

Description

Posifa designed the PMF2000 series of mass airflow sensors from the ground up, incorporating 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 cavity 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 for both unidirectional and bidirectional flow. 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.

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



Features

- Unsurpassed performance in a robust and cost effective package
- High accuracy and repeatability (1.5% F.S.)
- 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)
- Bidirectional flow sensing option

Absolute Maximum Ratings

- Operating Temperature -25 °C to 85 °C
- Storage Temperature -40 °C to 90 °C
- Media Compatibility: Dry Gas Only
- Shock 100 g peak (5 drops, 6 axis)
- Common Mode Pressure 25psi

ELECTRICAL CHARACTERISTICS					
Test Conditions: $V_{in}=10\pm 0.01VDC$, $T_a=25^{\circ}C$. Relative Humidity: $40\%<RH<60\%$					
Maximum Operating Temperature Range $-25^{\circ}C$ to $+85^{\circ}C$					
PARAMETERS	PMF2050V			UNIT	CONDITIONS
	MIN	TYP	MAX		
Flow Range ¹ (Full Scale)	0		10	SCCM	
Max Output Voltage	4.95	5.00	5.05	VDC	@10 sccm
PARAMETERS	PMF2100V			UNIT	CONDITIONS
	MIN	TYP	MAX		
Flow Range ¹ (Full Scale)	0		30	SCCM	
Max Output Voltage	4.95	5.00	5.05	VDC	@30 sccm
PARAMETERS	PMF2101V			UNIT	CONDITIONS
	MIN	TYP	MAX		
Flow Range ¹ (Full Scale)	0		200	SCCM	
Max Output Voltage	4.95	5.00	5.05	VDC	@200 sccm
PARAMETERS	PMF2102V			UNIT	CONDITIONS
	MIN	TYP	MAX		
Flow Range ¹ (Full Scale)	0		1000	SCCM	
Max Output Voltage	4.95	5.00	5.05	VDC	@1000 sccm
PARAMETERS	PMF2103V			UNIT	CONDITIONS
	MIN	TYP	MAX		
Flow Range ¹ (Full Scale)	0		2000	SCCM	
Max Output Voltage	4.95	5.00	5.05	VDC	@2000 sccm
PARAMETERS	PMF2000 Series			UNIT	CONDITIONS
	MIN	TYP	MAX		
Analog Voltage Output ²	1		5	VDC	
Null Voltage	.95	1	1.05	VDC	
Null Drift		0.2		% / Year	Full Scale
Temperature Drift			4	%	$0^{\circ}C$ to $+50^{\circ}C$
Repeatability		0.1		%	Full Scale
Load		100		K Ω	
Accuracy (Full Scale)		1.5		%	
Linearity Error (Full Scale)			0.8	%	
Response Time		1	3	mSec	
Supply Voltage	8	10	14	VDC	
Supply Current	22		23	mA	
Wetted Materials	Silicon carbide, Epoxy, PPS, FR4, Silicone as static seal				

