VERSATILE ELECTRONIC MASS FLOWMETERS *For Air, Oxygen, and Most Process Gases*

FMA-5000

1 YEAR WARRANTY NIST CE

Standard

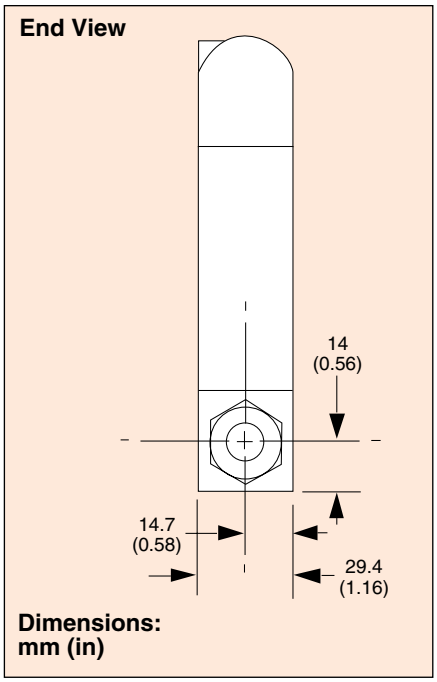
- **Unique Built-In Digital Display for Direct Readout in SCCM and SLM Units (FMA-5600 Series)**
- **13 Flow Ranges, from 0 to 10 SCCM to 0 to 40 SLM**
- **Excellent Performance: ±1.5% Accuracy FS, 0.5% Repeatability, and Time Response of 2 Seconds**
- **NIST Certificate Included**

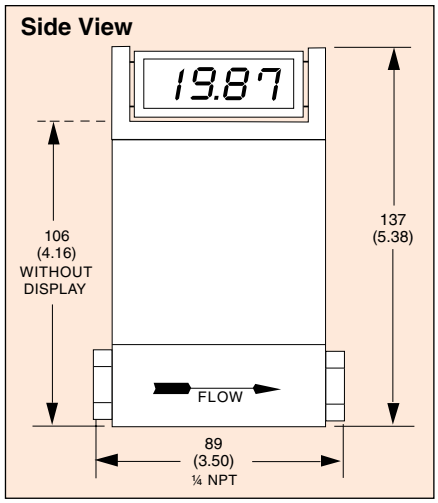
FMA-5000 Series electronic mass flowmeters combine high performance and versatility into a state-of-the-art, compact package. These flowmeters measure the mass flow rate of gases in 13 ranges from 0 to 10 SCCM (standard cubic centimeters per minute), to 0 to 50 SLM (standard liters per minute). For the complete listing of ranges, see the "Flow Range Table" on the next page. Accuracy is 1.5% FS over a wide temperature and pressure range. Time response is 2 seconds to within 2% of final flow. These unique flowmeters are available with (FMA-5600) or without (FMA-5700) digital display. The display is a 3½ digit LCD, tiltable to 180°. An optional power supply (12 to 24 Vdc) can be purchased separately (see "Accessory").

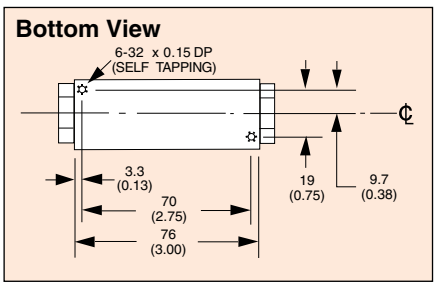
With their analog output, integral/remote digital display, insensitivity to temperature and pressure variations, and low cost, the FMA-5600 meters are ideal substitutes for rotameters; they can also be used to calibrate rotameters. Other applications include chemical and food processing, research and development, gas chromatography, and leak and filter testing.

A 0 to 5 Vdc (standard) or 4 to 20 mA (optional) output signal is linearly proportional to gas mass flow rate—for recording, data logging, or control. A 9-pin "D" subconnector for the output signal, input power, and remote display drive is supplied with its mating connector for all FMA-5000 Series units.

