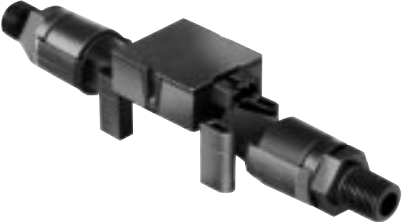


Airflow Sensors

High Flow Mass Airflow/Amplified



FEATURES

- Variety of flow connections possible
- Venturi design
- Remote mount
- Active laser trimmed to CO₂, N₂ or argon calibration

In-Line Flow Measurement

AWM5000 Series Microbridge Mass Airflow Sensors feature a venturi type flow housing. They measure flow as high as 20 standard liters per minute (SLPM) while inducing a maximum pressure drop of 2.25" H₂O. The microbridge chip is in direct contact with the flow stream, greatly reducing error possibilities due to orifice or bypass channel clogging.

Rugged, Versatile Package

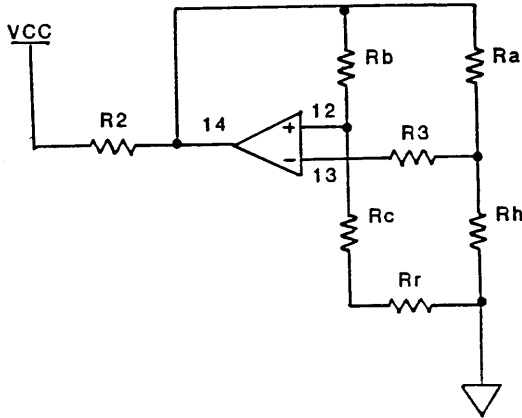
The rugged plastic package has been designed to withstand common mode pressures up to 50 psi, and the small sensing element allows 100 g's of shock without compromising performance. The ports are separate moldings which can be modified for alternative fittings with a minimum of tooling cost or performance impact. The snap-in "AMP" compatible connector provides reliable connection in demanding applications.

On-board Signal Conditioning

Each AWM5000 sensor contains circuitry which performs amplification, linearization, temperature compensation, and gas calibration. Figure 1 (Heater Control Circuit) and Figure 2 (Sensor Bridge Circuit and Amplification Linearization Circuit) illustrate the necessary circuits for the AWM5000 Series. A 1 to 5 VDC linear output is possible for all listings regardless of flow range (5, 10, 15, or 20 SLPM) or calibration gas (nitrogen, carbon dioxide, nitrous oxide, or argon). All calibration is performed by active laser trimming.

Figure 1

Heater Control Circuit

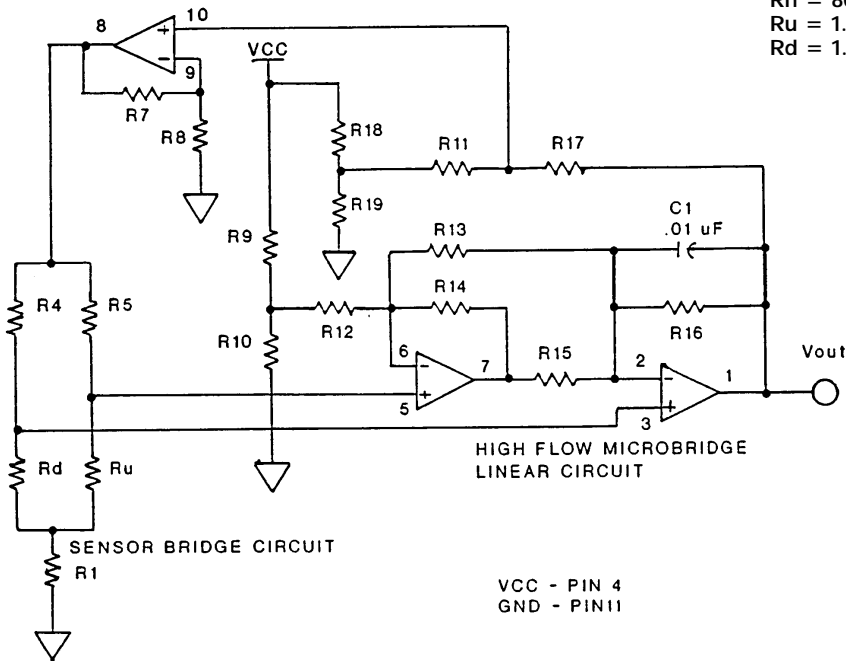


NOMINAL VALUES

- R1 = 3.3K
- R2 = 5.0K
- R3 = 1.82K
- R4 = 24.9K
- R5 = 24.9K
- R7 = 200K
- R8 = 32K
- R9 = 9.0K
- R10 = 1.0K
- R11 = 10K
- R12 = 400K
- R13 = 3.5K
- R14 = 5K
- R15 = 5K
- R16 = 400K
- R17 = 400K
- R18 = 9K
- R19 = 1K
- Ra = 500
- Rb = 3.0K
- Rc = 1.0K
- Rr = 6.0K
- Rh = 800
- Ru = 1.5K
- Rd = 1.5K

