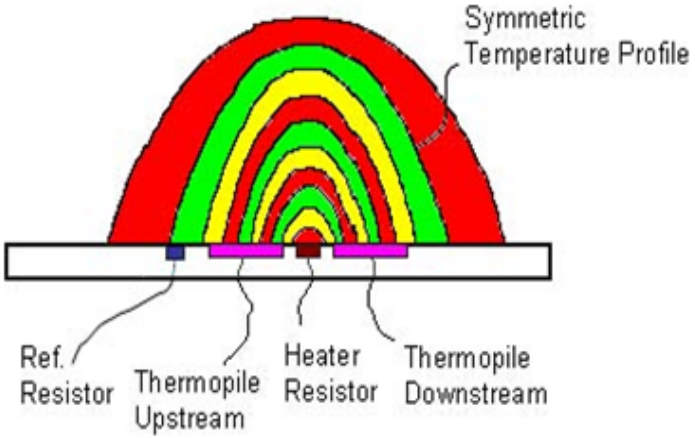
Introduction of Flow Sensors

Date: 1-Jun-2019

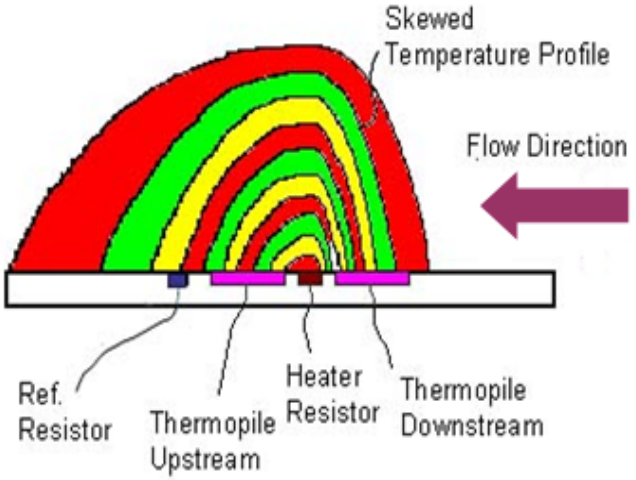
Version: 1.4

DESCRIPTION

The SFD flow sensing die consists of two thermopiles symmetrically positioned upstream and downstream from a heater element which heats up the hot junctions. The thermopile generates an output voltage proportional to the temperature gradient between its hot and cold junctions (the Seebeck effect). The hot junctions of the thermopiles and the heater reside on a thermal isolation base.



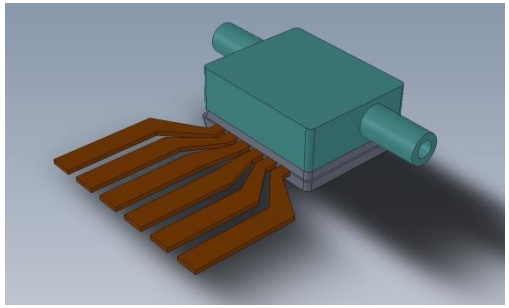
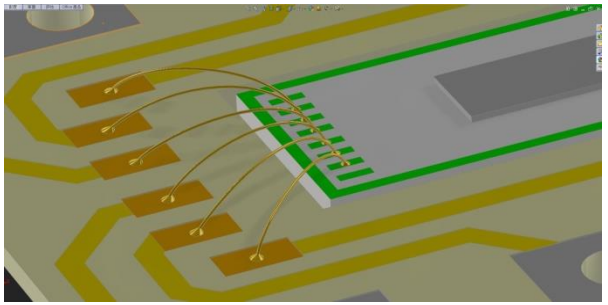
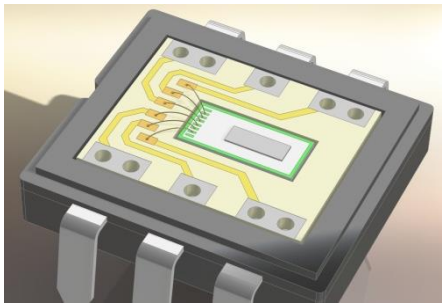
In case the medium is static, the temperature profile upstream and downstream from the heater is symmetric; In case the medium flows, the temperature profile skews in the flow direction due to heat transport of the flowing medium, causing changes in thermopile output. Heat transport is proportional to mass flow and heat capacity of the medium. Therefore the sensor measures the mass flow of the medium



A reference resistor is placed next to the cold junction of the upstream thermopile to provide input for temperature compensation.

