/2" (12.7 mm) Tapped Tip
Catalog No. 0-120-0010



1/2" (12.7 mm) Solid Extender Tip
Catalog No. 0-120-0032



Catalog No. . . . 0-120-0032
Tip Diameter . . 1/2" (12.7 mm)
TypeSolid



Catalog No. . . . 0-120-0033
Tip Diameter . . 1/2" (12.7 mm)
TypeTapped



Catalog No. . . . 0-120-0034
Tip Diameter . . 3/4" (19.1 mm)
TypeSolid



Catalog No. . . . 0-120-0035
Tip Diameter . . 3/4" (19.1 mm)
TypeTapped



Catalog No. . . . 0-120-0036
Tip Diameter . . 1" (25.4 mm)
TypeSolid



Catalog No. . . . 0-120-0037
Tip Diameter . . 1" (25.4 mm)
TypeTapped

Flat Tips

Replaceable tips for Tapped Tips Probes and Tapped Extender Tips

Tapped Tip and Extender Tip probes use replaceable Flat Tips. During normal use, the radiating face or Flat Tip of the probes erodes and becomes less effective over time.

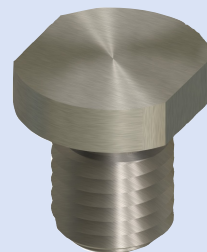
Replace Flat Tips with corresponding Tapped Tip or Extender Tip diameter.

1/2" (12.7 mm) Flat Tip
Catalog No. 0-120-0018

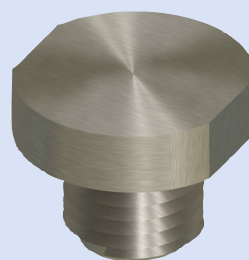
Worn Tip



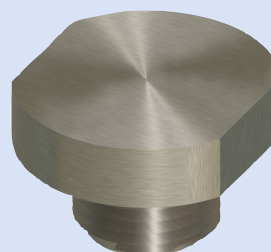
New Tip



Catalog No. . . 0-120-0016
Tip Diameter . 1/2" (12.7 mm)



Catalog No. . . 0-120-0017
Tip Diameter . 3/4" (19.1 mm)



Catalog No. . . 0-120-0018
Tip Diameter . 1" (25.4 mm)



Cup Tip

The Cup Tip offers non-contact homogenization of small volume samples in a high intensity ultrasonic bath. Samples are processed in sealed tubes or vials eliminating aerosols and cross contamination. Multiple tubes or vials of sterile or pathogenic samples can be processed simultaneously.

The titanium probe is mounted within an acrylic body where the body is filled with water. Sample tubes or vials can be placed in the tray and suspended above the probe during processing. The cavitation in the water processes the tubes or vials.

During sample processing, heated is generated, so inlets with barbed fittings can be connected to cold water or a Chiller to maintain temperature and water level within the acrylic body.

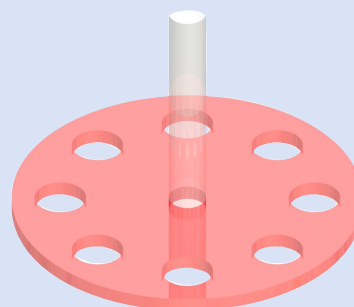


*Cup Tip shown with Microtube
Tray Catalog No. 0-120-0020*



Catalog No. . . 0-120-0019
Tip Diameter . . 1 1/2" (38.1 mm)
Chamber Vol . 250 ml
Intensity. . . . Medium

