



# PicoSonic™ Ultrasonic Flow Meter

## Principle of Operation

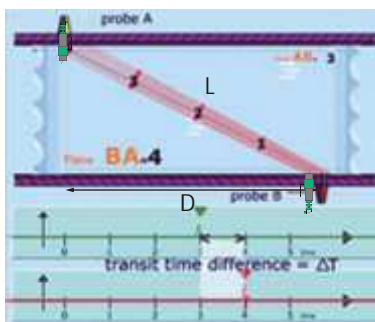
At first cycle, Ultrasonic wave gets propagated in direction of velocity (TAB). At second cycle ultrasonic wave gets propagated in the opposite direction of velocity (TBA). The propagation time difference (  $\Delta T$  ) is precisely measured by PicoSonic™.

$$Q = A \times V \times \frac{1}{kH}$$

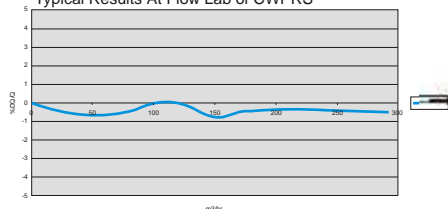
$$kH = f \text{ (Reynold's No.)}$$

$$V = \frac{L^2}{2D} \times \frac{\Delta T}{TAB \times TBA}$$

$$A = \text{Area}$$



Typical Results At Flow Lab of CWPRS



Parkhe  
Award  
Winner



40 Pico Seconds  
Time Resolution



Ultrasonic flowmeter works on Principle of transit time or time of flight measurement, which is known as the most accurate technique of flow measurement. Advanced improvements in sensor design & signal processing made transit time technology efficient to handle all range of applications of liquid flow metering.

PicoSonic™ offers Universality of flow measurement from conductive liquids like water to non-conductive liquids like hydrocarbons. Flow Measurements unaffected due to the change in physical / chemical properties of fluid or due to change in temperature & pressure. As well as technology is independent of pipe diameter having the unique features PicoSonic™ works on clamp-on as well as insertion type of probes.



### Specifications :

- Highest accuracy due to time measurement resolution of 40 Pico seconds.
- Bi-directional velocity measurement up to 20 m/s
- Single path, multi path measurements.
- Suitable for Pipe line sizes from 8 mm to 9999 mm.
- Dynamic amplification of 80 dB to sample weakest signals. Hence flow measurement, possible in critical conditions.
- Automatic computation of Reynolds number & Hydraulic coefficient.
- Very low power consumption (less than 2.5W).
- Data logging up to 4MB for flow rate, Totaliser, velocities, fault message & pressure\*.
- Suitable for pipe MOC all grades of Steel, Cast Iron, Ductile Iron, Aluminum, Pvc, Rubber, Polythene, Glass, Copper, Nylon, Asbestos & all sonic transparent metals.
- On request built in GSM slot for wire free interface.\*
- Online/ offline computer connectivity through RS485/ RS232 ports.
- Direct driving of dot matrix printer with on line/offline selection.
- Available with Graphic 128x64 / 16x2 LCD Modules.

### Input Specifications :

- Power input : 9 to 18 VDC standard / 230 VAC on request.
- Optional power : On request available with solar power.
- Signal input : Through CHETAS 0.5 MHz, 1.0 MHz, 2.0 MHz wetted or clamp on Probes with variety of temperature from : -20° C to 180° C.
- Signal transmitting cable : Twinex type 15 meter standard, up to 150 meters on request.
- Pressure input\* : 0 to 50 kg/cm<sup>2</sup> two wire pressure transmitter.

### Out Put Specifications :

- Current output : 4 to 20 mA up to 1000 ohm load
- Interface output : RS 232 & RS 485
- Parallel port for direct driving 80-column dot matrix printer.
- Wire free output : GSM slot on request.\*

### Performance Specifications :

- Accuracy : Better than  $\pm 1\%$  of reading including errors of linearity, repeatability
- Temperature -10° C to 60° C
- Humidity : up to 99 Rh
- Velocity : 0.001 m/s to 20 m/s

### Mechanical Specifications :

- Size : 220 mm (W) x 220 mm (H) x 70 mm (D)
- Weight : 3.5 Kgms.
- MOC : Anticorrosive ABS plastic
- Ingress Protection IP-65
- Mounting : Wall / DIN Rail

### Probes :



chetas W-1.0



chetas C-2.0



chetas C-1.0

### Application Areas :

- Raw & Pure Water Pumping Stations
- Master Balancing Gravity/ Elevated Reservoirs
- Pump Discharge Efficiency Calculations
- Irrigation & Bulk consumer billings
- Hydro Power Stations/ Thermal Power Plants/ Nuclear Power Plants
- Utility Management
- Pharma / Process industries
- Food & Beverage and Chemicals

\*Optional



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