

# HIGH FLOW-RATE GAS MASS CONTROLLERS AND METERS *For Clean Gases*

## FMA-700A/800A Series



- ✓ ±1% Accuracy (Up to 500 SLM), ±0.2% Repeatability
- ✓ Low Cost
- ✓ For Flow Rates Up to 1000 SLM
- ✓ Normally Closed Valve for Added Safety
- ✓ Fast Response
- ✓ Altitude Insensitive
- ✓ Removable Sensing Tube Assembly

The TRODEX® FMA-700A and 800A Series mass flow meters and controllers extend the range of mass flow measurement and control from 0 to 5 SCCM to 1000 SLM with 50:1 turndown capability. Like all mass flow sensors, these units measure mass flow rate directly, without the need for temperature or pressure corrections.

The FMA-700A and 800A Series work on the heated bypass sensor tube principle. The units feature corrosion-resistant stainless steel and FKM construction and a 325 mesh (44 micron) inlet screen to prevent contamination of the sensor. The flow body and valve leak less than 10<sup>-8</sup> atm-cc/sec of helium. In the event of a power failure, the valve is normally closed.

The FMA-78P2 and FMA-78P4 are 2- and 4-channel readout/power supply/setpoint control electronic boxes for use with FMA-700A and 800A Series mass flow sensors. The units feature 000.0 to 102.4% of full scale display, a ±15 Vdc power supply, setpoint potentiometers (for mass flow controllers), power cord, and an electrical connector for hookup of the electronics boxes' outputs.



The FMA-78P Series rate indicators/electronics packages also have back-panel blend control switches that select independent/slave operations for each channel (channel 1 is the master), and the units include a 0 to 5 Vdc output for each channel for chart recording, data acquisition, or computer interfacing.

### SPECIFICATIONS

- Accuracy:** ±1% full scale (up to 500 SLM), ±2% full scale for 750 to 1000 SLM
- Repeatability:** ±0.2% full scale
- Turndown Ratio:** 50:1
- Response Time:** 2.0 seconds
- Analog Setpoint:**
  - 0 to 5 Vdc: Voltage output models
  - 4 to 20 mA: Current output models
- Linear Output:**
  - Standard: 0 to 5 Vdc into 2000 Ω min
  - Optional: 4 to 20 mA, into 200 to 750 Ω

- Maximum Pressure:**
  - FMA-760A to FMA-772A: 1000 psig
  - FMA-773A to 778A: 200 psig
  - FMA-860A to FMA-874A: 1500 psig
  - FMA-875A to FMA-878A: 1000 psig

**Pressure Coefficient:** 0.1% typical

### Differential Pressure:

- FMA-800A Series: 0.5 psid
- FMA-700A Series: No less than 20% of supply pressure, depending on parameters

### Temperature Range:

Gas and Ambient -10 to 70°C (14 to 158°F)

### Temperature Coefficient:

0.05% full scale/°C

**Wetted Parts:** 316 SS body and sensing tube assembly, FKM elastomers, other materials available

### POWER

**Voltage Output Models:** 12 Vdc (±5%) or 15 Vdc (±10%)

**mA Output Models:** 15 Vdc (±5%) or 24 Vdc (±15%)

### Current Consumption:

- FMA-800A: <45 mA DC
- FMA-700A: <250 mA DC

### Dimensions: mm (inch); Weight: kg (lb)

Model No.	Height	Length	Width	Weight
FMA-760A	115 (4.5)	123 (4.8)	25 (1)	0.7 (1.5)
FMA-761A to 770A	115 (4.5)	128 (5.0)	25 (1)	0.7 (1.5)
FMA-771A & 772A	131 (5.1)	161 (6.4)	44 (1.8)	1.8 (4)
FMA-773A & 774A	134 (5.3)	184 (7.3)	48 (1.9)	2.4 (5.2)
FMA-775A to 778A	150 (5.9)	216 (8.5)	64 (2.5)	5 (11)
FMA-860A	115 (4.5)	102 (4.0)	25 (1)	0.5 (1)
FMA-861A to 870A	115 (4.5)	102 (4.0)	25 (1)	0.5 (1)
FMA-871A to 874A	131 (5.1)	116 (4.6)	44 (1.8)	0.9 (2)
FMA-875A & 876A	150 (5.9)	151 (5.9)	64 (2.5)	2.4 (5.3)
FMA-877A & 878A	150 (5.9)	185 (7.3)	64 (2.5)	3 (6.6)

# RATE INDICATORS

## Electronics For Completing The System



† Meters/controllers **must** have 0 to 5 Vdc outputs.

