

# Ultrasonic Homogenizers



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## Introduction

For over five decades, BioLogics laboratory instruments have 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 TITANIUM TIP when coupled. When the tip is immersed into a solution, the longitudinally vibrations are transmitted down the tip 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 tip.

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

The tip diameter and design profile determines the sample volume which can be effectively processed. Larger diameter tips generate low intensity cavitation and are utilized when processing large sample volumes. Smaller diameter tips 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**



**TITANIUM TIP**



# Contact vs. Non-Contact Homogenization Methods



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

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

Large diameter tips 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 tip 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 $\mu$ 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 3.9 mm diameter Titanium Stepped Micro Tip*

## CATALOG NO.

## VOLTAGE

0-121-0001	100-130 Volt/50-60 Hz
0-121-0002	210-240 Volt/50-60 Hz

## FEATURES

Processing Volume	250µl- 300ml
Max. Tip Diameter	13mm
Power Output	0- 150 Watts
Output Frequency	20 kHz
Amplitude Control	0- 100%
Automatic Tuning	Yes
Duty Cycle (Pulsing)	10- 90% of 2 secs
Timer	Continuous or 1- 15 mins
Microprocessor Control	No
Power Meter	LED
Sound Abating Chamber	Optional

## DIMENSIONS

Generator	31cm W x 25cm D x 10cm H
Transducer	7cm Dia. x 10cm L

## WEB LINKS



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 250µl to 300ml.

Select any of the titanium micro tips or up to 13mm in diameter titanium tip, based on your sample processing volume.

**Amplitude (Power) Control**-the operator can optimize the titanium tip's intensity to efficiently process the samples.

**Timer and Duty Cycle (Pulser) Control**- these 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.

**Auto Tuning**- proprietary feedback system insures that the power output and titanium tip are always working at

maximum efficiency regardless of the application. The amplitude percentage of the titanium tip is reflected by the output meter, enabling accurate, reproducible results.

To help reduce the cavitation sound emitted during sample processing, use the SONABOX Sound Abating Chamber.

The Model 150VT includes: Generator, Transducer, SS Transducer Post, Transducer Clamps, Pin Wrenches, Power Cord, Reference Manual, RoHS Compliant, and a 2 Year Warranty.

# Model 300VT Ultrasonic Homogenizer



*Shown with optional 12.7 mm diameter Solid Titanium Tip*

## CATALOG NO.

## VOLTAGE

0-122-0001	100-130 Volt/50-60 Hz
0-122-0002	210-240 Volt/50-60 Hz

## FEATURES

Processing Volume	Less than 250µl/Cup Tip
Processing Volume	250µl to 2000ml/Tip
Max. Tip Diameter	25mm or Cup Tip
Power Output	0- 300 Watts
Output Frequency	20 kHz
Amplitude Control	0- 100%
Automatic Tuning	Yes
Duty Cycle (Pulsing)	10- 90% of 2 secs
Timer	Continuous or 1- 15 mins
Microprocessor Control	No
Power Meter	LED
Sound Abating Chamber	Optional

## DIMENSIONS

Generator	31cm W x 25cm D x 10cm H
Transducer	7cm Dia. x 10cm L

## WEB LINKS



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 small sample volumes of 250µl to 2000ml.

Select from any of the wide range of titanium tips, based on your sample processing volume.

**Amplitude (Power) Control-** the operator can optimize the titanium tip's intensity to efficiently process the samples.

**Timer and Duty Cycle (Pulser) Control-** these 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.

**Auto Tuning-** a proprietary feedback system insures that the power output and titanium tip are always working at maximum efficiency regardless of the application. The

amplitude percentage of the titanium tip is reflected by the output meter, enabling accurate, reproducible results.

To help reduce the cavitation sound emitted during sample processing, use the SONABOX Sound Abating Chamber.

The Model 300VT includes: Generator, Transducer, SS Transducer Post, Transducer Clamps, Pin Wrenches, Power Cord, Reference Manual, RoHS Compliant, and a 2 Year Warranty.

# Model 3000 Ultrasonic Homogenizer



## CATALOG NO.

## VOLTAGE

0-127-0001	100-130 Volt/50-60 Hz
0-127-0002	210-240 Volt/50-60 Hz

## FEATURES

Processing Volume	Less than 250µl/Cup Tip
Processing Volume	250µl to 2000ml/Tip
Max. Tip Diameter	25mm or Cup Tip
Power Output	0- 300 Watts
Output Frequency	20 kHz
Amplitude Control	0- 100%
Automatic Tuning	Yes
Duty Cycle (Pulsing)	10- 90% of 2 secs
Timer	Continuous or 1- 15 mins
Microprocessor Control	No
Power Meter	LED
Sound Abating Chamber	Integrated

## DIMENSIONS

Generator	27cm W x 31cm D x 60cm H
Transducer	7cm Dia. x 10cm L

## WEB LINKS



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. The small vertical footprint is ideal for processing samples that range in volumes from 250µl to 2000ml.

