

# Honeywell Zephyr™ Digital Airflow Sensors

## HAF Series—High Accuracy: 10, 15, 20, 50, 100, 200, 300 SLPM

**Table 2. Operating Specifications**

Characteristic	Parameter
Supply voltage	3 Vdc to 10 Vdc
Supply current	20 mA max.
Power: 3 Vdc 10 Vdc	60 mW max. 200 mW max.
Calibrated temperature range <sup>1</sup>	0°C to 50°C [32°F to 122°F]
Operating temperature range	-20°C to 70°C [-4°F to 158°F]
Full scale (FS) flow <sup>2</sup>	10, 15, 20, 50, 100, 200, 300 SLPM
Calibrated flow range	0 to 10, 0 to 15, 0 to 20, 0 to 50, 0 to 100, 0 to 200, 0 SLPM to 300 SLPM
Calibration gas	clean, dry air
Accuracy <sup>3</sup> 0%FS to 14.3%FS 14.3%FS to 100%FS	0.5%FS 3.5%reading
Total Error Band: <sup>4</sup> 10, 15, 20, 50, 100, 200 SLPM: 0%FS to 12.5%FS 12.5%FS to 100%FS 300 SLPM only: 0%FS to 12.5%FS 12.5%FS to 66.7%FS 66.7%FS to 100%FS	0.5%FS 4.0%reading  0.5%FS 4.0%reading 7.0%reading
Null accuracy <sup>5</sup>	±0.5%FS
Flow response time <sup>6</sup>	1 ms
Warm up time <sup>7</sup>	35 ms
Resolution: 10 SLPM 15 SLPM 20 SLPM 50 SLPM 100 SLPM 200 SLPM 300 SLPM	0.002 SLPM 0.003 SLPM 0.003 SLPM 0.008 SLPM 0.015 SLPM 0.029 SLPM 0.043 SLPM
Proof pressure	10.3 bar   150 psig
Burst pressure	13.7 bar   200 psig
Bus standards <sup>8</sup>	I <sup>2</sup> C fast mode (up to 400 kHz)
Reverse polarity protection	no

<sup>1</sup> Custom and extended temperature compensated ranges are possible. Contact Honeywell for details.

<sup>2</sup> Honeywell standard for mass flow rate units is SLPM, which has reference conditions of 0°C and 1 atm. Custom units are given as LPM with listed reference conditions at the first mention.

<sup>3</sup> Accuracy is the maximum deviation in output from nominal over the entire calibrated flow range at 25°C. Errors include Offset, Full Scale Span, Linearity, Flow Hysteresis, and Repeatability.

<sup>4</sup> Total Error Band (TEB) is the maximum deviation in output from nominal over the entire calibrated flow range and temperature range. Total Error Band includes all Accuracy errors, as well as all temperature effects over the compensated temperature range, including Temperature Offset, Temperature Span and Thermal Hysteresis.

<sup>5</sup> Null Accuracy is the maximum deviation in output from nominal at null flow over the entire calibrated temperature range.

<sup>6</sup> Response time: time to electrically respond to any mass flow change at the microbridge airflow transducer (response time of the transducer may be affected by the pneumatic interface).

<sup>7</sup> Warm-up time: time to the first valid flow measurement after power is applied.

<sup>8</sup> Refer to the Technical Note "I<sup>2</sup>C Communications with Honeywell Digital Airflow Sensors" for I<sup>2</sup>C protocol information.

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**Table 3. Environmental Specifications**

Characteristic	Parameter
Humidity	0% to 95% RH, non-condensing
Shock	30 g, 6 ms
Vibration	1,33 g at 10 Hz to 500 Hz
ESD	ESD IEC6100-4-2 air discharge up to 8 kV, or direct contact discharge up to 4 kV
Radiated immunity: 20, 50, 100, 200, 300 SLPM 10, 15 SLPM	Level 3 from 80 MHz to 1000 MHz per IEC61000-4-3 1 m shielded cable with 3 cm exposed leads at connector 1 m shielded cable with 3 cm exposed leads at connector and 280 Ohm at MHz ferrite bead

**Table 4. Materials Specifications**

Characteristic	Parameter
Wetted materials	glass reinforced (GR) thermoplastic polymer, gold, silicon, silicon dioxide, silicon nitride, epoxy, PCB epoxy composite
Housing	GR thermoplastic polymer
Substrate	PCB
Adhesives	epoxy
Electronic components	silicon, gold
Compliance	RoHS, WEEE

**Table 5. Recommended Mounting and Implementation**

Characteristic	Parameter
Mounting screw size	10-32
Mounting screw torque	1,13 N m [20 in-lb]
Electrical connection	6 pin SIP connector
Pneumatic connection	manifold mount, 22 mm OD tapered male fitting, G 3/8 female threaded fitting