

ECONOMICAL GAS MASS FLOW CONTROLLERS

For Clean Gases
With Optional Integral Display



FMA5400A Series



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

The FMA5400A/5500A Series electronic gas mass flow controllers can control the flow of a wide variety of gases from 10 SCCM up to 100 SLM. Utilizing heat transfer through a heated tube, the FMA5400A/5500A measures gas mass flow rate directly, without needing 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 that require more corrosion resistance. The FMA5400A Series without integral display is supplied with both an analog 0 to 5 Vdc and 4 to 20 mA output for remote monitoring; the FMA5500A Series features an integral 3½ digit display and an analog output. The display is tiltable over 90 degrees for viewing convenience and is calibrated to read out directly in SCCM or SLM for nitrogen (other gas calibrations available by special order).

The FMA5400A/5500A mass flow controllers feature a built-in electromagnetic valve for maintaining a constant flow rate regardless of variations in inlet or outlet pressures. The setpoint is controlled either locally via a potentiometer accessible through a window in the case or remotely via an analog 0 to 5 Vdc or 4 to 20 mA signal (field selectable).



FMA5512A, shown smaller than actual size.

FMA5402A-ST mass flow controller without display, 316 SS body, shown smaller than actual size.

The FMA5400A/5500A Series controllers require 12 to 26 Vdc power @ 800 mA maximum, which can be supplied by the FMA545PW wall plug-in socket power supply. The electronics are reverse-polarity protected and have a resettable fuse. Model number FMA545C (supplied separately) provides a mating 15-pin "D" connector with 2.4 m (8') of shielded cable for accessing the analog output signals and power input connections. The LCD for the FMA5500A 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.

SPECIFICATIONS

Accuracy: For units with full range less than 100 SLM $\pm 1\%$ FS, including linearity over 15 to 25°C (59 to 77°F) and 0.7 to 4.2 kg/cm² (10 to 60 psia). For units ≥ 100 SLM Full Range: $\pm 1.5\%$ FS, including linearity over 15 to 25°C (59 to 77°F) and 0.7 to 4.2 kg/cm² (10 to 60 psia) from 20 to 100% of range; $\pm 3\%$ FS from 0 to 20% of range.

Repeatability: $\pm 0.5\%$ of full scale
Temperature Coefficient: 0.15% FS/°C
Pressure Coefficient: 0.01% FS per psi (0.07 bar)
Maximum Pressure Drop: 50 psid

Response Time: 5 seconds to within $\pm 2\%$ of set flow rate over 25 to 100% FS
Maximum Gas Pressure: 35 kg/cm² gage (500 psig); 70 kg/cm² gage (1000 psig) for ranges up to 100 SLPM. 1.76 kg/cm² (25 psig) optimum
Gas and Ambient Temperature: 5 to 50°C (41 to 122°F)
Leak Integrity: 1×10^{-7} 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 Ω minimum load
4 to 20 mA: 50 to 500 Ω loop resistance, ± 20 mV max noise

Transducer Power: 12 to 15 Vdc power @ 800 mA maximum (sizes 43, 44 and 45 ONLY)

Turndown Ratio: 40:1

Shipping Weight: 1.8 kg (4 lb)

Compliance:
EN55011 class 1, class B;
EN50082-1

	SLM	psid
Up to 9	1.1	
10 to 30	3.9	
50	8	
60 to 100	18.9	

Altitude Sensitivity: With horizontal flow path, no shift in calibration up to +20 degree pitch
Gas Relative Humidity: 0 to 70% RH

Dimensions: cm (inch)

Unit Maximum Flow Rate	Lay Length with Fittings	Maximum Height	Maximum Width	Connection-Compression Fitting
10 SCCM to 10 SLM	16.0 (6.29)	14.2 (5.60)	2.5 (1.00)	¼"
15 to 50 SLM	18.3 (7.21)	15.2 (5.98)	3.2 (1.25)	¼"
60 to 100 SLM	18.6 (7.33)	15.2 (5.98)	3.2 (1.25)	⅜"

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	Maximum Flow Rate
FMA5502A	FMA5502A-ST	FMA5402A	FMA5402A-ST	10 SCCM
FMA5504A	FMA5504A-ST	FMA5404A	FMA5404A-ST	20 SCCM
FMA5506A	FMA5506A-ST	FMA5406A	FMA5406A-ST	50 SCCM
FMA5508A	FMA5508A-ST	FMA5408A	FMA5408A-ST	100 SCCM
FMA5510A	FMA5510A-ST	FMA5410A	FMA5410A-ST	200 SCCM
FMA5512A	FMA5512A-ST	FMA5412A	FMA5412A-ST	500 SCCM
FMA5514A	FMA5514A-ST	FMA5414A	FMA5414A-ST	1 SLM
FMA5516A	FMA5516A-ST	FMA5416A	FMA5416A-ST	2 SLM
FMA5518A	FMA5518A-ST	FMA5418A	FMA5418A-ST	5 SLM
FMA5520A	FMA5520A-ST	FMA5420A	FMA5420A-ST	10 SLM
FMA5523A	FMA5523A-ST	FMA5423A	FMA5423A-ST	15 SLM
FMA5524A	FMA5524A-ST	FMA5424A	FMA5424A-ST	20 SLM
FMA5526A	FMA5526A-ST	FMA5426A	FMA5426A-ST	30 SLM
FMA5527A	FMA5527A-ST	FMA5427A	FMA5427A-ST	40 SLM
FMA5528A	FMA5528A-ST	FMA5428A	FMA5428A-ST	50 SLM
FMA5540A	FMA5540A-ST	FMA5440A	FMA5440A-ST	60 SLM
FMA5541A	FMA5541A-ST	FMA5441A	FMA5441A-ST	80 SLM
FMA5542A	FMA5542A-ST	FMA5442A	FMA5442A-ST	100 SLM
FMA5543	FMA5543-ST	FMA5443	FMA5443-ST	200 SLM
FMA5544	FMA5544-ST	FMA5444	FMA5444-ST	500 SLM
FMA5545	FMA5545-ST	FMA5445	FMA5445-ST	1000 SLM

Accessories

Model No.	Description
FMA545C	Female 15-pin D-connector, 2.4 m (8') of shielded cable
FMA545PW	Socket plug-in power supply for 100 to 240 Vac
FMA545PW-220VAC	Socket plug-in power supply for 220 Vac, European plug type
FMA18RC10	3.0 m (10') cable for remote LCD mounting
FMA18RC25	7.6 m (25') cable for remote LCD mounting

* Comes with ¼ FNPT connections instead of compression fittings.

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

Flow ranges specified are for nitrogen or air at 20 psig inlet (up to 50 SLM) or 25 psig inlet 60 to 100 SLM units) and 0 psig outlet. When used with 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 inlet pressure/outlet pressure as a suffix to the model number.

Calibration are done at ambient temperatures only, 20°C (70°F)

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

Ordering Examples: FMA5410A-ARGON, 50/0 psig, 70°F calls for an AL/BR body flow controller without an integral display, calibrated for Argon at 50 psig inlet pressure, 0 psig outlet pressure, 70°F gas temperature, powered by 12 Vdc.

FMA5516A, N₂ controller with display, and FMA545PW, power supply.



FMA5512A, shown smaller than actual size.