M-1500 PLUS

Non-invasive Inline DSP Ultrasonic Flowmeter

Features

The M-1500 Plus utilizes the latest digital signal processing (DSP) technology and features significant reduction of adverse influence of bubbles in measured fluids which is a common problem in semiconductor and chemical processes. Normally, ultrasonic flowmeters have difficulty in measuring fluid containing bubbles. This is because the bubbles interfere with ultrasonic signal passage. With our DSP technology and accumulated field experience, the measurement accuracy of fluids with bubbles capability has been remarkably improved.

Description

The M-1500 Plus consists of an inline flow sensor and externally mounted controller unit. The flow sensor is a straight-through PFA tube that uses ultrasonic sensing technology to measure the flow rate. There are no moving parts or mechanical seals. The M-1500 Plus is an ideal choice for use in the semiconductor industry where extreme cleanliness and anti-corrosiveness are required. The Controller Electronics receives the raw flow rate signal from the sensor and provides flow rate information in terms of analog output, pulse output, serial and LCD. The output signals are user-scalable.

Operation

This flowmeter uses a non-intrusive method to determine the flow rate of the liquid. Two piezoelectric rings (transducers) are mounted on the outer diameter of the flow tube and are excited producing a vibration. Alternately each transducer's ultrasonic disturbance transmits through the tubing wall and is propagated along with the liquid flow and back against the flow. The propagation wave velocity varies with flow rate and is proportional to flow rate. The flow rate can be determined by measuring the variation of these propagation wave velocities. (Covered by U.S. Patent nos. 6055868 & 5974897)

Applications

- Accuracy ± 2% of Reading
- All wetted parts made of PFA Contamination free from ions or particles
- Minute flow measurements down to 4 mL/min*
- Easy configuration in front panel with LCD display
- Bi-directional flow reading capabilities**

* Please contact the factory for special flow ranges

** Flow direction configurable through LCD display panel

Performance Specification

Flow Range*	4 to 600 mL/min
Accuracy**	± 2% R.D. for flow rates over 50 mL/min
	± 1 mL/min for flow rates under 50 mL/min
Repeatability	± 0.5%

* Please contact the factory for special flow ranges
** Special calibration is available upon request

Functional Specification

Analog Output	Current	Isolated 4 - 20 mA (Maximum load resistance of 500 Ω) current output
	Voltage	0 to 10 VDC
Pulse Output		Isolated Open Collector (15 VDC, 15 mA) Frequency of 1 kHz at 100% of full scale
Low Flow Cut-off		User settable
Power Supply		12 - 36 VDC
Power Consumption		5 W continous (1.5 A on start-up)
Ambient Temperature		32 - 115 °F (0 - 46 °C)
Fluid Temperature		50 - 140°F (10 - 50°C)
Maximum Operating Pressure		70 psig

Sensor Material Specifications

Enclosure Classification	IP65
Cable Material	PTFE jacketed cabling
Cable Length	2 meters (standard)
Non-wetted Parts	FEP, Peek, PP, PTFE, PVDF, Viton A
Wetted Parts	High Purity PFA

Converter Material Specifications

Enclosure Classification	IP20 (indoor use)
Mass	156 g (5.5 oz)
Materials	Annodized Aluminum, Plastic