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. Select from any of the wide range of titanium tips, based on your sample processing volume.

**Amplitude (Power) Control-** the operator can optimize the titanium tip's intensity to efficiently process the samples.

**Timer and Duty Cycle (Pulser) Control-** these 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.

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

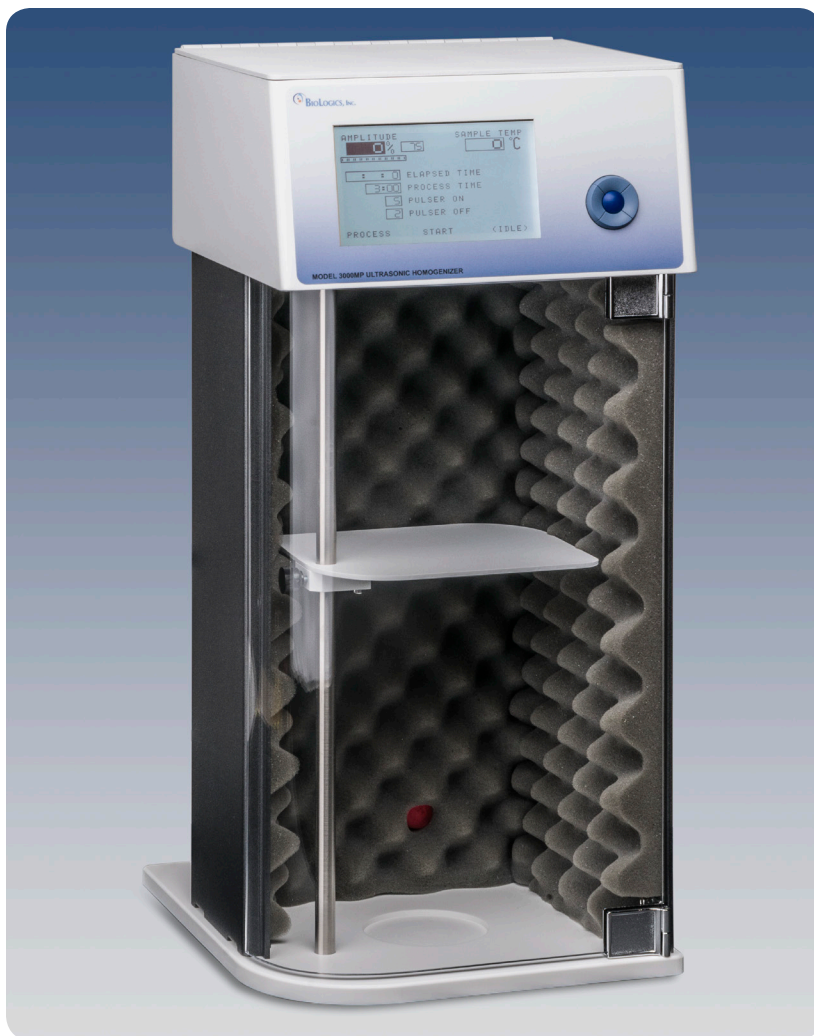
**Upper Compartment-** houses the Transducer when utilizing any of the Titanium Tips with the exception of the Cup Tip. The rear access port allows the Transducer cable to exit and connect to the power supply.

**Lower Compartment-** the clear door permits viewing of the sample, while protecting the operator from accidental slashing and reduces the sound being emitted. The adjustable sample table allows the operator to change the height of the table so that the Titanium Tip can be submerged into the sample at an optimal position.

The Model 3000 includes: Integrated Sound Chamber, Adjustable Sample Table, Transducer, Pin Wrenches, Power Cord, Reference Manual, RoHS Compliant, and a 2 Year Warranty.



# Model 3000MP Ultrasonic Homogenizer



## CATALOG NO.

## VOLTAGE

0-128-0001	100-130 Volt/50-60 Hz
0-128-0002	210-240 Volt/50-60 Hz

## FEATURES

Processing Volume	Less than 250µl/Cup Tip
Processing Volume	250µl to 2000ml/Tip
Max. Tip Diameter	25mm or 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 to 59 secs
Timer	1 sec to 99 mins
Temperature Controller	0 to 100°C
Temperature Probe	Optional
Display	LCD
Sound Abating Chamber	Integrated

## DIMENSIONS

Generator	27cm W x 31cm D x 60cm H
Transducer	7cm Dia. x 10cm L

## WEB LINKS



The Model 3000MP Ultrasonic Homogenizer delivers up to 300 watts of ultrasonic disruption with precision control from a microprocessor and a graphical user interface displayed on a large LCD display.

The integrated Sound Abating Chamber reduces cavitation sound emitted during sample processing. 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.

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 tip intensity is always working at maximum efficiency regardless of the application.

