

# MASS FLOWMETERS AND CONTROLLERS

## With or Without Integral Display



FMA-A21(\*)  
without display



FMA-A23(\*)  
with display

FMA-A2100/2200/2300/2400

**\$494**

Basic Model



- ✓ ±1% Accuracy
- ✓ Linear Output
- ✓ Low Cost
- ✓ Thermal Technology
- ✓ For Flow Rates up to 75 SLM
- ✓ Power Supply Included

The FMA-A2100/2200/2300/2400 Series Electronic Mass Flowmeters/Controllers provide high performance, versatility and state-of-the-art design in one compact package. The FMA-A2100/ 2200/2300/2400 uses capillary-type thermal technology to directly measure mass flow of gases. No temperature, pressure, or square root corrections are required.

The FMA-A2300/2400 Series comes with an LCD display, and all models come with linear 0-5 and 4-20 mA output.

The FMA-A2100/2200/2300/2400 measures the mass flowrate of

gases in 23 ranges from 0-10 SCCM to 0-75 SLM. For the complete listing, refer to the range table on p. D-14. The FMA-A2100/2200/ 2300/2400 Series is compatible with most non-corrosive gases. The user is advised to check the wetted materials against gas compatibility.

OMEGA's Mass Flow Controllers use an internal electromagnetic proportional valve to control the mass flowrate. A command signal can be supplied either by the internal setpoint pot or by a 0-5 Vdc external source.

**Range Table** *HIGHLIGHTED RANGES STOCKED FOR FAST DELIVERY ON FLOWMETERS!*

Code	SCCM	Code	SLM	Code	SLM
00	0-10	06	0-1	14	0-35
01	0-20	07	0-2	15	0-40
02	0-50	08	0-5	16	0-45
03	0-100	09	0-10	17	0-50
04	0-200	10	0-15	18	0-55*
05	0-500	11	0-20	19	0-60*
		12	0-25	20	0-65*
		13	0-30	21	0-70*
				22	0-75*