** MUST BE POWERED BY THE MODEL 300VT OR 3000 ONLY*



Catalog No. . . 0-120-0020
No. of Tubes . 8



Continuous Flow Chamber

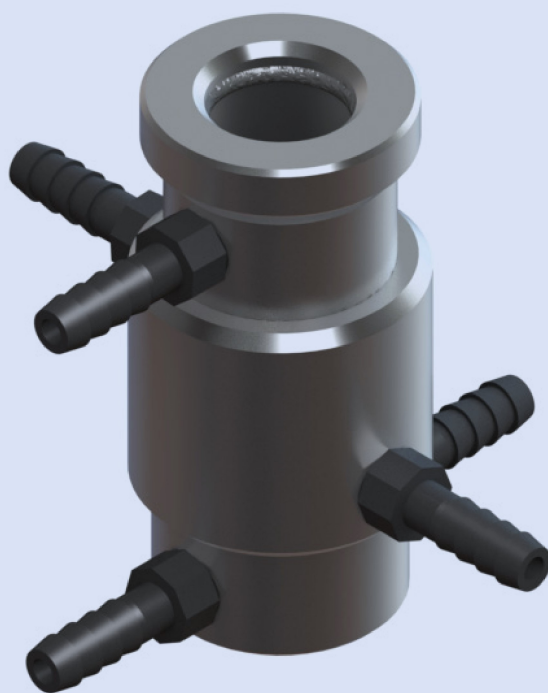
The Continuous Flow Chamber permits in line or continuous processing of large volume batch samples. Batch sample volumes can be recirculated through the chamber multiple times for desired sample results.

Samples are passed through the chamber using one of the two bottom inlets. As the sample flows through the cavitation chamber, the sample is processed. The processed sample exits the chamber through the two outlet ports. By recirculating the sample, adjusting flow rate and cavitation intensity, the desired results can be achieved.

During sample processing, heated is generated by the probe. Connecting the integrated cooling jacket to a cold water source or Chiller, will maintain sample temperature during processing.



*Continuous Flow Chamber shown
with 3/4" (19.1 mm) Solid Tip
Probe Catalog No. 0-120-0013*



Catalog No.0-120-0026
Material.Stainless Steel
Oper Pressure . . 20 psi
Internal Vol35 ml
Max Flow Rate . .0.25 l/min

** REQUIRES THE 3/4" (19.1 mm) DIAMETER SOLID TITANIUM TIP
CATALOG NO. 0-120-0013*



SONABOX Sound Abating Chamber



CATALOG NO.

0-125-0001

FEATURES

| | |
|----------------------|--------------------|
| Sample Table | Adjustable Height |
| Chamber Door | Clear Acrylic Door |
| Cable & Tubing Ports | 2 |

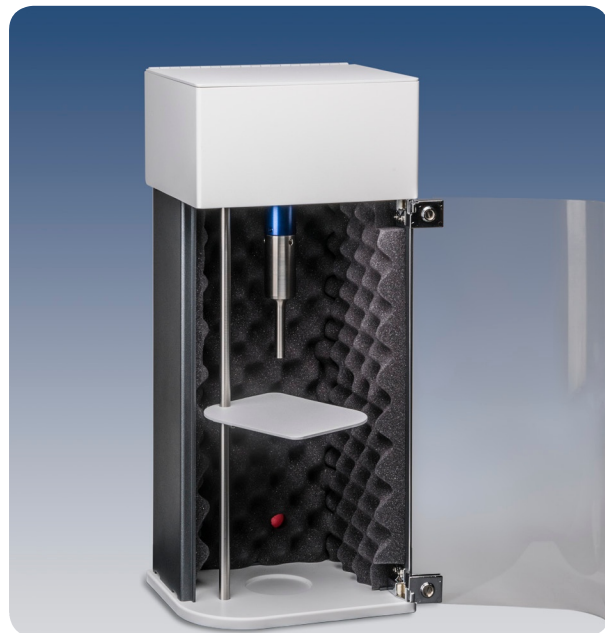
DIMENSIONS

| | |
|---------|------------------------------------|
| Outside | 10.5 in W x 8.5 in D x 23.5 in H |
| | 26.7 cm W x 21.6 cm D x 59.7 cm H |
| Inside | 9.75 in W x 7.75 in D x 17.75 in H |
| | 24.8 cm W x 19.7 cm D x 45.1 cm H |

