

ECONOMICAL GAS MASS FLOW METERS

For Clean Gases with Optional Integral Display



FMA1700A/1800A Series



Standard

- ✓ Reads Gas Mass Flow Without Temperature or Pressure Compensation
- ✓ Available in Economical Aluminum or Corrosion-Resistant 316 SS
- ✓ Tiltable LCD Display for Easy Reading
- ✓ NIST Traceable Calibration Included

The FMA1700A/1800A Series electronic gas mass flow meters provide for monitoring the flow of a wide variety of gases from 10 SCCM up to 1000 SLM. Utilizing heat transfer through a heated tube to measure molecular gas flow rate, the FMA1700A/1800A provides measurement of direct gas mass flow rate, without the need to compensate for variations in gas temperature or pressure (within stated limits). They are available in an economical aluminum/brass construction for typical gas flows and a 316 SS construction for applications requiring more corrosion resistance. The FMA1700A series without integral display is supplied with a field selectable analog 0 to 5 Vdc or 4 to 20 mA output for remote monitoring; the FMA1800A series has both an integral 3½ digit display and analog output. The display is tiltable over 90 degrees for viewing convenience. The display is calibrated standard to read out directly in SCCM or SLM for nitrogen (other gas calibrations available on special order).

Due to their low cost, digital display, analog output capability, and insensitivity to variations in gas

temperature and pressure, the FMA1700A/1800A Series are ideal substitutes for many rotameter applications. When used with the FMA178BP portable battery pack, the FMA1800A Series are ideal for in-the-field calibration of flow meters or testing of air sampling equipment. The FMA178BP battery pack includes batteries, recharger, and carrying case with shoulder strap and belt loop. With the FMA178BP, the flow meter can operate in excess of 40 hours; the batteries can be recharged at least 200 times.

The FMA1700A/1800A Series require 12 to 26 Vdc power @ 200 mA maximum, which can be supplied by the FMA178PW plug-in socket power supply. The electronics are reverse polarity protected and has externally-accessible fusing. Model number FMA178C (supplied separately) provides a mating 9-pin "D" connector with 3 feet of ribbon cable for accessing the 0 to 5 Vdc output signal and power input connections (use FMA178C-MA for 4 to 20 mA output signal connection).

The LCD supplied with the FMA1800A Series is connected to the lower electronics via a modular plug. The LCD can be remotely located by purchasing an FMA18RC remote cable assembly—you must then build your own assembly for panel mounting the LCD.

FMA1828A, shown smaller than actual size.



SPECIFICATIONS

Accuracy: ±1.5% of full scale, including linearity over 15 to 25°C and 5 to 60 psia (0.35 to 4.2 kg/cm²)

Repeatability: ±0.5% of full scale and for units ≥100 scm from 0 to 20% of range

Temperature Coefficient: 0.15% of full scale per °C or better

Pressure Coefficient: 0.01% of full scale per psi (0.07 bar)

Maximum Pressure Drop:

| SLM | in. W.C. | SLM | in. W.C. |
|-----|----------|------|----------|
| 10 | 1 | 80 | 168 |
| 20 | 14 | 100 | 227 |
| 30 | 34 | 200 | 112 |
| 50 | 90 | 500 | 140 |
| 60 | 129 | 1000 | 252 |

Response Time: 800 msec time constant; 2 seconds (typical) to within ±2% of set flow rate over 25 to 100% of full scale

Maximum Gas Pressure: 500 psig (35 kg/cm² gage); 1000 psig (70 kg/cm² gage) for ranges up to 100 SLM; 20 psig optimum

Gas and Ambient Temperature: 0 to 50°C (0 to 122°F)

Leak Integrity: 1 x 10⁻⁹ std cc/sec of helium maximum to outside environment

Materials in Fluid Contact:

Aluminum Models: Anodized aluminum, 316 SS, brass and FKM O-rings

Dimensions: cm (inch)

Stainless Steel Models: 316 SS and FKM O-rings
Output Signal
Linear 0 to 5 Vdc: 1000 Ω minimum load
4 to 20 mA: 50 to 250 Ω loop resistance
Transducer Power: 12 Vdc @ 200 mA maximum
Shipping Weight: 1.1 kg (2.5 lb)
Compliance: EN55011 class 1, class B; EN50082-1

| Unit Maximum Flow Rate | Lay Length with Fittings | Maximum Height | Maximum Width | Connection-Compression Fitting |
|------------------------|--------------------------|----------------|---------------|--------------------------------|
| 10 SCCM to 10 SLM | 12.8 (5.02) | 14.2 (5.60) | 2.5 (1.00) | 1/4" |
| 15 to 50 SLM | 15.6 (6.15) | 15.2 (5.98) | 3.2 (1.25) | 1/4" |
| 60 to 100 SLM | 15.9 (6.27) | 15.2 (5.98) | 3.2 (1.25) | 3/8" |
| 200 SLM | 22.4 (8.83) | 16.8 (6.60) | 4.4 (1.75) | 3/8" |
| 500 SLM | 24.6 (9.67) | 19.3 (7.60) | 7.6 (3.00) | 1/2" |
| 1000 SLM | 18.5 (7.30) | 21.8 (8.60) | 10.2 (4.00) | 3/4 FNPT |