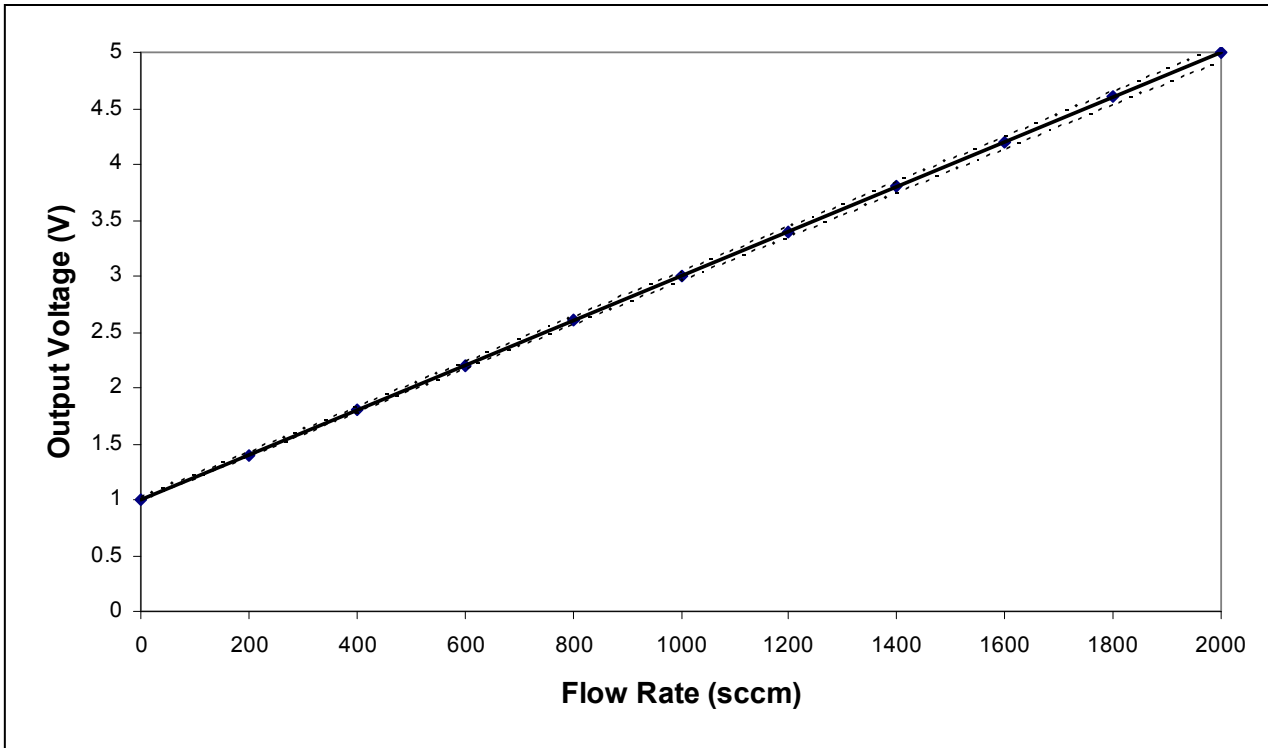
1. Custom ranges available between 10 and 2000 sccm

2. See Linear Output Flow Rate Calculation on Page 3

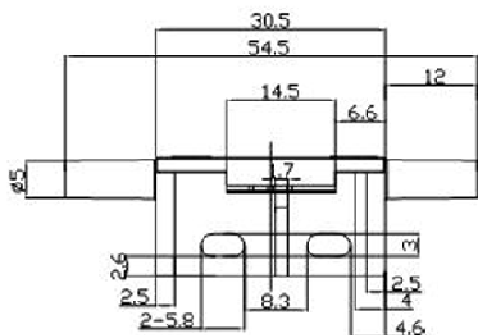
Linear Output

Flow Rate = $[(V_{out} - 1\text{ V}) / 4\text{ V}] \times \text{Full Scale Flow Rate}$

For example, PMF2103 has a Full Scale Flow Rate of 2000 sccm. When the Output Voltage reads 2.5V, the Flow Rate will be: $[(2.5\text{V}-1\text{V})/4\text{V} \times 2000\text{ sccm}] = 750\text{ sccm}$

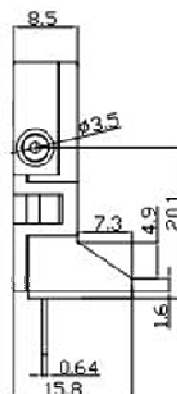
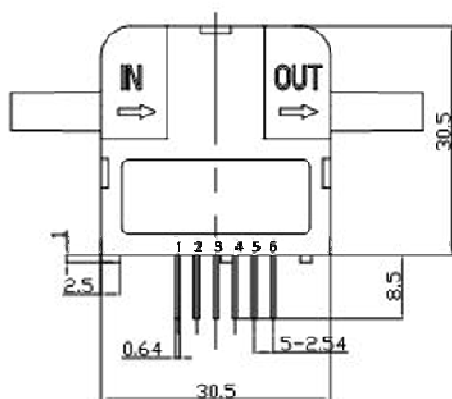


Package Dimensions



Pin-out

- 1 Null
- 2 Vout
- 3 Vcc
- 4 GND
- 5 Null
- 6 Null



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
PMF2999V	1 to 5 V, linear; custom range