DATASHEET

AMF SERIES

GAS MASS FLOW METER

History of Revision

Datasheet Rev.	Date	Note
00	Oct/12/2019	Draft
01	Feb/22/2021	Released

CONTENTS

1. Overview

1.1 Features

- Large range and low cost
- Linear output and temperature compensated
- Keep long-term stability with small zero drift
- Independent research and development of core chip
- Dual output analog and digital (0.5-4.5V and IIC output)

1.2 Applications

- Breathing machine
- Oxygen generator
- Gas mask
- Sprayer
- Anesthesia machine
- Other gas flow measurement application etc.

1.3 Descriptions

AIoTSensing Mass flow sensor products adopt advanced MEMS flow sensor chip, with 32-bit high-speed digital processing circuits, algorithms, and metal or injection molding bypass channel and body design, the formation of a large-range, highly reliable sensor micro-system. module has low power consumption (typically 80mW), large-scale range 0-300 liters/min, fast response 5ms and other advantages. This product is based on our independent research and develop high-performance MEMS flow sensor chip and core calibration algorithm technology, with a variety of different flow channel designs, has reliable long-term stability, and can be used in a variety of industrial, medical and other places.

2. Specification

20SLM, 50SLM, 100SLM, 200SLM, 300SLM (or customize)

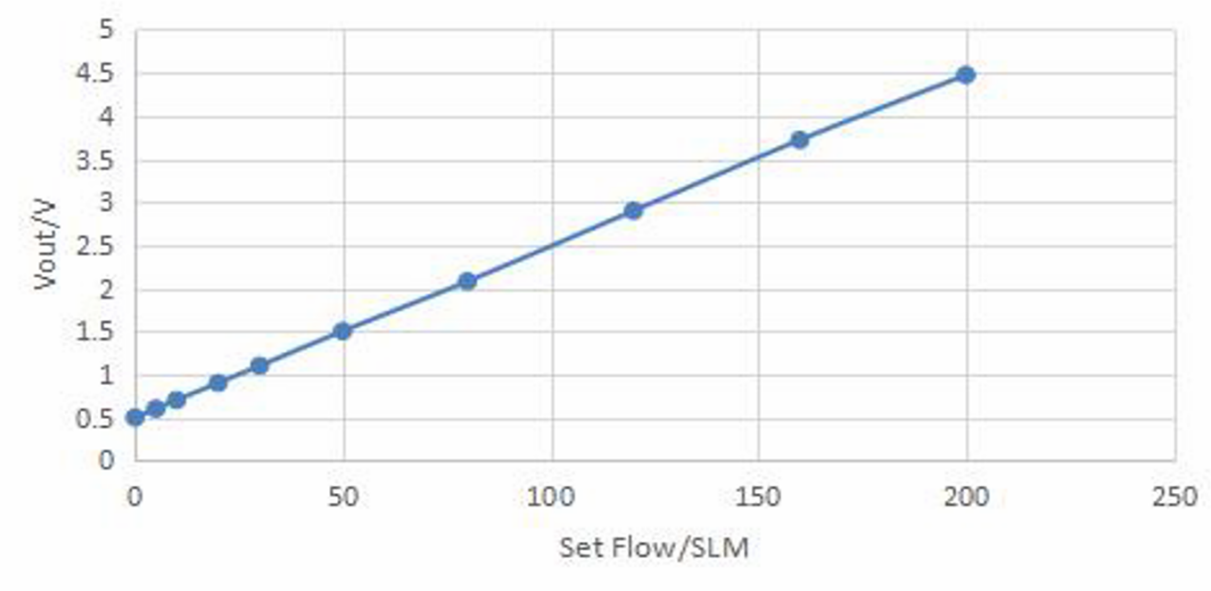
Parameter	Min	Typ.	Max	Unit
Operating voltage	7	8	12	V
Working current	8	10	15	mA
Output impedance	-	30	-	KΩ
Analog voltage output	0.5	-	4.5	V
Zero- voltage	0.45	0.5	0.55	V
Accuracy	-	2.0	2.5	% F.S
Resolution	-	0.1	-	% F.S
Repeatability	-	0.5	-	% F.S
Zero drift	-	0.2	-	% F.S
Response time	1.5	5	-	ms
Operating temperature	0	-	65	ºC
Storage temperature	-20	-	85	ºC
Body material	Epoxy resin, FR4, sealing silicone			

Note: SLM Standard Liter per Minute;

The measuring range can be customized between 10SLM and 300SML;

Test conditions are room temperature, clean air;