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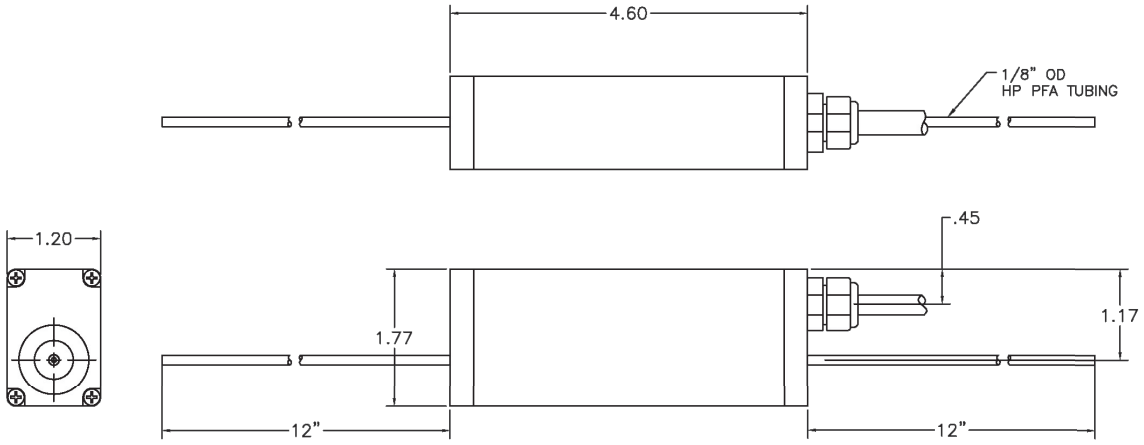
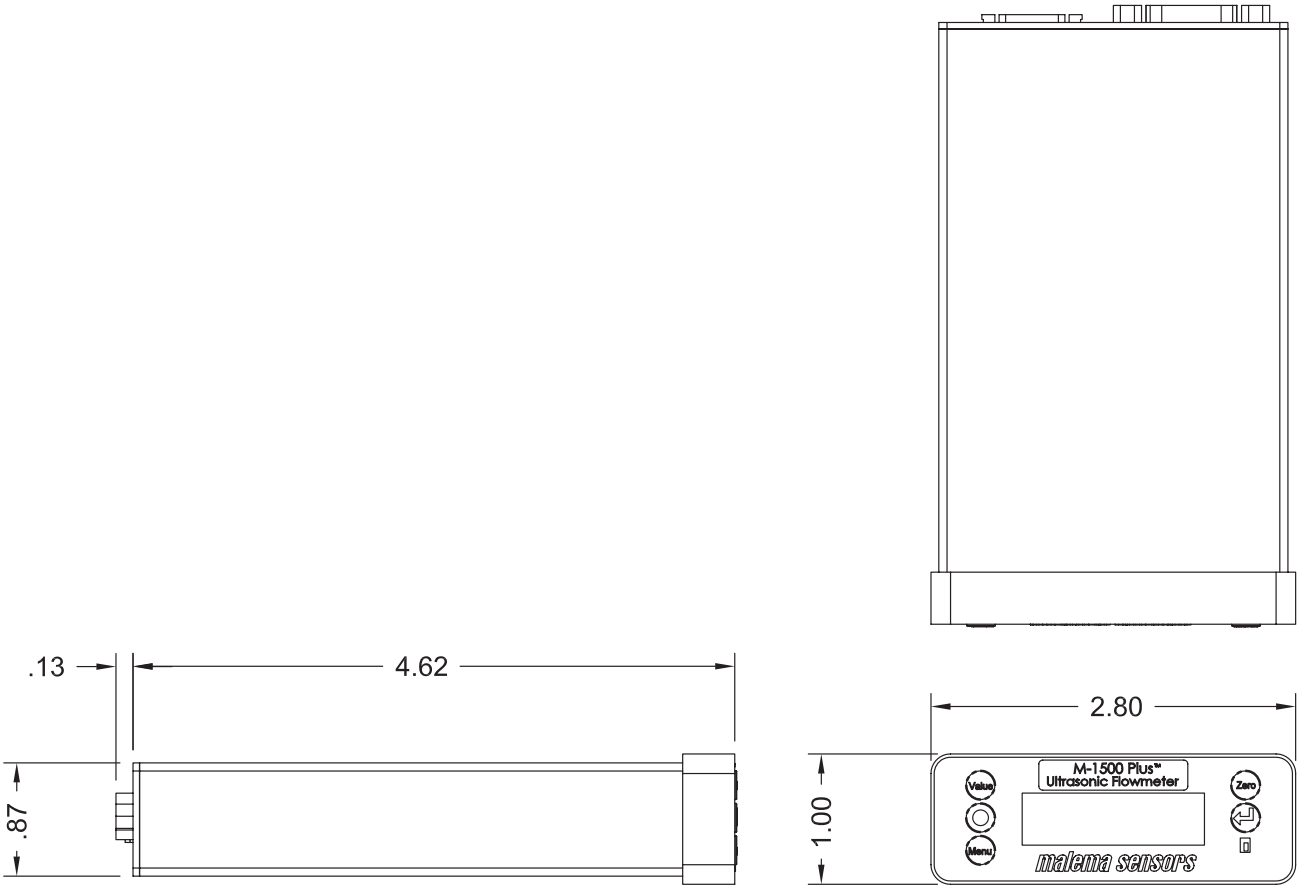
Sensor Dimensions



