

## Installation Instructions for the AWM3000 Series Microbridge Mass Airflow Sensors

ISSUE 2

PK 88671

### **⚠ 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.**

#### **GENERAL INFORMATION**

AWM3000 Series Microbridge Mass Airflow Sensors operate on the theory that airflow directed across the surface of a sensing element causes heat transfer. Output voltage varies in proportion to the mass of air or other gas flowing through a given sensor's inlet and outlet ports. Current sink/source. Maximum current ratings are 10 mA sinking and 20 mA sourcing, governed by an LM224 operational amplifier in the final stage of the instrumentation amplifier.

#### **MEDIA CONTAMINATION**

Media flowing through the sensor should be free of condensing moisture and particulate contaminants. An inexpensive 5 micron filter upstream of the sensing element substantially reduces the risk of damage due to contaminants.

#### **CLEANING**

Cover the ends of the ports when cleaning. Certain solvents may attack the epoxy used to seal the chip tubes to the ceramic substrate.

### **⚠ CAUTION**

#### **CLEANING DAMAGE**

- DO NOT USE ultrasonics when cleaning. Ultrasonic cleaning may damage the sensor's microstructure.
- Solvent cleaning may attack the epoxy that seals the chip tube. Do not use III Tri-chloroethane, methylene chloride, methyl pyrrolidone, or any oxidizing type acid such as formic acid.

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

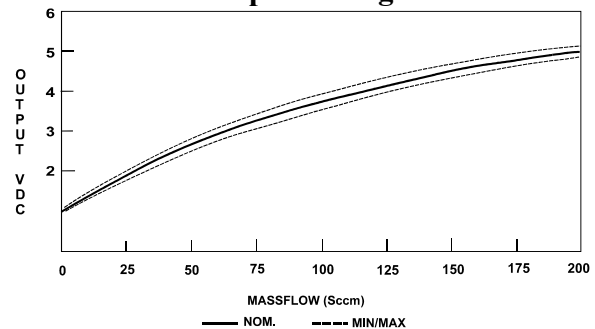
#### **SOLDERING INSTRUCTIONS**

Please note: sensor should be securely attached to printed circuit board before soldering.

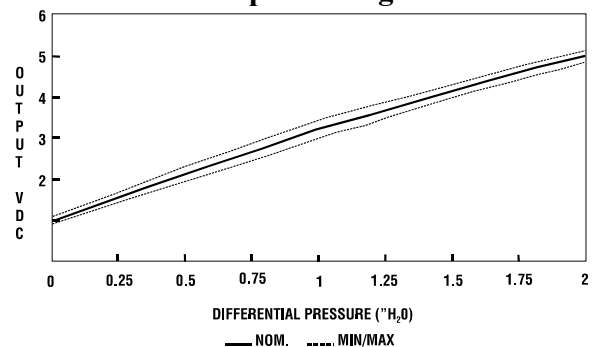
Hand soldering: Use temperature controlled soldering iron with 3,2 mm (1/8 in.) diameter tip. Set temperature at 400 °C [750 °F]. Hold tip on terminal for 5 seconds maximum. Use Type R flux rosin core solder and hand clean after soldering. Wave soldering: Set solder temperature at 250 °C [480 °F] maximum. Run belt at minimum of 1.54 m [5 ft] per minute. Cover tube ends when cleaning.

#### **OUTPUT CURVES**

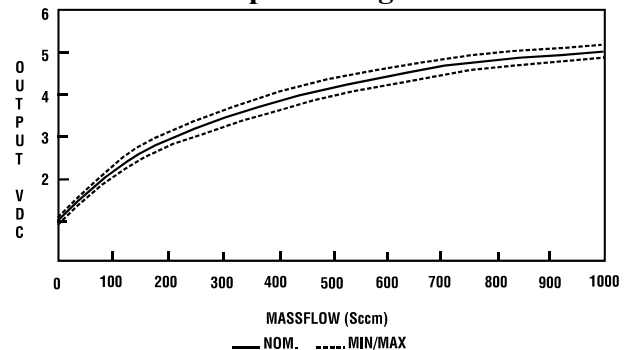
##### **AWM3100V Output Voltage vs Mass Flow**