Why Sensormate …

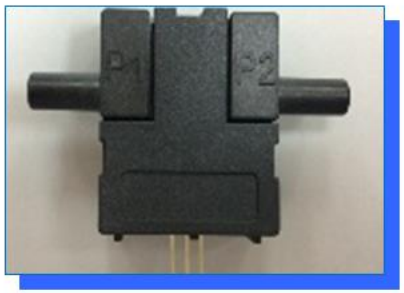
- MEMS flow sensor wafer fabrication
- Flow passage design
- In-house package & calibration facilities
- ODM prototyping & volume production

Portfolio of Flow Sensors

Series A

Series 1K



Series 2K&3K

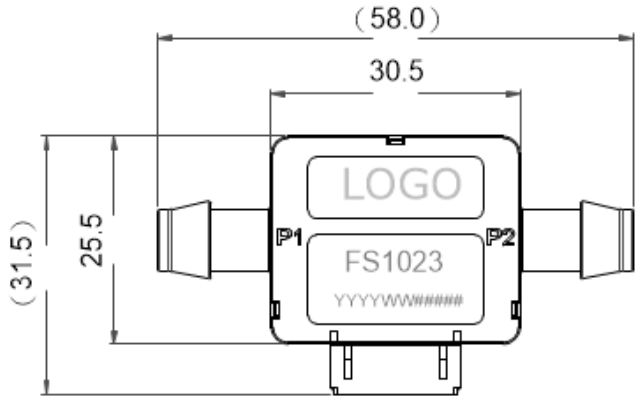
Series 4K

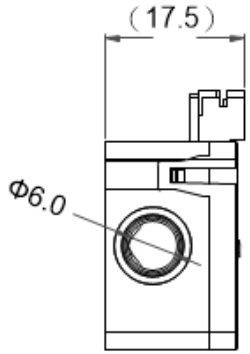
Series 5K

Series 6K

Series 7K

Series 1L

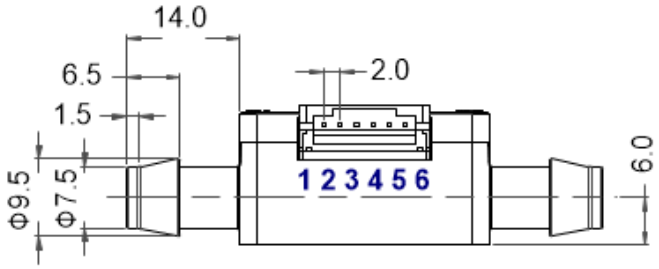


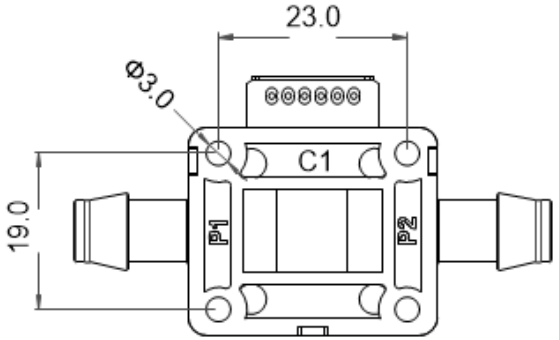


Unit: mm

Pin#	Description
1	+5V
2	GND
3	Flow Out
4	N/C
5	Heater Enable 5V
6	Temp Out

JST S6B-PH-SM4-TB or Equivalent





Ordering Information

1 L A – 3 0 2 U – 5 1 0 1

- 1 — Series
- L — Working Fluid
- A — Output Type
- 302 — Range
- U — Flow Direction
- 5 — Electric Connection
- 1 — Output
- 0 — Condition
- 1 — Option

