POSiFA
Microsystems, Inc.

PMF2000 Series

Mass Airflow Sensors

Description

Posifa designed the PMF2000 series of mass airflow sensors incorporate the latest MEMS and microelectronics innovations. The sensor die uses a pair of thermopiles to detect changes in temperature gradient caused by mass flow, delivering ultra-low noise-to-signal, and unsurpassed repeatability. The "solid state" thermal isolation on the sensor die eliminates the need for surface cavities or fragile membranes, used in competing solutions, making the sensor resistant to clogging and pressure shock. The sensor's internal signal conditioning circuitry leverages an off-the-shelf microcontroller, providing proven reliability and low cost.

The PMF2000 series of mass airflow sensors covers the ranges from 10 sccm to 2000 sccm. The sensors are fully calibrated and compensated over the temperature range of 0 to 50 °C (32 to 122 °F). The linearized analog output (1 to 5 V) provides customers with maximum flexibility and ease-of-use.

Bidirectional air flow versions are available upon request. Consult Factory

Features

- Unsurpassed performance in a robust and cost effective package
- High accuracy and repeatability (2% F.S. Max)
- Linear output and temperature compensation
- Long-term stability with minimal null drift
- "Solid state" sensing core (no surface cavity or fragile membrane), resistant to clogging and pressure shock
- Analog output (1 to 5 V)
- High sensitivity at very low flows
- Fast response time (1 ms)

Applications

- Medical respirators and ventilators
- Patient monitoring systems
- Anesthesia delivery machines
- Nebulizers
- Oxygen concentrators
- Sleep apnea machines
- Ventricular assistance devices
- Environmental monitoring
- Analytical instrumentation
- Gas leak detection
- Filter monitoring and VAV systems in HVAC
- Process Control

Absolute Maximum Ratings

- Operating Temperature: -25 °C to 85 °C
- Storage Temperature: -40 °C to 90 °C
- Humidity: 0 to 100% RH*
- Shock 100 g peak (5 drops, 6 axis)
- Common Mode Pressure 25 psi**

*Sensor is resistant to water condensation
*Packaging with higher common model pressure rating is available

ELECTRICAL CHARACTERISTICS

Test Conditions: Vin=10±0.01VDC, Ta=25°C. Relative Humidity: 40%<RH<60%

Maximum Operating Temperature Range –25°C to +85°C

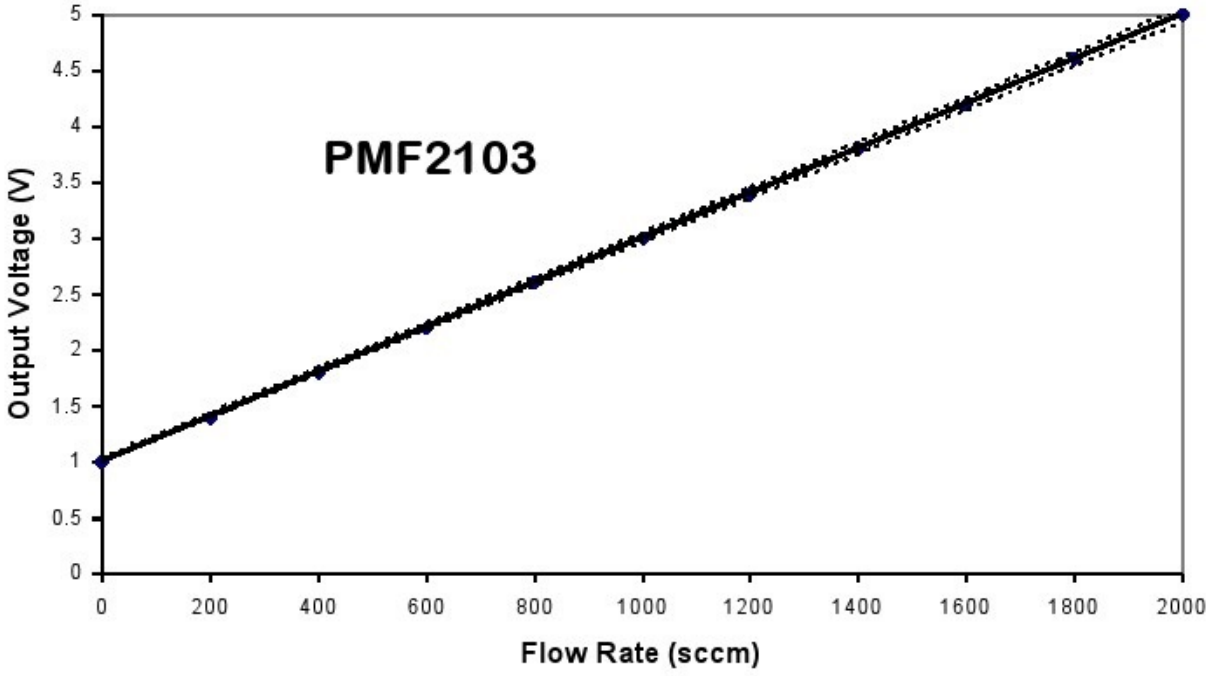
PARAMETERS	PMF2050V				CONDITIONS
	MIN	TYP	MAX	UNIT	
Flow Range[1] (Full Scale)	0		10	SCCM	
Max Output Voltage	4.94	5.00	5.02	VDC	@10 sccm
PARAMETERS	PMF2100V				CONDITIONS
	MIN	TYP	MAX	UNIT	
Flow Range[1] (Full Scale)	0		30	SCCM	
Max Output Voltage	4.94	5.00	5.02	VDC	@30 sccm
PARAMETERS	PMF2101V				CONDITIONS
	MIN	TYP	MAX	UNIT	
Flow Range[1] (Full Scale)	0		200	SCCM	
Max Output Voltage	4.94	5.00	5.02	VDC	@200 sccm
PARAMETERS	PMF2102V				CONDITIONS
	MIN	TYP	MAX	UNIT	
Flow Range[1] (Full Scale)	0		1000	SCCM	
Max Output Voltage	4.94	5.00	5.02	VDC	@1000 sccm
PARAMETERS	PMF2103V				CONDITIONS
	MIN	TYP	MAX	UNIT	
Flow Range[1] (Full Scale)	0		2000	SCCM	
Max Output Voltage	4.94	5.00	5.02	VDC	@2000 sccm
PARAMETERS	PMF2000 Series				CONDITIONS
	MIN	TYP	MAX	UNIT	
Analog Voltage Output [2]	1		5	VDC	
Null Voltage[3]	.98	1	1.02	VDC	
Null Drift		0.2		% / Year	Full Scale
Temperature Drift			4	%	0°C to +50°C
Repeatability		0.1		%	Full Scale
Load		100		KΩ	
Accuracy[4] (Full Scale)		1.5	2	%	
Response Time		1	3	mSec	
Supply Voltage	8	10	14	VDC	
Supply Current	22		23	mA	
Inrush Current [5]			550	mA	Duration: 3 ms
Wetted Materials	Silicon carbide, Epoxy, PPS, FR4, Silicone as static seal				