##### **AWM3200V Output Voltage vs Pressure**



##### **AWM3300V Output Voltage vs Mass Flow**



## SPECIFICATIONS

Type	AWM3100V	AWM3150V	AWM3200V	AWM3300V
Recommended excitation	10 ± 0.01 Vdc	10 ± 0.01 Vdc	10 ± 0.01 Vdc	10 ± 0.01 Vdc (2)
Power consumption	50 mW	50 mW	50 mW	50 mW
Output voltage @ laser trim point	5.00 Vdc @ 200 sccm	1.5 Vdc @ 5 sccm	5.00 Vdc @ 2" H <sub>2</sub> O	5.00 Vdc @ 1000 sccm
Null voltage	1.00 ± .05 Vdc	1.00 ± .10 Vdc	1.00 ± .08 Vdc	1.00 ± .10 Vdc
Null voltage shift @ -25 °C to 85 °C [-13 °F to 185 °F]	± 25 mV	± 75 mV	± 25 mV	± 25 mV
Output voltage shift				
-25 °C to 25 °C [-13 °F to 77 °F]	-5% Reading	-5% Reading	+24% Reading	-5% Reading (4)
25 °C to 85 °C [77 °F to 185 °F]	+6% Reading	+6% Reading	-24% Reading	+6% Reading
Repeatability and hysteresis, max.	± 0.50% reading	± 1.0% reading	± 0.50% reading	± 1.0% reading (3)
Maximum Response Time	3.0 msec	3.0 msec	3.0 msec	3.0 msec (1)
Operating Temperature range:	-25 °C to 85 °C [-13 °F to 77 °F]	-25 °C to 85 °C [-13 °F to 77 °F]	-25 °C to 85 °C [-13 °F to 77 °F]	-25 °C to 85 °C [-13 °F to 77 °F]
Storage Temperature range:	-40 °C to 90 °C [-40 °F to 194 °F]	-40 °C to 90 °C [-40 °F to 194 °F]	-40 °C to 90 °C [-40 °F to 194 °F]	-40 °C to 90 °C [-40 °F to 194 °F]
Termination (2,54 mm [0.100 in] centers)	0,635 mm [0.025 in] square	0,635 mm [0.025 in] square	0,635 mm [0.025 in] square	0,635 mm [0.025 in] square
Weight	10,8 g [0.381 oz]	10,8 g [0.381 oz]	10,8 g [0.381 oz]	10,8 g [0.381 oz]
Shock rating (5 drops, ea. of 6 axes)	100 g peak	100 g peak	100 g peak	100 g peak
Maximum Overpressure	25 psi	25 psi	25 psi	25 psi (5)

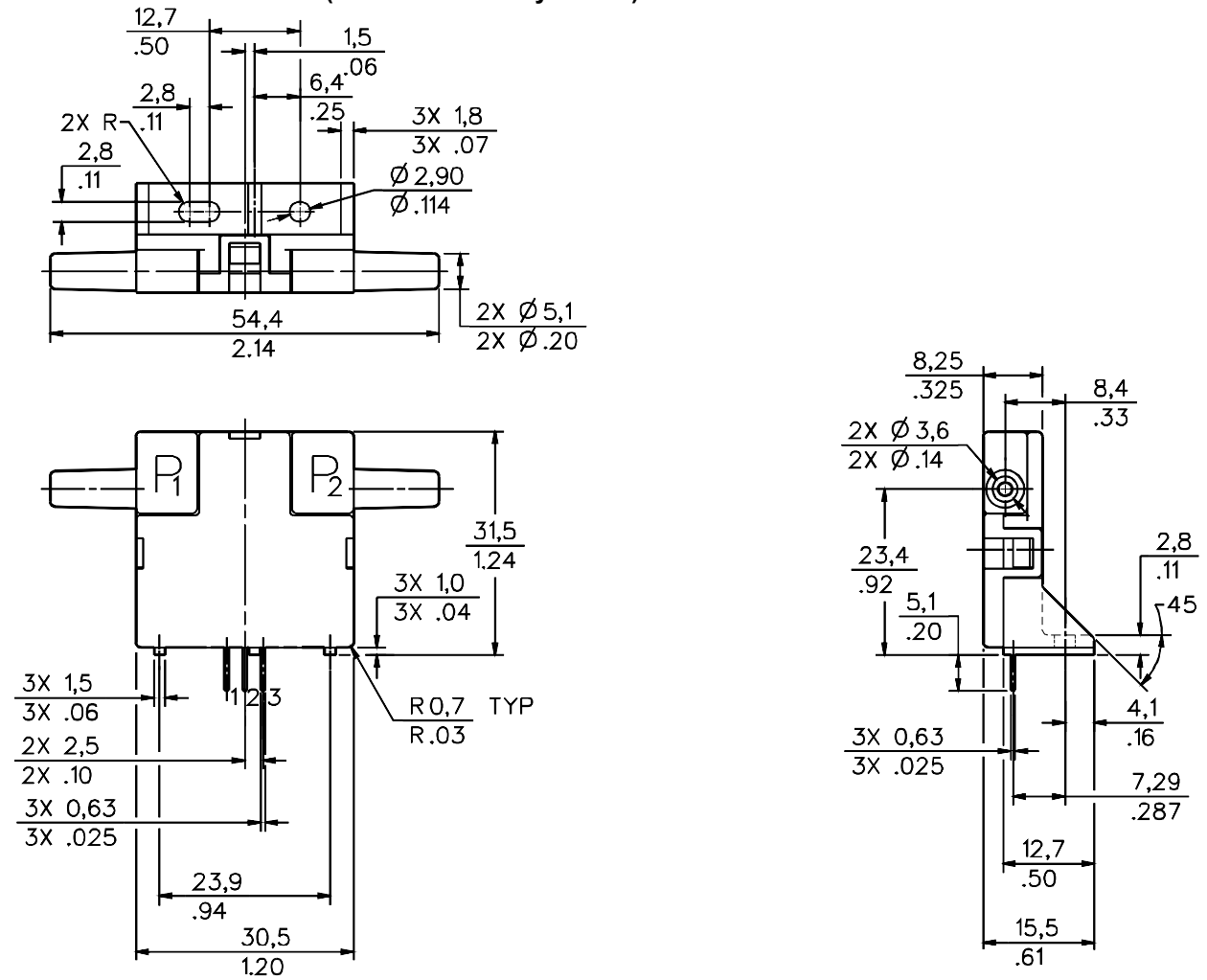
1. Response time typically 1 ms from 10% to 90%. Initial warm-up time for signal conditioned circuitry is 1 minute maximum
2. Output voltage is ratiometric to supply voltage.
3. Repeatability and hysteresis tolerances reflect inherent inaccuracies of the measurement equipment.
4. Temperature shifts in differential pressure devices are mostly due to the density change of the gas over temperature.
5. Maximum flow rate to prevent damage to sensing element (includes flow pulse) is 5 LPM.