**Manual Mode**- the operator defines the AMPLITUDE, can enable the PULSER feature, and monitor sample temperature during processing.

**Program Mode**- the operator can define, store, and

recall up to 10 programs. Within each PROGRAM, the AMPLITUDE, PULSER parameters, TEMPERATURE settings for COOL DOWN and SHUT DOWN temperatures, can be defined and stored.

**Macro Mode** - the operator can define a macro of up to 5 sequences, using any of the 10 stored PROGRAMS with an optional time delay, from 1 second to 99 minutes, between each sequence.

**Temperature Controller** - with the optional temperature probe (2-128-0006), the operator has the ability to monitor sample temperature during sample processing. The user defined temperature window prevents the sample from overheating.

The Model 3000MP includes: Integrated Sound Chamber, Adjustable Sample Table, Transducer, Pin Wrenches, Power Cord, Reference Manual, RoHS Compliant, and a 2 Year Warranty.



# Micro Tips

## 300µl to 25ml Sample Volumes

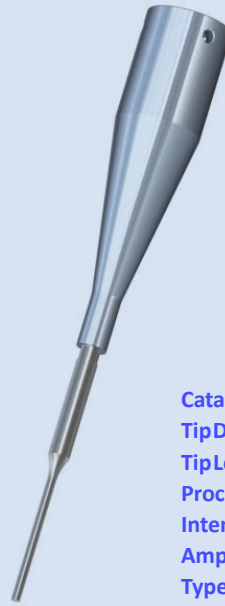
Micro Tips are for small volume sample processing. They radiate ultrasonic energy with high intensity and have a narrow cavitation field.

The Stepped Micro Tip incorporates an aluminum base section and titanium nose section and is coupled directly to the Transducer.

The Tapered Micro Tips are threaded to the 13mm Tapped Tip (0-120-0010) then coupled to the Transducer.



### Stepped Micro Tip



**CatalogNo.**.....0-120-0005  
**TipDiameter**.....4mm  
**TipLength**.....274mm  
**Processing Vol.**.....300µl-15ml  
**Intensity**.....VeryHigh  
**Amplitude**.....225µm  
**Type**.....Stepped

### Tapered Micro Tips



**CatalogNo.**.....0-120-0007  
**TipDiameter**.....3mm  
**TipLength**.....169mm  
**Coupled Length**.....303mm  
**Processing Vol.**.....250µl-10ml  
**Intensity**.....VeryHigh  
**Amplitude**.....240µm  
**Type**.....Tapered



**CatalogNo.**.....0-120-0008  
**TipDiameter**.....5mm  
**TipLength**.....156mm  
**Coupled Length**.....291mm  
**Processing Vol.**.....750µl-25ml  
**Intensity**.....High  
**Amplitude**.....200µm  
**Type**.....Tapered



# Solid Tips

## 5ml to 2000ml Sample Volumes

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

Solid Tip should be utilized when processing liquids containing organic solvents or low surface tension samples. In addition, Solid Tips 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 tips generate high intensity cavitation in a small focused area, ideal for small sample volumes. Larger diameter tips generate low intensity cavitation in a broader area, ideal for larger sample volumes.

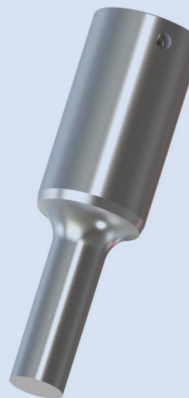
The radiating face or flat portion of the tip will pit or erode in time and should be replaced when worn. Tip performance degrades in proportion to the degree of erosion or pitting which occurs at the tip surface, until a point is reached where the level of energy transmitted in the sample is significantly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



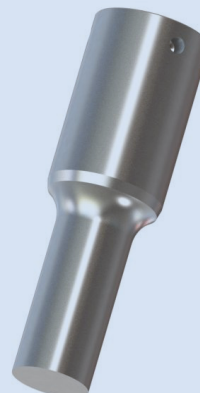
**CatalogNo.**.....0-120-0009  
**TipDiameter**.....10mm  
**TipLength**.....103mm  
**Processing Vol.**.....5ml-200ml  
**Intensity**.....High  
**Amplitude**.....170µm  
**Type**.....Solid



**CatalogNo.**.....0-120-0011  
**TipDiameter**.....13mm  
**TipLength**.....139mm  
**Processing Vol.**.....10ml-300ml  
**Intensity**.....Medium High  
**Amplitude**.....140µm  
**Type**.....Solid



**CatalogNo.**.....0-120-0013  
**TipDiameter**.....19mm  
**TipLength**.....133mm  
**Processing Vol.**.....25ml-600ml  
**Intensity**.....Medium  
**Amplitude**.....70µm  
**Type**.....Solid



**CatalogNo.**.....0-120-0015  
**TipDiameter**.....25mm  
**TipLength**.....123mm  
**Processing Vol.**.....50ml-2000ml  
**Intensity**.....Low  
**Amplitude**.....40µm  
**Type**.....Solid



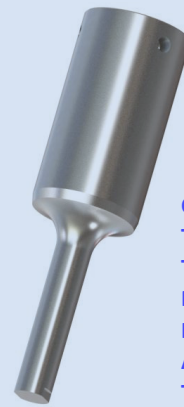
# Tapped Tips

## 10ml to 2000ml Sample Volumes

Tapped Tips 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. Tip 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.

