Siargo Ltd.

Model FS7001P

SIARGO MEMS FLOW SENSING PRODUCTS

MEMS Mass Flow Sensors

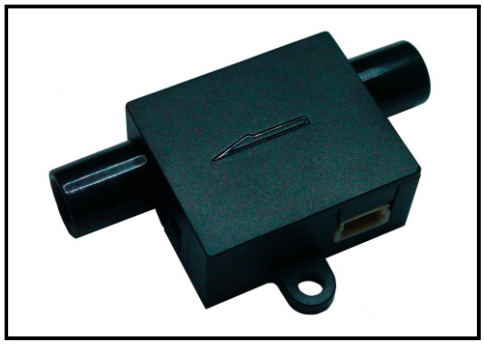
VA.1

MEMS Mass Flow Sensor

FS7001P

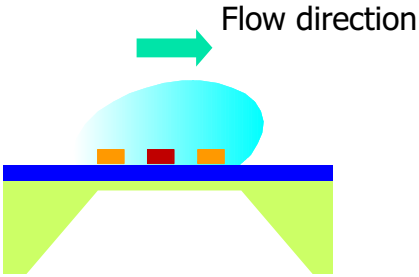
Features

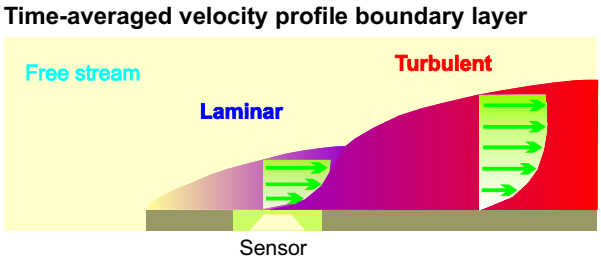
- Mass flow sensing from 0 ~ 500 sccm
- Customizable and friendly user interface
- Customizable connection
- Pressure drop less than 15 Pa
- Miniature design for easy installation
- High sensitivity



Working Principle and Configuration

The MEMS calorimetric sensor is installed at the flow channel wall forming a plate that serves as the additional flow condition from the boundary layer configuration resulting in a laminar flow. The mass flow measurement is established as the fluid carries heat away from the heater causing the redistribution of the temperature field. Accurate flow





Specifications

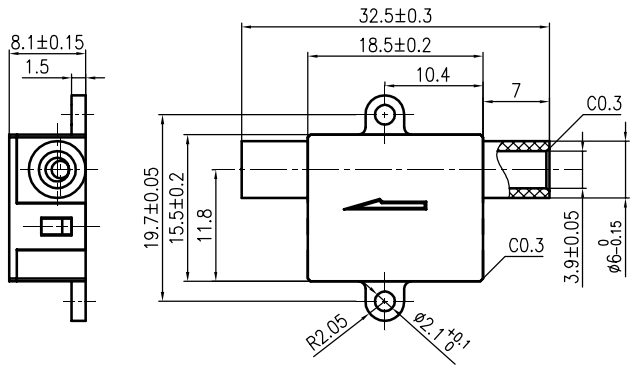
All data unless otherwise noted apply for calibration conditions: Air , 20 °C, 101.325 kPa absolute pressure, horizontal mounting.

Specifications	Value			Unit
Flow range[1]	0~500 (Max. 600)			sccm
Repeatability[2]	± 3%			FS
Supply voltage[3]	3.3 ± 5%			Vdc
Output[4]	Non-linear analog voltage			
	Min.	*Typ.*	*Max.*	
Output voltage@600sccm	2.5	2.75	3.0	Vdc
Null voltage	0.4	0.6	0.8	Vdc
Power consumption[5] (@ Full scale)	8.5	9.2	10	mA
Working Pressure	70		140	kPa
Pressure drop (@ Full scale)		10	15	Pa
Humidity	0		95	%RH (no icing or condensation)
Temperature	0		55	°C
Temperature coeff.	0	0.25	0.3	%/°C
Offset/FS stability[6,7]		0.2		%FS/year
Noise level/SNR (signal to noise)		100:1		
Life time[7]		5.5		years
Storage pressure	50		150	kPa
Storage temperature	-20		60	°C
Storage humidity	0		90	%RH (no icing or condensation)
Warming up drift[8]			±10	mV
Warming up time[8]			1	min
Connector	SM03B-SRSS-TB (LF)(SN)(JST Mfg. Co., Ltd.)			
Weight	2.475			g
Freight(vibration)	49 CRF178.608 30min; 250rpm; amplitude 25.4 gyration			

