NUSONICS DIVISION
MESA LABORATORIES, INC.

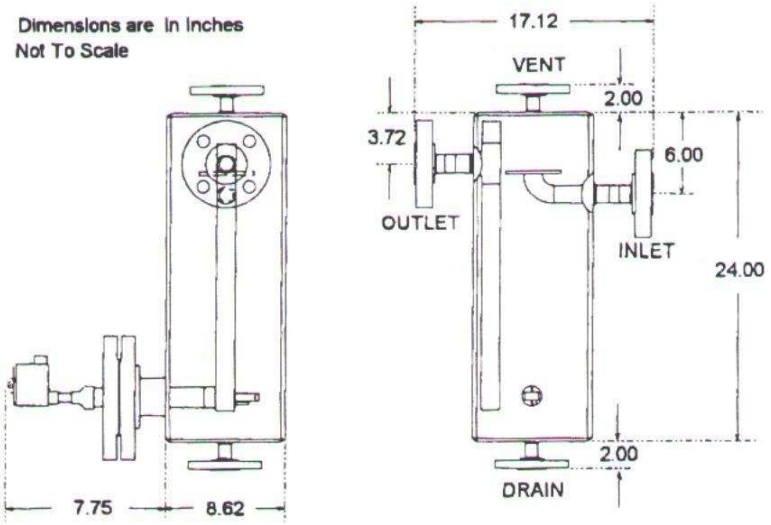
Sulfuric Acid Concentration Measurement
NuSonics Bubble Chamber Technical Application Note

A common application for the NuSonics line of Sonic Concentration Analyzers is the measurement of acids. Many sulfuric acid processes have a tendency to entrain air bubbles. If enough of these bubbles are present, they will adversely affect the performance of the sonic analyzer. The NuSonics bubble chamber can mitigate this effect.

The presence of bubbles in a process can usually be determined by the appearance of the acid. Sulfuric acid is a transparent liquid. When it has a high bubble content, it will appear milky or translucent.

The bubble chamber, shown below, is installed in the system such that the Vent and Drain are normally valved shut. Acid enters the chamber through the inlet, the bulk of which flows into the top of the internal tube and to the outlet. Some acid flows down through the chamber, past the sensor, into the internal tube and to the outlet. The chamber itself is installed in a bypass loop with a throttling valve such that the flow through the system can be controlled.

The flow through the chamber is set such that the rise rate of bubbles is greater that the descent rate of the acid in the chamber. The presence of bubbles in the acid at the sensor can be determined by observing the attenuation value reported by the sonic analyzer. When bubbles are present, attenuation will be high (around 100%); when the acid is clear, the value will be low (typically less than 25 %).



Vent and Drain Flange	Inlet and Outlet Flange	Sensor Flange
½" 150# ANSI	1" 150# ANSI	2" 150# ANSI

NuSonics Bubble Chamber, Part No. 301600-00X

X = 1 Stainless Steel (316)	X = 2 Carpenter 20 (Alloy 20 cb-3)	X = 3 Carbon Steel

The sensor depicted is not included. The chamber requires a HSX/T Sound Velocity Sensor, 2" Flange Mount, 9.05" length. Please refer to NuSonics publication "Flange Mount HSX/T" for sensor part numbers and materials options.

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