Converter Dimensions



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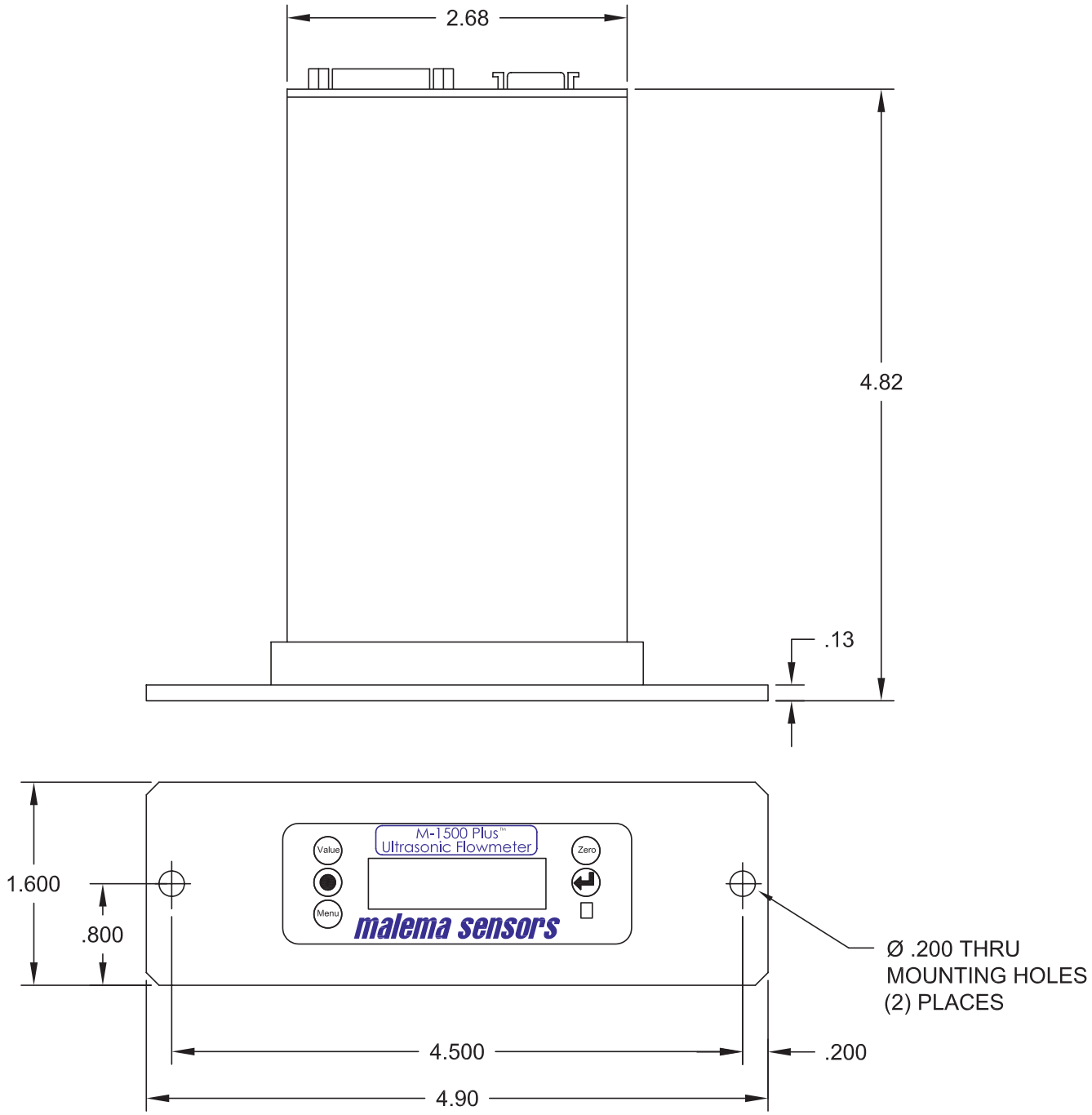
Mounting Bracket Dimensions



Cautions On Installation

- Installation Area for Flow Detector: Select the area of pipe where no air or gas bubbles exist in the flow.
- Mounting of flow detector: Recommend to install detector vertically with upward flow, in order to prevent deposit of slurry or bubbles in low flowrate conditions.
- Location of control valve: If a flow control valve is installed in the piping, it should be located on the downstream side of the flow detector to keep the fluid pressure high. The high fluid pressure will prevent the formation of bubbles in the flow.
- Noise Suppression: All electrical noise sources near the flowmeter, such as power relays or solenoid valves, should be fitted with a surge suppressor.
- Signal Cable Wiring: Keep signal cables away from high voltage or high current power cables to avoid induced electrical noise.

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Ordering Information

Model Code											Description
M-1500P											
	-										
Tube Material		T									PFA
Tube Size*			1								1/8” OD
			2								1/4” OD
Connection				1							Tube ends
					-						
Mounting Bracket						0					Without Mounting Bracket
						1					With Mounting Bracket
Converter							1				Standard
							2				Custom
Output								1			0 to 10 VDC
								2			4 to 20 mA
									-		
										XXX	Unique Part Number Identifier

* consult factory for Special tube size

CE Compliance as per LVD directive

NOTE: Specifications are subject to change without notice.

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