1. Custom ranges available between 10 and 2000 sccm
2. See Linear Output Flow Rate Calculation on Page 3
3. Null tolerance for PMF2050V is ± 0.1V
4. Accuracy for PMF2100V and PMF2050V is 2.5% F.S. Max
5. A series resistance of 5 ohms on the source supply will reduce inrush current to under 250 mA (duration: 8 ms)

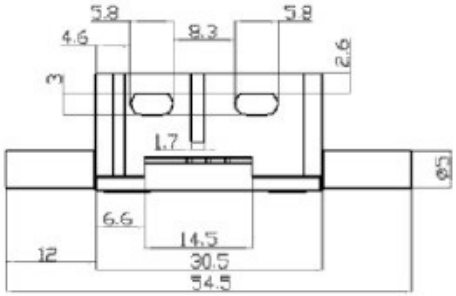
Linear Output

Flow Rate = [(Vout - 1 V) / 4 V] x Full Scale Flow Rate

For example, using the PMF2103 below, the device has a Full Scale Flow Rate of 2000 sccm. When the Output Voltage reads 2.5V, the Flow Rate will be: [(2.5V-1V)/4V x 2000 sccm] =750 sccm

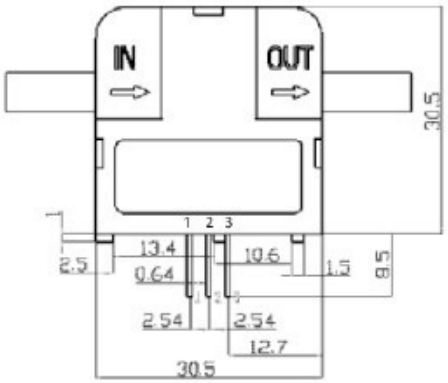


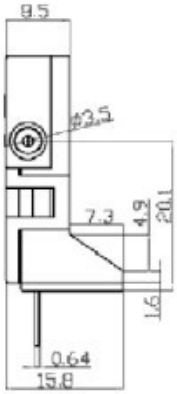
Package Dimensions



Pin-out

1 Vout
2 Vcc
3 GND





Ordering Information

Part Number	Specifications
PMF2050V	1 to 5 V, linear; 0 to 10 SCCM
PMF2100V	1 to 5 V, linear; 0 to 30 SCCM
PMF2101V	1 to 5 V, linear; 0 to 200 SCCM
PMF2102V	1 to 5 V, linear; 0 to 1000 SCCM
PMF2103V	1 to 5 V, linear; 0 to 2000 SCCM

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