

# ECONOMICAL GAS MASS FLOWMETERS

## For Clean Gases With Optional Integral Display

FMA1700/1800 Series  
Starts at

**\$474**



Standard

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

The FMA1700/1800 Series electronic gas mass flowmeters 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 FMA1700/1800 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 316SS construction for applications requiring more corrosion resistance. The FMA1700 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 FMA1800 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).

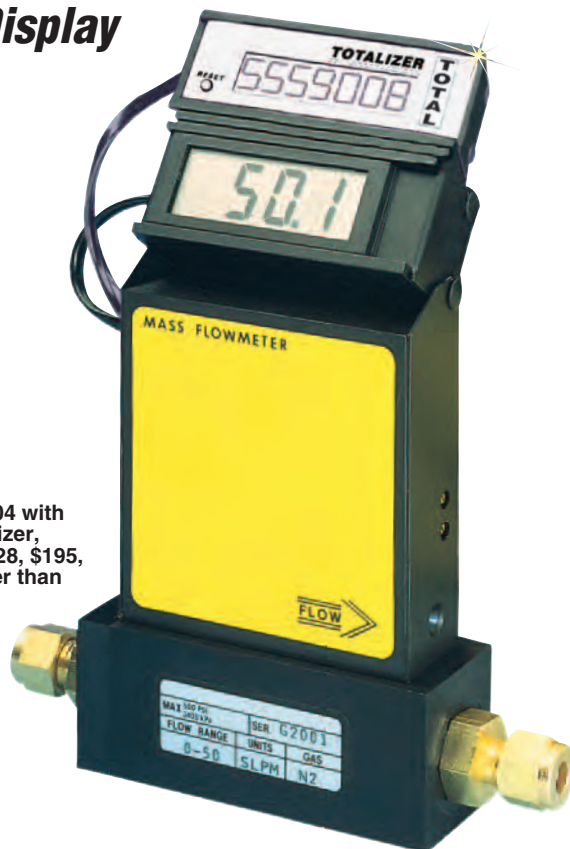
Due to their low cost, digital display, analog output capability, and insensitivity to variations in gas temperature and pressure, the FMA1700/1800 Series are ideal substitutes for many rotameter

applications. When used with the FMA178BP portable battery pack, the FMA1800 Series are ideal for in-the-field calibration of flowmeters 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 flowmeter can operate in excess of 40 hours; the batteries can be recharged at least 200 times.

The FMA1700/1800 Series require 12 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 FMA1800 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.

FMA1828, \$704 with optional totalizer, FMA-TOTAL-28, \$195, 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/cm<sup>2</sup>); ±3% of full scale, including linearity over 0 to 50°C and 1 to 500 psia (0.07 to 10 kg/cm<sup>2</sup>)

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

**Temp 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

**Max Gas Pressure:** 500 psig (35 kg/cm<sup>2</sup> gauge); 20 psig optimum  
**Gas and Ambient Temp:** 0 to 50°C (0 to 122°F)

**Leak Integrity:** 1 x 10<sup>-7</sup> std cc/sec of helium max. to outside environment

**Materials in Fluid Contact:**

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

**Stainless Steel Models:** 316 SS and FKM O-rings

**Output Signal**

Linear 0 to 5 Vdc: 1000  $\nabla$  min load;  
 4 to 20 mA: 50 to 250  $\nabla$  loop resis  
 Transducer Power: 12 Vdc @ 200 mA max.

Shipping Weight: 1.1 kg (2.5 lb)  
 Compliance: EN55011 class 1, class B;  
 EN50082-1

**Range Table  
for FMA-TOTAL-(\*\*) Totalizer Display**

Code**	SCCM	Code**	SLM
02	0 to 10	14	0 to 1
04	0 to 20	16	0 to 2
06	0 to 50	18	0 to 5
08	0 to 100	20	0 to 10
10	0 to 200	23	0 to 15
12	0 to 500	24	0 to 20
		26	0 to 30
		27	0 to 40
		28	0 to 50
		40	0 to 60
		41	0 to 80
		42	0 to 100
		43	0 to 200
		44	0 to 500
		45	0 to 1000

