

## Mass Airflow Sensors

### AWM720P1 Airflow

#### FEATURES

- Flow tubes for ranges up to 200 SLPM
- Highly stable null and full-scale
- Compact package design
- Extremely low hysteresis and repeatability errors, less than 0.35% of reading
- Fast response time, 6 ms typical
- Low power consumption, less than 60 mW

#### TYPICAL APPLICATIONS

- Oxygen concentrators
- Oxygen conservers
- Respirators and ventilators
- Nebulizers
- Continuous positive airway pressure (CPAP) equipment
- Anesthesia delivery
- Leak detection
- Spectroscopy
- Mass flow controllers
- Telecommunication systems
- Environmental climate controls
- Fuel cell controls

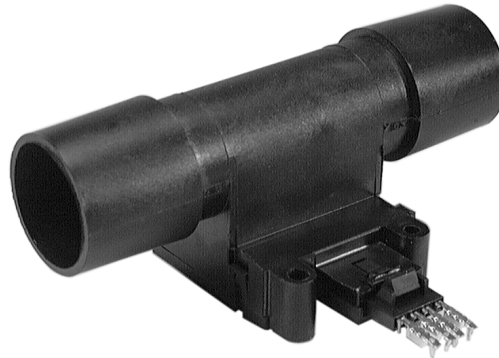
#### **⚠️ WARNING**

##### **PERSONAL INJURY**

- DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

**Failure to comply with these instructions could result in death or serious injury.**

## *AWM700 Series*



AWM700 Series microbridge mass airflow sensors provide in-line flow measurement with a specially designed bypass flow housing. The sensors measure flow as high as 200 standard liters per minute (SLPM) while inducing a pressure drop of 1 inch H<sub>2</sub>O, typically. The AWM700 has a high flow range capability in a small package.

The AWM700 has a 6 millisecond response time, requires a 10 Vdc supply, but consumes only 60 mW of power. The compact plastic package withstands overpressures of 25 psi without compromising performance. The snap-in AMP compatible connector provides reliable connection. The sensor is also well suited for use in portable devices and battery-powered applications.

The AWM700 Series provides a combination of time proven reliability, high accuracy, and precision operating characteristics. This inherent accuracy over life reduces need for recalibration. AWM700 sensor circuitry performs amplification and temperature compensation.

The AWM720P1 200 LPM Mass Airflow Sensor, developed primarily for the medical ventilation market, meets the high performance requirements of many medical and analytical instrumentation applications.

#### **⚠️ WARNING**

##### **MISUSE OF DOCUMENTATION**

- The information presented in this product sheet is for reference only. Do not use this document as product installation information.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

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## AWM720P1 Airflow

## AWM700 Series

### PERFORMANCE SPECIFICATIONS

Flow Range (Full Scale)		+ 200 SLPM		
	Min.	Typ.	Max.	Units
Excitation (1)	9.990	10.000	10.010	Vdc
Power Supply	8.000	10.000	15.000	Vdc
Power Consumption			60	mW
Output Load				
Sinking		10		mA
Sourcing		20		mA
Calibration gas		Air		
Null Voltage Shift				
+25°C to -25°C, +25°C to +85°C		± .025 typ.		Vdc
Full Scale Output Shift				
+25°C to +10°C		-2.0		% Reading
+25°C to +40°C		+2.0		% Reading
Ratiometricity Error (1)		± 0.30 typ.		% Reading
Repeatability and Hysteresis (2)		± 0.50		% Reading
Response Time		6 typ.		ms
Pressure Drop @ Full Scale		1.0 typ. 2,5 typ.		inch H <sub>2</sub> O mBar
Overpressure		25 max.		psi
Temperature Range				
Operating		-25°C to +85°C [-13°F to +185°F]		
Storage		-40°C to +90°C [-40°F to +194°F]		
Weight		34 [1.20 oz]		gram
Connector—4 pin receptacle		AMP 103956-3 (provided with sensor)		

### FLOW SPECIFICATIONS

Flow (SLPM)	Nominal (Vdc) Typical	±Tolerance (Vdc)	Pressure Drop	
			(inch H <sub>2</sub> O)	(mBar)
0	1.00	0.05	0	0
25	2.99	—	0.04	0.10
50	3.82	0.18	0.13	0.33
75	4.30	—	0.21	0.53
100	4.58	—	0.34	0.85
150	4.86	—	0.65	1.64
200	5.00	0.36	1.09	2.74

Notes: 1. Output voltage is ratiometric to supply voltage.