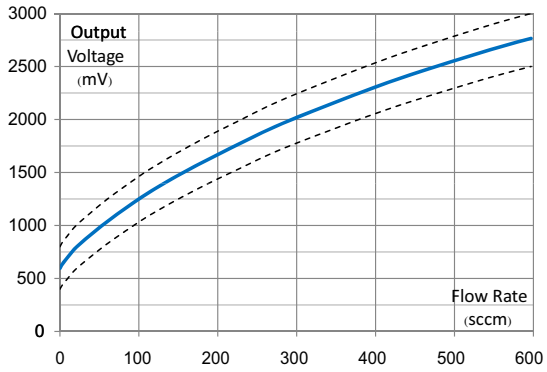
Notes:

1. The absolute maximum flow rate is 3 SLPM;
2. Repeatability is same for different temperature, whether it is 0 degC, 20 degC or 55degC;
3. The maximum power supply voltage is 5.5Vdc, but without 3.3±5% Vdc, the accuracy will be worse;
4. The maximum output load is 30mA. Void add a power supply to the output pin. If add a 3.3Vdc power supply to the output pin, the analog output component will be damaged;
5. The power consumption range include the temperature effect;
6. Offset and full scale stability means the average value shift. This value includes temperature effect of conditions that includes specification of storage and operation condition.
7. if customer use or storage the sensors out of spec, the offset and full scale stability will be higher, and the life time will be shorted.
8. The warming up drift and warming up time apply for the whole working temperature range.

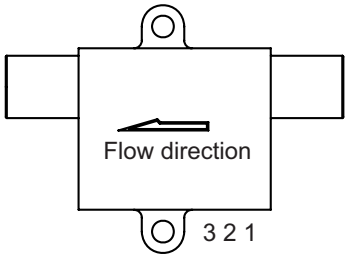
Dimensions



Output



Electrical connection



1 VCC
2 Vout
3 GND

Connector:
3 Pin, S3B-ZR-SM2-TF (LF)(SN)

Application Notes:

1. The operational output curves are from the measurement of the sensor for air flow at 20°C, 101.325kPa with straighteners. For applications deviated from these conditions, the performance may vary depending on the specific environments.
2. Place of the sensor in an environment where particle size is larger than 1.5mm may have chances to block the sensing channel thus resulting in undesired output. Presence of excessive grease or grease-like materials may also result in sensor malfunction.
3. Pressure variation would usually not result in the change of the performance of the sensor.
4. Humidity variation but without condensation would not lead to deteriorate in performance of the sensor.
5. The sensor can be cleaned by blow the dry air through the sensing channel in case some excessive foreign materials block the channel. Alternatively, the sensor can be washed with alcohol and dried with dry air or even dried in natural conditions after wash.
6. Avoid using any sharp or metal or hard solid tool to clean the channel that may result in unrecoverable damage to the sensors.
7. Avoid using any heavy tool to hit or press the sensor that may break the PC package and result in unrecoverable damage.
8. The sensors can also be configured into a linear output with additional cost. For such requirements, please contact manufacture for further information.

Safety and Maintenance

Wetted Materials and Compatibility

The sensor body is made of aluminum. Sensors comprise of silicon, silicon nitride and silicon dioxide and the sensor surfaces are passivated with silicon nitride and silicon dioxide. The electronic sealing is provided by RTV (room temperature vulcanizing) silicone sealant WR-704 composed of HOCH3(SiO)nCH3H.

Safety Precautions

The product is designed for use with general purpose gases such as air and nitrogen. It is advised that the products are best used for non-explosive clean gases. The sensors cannot be used for gas metrology of fluoride or fluoride containing gases. For updates of the product certification information, please contact manufacturer or visit www.Siargo.com. Use for other gases such as extreme corrosive and toxic may cause the product malfunctioning or even severe damages The product sealing is ensured to work under working pressure of 20 psi and is leakage proof before the shipment But cautions and further leakage test are important at installation as well since any leakage could cause severe safety issue. The power supply for this product requires a voltage supply of 3.3 ±5% VDC, all precautions and measures for electrical voltage handling must apply.

Attention: Any alternation and/or improper use of the product without the permission of the manufacturer can cause unpredicted damages and even injuries or other severe situations. Siargo Ltd. or any of its employees subsidiaries shall not be hold and indemnified against such consequences due to such circumstances via improper use of the product.

All maintenance of the sensor should be done by trained and certified personnel by Siargo Ltd. products.

For further information, please contact the manufacturer:

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