3. Linear Output

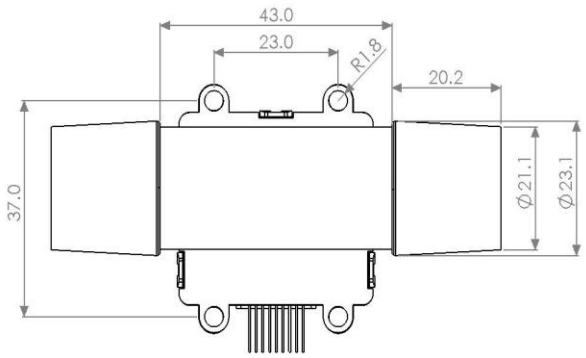


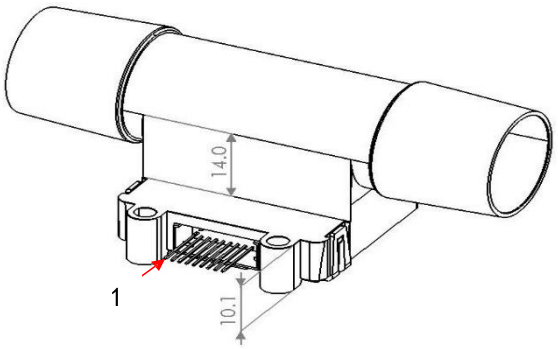
Flow conversion

Flow rate=[(Vout–0.5)/4] × full scale flow rate

For example: the full-scale output is 200SLM and the current output voltage is 2.5V, the instantaneous flow rate is [(2.5V – 0.5V)/4 × 200] = 100(SLM)

4. Dimension





Pin Definition：1 VOUT，2 NC，3 VIN，4 NC，5 GND，6 NC，7 SCL，8 NC，9 SDA

5. Model

AMF 0 6 2 3 A

- Measuring gas/calibration gas: A-Air air；N-N2 Nitrogen；O-O2 oxygen；C-CO2 Carbon Dioxide；H-CH4 Methane；R-Ar Argon.....
- Output type: 1-Analog voltage output; 2-IIC output; 3-Dual output
- Maximum range: 1. 100SLM; 2. 200SLM; 3. 300SLM
- Product type: 6
- Product definition/product features:
  0-conventional product/standard product/common product;
  1-Customized products;
  2-Low power consumption products/special products;

6. II Protocol

1. The IIC interface of this product is in Slave Mode, and the power supply voltage of the IIC device is 3.3V;
2. The device address is 0x90 (the address bit is 7 bits), the lowest bit is the read-write flag bit (0 is write, 1 is read), and its communication protocol is the standard IIC communication protocol;
3. Transmission rate: 100Kb/s in standard mode;
4. Flow data reading, the data format is as follows: direct reading-digital flow data high byte + digital flow data low byte + device IIC address + 0xED

The flow data reading example is as follows:

byte #		0							
Sent from host to slave		0x91							
	S	1	0	0	1	0	0	0	1	A
	Host start bit	Slave address (0x90)							R	Slave answer

byte #	0		1		2		3		
Host receives from slave	flow Data high byte	A Host answer	flow Data low byte	A Host answer	Device IIC address	A Host answer	0xED	A Host answer	P Host stop bit

S：Start bit
W：IIC Write mode
A：Answer
P：Stop bit
R：IIC Read mode
N：Non-response

For example, the data read is:

0x10+0x36+0x90+0xED

indicates that the gas flow is：0x1036（Hexadecimal）=4150（Decimal），as 41.50SLM

7. Safety and warranty

7.1 Safe use

When the product is used for hazardous or explosive gas, you must strictly follow the product instructions or consult the company's technicians. For the latest information about product applications, please contact the manufacturer or visit the company website. Strong corrosive or fluoride gas may affect the normal operation of the product, and even cause damage to the product. The product has been sealed and has undergone a leak-proof test before packing. It must be used under high pressure in accordance with the restrictions of the product instructions, otherwise it will cause leakage and safety problems.

Note: Any modification or improper use of this product without AIoT's permission may cause unforeseen damage, personal injury, and other harmful consequences, and the company will not bear any responsibility.

7.2 Product warranty

The product must be installed, used and maintained in strict accordance with the correct method under the normal working conditions specified in the manual. The product quality guarantee period provides 365 days free warranty from the date of shipment. For repaired or replaced products, the warranty period is 90 days or the original warranty period is extended (whichever is longer).

AIoTSensing Inc (hereinafter referred to as AIoT) is not responsible for any direct and indirect damages and losses caused by installation, disassembly and replacement (but not limited to installation, disassembly and replacement). In order to avoid unnecessary disputes, users should return their questionable products to the company. After confirming the problem, the company will determine the payment, repair or replacement. The user bears the cost and possible risks of product delivery, and AIoT bears the cost and possible risk of returning the product to the customer. All sales contracts of AIoT confirm that the user automatically accepts this warranty and its limited liability. Only AIoT has the right to change, revise the warranty conditions or decide not to enforce its terms. Note that the following conditions do not apply to the warranty terms:

1) The product has been changed, modified, in an abnormal environment specified in the manual (or outside), and any other conditions that can be regarded as abnormal use;

2) Not original products of our company;

8. Environmental requirements

For the unpacked packaging boxes, filling materials, anti-static bags and other wastes, please sort them according to paper, plastic and other garbage. For products that have reached the end of their service life, please refer to the relevant national regulations on scrapping of electronic and electrical products for disposal.

9. Legal disclaimer

1. For the export of products which are controlled items subject to foreign and domestic export laws and regulations, you must obtain approval and/or follow the formalities of such laws and regulations.
2. Products must not be used for military and/or antisocial purposes such as terrorism, and shall not be supplied to any party intending to use the products for such purposes.
3. Unless provided otherwise, the products have been designed and manufactured for application to equipment and devices which are sold to end-users in the market.
4. Before using products which were not specifically designed for use in automotive applications, please contact an AIOT sales representative.
5. This specification is subject to change without notice.

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