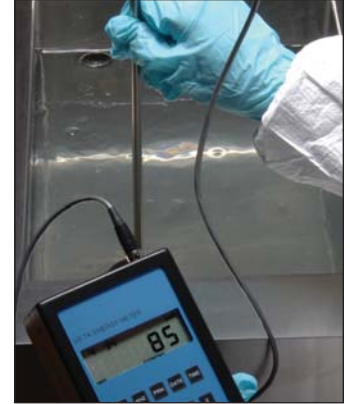


# CAVITATION METER

Since 1996, ppb has been the leader in providing solutions to your Ultrasonic and Megasonic cleaning efficiency concerns. With ever decreasing dimensions, the understanding and analysis of your cleaners has never been more critical.

Our advanced line of cavitation metrology instruments have been proven to increase yield by accurately measuring the energy and frequency in Ultrasonic and Megasonic cleaning baths, nozzle streams and films, and single wafer cleaners.



Our digital hand-held meters allow users to map the in-situ energy distribution, establish tank-to-tank uniformity, and identify debonded or failed transducers. This is accomplished through our advance sensor and signal processing design, which captures the cavitation implosion and the driving acoustic signatures.

Our probes provide an accurate and repeatable measure that incorporates such solution variables as temperature, vapor pressure, surface tension, and flow rate. Continuous monitoring is also possible with our Monitoring-Transmitter. An NIST Traceable Calibration is available.

## ULTRASONIC AND MEGASONIC ENERGY METERS

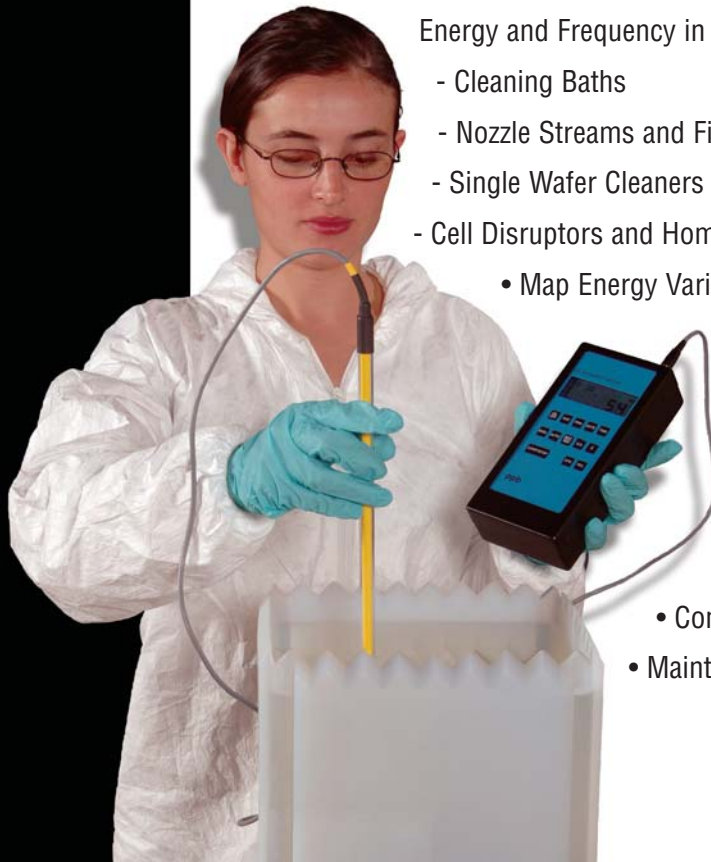
- Proven to Increase Yield by Accurately Measuring Energy and Frequency in Ultrasonic and Megasonic:
  - Cleaning Baths
  - Nozzle Streams and Films
  - Single Wafer Cleaners
  - Cell Disruptors and Homogenizers
- Map Energy Variations