All wetted surfaces are constructed of corrosion-resistant glass-filled nylon 66 plastic, 316 SS, and FKM O-rings. Ordering option "-ST" replaces the FNPT-ported nylon flow body with a 316 SS flow body with ¼" compression fittings for tubing. (The "-ST" option is available on the FMA-5600 display unit only). The plastic flow body is suitable for use with non-toxic, non-flammable gases; the 316 SS flow body is suitable for higher pressures and hazardous gases.







The FMA-5000 Series flowmeters measure molecular flow—the measurement of concern in most applications, including chemical processing, combustion, and heating or cooling. No temperature or pressure corrections are required, unlike with most other volumetric flow monitoring devices.

The flowmeter is operated by 2 RTD coils around the sensor tube, which direct a constant amount of heat into the gas stream. The gas mass flow carries heat from the upstream coil to the downstream coil. The resulting temperature difference (T2 - T1) is detected by the RTD coils, producing the output signal.

SPECIFICATIONS

Accuracy: 1.5% FS including linearity over 15 to 25°C (59 to 77°F) and 5 to 60 psia; 4% FS over 0 to 50°C (32 to 122°F) and 1 to 150 psia
Power: 12 to 15 Vdc @ 100 mA max
Response Time: 800 ms time constant; 2 seconds typical to within ±2% of final value over 25 to 100% FS
Temperature Coefficient: 0.08 to 15% FS/°C
Pressure Coefficient: 0.01% FS/psi
Maximum Gas Pressure: 150 psig for nylon flow body, 500 psig for 316 SS flow body; units are calibrated standard for 20 psig
Gas and Ambient Temperature: 0 to 50°C (32 to 122°F)
Leak Integrity (Standard cc/s He): 1×10^{-4} for nylon flow body; 1×10^{-7} for 316 SS flow body
Connections: ¼ FNPT standard
Electrical Connections: 9-pin sub "D" connector
Weight: 0.91 kg (2 lb)

Pressure Drop
Max Pressure Drop (cm of Water)

Flow Rate (SLM)	Plastic Body	316 SS Body
Up to 10	2.5	6
20	10	15
30	16	15
40	24	15

Electronic Flowmeters with 0 to 5 Vdc Output

To Order

Model No.	Description
FMA-56[*]	Flowmeter with display and nylon body
FMA-57[*]	Flowmeter without display and nylon body

** Insert range code to complete model number.*
***Note 1:** To order the FMA-5000 Series with 4 to 20 mA output, add suffix "**-I**" to the model number and consult Flow Engineering for price.*
***Note 2:** To order the **FMA-5600** Series with 316 SS body and ¼" compression fittings, add suffix **"-ST"** to part number. Consult Flow Engineering for price.*

Flow Range† Code Table (Insert Code into Model Number)

Code	SCCM	Code	SLM
01††	0 to 10	07	0 to 1
02††	0 to 20	08	0 to 2
03	0 to 50	09	0 to 5
04	0 to 100	10	0 to 10
05	0 to 200	11	0 to 20
06	0 to 500	12	0 to 30
		13	0 to 40

*† Flow ranges specified are for nitrogen or air. When used for other gases, a multiplication factor is used to determine the flow rate and the digital display must be rescaled in the field. Or request "**Special Calibration" for _____gas at _____ (temperature) and _____ (pressure).**"*
*†† Add additional cost to price for range code "**01**" and "**02**".*

Accessory

Model No.	Description
820-T5	Power supply for FMA-5600

Comes complete with NIST calibration certificate and operator's manual.
***Ordering Examples: FMA-5601,** flowmeter with display, nylon body and 0 to 10 SCCM range.*
***FMA-5702,** flowmeter without display or nylon body, 0 to 20 SCCM.*