

Ultrasonic Flow Meters

This five-day course discusses many varieties of ultrasonic meters manufactured by several vendors in use on pipelines. The primary function of ultrasonic meters is to provide a non-intrusive method to measure the flow of gas in a pipe. The following types of ultrasonic flow meters are described in this course: Instromet single path meters (GasSonic 400 and Check Sonic), Instromet Multipath meters (3 & 5 path Q sonic), Daniel Multipath meters (Senior Sonic), and Daniel Multipath meters (Junior Sonic).

I. Introduction to Ultrasonic Meters

II. Terms and Definitions

III. Theory of Operation

- Transit Time Calculations
- Transit Time Example
- General Requirements for Accurate Ultrasonic Flow Measurement
- Example Path Configurations and Uses
- Path Configuration Examples
- General Physical Properties
- Wire Frame Model of Gas Flow Profiles
- Acoustic Path Length
- Electronic Outputs
- Meter Capacity Comparisons
- Dry Calibration
- Ultrasonic Meter Flow Calibration Results 8-30"
- Characteristics of Ultrasonic Flow Meters
- Meter Liabilities
- Installation Considerations or Manufacturer's Recommendations
- Plant Applications

IV. Manufacturers of Ultrasonic Flowmeters

- Instromet Ultrasonic Flow Meters
- Daniel Multipath Ultrasonic Meter (Senior Sonic)

V. Flowmeter Applications

- Using SonicWare Software
- Test Procedures
- Station Inspection Frequencies
- Safe Retraction, Removal, and Replacement of Ultrasonic Transducers

VI. Ultrasonic Meter Monthly Maintenance Requirements

- Long-Term Maintenance
- Maintenance Procedures