

# MASS AND VOLUMETRIC GAS FLOW CONTROLLERS

FMA-2617A  
Starts at

£935



- ✓ 20+ Gas Calibrations, Including He, O<sub>2</sub>, Neon, N<sub>2</sub>O, N<sub>2</sub>, Air, Argon, CO, CO<sub>2</sub>, Methane, Ethane, H<sub>2</sub>, Propane, Butane, iso-Butane, Ethylene, Acetylene, Krypton, Xenon, Sulfur Hexafluoride
- ✓ Pressure, Temperature, and Volumetric and Mass Flow Simultaneously Displayed (FMA-2600A Series)
- ✓ Easy-to-Use Pushbutton Interface
- ✓ Traceability Standard
- ✓ Full Scale Ranges from 0.5 SCCM to 1500 LPM
- ✓ Response Time of 50 to 100 ms Typical
- ✓ Turndown Ratio of 100:1 Typical
- ✓ Position Insensitive
- ✓ ±0.8% Reading Accuracy
- ✓ RS232 Standard



FMA-1613A, £1880, shown smaller than actual size.

FMA-2601A, £1405, shown smaller than actual size.

The FMA-2600 and FVL-2600 Series mass and volumetric flow controllers use the principle of differential pressure within a laminar flow field to determine and control mass flow rate. A laminar flow element (LFE) inside the meter forces the gas into laminar (streamlined) flow. Inside this region, the Poiseuille equation dictates that the volumetric flow rate be linearly related to the pressure drop. A differential pressure sensor is used to measure the pressure drop along a fixed distance of the LFE. This, along with the viscosity of the gas, is used to accurately determine the volumetric flow rate. Separate absolute temperature and pressure sensors are incorporated and correct the volumetric flow rate to a set of standard conditions. This standardised flow rate is commonly called the mass flow rate and is reported in units such as standard cubic feet per minute (SCFM) or standard litres per minute (SLM).

The controller uses a true proportional valve coupled to the flow body to control flow using the integral PID loop controller. Standard units include a 0 to 5V output (4 to 20 mA optional) and RS232 communications. The gas-select feature and the setpoints can be adjusted from the front keypad or via RS232 communications. Volumetric flow, mass flow, absolute pressure, and temperature can all be viewed or recorded through the RS232 connection. It is also possible to multi-drop up to 26 units on the same serial connection to a distance of 50 metres.

The FVL-2600 Series comprises volumetric flow controllers only. They do not measure or correct for absolute pressure or temperature. The FMA-2600 Series is recommended if operating pressure is above 1 barg or if there is any restriction or backpressure in the application.

## SPECIFICATIONS

**Accuracy:** ±0.8% of reading<sup>†</sup>

**Repeatability:**

FMA-2600A: ±0.5% FS

FVL-2600A: ±1% FS

**Turndown Ratio:** 100:1

**Control Response Time:** 100 ms

**Input Control Signal:** 0 to 5 Vdc, RS232

**Output Signal:** 0 to 5 Vdc, RS232

**Optional Input/Outputs:** 4 to 20 mA, 0 to 10 Vdc

**Operating Temperature:** -10 to 50°C

**Zero Shift:** 0.02%/ATM FS/°C

**Span Shift:** 0.02%/ATM FS/°C

**Humidity Range:** 0 to 100% RH, non-condensing

**Excess Flow Rate:** 2.4% FS

**Maximum Pressure:** 125 psig, typical

**Mass Flow Controllers:** 125 psig

**Volumetric Flow Controllers:** Near atmosphere<sup>†</sup>, 15 psig recommended maximum

**Minimum Differential Pressure Required:**

5 LPM and under: 5 psid; 10 to 250 LPM: 15 psid;

500 LPM: 5 psid; 1500 LPM: 10 psid

**Supply Current:** 0.250 A for 20 (S) LPM and under; 0.75 A for 50 (S) LPM and above (typical)

**Supply Voltage:** Less or equal to 20 (S) LPM: 12 to 25V; Less or equal to 50 (S) LPM: 24 to 30V

**Electrical Connections:** 8-pin circular mini DIN

**Wetted Materials:** 303 and 302 SS, FKM, silicone RTV (rubber), glass-reinforced nylon, aluminium, brass, 410 SS; >250 (S) LPM: add 416 SS and nickel

<sup>†</sup> Volumetric flowmeters and controllers not certified for accuracy at mass flow rates above the rated flow range of the meter. They are designed for near atmospheric pressure conditions only. The recommended maximum operating pressure is 1 barg.