Figure 2

Sensor Bridge Circuit and Amplification Linearization Circuit



VCC - PIN 4
GND - PIN 11

Airflow Sensors

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AWM5000 Series

SPECIFICATIONS

	AWM5101	AWM5102	AWM5103	AWM5104
Flow Range	0-5 SLPM	0-10 SLPM	0-15 SLPM	0-20 SLPM

Suffix - Calibration gas	VA - Argon (Ar)	VC - Carbon dioxide (CO ₂)	VN - Nitrogen (N ₂)
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	Min.	Typ.	Max.
Excitation VDC	8	10±0.01	15
Power consumption (mW)	—	—	100
Response time (msec)	—	—	60
Null output VDC	0.95	1	1.05
Null output shift -20 to 70°C	—	±0.050 VDC	±.200 VDC
Maximum Common Mode Pressure (psi)	—	—	50
Temperature range	-20 to +70°C, (-4 to 158°F)		
Termination	2.54mm (.100") centers, .635mm (.025") square		
Weight	60 grams (2.12 oz.)		
Shock ratings	100 g peak, 6 msec half-sine (3 drops, each direction of 3 axes)		
Output @ laser trim point	5 VDC @ Full Scale Flow		
Differential pressure @ full scale	See Pressure vs. Airflow chart		
Full scale output shift -20 to +25°C, -20 to 70°C	Suffix VA or VN ±7.0% Reading, Suffix VC ±10.0% Reading		
Linearity error (2)	±3.0% Reading		
Repeatability & Hysteresis	±0.5% Reading		
Connector (Included) —Four pin receptacle (3)	Micro Switch (SS12143)/AMP (103956-3)		
Leak rate, max	0.1 psi/min. at static condition, (4)		

Notes:

1. Cannot guarantee calibration at supply voltages other than 10.00 ±0.01 VDC
2. Linearity specification applies from 2 to 100% full scale of gas flow range, and does not apply to null output at 0 SLPM.
3. Supplied in strip form. Other strip form receptacles are available, as well as various tools to assemble receptacles in strip form. Individual receptacle assemblies are also available from Amp.
4. The AWM5000 series product has a leakage spec of less than 0.1 psi per minute at 50 psi internal pressure. If during installation, the end adapters are twisted with respect to the flowtube, this will break the seal between the o-ring and the flowtube and cause a temporary leak. This leak might be as high as 1 psi or might remain in specification. It will self-reseal as the o-ring takes a new set. About 85% of the temporary leak will be gone in 24 hours. In 48 hours, complete recovery will take place.

* SLPM denotes standard liters per minute, which is a flow measurement referenced to standard conditions of 0°C torr (sea level), 50% RH.