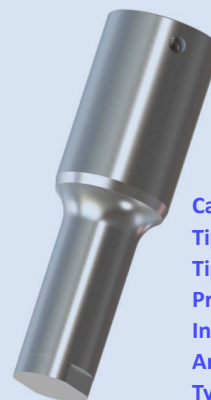
Tapped Tips are NOT recommended when processing liquids containing organic solvents or LOW surface tension samples. Utilizing Tapped Tips with such samples are likely to cause sample cross contaminations.



Catalog No. .... 0-120-0010  
Tip Diameter ..... 13mm  
Tip Length ..... 138mm  
Processing Vol. .... 10ml-300ml  
Intensity ..... Medium High  
Amplitude ..... 140µm  
Type ..... Tapped



Catalog No. .... 0-120-0012  
Tip Diameter ..... 19mm  
Tip Length ..... 134mm  
Processing Vol. .... 25ml-600ml  
Intensity ..... Medium  
Amplitude ..... 70µm  
Type ..... Tapped



Catalog No. .... 0-120-0014  
Tip Diameter ..... 25mm  
Tip Length ..... 124mm  
Processing Vol. .... 50ml-2000ml  
Intensity ..... Low  
Amplitude ..... 40µm  
Type ..... Tapped





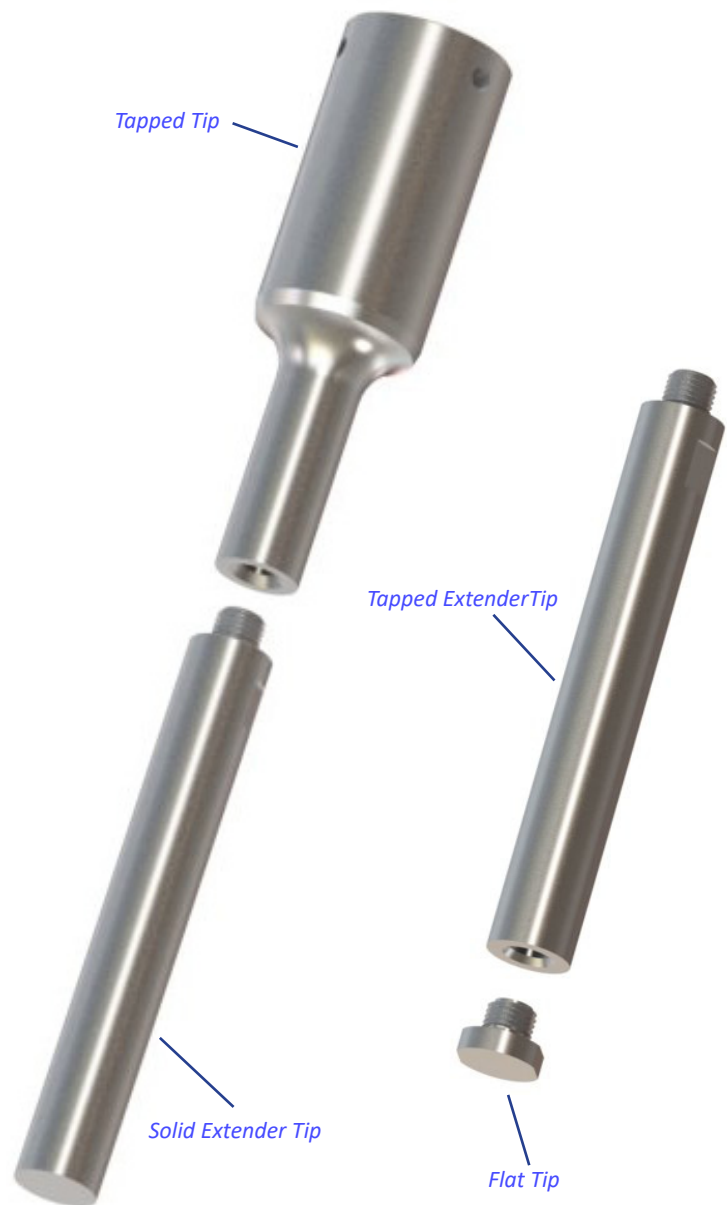
# Extender Tips

## Solid and Tapped

Extender Tips are utilized to extend the length of a tip to reach into long necked vessels and attach to corresponding diameter Tapped Tips.

Extender Tips offer the same sample volume and amplitude as their corresponding diameter Tapped Tips.