## OUTPUT FLOW VS. INTERCHANGEABILITY

AWM3100V			AWM3150V			AWM3200V			AWM3300V		
Flow sccm	Nom. Vdc	Tol. (2) ± Vdc	Flow sccm	Nom. Vdc	Tol. (2) ± Vdc	Pressure in H <sub>2</sub> O	Nom. Vdc	Tol. (2) ± Vdc	Flow sccm	Nom. Vdc	Tol. (2) ± Vdc
200	5.00	0.15	30	3.75	0.70	2.00	5.00	0.15	1000	5.00	0.15
175	4.80	0.16	20	2.90	0.45	1.75	4.59	0.15	900	4.90	0.16
150	4.50	0.17	10	1.95	0.20	1.50	4.16	0.16	800	4.80	0.17
125	4.17	0.18	5	1.50	0.07	1.25	3.70	0.20	700	4.66	0.18
100	3.75	0.19	4	1.40	0.08	1.00	3.25	0.22	600	4.42	0.19
75	3.27	0.19	3	1.30	0.08	0.75	2.65	0.22	500	4.18	0.20
50	2.67	0.17	2	1.20	0.07	0.50	2.15	0.19	400	3.82	0.21
25	1.90	0.13	1	1.10	0.06	0.25	1.55	0.11	300	3.41	0.19
0	1.00	0.05	0	1.00	0.05	0.00	1.00	0.08	200	2.96	0.17
									100	2.30	0.14
									0	1.00	0.10

The unique design of the microbridge mass airflow sensor accommodates your special requirements. Custom laser trimming and flow channel dimensioning can conform performance characteristics to specific applications. Please contact your Honeywell sales office for assistance.

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



## DESCRIPTION

Catalog Listing	Flow Range
AWM3100V	+200 sccm / + 0.2 in H <sub>2</sub> O full scale
AWM3150V	+30 sccm / + 1 in H <sub>2</sub> O full scale
AWM3200V	+ 60 sccm (± 20 sccm) + 2 in H <sub>2</sub> O full scale
AWM3300V	+1000 sccm / 1.3 in (± 0.1 in) H <sub>2</sub> O full scale

## OUTPUT CONNECTIONS

Pin 1	Output voltage
Pin 2	+ Supply voltage
Pin 3	Ground

**Note:** Positive flow direction is defined as proceeding into Port 1 (P1) and out of Port 2 (P2), and results in a positive output.

## 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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