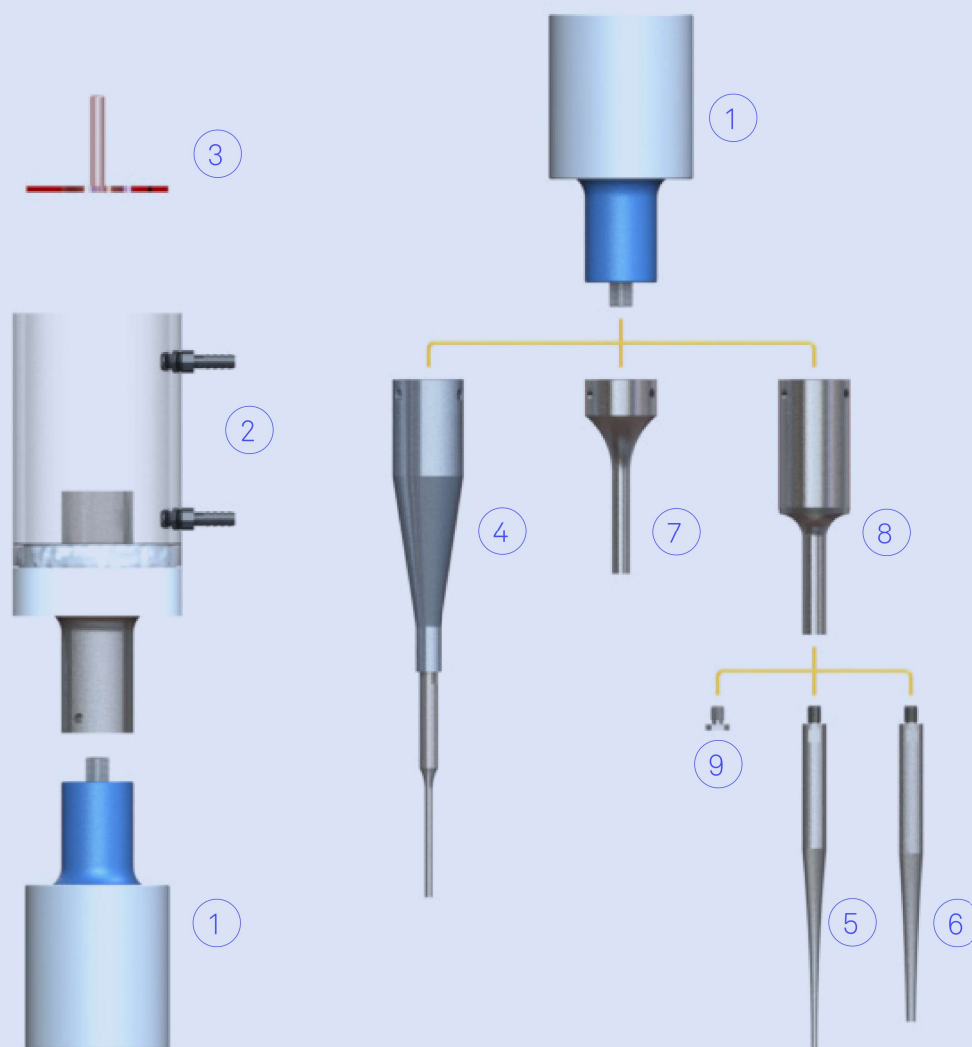


The SONABOX sound abating chamber reduces cavitation sound emitted during processing when used in conjunction with the Model 150VT and 300 VT Ultrasonic Homogenizers. Harmonics are produced by the vessel walls and fluid surface, and can be discomforting to the user with extended operation. The SONABOX reduces the harmonics by approximately 20-25 dBa.

The clear acrylic door permits viewing of the sample while protecting the operator against accidental splashing. The height of the sample table can be adjusted to vessel size and shape. Access ports for cables and tubing are also provided for use with the Cup Tip or Continuous Flow Chamber.



Small Volume Probe Map



| NO. | VOLUME | DESCRIPTION | CATALOG NO |
|-----|-------------------|----------------------------------|------------|
| 1 | - | Transducer | 2-122-0010 |
| 2 | Based on tube vol | Cup Tip | 2-122-0019 |
| 3 | - | Microtube Tray | 0-120-0021 |
| 4 | 300 µl - 15 ml | 5/32" (3.9 mm) Stepped Micro Tip | 0-120-0005 |
| 5 | 250 µl - 10 ml | 1/8" (3.2 mm) Tapered Micro Tip | 0-120-0007 |
| 6 | 750 µl - 25 ml | 3/16" (4.8 mm) Tapered Micro Tip | 0-120-0008 |
| 7 | 5 ml - 200 ml | 3/8" (9.5 mm) Solid Tip | 0-120-0009 |
| 8 | 10 ml - 300 ml | 1/2" (12.7 mm) Tapped Tip | 0-120-0010 |
| 9 | - | 1/2" (12.7 mm) Flat Tip | 0-120-0016 |