

ECONOMICAL GAS MASS FLOW CONTROLLERS

For Clean Gases
With Optional Integral Display

FMA5400 Series



Standard

- ✓ 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 FMA5400/5500 Series electronic gas mass flow controllers can control the flow of a wide variety of gases from 10 SCCM up to 1000 SLM. Utilizing heat transfer through a heated tube, the FMA5400/5500 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 FMA5400 Series without integral display is supplied with both an analog 0 to 5 Vdc and 4 to 20 mA output for remote monitoring; the FMA5500 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 FMA5400/5500 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).



FMA5512, shown smaller than actual size.

FMA5402ST mass flow controller without display, 316 SS body, shown smaller than actual size.

The FMA5400/5500 Series controllers require 12 to 15 Vdc power @ 800 mA maximum, which can be supplied by the FMA545PW wall plug-in socket power supply (24 Vdc power input @ 650 mA is available as an option). 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 FMA5500 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: ±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) ±3% FS for units ≥100 SLM from 0 to 20% of range

Repeatability: ±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 ±2% of set flow rate over 25 to 100% FS

Maximum Gas Pressure: 35 kg/cm² gage (500 psig); 1.76 kg/cm (25 psig) optimum

Gas and Ambient Temperature: 5 to 50°C (41 to 122°F)

Leak Integrity: 1 x 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 Vdc @ 800 mA standard; 24 Vdc @ 650 mA optional

Turndown Ratio: 50:1

Shipping Weight: 1.8 kg (4 lb)

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

Minimum Pressure Drop:

SLM	psid	SLM	psid
Up to 9	1.1	200	10
10 to 30	3.9	500	12
50	8	1000	15
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"
200 SLM	31.2 (12.30)	16.8 (6.60)	4.4 (1.75)	⅜"
500 SLM	31.5 (12.40)	19.2 (7.55)	7.6 (3.00)	½"
1000 SLM	26.7 (10.53)	21.7 (8.56)	10.2 (4.00)	¾ 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	Maximum Flow Rate
FMA5502	FMA5502ST	FMA5402	FMA5402ST	10 SCCM
FMA5504	FMA5504ST	FMA5404	FMA5404ST	20 SCCM
FMA5506	FMA5506ST	FMA5406	FMA5406ST	50 SCCM
FMA5508	FMA5508ST	FMA5408	FMA5408ST	100 SCCM
FMA5510	FMA5510ST	FMA5410	FMA5410ST	200 SCCM
FMA5512	FMA5512ST	FMA5412	FMA5412ST	500 SCCM
FMA5514	FMA5514ST	FMA5414	FMA5414ST	1 SLM
FMA5516	FMA5516ST	FMA5416	FMA5416ST	2 SLM
FMA5518	FMA5518ST	FMA5418	FMA5418ST	5 SLM
FMA5520	FMA5520ST	FMA5420	FMA5420ST	10 SLM
FMA5523	FMA5523ST	FMA5423	FMA5423ST	15 SLM
FMA5524	FMA5524ST	FMA5424	FMA5424ST	20 SLM
FMA5526	FMA5526ST	FMA5426	FMA5426ST	30 SLM
FMA5527	FMA5527ST	FMA5427	FMA5427ST	40 SLM
FMA5528	FMA5528ST	FMA5428	FMA5428ST	50 SLM
FMA5540	FMA5540ST	FMA5440	FMA5440ST	60 SLM
FMA5541	FMA5541ST	FMA5441	FMA5441ST	80 SLM
FMA5542	FMA5542ST	FMA5442	FMA5442ST	100 SLM
FMA5543	FMA5543ST	FMA5443	FMA5443ST	200 SLM
FMA5544	FMA5544ST	FMA5444	FMA5444ST	500 SLM
FMA5545*	FMA5545ST*	FMA5445*	1827FMA5445ST*	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 ¾ 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 24 Vdc powered units, add suffix "24VDC" to the model number, no additional cost.

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

Ordering Examples: FMA5410-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.

FMA5516, N₂ controller with display, and FMA545PW, power supply.



FMA5512, shown smaller than actual size.