Airflow Sensors, AWM90000 Series

Table 1. Specifications

Characteristic	Parameter	
	AWM92100V	AWM92200V
Type	mass flow	differential
Flow range	±200 SCCM	—
Pressure range	—	±5 mbar | ± 500 Pa | ±2.0 inH_2O
Excitation voltage[3]	8.0 Vdc min./10 Vdc ±0.01 Vdc typ./15 Vdc max.	
Power consumption	50 mW max.	
Calibration gas	air	
Null voltage shift[1]: Null voltage (25 °C [77 °F]) Null output shift: -25 °C to 85 °C [-13 °F to 185 °F] -20 °C to 80 °C [-4 °F to 176 °F]	 0 mV ±15 mV ±2 mV typ. —	 0 mV ±15 mV — ±1 mV max.
Full scale output shift[2]: -25 °C to -25 °C [-13 °F to 77 °F] 25 °C to 85 °C [77 °F to 185 °F]	 -3.0 %FSS typ. ±1.0 %FSS typ.	 25 %reading max. 30 %reading max.
Full scale output	77 mV ±32 mV	45 mV ±25 mV
Ratiometricity error[3]	±0.30 %reading typ.	
Repeatability and hysteresis[4]	±0.35 %FSS typ.	±0.1 %reading typ.
Response time	1 ms typ.	3 ms typ.
Pressure drop at full scale	0.49 mbar | 49 Pa | 0.007 psi, typ.	—
Overpressure	1720 mbar | 172 kPa | 25 psi max.	
Temperature range: operating storage	 -25 °C to 85 °C [-13 °F to 185 °F] -40 °C to 90 °C [-40 °F to 194 °F]	 -25 °C to 80 °C [-13 °F to 176 °F] -40 °C to 90 °C [-40 °F to 194 °F]
Vibration	20 g, 10 Hz to 2000 Hz	
Shock	100 g, 6 ms	
Weight	5,6 g [0.20 oz]	

[1]Assumes low TCR bridge resistance used (pins 2 and 8).
[2]Requires recommended RC value of 1 kOhm to be used (pins 3 though 7) and typical heater control circuit. Maximum current RH.
[3]Output voltage is ratiometric to supply voltage.
[4]Repeatability and hysteresis tolerances reflect inherent inaccuracies of the measurement equimpment.

Table 2. AWM92100V Flow Specifications

Flow (SCCM)	Tolerance, min. (mV)	Nominal, typ. (Vdc)	Tolerance, typ. (mV)	Pressure Drop		
				(mbar)	(Pa)	(inH_20)
200	45	77	109	0.148	14.775	0.0593
150	45	68	109	0.103	10.271	0.0412
100	45	56	109	0.063	6.299	0.0253
50	45	36	109	0.028	2.814	0.0113
0	45	0	109	0.000	0.000	0.0000
-50	45	-37	109	-0.028	-2.775	-0.0111
-100	45	-57	109	-0.063	-6.293	-0.0253
-150	45	-69	109	-0.103	-10.271	-0.0412
-200	45	-78	109	-0.148	-14.834	-0.0596

Table 3. AWM92200V Differential Pressure Specifications

Flow (inH_20)	Tolerance, min. (mV)	Nominal, typ. (mV)	Tolerance, max. (mV)
2.0	22	38	77
1.5	18	32	66
1.0	12	23	49
0.5	7	12	29
0.0	-20	0	20
-0.5	-7	-12	-30
-1.0	-12	-23	-51
-1.5	-18	-32	-68
-2.0	-22	-39	-79

LAMINAR FLOW

Due to the fast response time of the sensor, the specifications in this datasheet were generated using laminar flow. Airflow instability or “turbulence” present in the airstream will result in an increase in measurement uncertainty. Turbulent flow may be corrected by either of the following two methods:

- Straightening the airflow by using flow laminarizing.
- Slowing the response of the sensor by using a simple RC time constant on the output of the sensor. (This will slow down the sensor response time.

The values needed depend on the amount of turbulence present in the application. A technique for laminarizing the flow includes adding the following laminar flow elements to the flow stream:

- Hex-shaped honeycombs
- Foam
- Screen materials
- Constrictors (frits)

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.

Ensure sharp radii are avoided in any test fixture.