*\*Only for FMA-A2100/2300 Series*

**SPECIFICATIONS**

**Accuracy:** ±1% of full scale including linearity

**Repeatability:** ±0.15% full scale or better

**Turndown Ratio:** 100:1

**Response Time:** 1 second

**Gas Ambient Temperature:** 0 to 50°C (32 to 122°F)

**Temperature Coefficient:** 0.05% full scale per 1°C or better

**Pressure Coefficient:** 0.01% full scale per PSI or better

**Minimum Pressure Requirements:**

**Meters:** 1 inch of H<sub>2</sub>O

**Controllers up to 1 SLM:** 1 PSI

**Controllers greater than 20 SLM:** 20 PSI

**Differential Pressure for Mass**

**Flow Controllers:** <5 LPM, 5-50 psi standard >5 LPM, 20-40 psi standard

**Maximum Gas Pressure:** 250 psig

**Leak integrity:**

1 x 10<sup>-6</sup> %<sub>min</sub> of He or better

**Wetted Parts:** Delrin, Viton® O-rings (optional) and 316 SS, Viton® O-rings (standard for controllers)

**Connections:** ¼" FNPT standard, for all stainless steel models ¼" compression fitting

**Input/Output Connection:**

9-pin sub-D connector

**Control Signal:** 0-5 Vdc

**Control Valve:** Electromagnetic normally closed

**Output signal:** Linear 0-5 Vdc, 1000 ohms min load, 4-20 mA, 500 ohms loop resistance

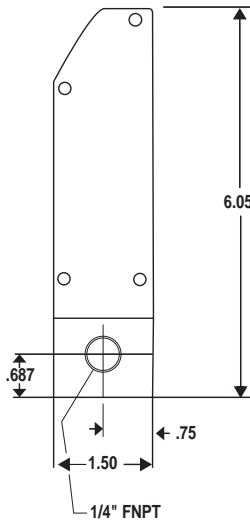
**Input Power:**

**Meters:** 24 Vdc @ 300 mA, 115 Vac, 220 Vac with ac adaptor

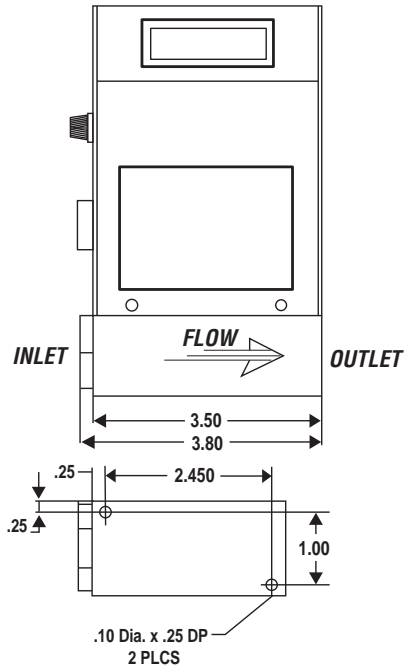
**Controller:** 24 Vdc @ 300 mA, 115 Vac, 220 Vac with ac adaptor

**Dimensions:** See drawing

**Weight:** 1.25 kg (2.75 lb) with power supply



**Compatible Meters:**  
DPF50, DPF60, DPF300,  
DP24-E, DPF403



**MOST POPULAR MODELS HIGHLIGHTED!**

<b>To Order (Specify Model Number)</b>		
Model No.	Price	Description
FMA-A21(*)	\$494	Mass flow meter without display, ranges 0-10 SCCM to 0-75 SLM
FMA-A22(*)-SS-(**)	1024	Mass flow controller with control valve, ranges 0-10 SCCM to 0-50 SLM, 316 SS Std.
FMA-A23(*)	544	Mass flow meter with display, ranges 0-10 SCCM to 0-75 SLM
FMA-A24(*)-SS-(**)	1059	Mass flow controller with display and control valve, ranges 0-10 SCCM to 0-50 SLM, 316 SS Std.

*\*Insert range code from table at top of page to complete model number. Add "-SS" for optional 316 stainless steel body and add \$400 to cost of unit. (¼" compression fittings standard)*

*Note: All controller flow ranges specified are for nitrogen or air at 20; psig when used for other gases, a correlation factor is needed to determine the flow rate. See page D-22. Meter flow rates are specified at nitrogen 14.7 psia.*

*\*\*Specify gas, inlet/outlet Pressure, temperature*

*Ordering Examples: FMA-A2416-SS, 316 SS mass flow controller with control valve, calibrated for nitrogen at 20 psig inlet, room temperature for 0-45 SLM. ΔP: 5-20 psi, \$1059 + 400 = \$1459.*

*FMA-A2102-SS, mass flow meter without display, 0-50 SCCM, \$494 + 400 = \$894.*

*All units are supplied with operator's manual, 9-pin sub-D connector, power supply and NIST calibration. (No Data Points).*

*Add -NIST5 to model number and a 5-point NIST Certificate will be included free of charge.*

*Add -NIST10 for a 10-point NIST Calibration Certificate and add \$125 to price of unit.*

**Accessory\***

Model No.	Price	Description
FMA-200PWA	\$40	Replacement socket plug-in power supply for 90 to 260 Vac

*\*All units are supplied with power supply, this accessory is for an additional power supply.*



#### UNITED STATES

[www.omega.com](http://www.omega.com)  
1-800-TC-OMEGA  
Stamford, CT.

#### CANADA

[www.omega.ca](http://www.omega.ca)  
Laval(Quebec)  
1-800-TC-OMEGA

#### GERMANY

[www.omega.de](http://www.omega.de)  
Deckenpfronn, Germany  
0800-8266342

#### UNITED KINGDOM

[www.omega.co.uk](http://www.omega.co.uk)  
Manchester, England  
0800-488-488

#### FRANCE

[www.omega.fr](http://www.omega.fr)  
Guyancourt, France  
088-466-342

#### CZECH REPUBLIC

[www.omegaeng.cz](http://www.omegaeng.cz)  
Karviná, Czech Republic  
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