Extender Tips are available in Solid and Tapped configurations.



 <b>CatalogNo.</b> .....0-120-0032 <b>TipDiameter</b> .....13mm <b>TipLength</b> .....128mm <b>Type</b> .....Solid	 <b>CatalogNo.</b> .....0-120-0033 <b>TipDiameter</b> .....13mm <b>TipLength</b> .....128mm <b>Type</b> .....Tapped
 <b>CatalogNo.</b> .....0-120-0034 <b>TipDiameter</b> .....19mm <b>TipLength</b> .....130mm <b>Type</b> .....Solid	 <b>CatalogNo.</b> .....0-120-0035 <b>TipDiameter</b> .....19mm <b>TipLength</b> .....130mm <b>Type</b> .....Tapped
 <b>CatalogNo.</b> .....0-120-0036 <b>TipDiameter</b> .....25mm <b>TipLength</b> .....134mm <b>Type</b> .....Solid	 <b>CatalogNo.</b> .....0-120-0037 <b>TipDiameter</b> .....25mm <b>TipLength</b> .....134mm <b>Type</b> .....Tapped



# KoldPods

## Thermo-Conductive Tube Pods

KoldPods are thermo-conductive tube pods which decrease temperature variability when tubes are position directly into ice, water baths, or any conventional temperature sources. Titanium tips can be precisely submerged into the sample using the “vision window”.

KoldPods can be sterilized using lab disinfecting detergents, bleach, alcohol, high heat, or autoclaving.



50ml Tube KoldPod shown with  
4mm Stepped Micro Tip



1.5ml Tube KoldPod shown with  
3mm Tapered Micro Tip



CatalogNo.....0-120-0038  
TubeVolume.....1.5ml  
NumberofTubes.....4



CatalogNo.....0-120-0039  
TubeVolume.....15ml  
NumberofTubes.....4



CatalogNo.....0-120-0040  
TubeVolume.....50ml  
NumberofTubes.....4

# Flat Tips

## For Tapped Tips and Tapped Extender Tips

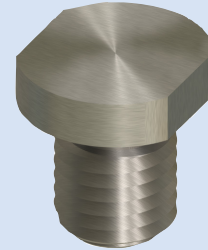
Tapped Tips and Tapped Extender Tips use replaceable Flat Tips. During normal use, the radiating face or flat surface of the tip erodes and becomes less effective over time.

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

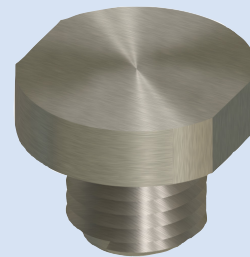
*Flat Tip Erosion*

*Worn Tip*

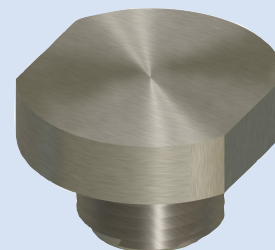
*New Tip*



CatalogNo.....0-120-0016  
TipDiameter.....13mm



CatalogNo.....0-120-0017  
TipDiameter.....19mm



CatalogNo.....0-120-0018  
TipDiameter.....25mm





# Cup Tip

## Non-contact Homogenization

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 tip 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 tip during processing. The cavitation in the water processes the tubes or vials.

During sample processing, heat 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.

