

## Mass Airflow Sensors AWM720P1 Airflow

## AWM700 Series

### FEATURES

- Flow tubes for ranges up to 200 SLPM
- Highly stable through operating range
- 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

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

### **⚠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 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 0.85 in H<sub>2</sub>O, typically. The AWM700 has a high flow range capability in a small package.

The AWM700 has a 6 ms 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 a reliable connection. The sensor is also well suited for use in portable devices and battery-powered applications.

These sensors provide 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.

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

### PERFORMANCE CHARACTERISTICS

Flow Range (Full Scale)	200 SLPM		
	Min.	Typ.	Max.
Excitation <sup>1</sup>	9.990 Vdc	10.000 Vdc	10.010 Vdc
Power Supply	9.000 Vdc	10.000 Vdc	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 Vdc typ.		
Full Scale Output Shift			
25 °C to 10 °C	-2.0 (% reading)		
25 °C to 40 °C	2.0 (% reading)		
Ratiometricity Error <sup>1</sup>	± 0.30 (% reading) typ.		
Repeatability and Hysteresis <sup>2</sup>	± 0.50 (% reading)		
Response Time	6 ms typ.		
Pressure Drop at Full Scale	2.12 mb [0.85 in H <sub>2</sub> O] typ.		
Overpressure	25 psi max.		
Weight	34 g [1.20 oz]		

- Notes:**
1. Output voltage is ratiometric to supply voltage.
  2. Repeatability and hysteresis tolerances reflect inherent inaccuracies of the measurement equipment.

### ENVIRONMENTAL SPECIFICATIONS

Temperature Range	
Operating	-25 °C to 85 °C [-13 °F to 185 °F]
Storage	-40 °C to 90 °C [-40 °F to 194 °F]
Shock	100 g, 6 ms, half-sine
Vibration	10 Hz to 2 kHz, 15 g, sine
Connector, 4-pin receptacle	AMP 103956-3 (provided with sensor)

### FLOW SPECIFICATIONS

Flow (SLPM)	Nominal (Vdc) Typical	± Tolerance (Vdc)	Pressure Drop (in H <sub>2</sub> O)	Pressure Drop (mbar)
0	1.00	0.05	0	0
25	2.85	—	0.04	0.10
50	3.82	0.18	0.11	0.28
75	4.30	—	0.20	0.50
100	4.58	—	0.29	0.74
150	4.86	—	0.53	1.35
200	5.00	0.36	0.85	2.16

# Mass Airflow Sensors

## AWM720P1 Airflow

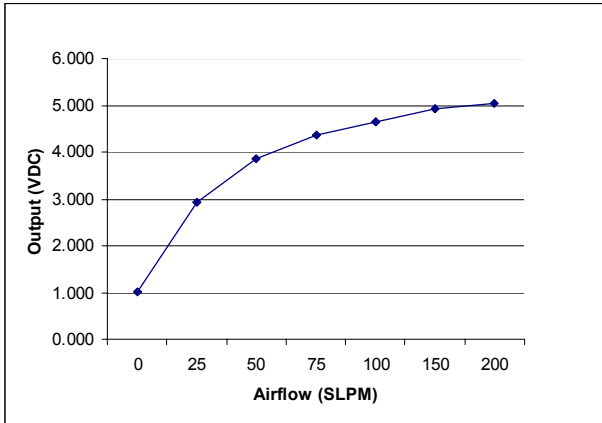


Figure 1. Output Voltage vs. Airflow (10.0 Vdc  $\pm$  0.01 Vdc at 25 °C)

## AWM700 Series

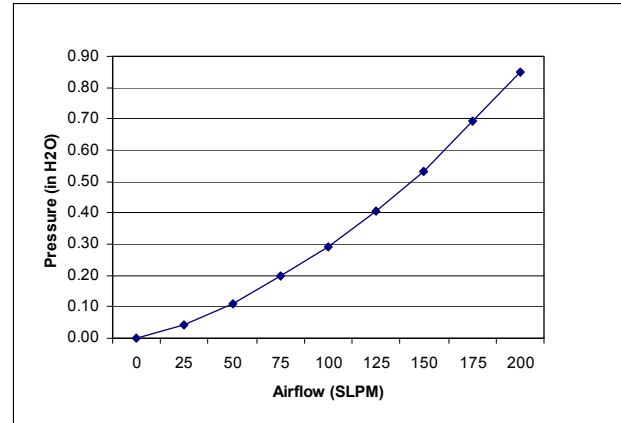


Figure 2. Pressure vs. Airflow (10.0 Vdc  $\pm$  0.01 Vdc at 25 °C)

### CAUTION

#### 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 Tyco Product Information Center at 1-800-522-6752 or the Tyco Customer Hotline at 1-800-722-1111.

### RELATED TYCO LITERATURE

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.
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

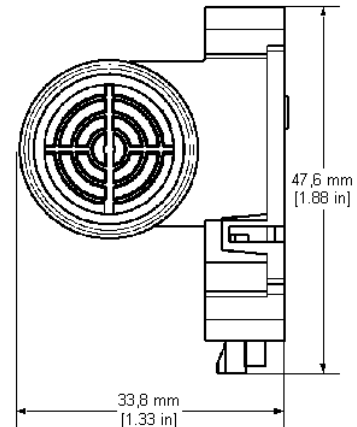
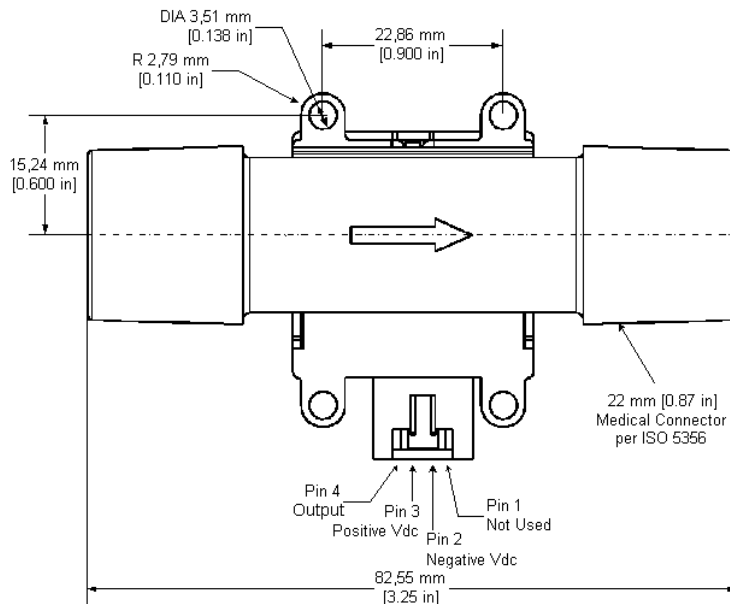
Mount AWM700 Series sensors with 6-32 screws. Honeywell recommends use of washers below screw head. Mounting torque is 0,68 N m [6.0 in lb] max.

# Mass Airflow Sensors

## AWM720P1 Airflow

## AWM700 Series

### MOUNTING DIMENSIONS (for reference only)



### WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace without charge those items it finds defective. The foregoing is Buyer's sole remedy and is **in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose.**

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While we provide application assistance personally, through our literature and the Honeywell Web site, it is up to the customer to determine the suitability of the product in the application.

For application assistance, current specifications, or name of the nearest authorized distributor, check the Honeywell Web site or call:

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1-800-737-3360 Canada

1-815-235-6847 International

### FAX

1-815-235-6545 USA

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[www.honeywell.com/sensing](http://www.honeywell.com/sensing)  
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