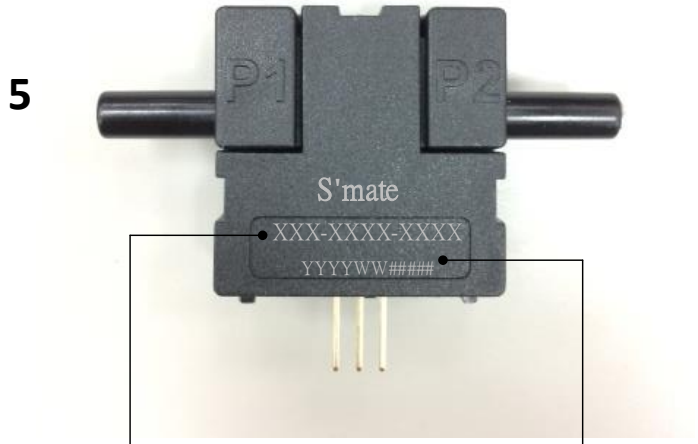
1	Series 1000
L	Liquid
A	Analog
302	3 LPM
U	Uni-direction
5	Connector
1	0~4.5V
0	n/a
1	FS1023

Air Flow Sensors

The 2K series of mass airflow sensors covers the ranges from 10 sccm to 10000 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.

Applications

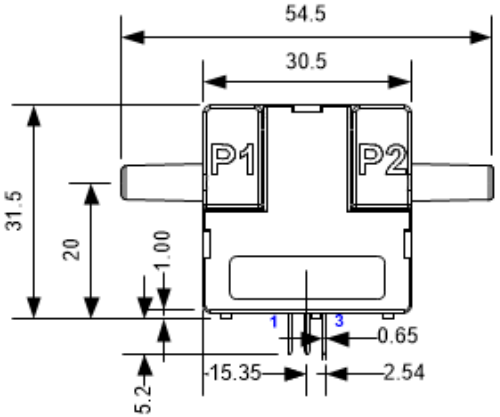
- Medical respirators and ventilators
- Patient monitoring systems
- Anesthesia delivery machines
- Nebulizers
- Oxygen concentrators
- Sleep apnea machines
- Ventricular assistance devices
- Environmental monitoring
- Analytical instrumentation

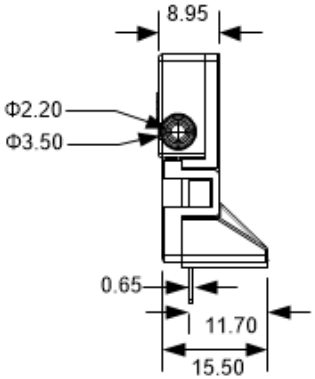


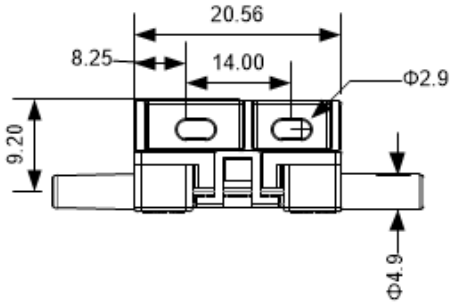
Smate Ref.
2GA-102U-3210

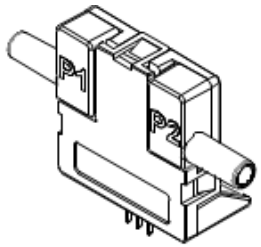
Serial Numbering
YYYYWW#####
(i.e. year, week, and a 5-digit number)