- Establish Tank-to-Tank Uniformity
- Identify Debonded or Failed Transducers

## MONITORING TRANSMITTER

- Continuously monitors cavitation energy and frequency in Ultrasonic and Megasonic cleaning baths
- Connect directly to a PLC or Dual Display
- Maintain uniform energy with a feedback to the generator





## ULTRASONIC AND MEGASONIC ENERGY METERS

ppb manufactures three models of meters that measure the cavitation energy and frequency within ultrasonic and megasonic cleaning tanks:

**pb-500** Ultrasonic Energy Meter (0 to 500 kHz)

**pb-501** Megasonic Energy Meter (500 kHz to 5 MHz)

**pb-502** Ultrasonic/Megasonic Energy Meter (0 to 5 MHz)

The digital meters detect the RMS energy in  $W/in^2$  and also detect the frequency. The meter is battery operated with 100 memory locations and is PLC compatible with RS-232 downloading capabilities of date, time, average cavitation energy, standard deviation, maximum, minimum, and frequency. The probes are fully compatible with most chemical solutions and operating temperatures.

## SPECIFICATIONS

**pb-208** Standard probe suitable for most ultrasonic megasonic solutions. The probe has three components that come in contact with the solution:

Half Sphere: made of Ethylene Propylene (EPDM), angled at  $0^\circ$  with the probe tube, 2" dia. Tube: made of 1/4" OD 316 Stainless Steel with a Teflon<sup>®</sup> wrapping, 18" long. Lens: made of Quartz

**pb-308** All-Quartz probe suitable for most megasonic applications. The sensor is located at the tip.

Rod: made of Quartz, 1/2" OD, 14" long, sealed.

**pb-508** All-Quartz probe suitable for most megasonic nozzle applications. The sensor is located on the inner side-wall of the tip (NEW!).

Cylinder: made of Quartz, Rectangular, 4.5" long, sealed.

Range	0 to 255 $W/in^2$
Display	Custom LCD
Fluid Temp.	$1^\circ$ to $100^\circ$ C (to $200^\circ$ C pb-308 & pb-508)
Memory	100 sets: loc, date, time, avg, $\sigma$ , max, min, $\Delta t$
Output	RS-232 or serial (9600, 8, 1, n, p)
Input	Ni-MH 7.2-volts battery charger (220/110 Voltage adapter available)
Power	7.2V/3000mAh NiMH Battery
Case Materials	Aluminum with Polyurethane baked enamel black paint
Dimensions Case:	4" W x 8" L x 2" H
Weight	3 lb. Complete

NIST Traceable Calibration Certificate available

## MONITORING TRANSMITTER

The bx-502 is a panel-mount-ready unit designed to continuously monitor cavitation energy and frequency in your ultrasonic and megasonic cleaning tanks.

It is designed to provide a non-isolated 4 to 20 mA current output and a 0 to 10 Vdc output which are proportional to the cavitation energy density present within a cleaning tank. The unit also provides a non-isolated 4 to 20 mA current output and a 0 to 10 Vdc output which are proportional to the Ultrasonic-Megasonic frequency. The transmitter may be connected to a PLC or to a dual display for passive monitoring of both the energy and frequency. The transmitter may also be used to maintain and control the tank energy via a PLC or standard controller by providing a feedback to the generator.



## SPECIFICATIONS

The transmitter accommodates both the bx-308 or bx-408 probes, which are tank-mountable versions of the pb-308 and an all Stainless Steel version of the pb-308, respectively.

Energy Outputs (2)	4 to 20 mA (non-isolated), 0 to 10 Vdc
Energy Units	$W/in^2$
Frequency Outputs (2)	4 to 20 mA (non-isolated), 0 to 10 Vdc
Frequency Range	0 to 5 MHz (5000 kHz)
Power	22 to 36 Vdc input
Case Materials	Aluminum with Polyurethane baked enamel paint
Dimensions	4.275" W x 5.125" L x 1.928" H (2.938" H with DIN Rail Mount)



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