When a panel meter system is required, order your mass flow sensor with the following components:

- **Power Supply (FPW-15):**  
See Accessories table below
- **Display and Alarm (DPF64)**
- **Totalization (DPF65 or DPF66)**

FMA-78P4 readout/power supply electronics shown smaller than actual size.  
FMA-78C10, 3 m (10') interconnecting cable, sold separately.

Various Compatible Meters: DPF50, DPF60, DPF300, iSeries, DPF403.  
Visit us online for details

### SPECIFICATIONS (FMA-78P Series)

**Power:** 117 Vac ±10%, 50 to 60 Hz, 50 watts

**Dimensions:**

215.9 W x 123.8 H x 247.7 mm D  
(8½ x 4¾ x 9¾")

**Display:** 0 to 102.4%

### Rate Indicators/Electronics Boxes

Model No.	Description
FMA-78P2	For up to 2 meters controllers†
FMA-78P4	For up to 4 meters controllers†

† Meters/controllers **must** have 0 to 5 Vdc outputs.

### Accessories

Model No.	Description
FMA-78C10	3 m (10') interconnect cable with connectors
FMA-78C25	8 m (25') interconnect cable with connectors
FMA-78C50	15 m (50') interconnect cable with connectors
FPW-15	15 Vdc power supply**

**Note:** All flow ranges are specified for nitrogen or air. When used for other gases, a correlation factor is used to determine flow rate.

Comes complete with operator's manual and mating connector.

\*\* For use with FMA-700A/800A Series units only.

### Mass Flow meters/Controllers

#### To Order

Model No. Controller (with Valve)	Model No. Meter	Compression Fitting (inch)	Range
FMA-760A-V(*)	FMA-860A-V	1/8	0 to 5 SCCM
FMA-761A-V(*)	FMA-861A-V	1/4	0 to 10 SCCM
FMA-762A-V(*)	FMA-862A-V	1/4	0 to 20 SCCM
FMA-763A-V(*)	FMA-863A-V	1/4	0 to 50 SCCM
FMA-764A-V(*)	FMA-864A-V	1/4	0 to 100 SCCM
FMA-765A-V(*)	FMA-865A-V	1/4	0 to 200 SCCM
FMA-766A-V(*)	FMA-866A-V	1/4	0 to 500 SCCM
FMA-767A-V(*)	FMA-867A-V	1/4	0 to 1 SLM
FMA-768A-V(*)	FMA-868A-V	1/4	0 to 2 SLM
FMA-769A-V(*)	FMA-869A-V	1/4	0 to 5 SLM
FMA-770A-V(*)	FMA-870A-V	1/4	0 to 10 SLM
FMA-771A-V(*)	FMA-871A-V	1/4	0 to 15 SLM
FMA-772A-V(*)	FMA-872A-V	1/4	0 to 20 SLM
FMA-773A-V(*)	FMA-873A-V	1/4	0 to 50 SLM
FMA-774A-V(*)	FMA-874A-V	1/4	0 to 100 SLM
FMA-775A-V(*)	FMA-875A-V	3/8	0 to 200 SLM
FMA-776A-V(*)	FMA-876A-V	3/8	0 to 500 SLM
FMA-777A-V(*)	FMA-877A-V	1/2	0 to 750 SLM
FMA-778A-V(*)	FMA-878A-V	3/4	0 to 1000 SLM

(\*) Replace asterisk in model number with gas name, inlet pressure, and outlet pressure.

Replace "-V" in model number with "-I" for 4 to 20 mA output; no additional cost.

For NIST calibration, add suffix "-NIST" to model number for additional cost.

**Ordering Examples:** FMA-871A-V, 150 psig, ambient temperature.

FMA-766A-V(N2, 20/0 psi, 70°F), mass flow controller for nitrogen, 20 psi inlet pressure, 0 psi outlet, and 70°F temperature, range 0 to 500 SCCM.