PMF5000 Series
MASS AIR FLOW SENSOR FOR MEDICAL DEVICES

DESCRIPTION
Posifa designed the PMF5000 series of mass air flow sensors specifically for portable medical devices. The sensor is fast and accurate, enabling the precise amount of gas to be delivered in a pulse mode. The sensor's small footprint fits nicely inside a space-constrained housing. The push-to-connect fittings supports efficient assembly. The flow direction (forward or backward) can be customized to work with an existing system layout.

PMF5000 features Posifa's third-generation thermal flow die, benefiting from the latest innovations in microfabrication. The sensor die uses a pair of thermopiles to detect changes in temperature gradient caused by mass flow, delivering excellent signal-to-noise, and repeatability. The "solid state" thermal isolation structure on the sensor die eliminates the need for surface cavity or fragile membrane used in competing technologies, making the sensor resistant to clogging and pressure shock.

The PMF5000 series includes the analog output PMF5000V and the digital I²C output PMF5000D.

The PMF5000 series is a proven product that has been used in quantity in FAA approved, FDA cleared, and CE certified medical devices.

MAXIMUM RATINGS
- Operating Temperature: -25 to 85 °C
- Calibrated Temperature Range: 0 to 50 °C
- Storage Temperature: -40 to 90 °C
- Humidity: 0 to 100% RH, non-condensing
- Shock: 100 g peak (5 drops, 3 axis)
- Operating Pressure: 25 psi

FEATURES
- Unsurpassed performance in a robust and cost effective package
- "Solid state" sensing core (no surface cavity or fragile membrane) resistant to clogging and pressure shock
- Highly accurate (4% reading typ.)
- Fast response time (5 ms typ.)
- Linear output and temperature compensation
- Long-term stability with minimal null drift
- Push-to-connect fittings
- Flow direction can be changed (forward or backward) per customer request
- Analog or digital I²C output
- Proven in FAA approved, FDA cleared, and CE certified medical devices
### SPECIFICATIONS

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

<table>
<thead>
<tr>
<th>SPECIFICATIONS</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNIT</th>
<th>CONDITIONS</th>
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<td>SLM</td>
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- **Output Voltage (V)** 1 to 5 VDC
- **Null Voltage (V)** 0.95 to 1.05 VDC
- **Output Count (D)** 256 to 16124 Count
- **Null Count** 156 to 356 Count
- **Null Drift** 0.5 to 1% F.S.
- **Repeatability** 0.2 to 1% F.S.
- **Accuracy** 1% F.S. 0 to 25% F.S., 4% Reading 25 to 100% F.S.
- **Resolution (D)** 14 Bit
- **Response Time** 5 mSec
- **Warm Up Time** 30 mSec
- **Supply Voltage (V)** 6 to 16 Vdc 10V recommended
- **Supply Voltage (D)** 4.75 to 16 Vdc 10V recommended
- **Supply Current** 22 to 26 mA at 10 VDC supply
- **Wetted Materials** Silicon carbide, Epoxy, Nylon (fittings), PPE+PE (main housing), FR4.

1. SLM: standard liter per minute. Standard conditions: 0 °C and 1 atmosphere.
2. V refers to the analog version of PMF5000, and D refers to the digital I2C version.
3. Maximum deviation in output from nominal over the entire calibrated flow range and temperature range. Errors include offset, full scale span, linearity, flow hysteresis, repeatability and temperature effects over the compensated temperature range.
4. 10% to 90% rise time of the flow sensor to electrically respond to any mass flow change. May be affected by the pneumatic interface.
LINEAR OUTPUT

For **PMF5000V**
Flow Rate = \[(V_{out} - 1 \text{ V}) / 4 \text{ V}\] x Full Scale Flow Rate

For example, for PMF5006V full scale flow rate is 15 SLM. When Vout reads 3 V, the Flow Rate is: \[(3 \text{ V} - 1 \text{ V})/4 \text{ V} \times 15 \text{ SLM}] = 7.5 \text{ SLM}\n
For **PMF5000D**
Flow Rate = \[(\text{Count} - 256) / 15868\] x Full Scale Flow Rate

For example, for PMF5006V full scale rate is 15 SLM. When digital output reads 10000, the Flow Rate is:
\[(10000 - 256)/15868 \times 15 \text{ SLM}] = 9.21 \text{ SLM}\n
*Contact Posifa for I²C communication app note*
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PACKAGE DIMENSIONS

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<th>Pin#</th>
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Mating connector:
JST XH Connector
Contact: SXH-002T-P0.6
Housing: XHP-6

Contact Posifa for sensor CAD model
PMF5000 Series
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ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>SPECIFICATIONS</th>
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<tr>
<td>PMF5006D</td>
<td>15 SLM, ¹C, Linear</td>
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<tr>
<td>PMF5007D</td>
<td>20 SLM, ¹C, Linear</td>
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<td>PMF5003D</td>
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<td>PMF5008D</td>
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<tr>
<td>PMF5009D</td>
<td>60 SLM, ¹C, Linear</td>
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Note:
Order 1 to 5V analog output models by specifying "V" instead of "D" in part numbers above.
Please use suffix -IN or -MM to indicated desired tubing dimensions. -IN is for 1/4 OD tubing, and
-MM for 6mm OD tubing.

Please contact Posifa or your local distributor to place an order.

EUROPEAN DISTRIBUTOR
BS-rep GmbH
Eichertstr. 68, D-56745 Weibern, Germany
Tel: +49 (0) 2655 / 96 26 476
Email: info@sensor-rep.de

CUSTOMIZATION OPTIONS
If the standard product described in this datasheet does not completely meet your needs, please contact Posifa Technologies to discuss other options. Help us understand your application and sensor requirements and we can work together to find the best overall solution.