## Quick Selection Guide

- Operating pressures over 1 barg or with more than a little backpressure, use FMA-2600A Series.
- Line temperature or pressure changes, use FMA-2600A Series.
- If only basic, digital, and uncompensated volumetric flow is required, use the more economical FVL-2600A Series.
- For comparing or running flowmeters or controllers in line, use FMA-2600A Series.

Dimensions: mm

Flow Range	Height	Length	Depth
0.5 to 50 SCCM	100	89	26.7
100 SCCM to 10 SLPM	104.1	92	26.7
20 SLPM	107	92	26.7
50 to 100 SLPM	120	177	58
250 SLPM	127	177	58
500 to 1500 SLPM	127	188	58

Please allow approximately 45 mm on top of the unit for electrical cable connection.

 **MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model Number)

Model No. Gas Mass Flow Controller	Price	Model No. Volumetric Gas Flow Controller	Price	Connection	Flow Range
FMA-2601A	£1405	FVL-2601A	£1395	10-32 thread	0.5 SCCM
FMA-2602A	1405	FVL-2602A	1240	10-32 thread	1 SCCM
FMA-2614A	1255	FVL-2614A	1240	10-32 thread	2 SCCM
FMA-2615A	1255	FVL-2615A	1240	10-32 thread	5 SCCM
FMA-2603A	1090	FVL-2603A	1075	10-32 thread	10 SCCM
FMA-2616A	1090	FVL-2616A	1075	10-32 thread	20 SCCM
FMA-2604A	1090	FVL-2604A	1075	10-32 thread	50 SCCM
FMA-2617A	935	FVL-2617A	920	¼ FNPT	100 SCCM
FMA-2618A	935	FVL-2618A	920	¼ FNPT	200 SCCM
FMA-2619A	935	FVL-2619A	920	¼ FNPT	500 SCCM
FMA-2620A	935	FVL-2620A	920	¼ FNPT	1 SLPM
FMA-2605A	935	FVL-2605A	920	¼ FNPT	2 SLPM
FMA-2606A	935	FVL-2606A	920	¼ FNPT	5 SLPM
FMA-2607A	935	FVL-2607A	920	¼ FNPT	10 SLPM
FMA-2608A	1095	FVL-2608A	1080	¼ FNPT	20 SLPM
FMA-2609A	1195	FVL-2609A	1180	¼ FNPT	50 SLPM
FMA-2610A	1340	FVL-2610A	1325	¼ FNPT	100 SLPM
FMA-2611A	1580	FVL-2611A	1570	½ FNPT	250 SLPM
FMA-2612A	1660	FVL-2612A	1650	¾ FNPT	500 SLPM
FMA-2613A	1880	FVL-2613A	1870	¾ FNPT	1000 SLPM
FMA-2621A	1880	FVL-2621A	1870	¾ FNPT	1500 SLPM

Each unit comes with NIST certificate, AC power supply, 1.8 m cable 8-pin mini DIN connector and complete operator's manual.

Standard "-I2" and "-V2" options are scaled to the flow rate. For a different secondary output scale, add "-T" for temperature and "-P" for pressure, no additional charge.

Add "-(\*)": Please specify gas, inlet/outlet or backpressure, and temperature for custom calibrations.

Add "-I" to model number for 4 to 20 mA output, and add £40 to price.

Add "-I2" to model number for second channel output of 4 to 20 mA, and add £40 to price.

Add "-V2" to model number for second channel output of 0 to 5V, and add £40 to price.

Add "-TOT" to model number for totaliser option, and add £80 to price.

Please specify resolution. This is a 6-digit counter. **Example:** For totalising in litres with 10 ml resolution, the max count would be 9999.99.

**Example:** For totalising in litres with 1 litre resolution, the max count would be 999999.

**Ordering Example:** FMA-2617A-I2, ¼ FNPT mass gas flow controller with optional second channel output of 4 to 20 mA, £935 + 40 = £975.

FMA-2620A, ¼ FNPT mass flow controller, £935.

## Accessories for FMA/FVL-2600A Series

Model No.	Price	Description
FMA1600-C1	£23.50	Replacement single-ended 1.83 m 8-pin mini DIN cable connector
FMA1600-C3	28.00	1.8 m adaptor cable with male 8-pin DIN to male DB9
FMA1600-E1-UK	56.00	230 Vac to 12 Vdc power supply, with 3-pin UK plug
FMA1600-E2-UK	98.00	230 Vac to 24 Vdc power supply, with 3-pin UK plug
FMA1600-E1	56.00	230 Vac to 12 Vdc power supply, with 2-pin Euro plug
FMA1600-E2	98.00	230 Vac to 24 Vdc power supply, with 2-pin Euro plug
FW-364	58.00	Reference Book: Control Valve Primer—A User's Guide

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