**Dimensions: cm (in)**

Unit Max Flow Rate	Lay Length with Fittings	Max Height	Max 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

**MOST POPULAR  
MODELS HIGHLIGHTED!**

**To Order (Specify Model Number)**

Model No. Al/Br Body with Display	Price	Model No. SS Body with Display	Price	Model No. Al/Br Body w/o Display	Price	Model No. SS Body w/o Display	Price	Range Code**	Maximum Flow Rate
FMA1802	\$562	FMA1802ST	\$936	FMA1702	\$474	FMA1702ST	\$847	02	10 SCCM
FMA1804	562	FMA1804ST	936	FMA1704	474	FMA1704ST	847	04	20 SCCM
FMA1806	562	FMA1806ST	936	FMA1706	474	FMA1706ST	847	06	50 SCCM
FMA1808	562	FMA1808ST	936	FMA1708	474	FMA1708ST	847	08	100 SCCM
FMA1810	562	FMA1810ST	936	FMA1710	474	FMA1710ST	847	10	200 SCCM
FMA1812	562	FMA1812ST	936	FMA1712	474	FMA1712ST	847	12	500 SCCM
FMA1814	562	FMA1814ST	936	FMA1714	474	FMA1714ST	847	14	1 SLM
FMA1816	562	FMA1816ST	936	FMA1716	474	FMA1716ST	847	16	2 SLM
FMA1818	562	FMA1818ST	936	FMA1718	474	FMA1718ST	847	18	5 SLM
FMA1820	562	FMA1820ST	936	FMA1720	474	FMA1720ST	847	20	10 SLM
FMA1823	704	FMA1823ST	1162	FMA1723	618	FMA1723ST	1075	23	15 SLM
FMA1824	704	FMA1824ST	1162	FMA1724	618	FMA1724ST	1075	24	20 SLM
FMA1826	704	FMA1826ST	1162	FMA1726	618	FMA1726ST	1075	26	30 SLM
FMA1827	704	FMA1827ST	1162	FMA1727	618	FMA1727ST	1075	27	40 SLM
FMA1828	704	FMA1828ST	1162	FMA1728	618	FMA1728ST	1075	28	50 SLM
FMA1840	865	FMA1840ST	1329	FMA1740	829	FMA1740ST	1286	40	60 SLM
FMA1841	865	FMA1841ST	1329	FMA1741	829	FMA1741ST	1286	41	80 SLM
FMA1842	865	FMA1842ST	1329	FMA1742	829	FMA1742ST	1286	42	100 SLM
FMA1843	1024	FMA1843ST	1575	FMA1743	940	FMA1743ST	1491	43	200 SLM
FMA1844	1092	FMA1844ST	1680	FMA1744	1008	FMA1744ST	1596	44	500 SLM
FMA1845	1229	FMA1845ST	1890	FMA1745	1145	FMA1745ST	1806	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.	Price	Description
FMA178PW	\$40	Socket plug-in power supply for 115 Vac (recommended)
FMA178C	28	Female 9-pin D-connector with 1 m (3') of ribbon cable, 0 to 5 Vdc output
FMA178C-MA	28	Female 9-pin D-connector with 1 m (3') of ribbon cable, 4 to 20 mA output
FMA178PW-220VAC	57	Socket plug-in power supply for 220 Vac, VDE plug type
FMA178BP	166	Portable battery pack, with recharger for 115 Vac
FMA178BP-220VAC	224	Portable battery pack, with recharger for 220 Vac
FMA18RC10	27	3 m (10') cable for remotely locating LCD of FMA1800
FMA18RC25	42	7.6 m (25') cable for remotely locating LCD of FMA1800
FMA-TOTAL-(**)	195	Totalizer display with cable and splitter. Requires calibration to flow range.

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

For 24 Vdc powered units, add suffix "-24VDC" to model number, no additional price.

For oxygen cleaned units, add suffix "-02CLEAN" to model number and \$125 to price.

**Ordering Examples:** FMA1712, AL/BR body flowmeter without an integral display, calibrated for nitrogen at 20 psig, ambient temperature from 0 to 500 SCCM, \$474.

FMA1810, AL/BR body with display and FMA178PW, power supply, \$562 + 40 = \$602.



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