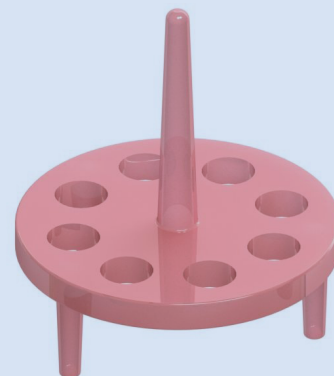


*Cup Tip shown with  
Microtube Tray*



**CatalogNo.**.....0-120-0019  
**TipDiameter**.....38mm  
**ChamberVolume**.....250ml  
**Intensity**.....Medium/High

*\* MUST BE POWERED BY THE MODEL 300VT, 3000 OR 3000MP*



**CatalogNo.**.....0-120-0020  
**No.ofTubes**.....8



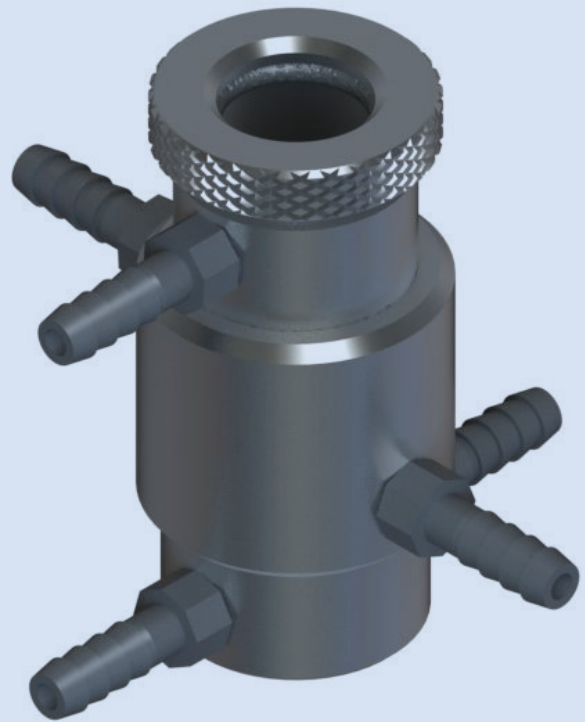
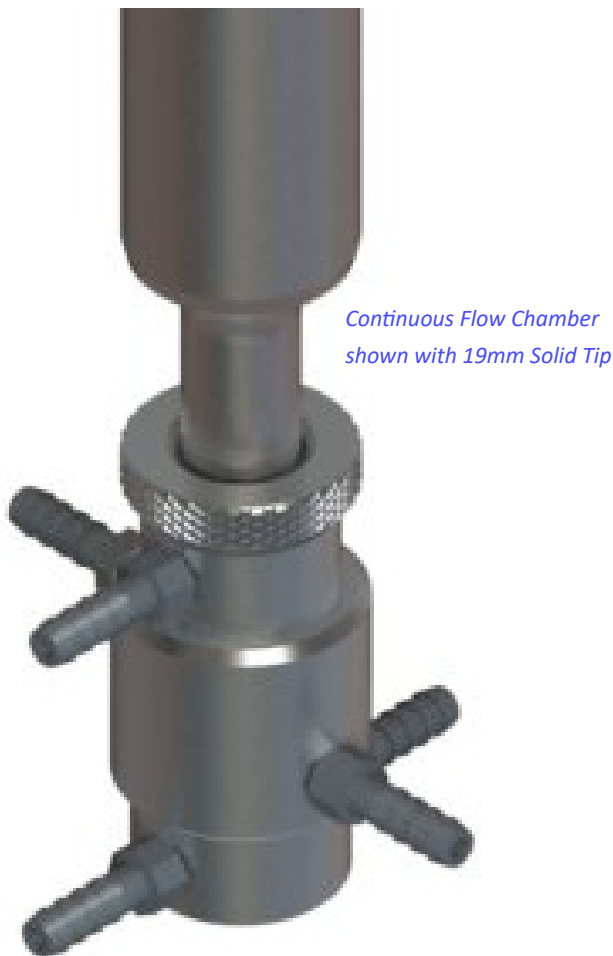
# Continuous Flow Chamber

## Large Volume Continuous Homogenization

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 tip. Connecting the integrated cooling jacket to a cold water source or Chiller, will maintain sample temperature during processing.



**CatalogNo**.....0-120-0026  
**Material**.....StainlessSteel  
**OperPressure**.....20psi  
**InternalVolume**.....35ml  
**MaxFlowRate**.....0.25l/min

*\* REQUIRES THE 19mm DIAMETER SOLID TITANIUM TIP CATALOG NO. 0-120-0013 and POWERED BY THE MODEL 300VT, 3000 OR 3000MP*



# SONABOX

## Sound Abating Chamber



### CATALOG NO.

0-125-0001

### FEATURES

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

### DIMENSIONS

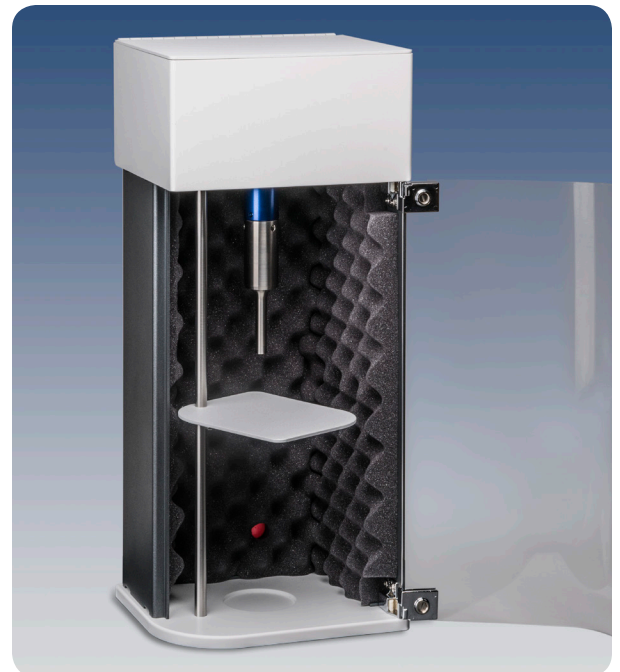
Outside	27cm W x 22cm D x 60cm H
Inside Chamber	25cm W x 20cm D x 45cm H

### WEB LINKS



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.