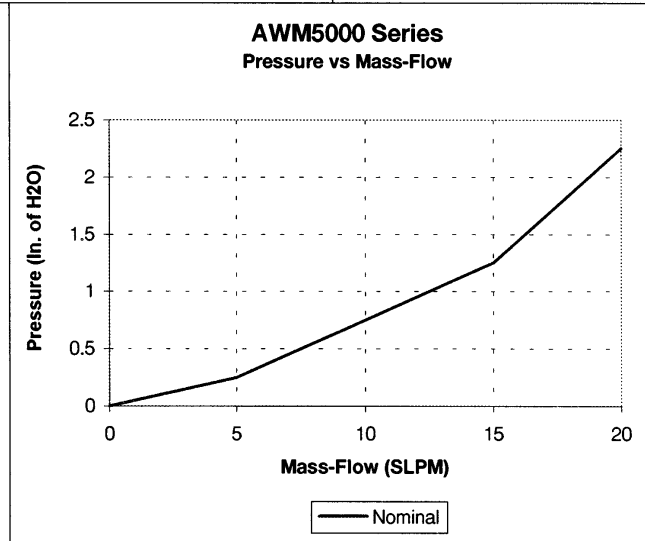
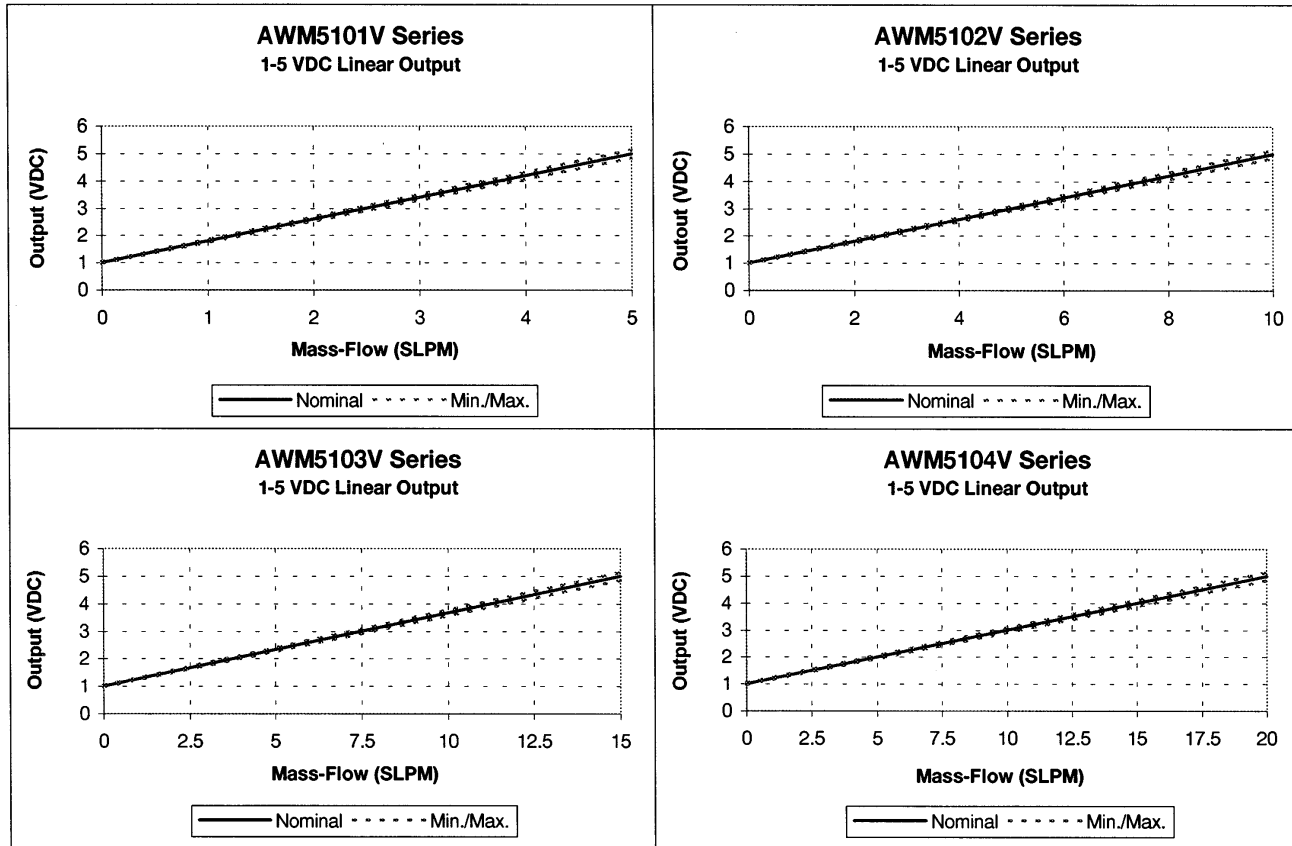


Airflow Sensors

High Flow Mass Airflow/Amplified

AWM5000 Series

OUTPUT CURVES



Airflow Sensors

AWM5000 Series

Highflow Mass Airflow/Amplified

AWM5000 ORDER GUIDE

Catalog Listing	Flow Range
AWM5101VA	5 SLPM, Argon calibration
AWM5101VC	5 SLPM, CO ₂ calibration (2)
AWM5101VN	5 SLPM, N ₂ calibration (1)
AWM5102VA	10 SLPM, Argon calibration
AWM5102VC	10 SLPM, CO ₂ calibration (2)
AWM5102VN	10 SLPM, N ₂ calibration (1)
AWM5103VA	15 SLPM, Argon calibration
AWM5103VC	15 SLPM, CO ₂ calibration (2)
AWM5103VN	15 SLPM, N ₂ calibration (1)
AWM5104VA	20 SLPM, Argon calibration
AWM5104VC	20 SLPM, CO ₂ calibration (2)
AWM5104VN	20 SLPM, N ₂ calibration (1)

CONNECTOR ORDER GUIDE

Catalog Listing	Description
SS12143	Four pin Electrical connector Connectors use Amp 103956-3

NOTE: All listings have 1 - 5 VDC linear output with 10 VDC supply over given flow range for a gas.

1. N₂ calibration is identical to O₂ and air calibration.

2. CO₂ calibration is identical to N₂O calibration.

OUTPUT CONNECTIONS

Pin 1 + Supply voltage

Pin 2 Ground

Pin 3 No connection

Pin 4 Output voltage

Flow direction indicated on housing

MOUNTING DIMENSIONS (for reference only)

