

# M-2700 Series

Integrated High-Purity Ultrasonic Flow Meter



Where Innovation Flows



The M-2700 series is an integrated flow meter in a small package. The M-2700 utilizes the latest high-speed digital signal processing (DSP) technology to provide a cost effective flow measuring solution with no compromise in performance. Malema DSP algorithms sample the entire wave form resulting in a demonstrable advantage in bubble immunity over traditional ultrasonic technologies. The flow sensor is a U- or Z-shaped High Purity PFA tube with no internal obstructions, moving parts, or mechanical seals. The M-2700 is an ideal choice for use where minimal footprint, high purity, corrosion resistance, low pressure drop, and easy installation are desired.

## Operation

The M-2700 utilizes transit-time ultrasonic technology to determine flow rate. Two piezoelectric transducers mounted at the ends of the measuring tube alternately transmit and receive ultrasound energy pulses. The difference between upstream and downstream transit time of the pulses is proportional to the velocity of the fluid, and is used to calculate flow rate.

## Applications

- CMP
- ECD
- Electroless Deposition
- Wet Clean and Track Tools
- Solar PV Equipments
- Medical Devices
- Wet Process / Chemical Distribution System
- Laser Equipment
- Cooling Systems

## Key Features

- Sensor and electronics integrated in a compact easy-to-install package
- No dead legs
- No obstructions
- No moving parts in the flow path
- All wetted parts made of High Purity PFA
- Free from ion or particle contamination
- Corrosion resistant
- Wide rangeability



## Operation Specifications

- Measurable Fluid: Liquids; Most semiconductor chemistry (acids, bases, solvents, and slurries)
- Fluid Temperature: 50° – 356°F (10° – 60°C)\*
- Fluid Pressure: 0 – 70 psig
- Ambient Temperature: 32° – 115°F (0° – 46°C)
- PFA Tube End\*\*
- Enclosure Classification: IP64

\* Consult factory for higher temperature application

\*\* Consult factory for any special requirements

### Table 1. Performance Specifications

End Connection Tube Size (Sensor Internal Diameter)	1/4" (4 mm)	3/8" (4 mm)	3/8" (6 mm)	1/2" (10 mm)
Standard Full Scale Range *	3 lpm	4 lpm	8 lpm	20 lpm
Accuracy	±1% of Flow Reading, down to 10% of Full Scale *			
Repeatability	±0.5% of Flow Reading, down to 10% of Full Scale *			

\* Custom flow ranges available upon request. Consult factory for any other special requirements

\* Accuracy statement is based on a room temperature DIW calibration

### Table 2. Electrical Specifications

Output Options	Analog Output	Current O/p: Active: 4 to 20 mA (Max. Load < 900 ohms) Passive: 4 to 20 mA (Max. Load < 1200 ohms @ 30 V max.) Voltage O/p: 0 to 10 Vdc (min. impedance > 10 K)
	Digital Output	Open Collector / Max. 30 Vdc, 200 mA max. Configurable for Low flow rate, High flow rate, Totalizer greater than, Totalizer less than, Signal strength less, Positive totalizer pulse *
Digital Input	Zeroing - Momentary pull-up to 24 Vdc for activation	
Power Supply	24 Vdc ± 10%	
Power Consumption	100 mA (nominal)	
Digital Communication	MODBUS over RS-485	

\* Pulse frequency configurable up to 10 KHz; Pulse weight configurable from 0.01 ml

### Table 3. Sensor Material Specifications

Enclosure Classification	IP64
Cable	FEP Jacketed
Non-wetted Parts	Polypropylene, PEEK, FEP
Wetted Parts	High Purity PFA

Table 4. Cable Specification

CABLE	8 conductor shielded, FEP jacketed cable with free leads * 26 AWG
Wire Color	Function
White	Signal OUT (4 to 20 mA or 0-10 Vdc)
Brown	Power IN (+24 Vdc)
Green	Remote Zero IN **
Yellow	Alarm or Pulse OUT
Gray	RS-485 A, Data -
Pink	RS-485 B, Data +
Blue	Ground (Power and signal)
Red	Not Used