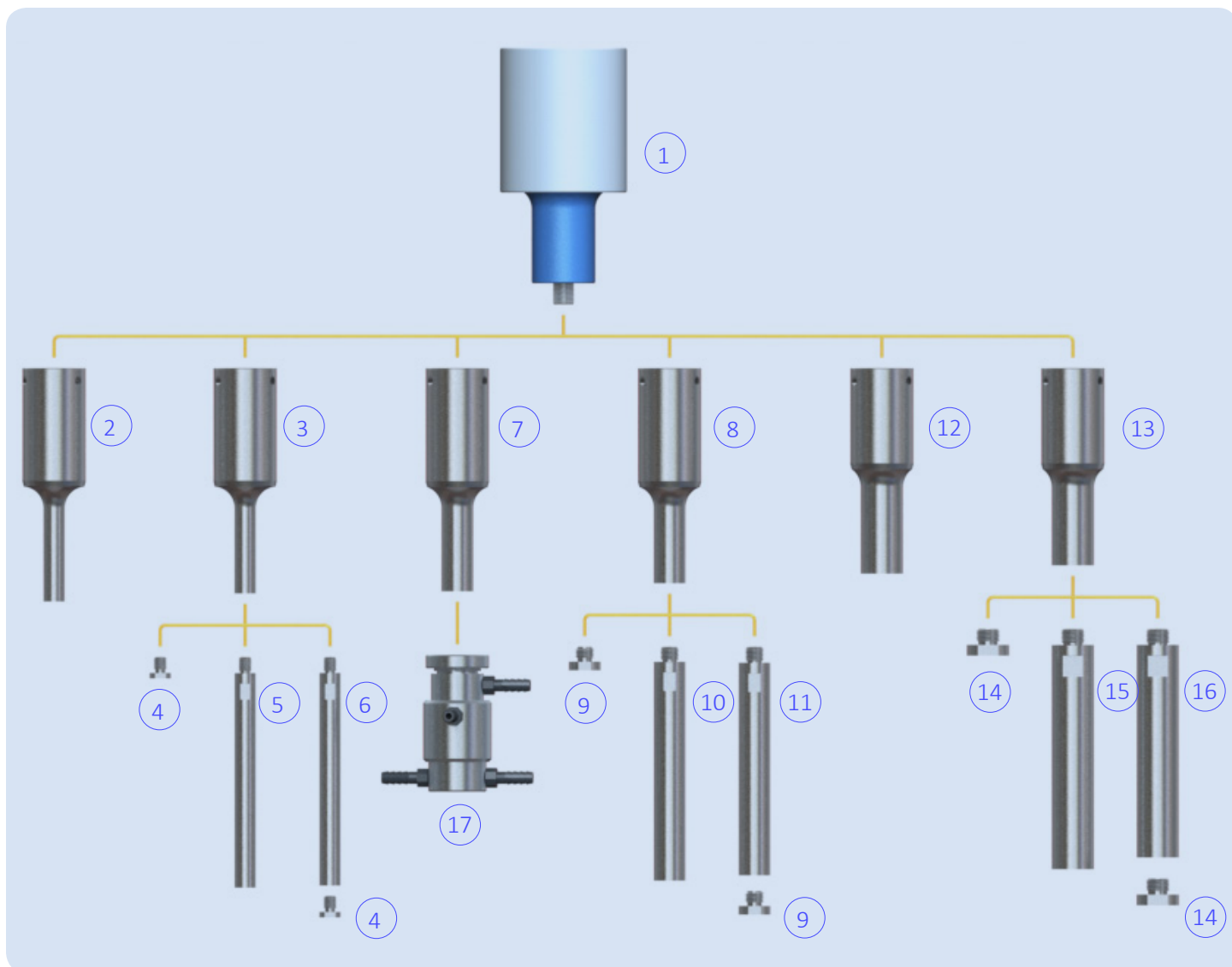
The clear acrylic door permits viewing of the sample while protecting the operator against accidental splashing. The height of the sample table can be adjusted to vessel size and shape. Access ports for cables and tubing are also provided for use with the Cup Tip or Continuous Flow Chamber.







# Large Volume Tip Map



NO.	VOLUME	DESCRIPTION	CATALOG NO
1	-	Transducer	2-122-0010
2	10ml - 300ml	13mm Solid Tip	2-122-0011
3	10ml - 300ml	13mm Tapped Tip	0-120-0010
4	-	13mm Flat Tip	2-122-0016
5	10ml - 300ml	13mm Solid Extender Tip	0-120-0032
6	10ml - 300ml	13mm Tapped Extender Tip	2-122-0033
7	25ml - 600ml	19mm Solid Tip	0-120-0013
8	25ml - 600ml	19mm Tapped Tip	2-122-0012
9	-	19mm Flat Tip	0-120-0017
10	25ml - 600ml	19mm Solid Extender Tip	2-122-0016
11	25ml - 600ml	19mm Tapped Extender Tip	0-120-0035
12	50ml - 2000ml	25mm Solid Tip	2-122-0015
13	50ml - 2000ml	25mm Tapped Tip	0-120-0014
14	-	25mm Flat Tip	2-122-0018
15	50ml - 2000ml	25mm Solid Extender Tip	0-120-0036
16	50ml - 2000ml	25mm Tapped Extender Tip	2-122-0037
17	0.25L/min	Continuous Flow Chamber	0-120-0026