Ex. 20173100001
- 1st part which was manufactured in 31th week of 2017









Unit:mm

Pin #	Description
1	OUT
2	V_{DD}
3	V_{SS}

Ordering Information

2	G	A	–	100	U	–	3	2	1	0
Series	Working Fluid	Output Type		Range	Flow Direction		Electric Connection	Output	Condition	Option

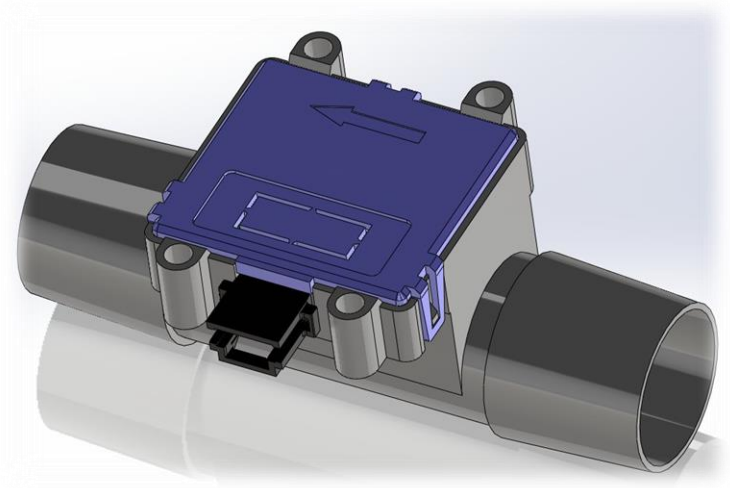
2	2K
G	Gas
A	Analog
100	10 sccm
U	Uni-direction
3	Terminal pins
2	1 to 5 V
1	0℃
0	n/a

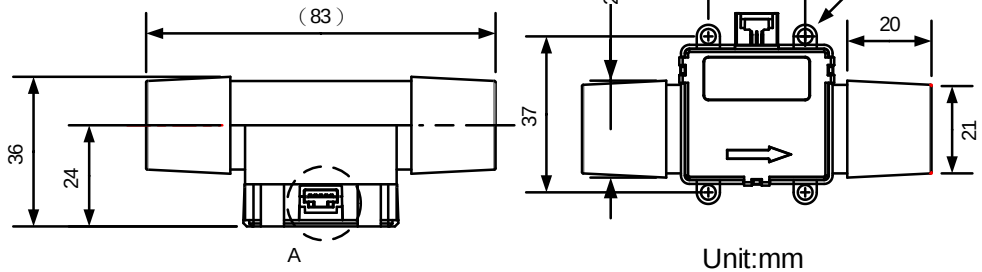
Air Flow Sensors

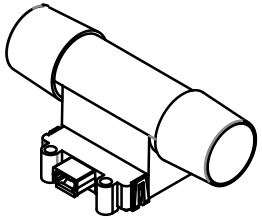
The PMF4000 series of Mass Air Flow Sensors covers the ranges from 12 SLM to 300 SLM. The sensors are temperature compensated over the temperature range of 0 to 50 ˚C (32 to 122 ˚F). The linearized analog output (1 to 5 V) provides maximum flexibility and ease-of-use.

Applications

- Oxygen concentrators
- Oxygen conservers
- Respirators and ventilators
- Nebulizers
- Anesthesia delivery
- Spectroscop
- Mass flow controllers