2. Repeatability and Hysteresis tolerances reflect inherent inaccuracies of the measurement equipment.

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## AWM720P1 Airflow

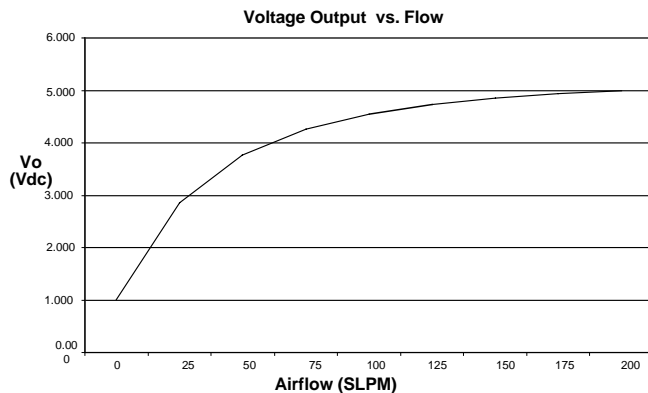


Figure 1. Voltage Output vs. Airflow

## AWM700 Series

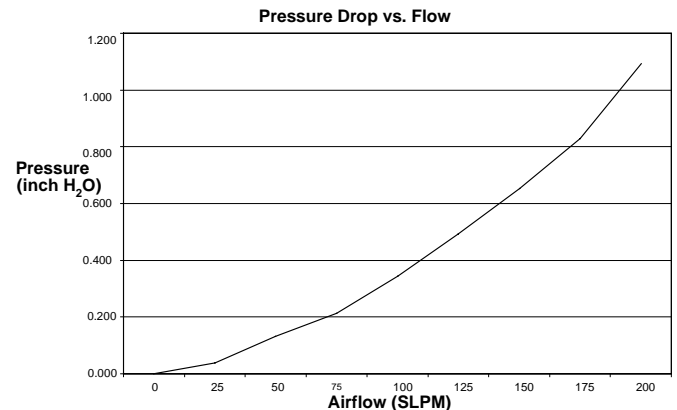


Figure 2. Pressure Drop vs. Airflow

### OUTPUT CURVES

Figure 1, Voltage Output vs. Airflow and Figure 2, Pressure Drop vs. Airflow depict performance characteristics for the AWM700 Series sensors at  $10.0 \pm 0.01$  Vdc at  $25^\circ\text{C}$ .

### NOTICE

#### LAMINAR FLOW

Due to the fast response time of the sensor, these specifications were generated using laminar flow. Airflow instability or “turbulence” present in the airstream will result in an increase in measurement uncertainty.

The turbulent flow problem can be corrected by either straightening the airflow using flow laminarizing or by slowing the response of the sensor using a simple RC time constant on the output of the sensor. This, of course, slows down the sensor response time. The values needed depend on the amount of turbulence present in the application.

Several techniques for laminarizing the flow include adding hex shaped honeycombs, foam, screen materials or adding constrictors (frits) to the flow stream. There are various commercial laminar flow elements that can be purchased. Unfortunately the greater the efficiency of the laminarizer, the greater the increase in pressure drop in order to establish a given flow rate. Plastic honeycomb material probably gives the most improvement for the least pressure drop. In any test fixture, the avoidance of sharp radii is an absolute requirement.

**Failure to comply with these application instructions may result in product failures.**

### ELECTRICAL CONNECTION

The AWM700 Series accepts a latch detent connector, such as: AMP part number 103956-3. Information on latch detent connectors is available from the AMP Product Information Center, 1-800-522-6752 or the AMP Customer Hotline, 1-800-722-1111.

### RELATED AMP LITERATURE

82160	MTE Interconnection System (AMPMODU) Catalog
108-25034	Product Specification (technical performance information)
114-25026	Application Specification (describes product, proper assembly, full tooling information)
IS 6919	Instruction Sheet for assembly procedure

### MAKING ELECTRICAL CONNECTIONS

1. Remove (unlatch) the connector from the AWM700.
2. Hand-crimp the interface wire to the appropriate pin on the connector. One possible tool: AMP Hand-Crimp Tool, part number 58342-1.
3. Insert the terminal contacts into the connector housing after carrier strip (lead-frame) is removed.
4. Reconnect (latch) connector to AWM700 device.

### MOUNTING INSTRUCTIONS

Mount AWM700 Series sensors with 6-32 screws. Honeywell recommends use of washers below screw head. Mounting torque is 0.68 N m [6.0 in lb] max.

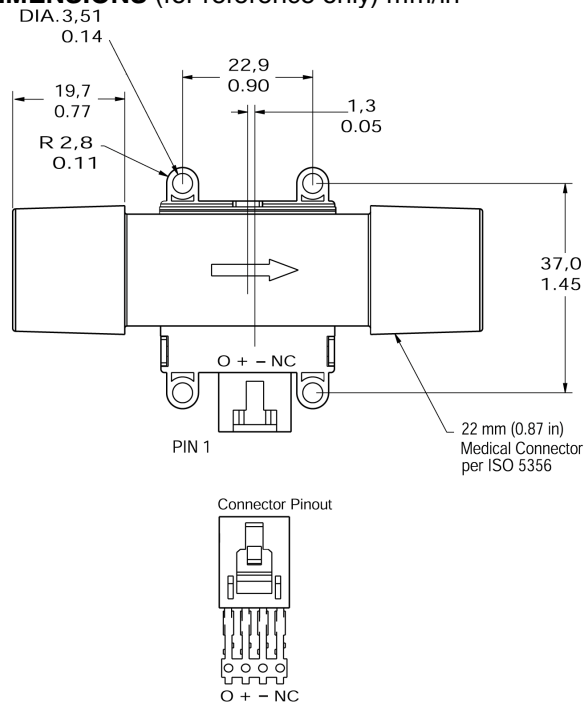
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**MOUNTING DIMENSIONS** (for reference only) mm/in



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