ULTRASONIC INTERFEROMETER

WORKING PRINCIPLE
An ultrasonic interferometer is a simple and direct device to determine the ultrasonic velocity in liquids with a high degree of accuracy.

The principle used in the measurement of velocity ($v$) is based on the accurate determination of the wavelength ($\lambda$) in the medium. Ultrasonic waves of known frequency ($f$) are produced by a quartz plate fixed at the bottom of the cell. The waves are reflected by a movable metallic plate kept parallel to the quartz plate. If the separation between these plates is exactly a whole multiple of the sound wavelength, standing waves are formed in the medium. The acoustic resonance gives rise to an electrical reaction on the generator driving the quartz plate and the anode current of the generator becomes maximum.

If the distance is now increased or decreased and the variation is exactly one half wavelength ($\lambda/2$) or multiple of it, anode current again becomes maximum. From the knowledge of wavelength ($\lambda$) the velocity ($v$) can be obtained by the relation:

$$v = \frac{\lambda \times f}{2}$$

The determination of the adiabatic and isothermal compressibilities may be done by the following formula:

$$v = \left(\frac{\rho \beta_{ad}}{\rho \beta_{iso}}\right)^{1/2} = \left(\frac{\gamma}{\gamma - 1}\right)^{1/2}$$

where

$\gamma$ = ratio of specific heats,
$\beta_{ad}$ and $\beta_{iso}$ = adiabatic and isothermal compressibilities respectively, and
$\rho$ = density of liquid.

DESCRIPTION
The Ultrasonic Interferometer consists of the following two parts:
(i) The High Frequency Generator
(ii) The Measuring Cell

MODELS
Lab Models (L.C.: 0.01mm): F-80 (2 MHz), F-80D (1 & 3 MHz)
Research Models (Acc: 0.03%): F-81 (2 MHz), M-81 (1-4 MHz), M-83 (1-10MHz), M-84 (1-12 MHz)
Research Digital Models (Acc: 0.02%): F-05 (2MHz), M-81S (1-4 MHz), M-83S (1-10MHz), M-84S (1-12MHz)

DESIRED FREQUENCY SELECTION MAY ALSO BE INCORPORATED AS PER REQUEST

Manufacturers:

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