### To Order

BioLogics Customer Service representatives receive orders Monday through Friday, from 8:30 AM to 5:00 PM Eastern Standard Time. To place an order call:

- phone number 703-367-9020, option 1
- fax number 703-367-9024
- e-mail [orders@biologics-inc.com](mailto:orders@biologics-inc.com)

### When ordering, please specify the following:

1. Your Customer Number
2. Your Purchase Order Number
3. Catalog Number
4. Product Description
5. Quantity
6. Requested Ship Date

*Written confirmation of telephone orders is not required. If written confirmation is sent, it must be clearly marked as CONFIRMED since duplicate orders cannot be returned for credit.*

### Shipment Method

Products will normally be shipped upon receipt of order. Shipment methods include common carriers, mail, or air freight. Orders placed before 3:00 PM Eastern Time will be shipped the same day.

### Return Shipments

Do not return any Product(s) without the Return Material Authorization (RMA) number provided by BioLogics Customer Service representative.

### **UNAUTHORIZED RETURNS CANNOT BE ACCEPTED AND WILL BE RETURNED AT SENDER'S EXPENSE.**

Mistakes in ordering should be reported promptly. Any returns accepted due to the fault of the purchaser will be subject to a 30% restocking fee. Products made to order will not be authorized for return except when the Product has been proven to be defective or a shipping error has been made.

For products damaged during shipping or received in unsatisfactory condition, the carrier must note the condition on the delivery receipt and BioLogics must be notified within 48 hours. Damaged Product(s) must be retained for inspection by carrier.

### Terms and Conditions

Terms of payment are 2% 10, Net 30 days with approved credit. All shipments are F.O.B. shipping point (Manassas, Virginia, USA). Shipping charges, insurance and applicable taxes are at the purchaser's expense, and will be prepaid and added to the invoice. All prices are subject to change without notice.

### Bids and Quotations

Requests for price quotations can be sent to:

- By phone: 703-367-9020, option 1
- By fax: 703-367-9024
- By mail: BioLogics, Inc.

8761 Virginia Meadows Drive  
Manassas, Virginia 20109 USA

### Prices

The prices, specifications, and accessories contained in this catalog were in effect at the time this publication was approved for printing. BioLogics, whose policy is one of continuous improvement and innovation, reserves the absolute right to discontinue models and accessories, and to change the design or price(s) without notice, and without incurring obligation. Prices are based on the BioLogics Price Policy. That policy is current at the time of shipment. Prices and taxes are subject to change without notice. We recommend you confirm prices when placing your order.

### Payment Method

In addition to payment by check, we accept VISA, and Master Card, and Electronic Fund Transfer (EFT) payments.



All products manufactured by BioLogics, Inc. are warranted to the purchaser to be free of defects caused by faulty materials of workmanship as follows: defective parts and materials will be replaced, or at the election of BioLogics, repaired at no charge for a period of two(2) year from the date of sale.

BioLogics' liability under this warranty is restricted to replacing, repairing, or issuing credit (at BioLogics' option) for any BioLogics product found to be defective within the warranty period stated above. Defective products shall be returned to the place of manufacture, with shipping charges prepaid by the Purchaser. BioLogics shall make a reasonable determination as to the existence or cause of any alleged defect and warranty eligibility upon the return of the defective product.

The foregoing warranty shall not be valid if 1) BioLogics is not promptly notified in writing of a defect within fifteen (15) days after the defect is noted or 2) if the product has been subjected to abuse, misuse, accident, alteration, neglect, unauthorized repair or installation.

THE FOREGOING WARRANTY IS MADE EXPRESSLY IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY OTHER OBLIGATIONS OR LIABILITY ON THE PART OF BIOLOGICS, INC. (THE SELLER). IN NO EVENT, INCLUDING THE CASE OF A CLAIM OF NEGLIGENCE, SHALL BIOLOGICS BE LIABLE FOR INCIDENTAL AND/OR CONSEQUENTIAL DAMAGES.

When an instrument is required to be installed by a BioLogics engineer, technician or sales representative, the period of this Warranty shall begin on the date of such installation provided that any use of the instrument prior to such installation shall, at the sole election of BioLogics, void this Warranty.

When installation by BioLogics representative is not required, the period of this Warranty shall begin as described above. Whether or not the instrument has been installed or shipped pursuant to a purchase order, and any trial period shall be deducted from the Warranty period that would otherwise apply under a subsequently placed purchase order for that instrument.