Pin	Description
5	N.C.
4	GND
3	V_{IN}
2	SCL
1	SDA

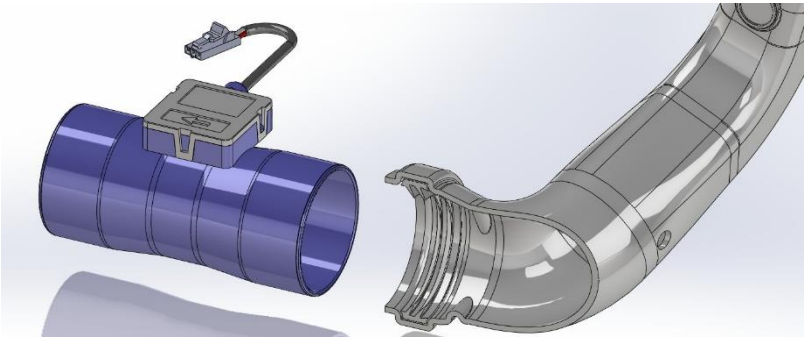
Ordering Information

4 G A — 2 0 4 U — 5 2 1 0

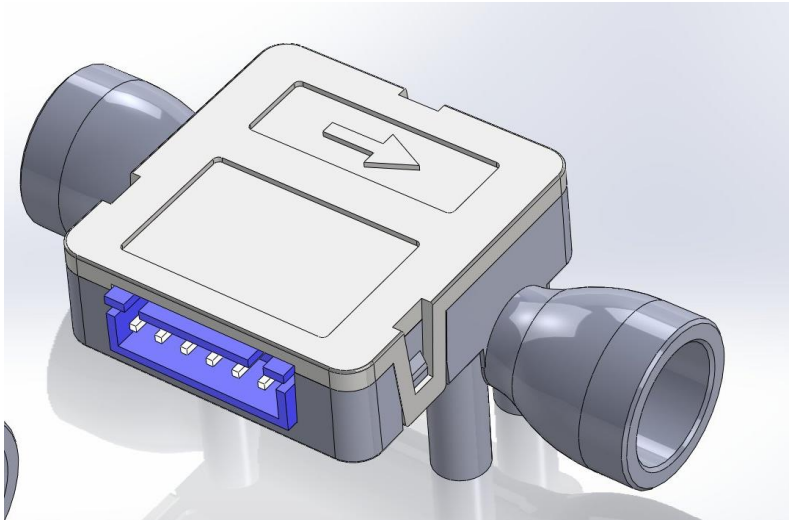
- **4** — Series
- **G** — Working Fluid
- **A** — Output Type
- **204** — Range
- **U** — Flow Direction
- **5** — Electric Connection
- **2** — Output
- **1** — Condition
- **0** — Option

4	Series
G	Gas
A	Analog
204	200 SLM
U	Uni-direction
5	Connector
2	1 to 5 V
1	0º C
0	n/a

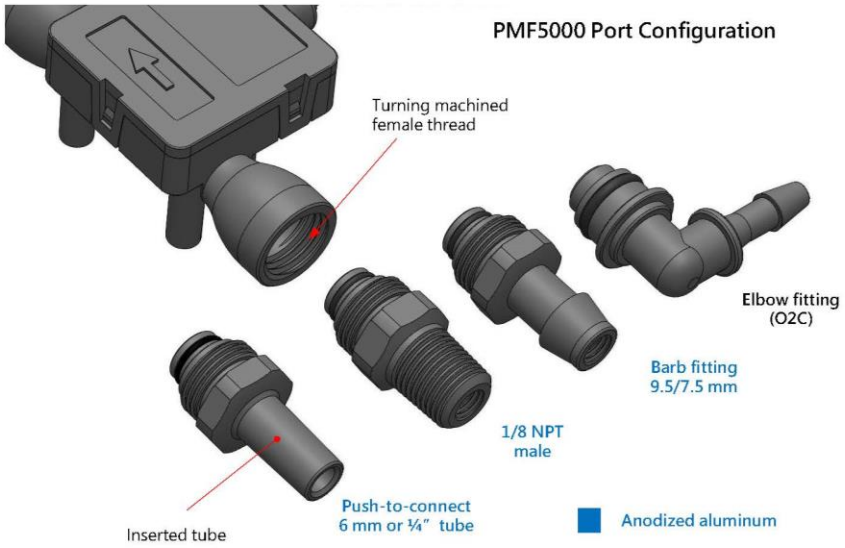
Customized Flow Sensors



Flow Sensor for Blower



Flow Sensor w/PTC



How to create part number to order flow sensors