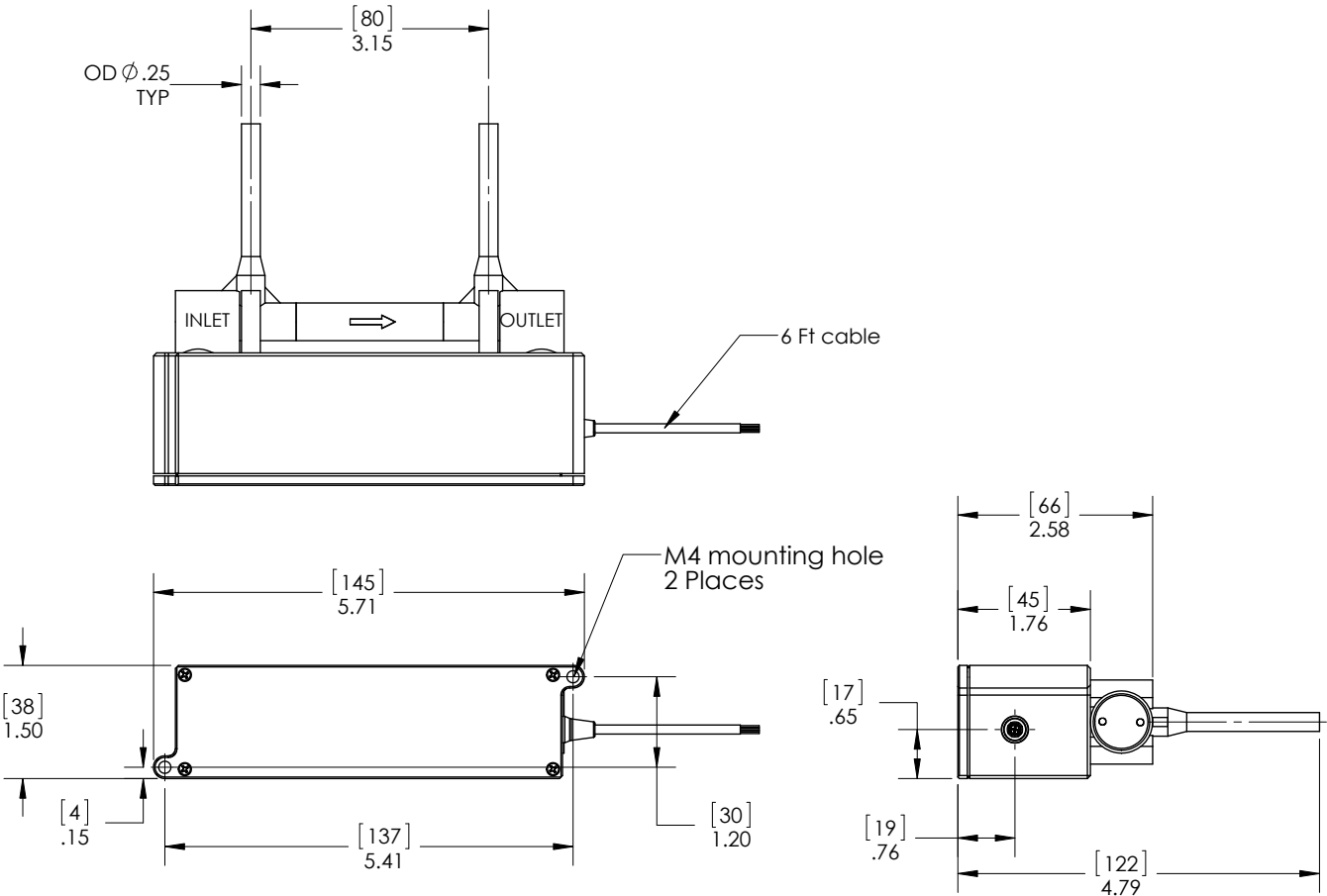
\*Bulkhead connector option available

\*\*Momentary pull-up to 24 Vdc

NOTE: Consult factory for other cable and pin out options

Sensor Dimensions

FOR REFERENCE ONLY



1/4" U-shaped sensor model with standard cable connector shown. Contact factory for other model sizes and configurations.

# Ordering Information

Model Ordering Code													Description
M-2700	-	*	**	*	**	-	*	*	-	*	-	***	
Body Material		F											PFA
Connection Size (OD)			2R										1/4" Regular
			3R										3/8" Regular
			4R										1/2" Regular
Connection Type			1										Tube Ends
			2										Flare (Female)
			3										Pillar (Female)
			4										Other
Standard Full Scale Range			03										3 LPM
			04										4 LPM
			06										8 LPM
			10										20 LPM
						-							
Converter							B						Converter without Display
Electrical Connection								S					Standard (6' Pigtail)
								C					Custom
										-			
Geometry										U			U-shape
										Z			Z-shape
											-		
												XXX	Unique PN Identifier



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