To Order

| Model No. Aluminum/Brass Body with Display | Model No. Stainless Steel Body with Display | Model No. Aluminum/Brass Body without Display | Model No. Stainless Steel Body without Display | Range Code** | Maximum Flow Rate |
|--|---|---|--|--------------|-------------------|
| FMA1802A | FMA1802A-ST | FMA1702A | FMA1702A-ST | 02 | 10 sccm |
| FMA1804A | FMA1804A-ST | FMA1704A | FMA1704A-ST | 04 | 20 sccm |
| FMA1806A | FMA1806A-ST | FMA1706A | FMA1706A-ST | 06 | 50 sccm |
| FMA1808A | FMA1808A-ST | FMA1708A | FMA1708A-ST | 08 | 100 sccm |
| FMA1810A | FMA1810A-ST | FMA1710A | FMA1710A-ST | 10 | 200 sccm |
| FMA1812A | FMA1812A-ST | FMA1712A | FMA1712A-ST | 12 | 500 sccm |
| FMA1814A | FMA1814A-ST | FMA1714A | FMA1714A-ST | 14 | 1 SLM |
| FMA1816A | FMA1816A-ST | FMA1716A | FMA1716A-ST | 16 | 2 SLM |
| FMA1818A | FMA1818A-ST | FMA1718A | FMA1718A-ST | 18 | 5 SLM |
| FMA1820A | FMA1820A-ST | FMA1720A | FMA1720A-ST | 20 | 10 SLM |
| FMA1823A | FMA1823A-ST | FMA1723A | FMA1723A-ST | 23 | 15 SLM |
| FMA1824A | FMA1824A-ST | FMA1724A | FMA1724A-ST | 24 | 20 SLM |
| FMA1826A | FMA1826A-ST | FMA1726A | FMA1726A-ST | 26 | 30 SLM |
| FMA1827A | FMA1827A-ST | FMA1727A | FMA1727A-ST | 27 | 40 SLM |
| FMA1828A | FMA1828A-ST | FMA1728A | FMA1728A-ST | 28 | 50 SLM |
| FMA1840A | FMA1840A-ST | FMA1740A | FMA1740A-ST | 40 | 60 SLM |
| FMA1841A | FMA1841A-ST | FMA1741A | FMA1741A-ST | 41 | 80 SLM |
| FMA1842A | FMA1842A-ST | FMA1742A | FMA1742A-ST | 42 | 100 SLM |
| FMA1843A | FMA1843A-ST | FMA1743A | FMA1743A-ST | 43 | 200 SLM |
| FMA1844A | FMA1844A-ST | FMA1744A | FMA1744A-ST | 44 | 500 SLM |
| FMA1845A | FMA1845A-ST | FMA1745A | FMA1745A-ST | 45 | 1000 SLM* |

* Comes with dual 3/4 FNPT connections instead of compression fittings.

** Insert range code, see table above.

Flow ranges specified are for nitrogen or air at 20 psig. 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. To request a custom calibration add the gas abbreviation and pressure as a suffix to the model number.

Accessories

| Model No. | Description |
|-----------------|---|
| FMA178PW | Socket plug-in power supply for 115 Vac (recommended) |
| FMA178C | Female 9-pin D-connector with 1 m (3') of ribbon cable, 0 to 5 Vdc output |
| FMA178C-MA | Female 9-pin D-connector with 1 m (3') of ribbon cable, 4 to 20 mA output |
| FMA178PW-220VAC | Socket plug-in power supply for 220 Vac, VDE plug type |
| FMA178BP | Portable battery pack, with recharger for 115 Vac |
| FMA178BP-220VAC | Portable battery pack, with recharger for 220 Vac |
| FMA18RC10 | 3 m (10') cable for remotely locating LCD of FMA1800 |
| FMA18RC25 | 7.6 m (25') cable for remotely locating LCD of FMA1800 |

Comes complete with compression fittings, operator's manual, and NIST certificate. Power supplies sold separately.

For oxygen cleaned units, add suffix "-02CLEAN" to model number for additional cost.

Ordering Examples: FMA1712A, AL/BR body flow meter without an integral display, calibrated for nitrogen at 20 psig, ambient temperature from 0 to 500 SCCM.

FMA1810A, AL/BR body with display and FMA178PW, power supply.