



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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Airflow Sensors Line Guide



Go with the flow of engineering leadership. All airflow sensors operate on heat transfer — flow and differential pressure. But Honeywell Sensing and Control (S&C) offers advanced chip design, manufacturing techniques and microstructure technology, allowing our microbridge to be notably faster, smaller and more sensitive. Our silicon chip design is created from a thin-film, thermally isolated bridge structure, containing both heater

and temperature sensing elements. This provides rapid response to the air or gas flow and amount and direction, delivering a proportional output voltage. Amplified versions provide an enhanced output signal and less external circuitry, while unamplified versions allow additional external circuit options. What's more, a variety of port styles provides greater application flexibility.

FEATURES

HONEYWELL ZEPHYR™ AIRFLOW SENSORS

HAF Series-High Accuracy. ±50 SCCM to ±750 SCCM

Features: Total Error Band (TEB) as low as ±0.25 %FSS • Fast response time

- Wide range of airflows • Customizable flow ranges and configurable package styles • Full calibration and temperature compensation • High sensitivity at very low flows • Linear output • High stability
- Low pressure drop • High 12-bit resolution (digital), 0.039 %FS resolution (analog) • Low 3.3 Vdc operating voltage
- ASIC-based I²C output compatibility (digital) • Insensitivity to mounting orientation • Insensitivity to altitude
- Small size • RoHS-compliant materials

Benefits: Total Error Band (TEB) as low as ±0.25 %FSS allows for precise airflow measurement, often ideal for demanding applications with high accuracy requirements. Fast response time allows a customer's application to respond quickly to airflow change, important in critical medical (e.g., anesthesia) and industrial (e.g., fume hood) applications. Measures mass flow at standard flow ranges of ±50, ±100, ±200, ±400 or ±750 SCCM, or custom flow ranges,

increasing the options for integrating the sensor into the application. Customizable flow ranges and configurable package styles meet specific end-user needs. Full calibration and temperature compensation typically allow customer to remove additional components associated with signal conditioning from the PCB, reducing PCB size as well as costs often associated with those components (e.g., acquisition, inventory, assembly). High sensitivity at very low flows provides for faster response time at the onset or cessation of flow. Linear output provides a more intuitive sensor signal than the raw output of basic airflow sensors, which can help reduce production costs, design, and implementation time. High stability reduces errors due to thermal effects and null shift to provide accurate readings over time, often eliminating need for system calibration after PCB mount and periodically over time. Low pressure drop typically improves patient comfort in medical applications, and reduces noise and system wear on other components such as motors and pumps. High 12-bit resolution (digital) increases ability to sense small airflow changes, allowing customers to more precisely control their application; 0.039

%FS resolution (analog) increases ability to sense small airflow changes, allowing customers to more precisely control their application. Low 3.3 Vdc operating voltage option and low power consumption allow for use in battery-driven and other portable applications. ASIC-based I²C digital output compatibility eases integration to microprocessors or microcontrollers, reducing PCB complexity and component count. Insensitivity to mounting orientation allows customer to position the sensor in most optimal point in the system, eliminating concern for positional effects. Insensitivity to altitude eliminates customer-implemented altitude adjustments in the system, easing integration and reducing production costs by not having to purchase additional sensors for altitude adjustments. Small size occupies less space on PCB, allowing easier fit and potentially reducing production costs; PCB size may also be reduced for easier fit into space-constrained applications. Designed for use in medical equipment such as anesthesia delivery machines, ventricular assist devices (heart pumps), hospital diagnostics (spectrometry, gas chromatography), nebulizers, oxygen concentrators, patient monitoring systems

Airflow Sensors Line Guide

Our technology is most sensitive to your needs.

Honeywell S&C offers specially crafted airflow sensor housings to precisely direct and control the airflow across the element. The mechanical package design allows easy mounting to circuit boards, plus other advantages: amplified or un-amplified microbridge airflow; state-of-the-art silicon micromachining; sensitivity to low flows (30 SCCM to 300 SLPM); accurate low pressure sensing 0.003 mbar to 10 mbar (0.0001 in H₂O to 4.0 in H₂O); analog or digital output.

Honeywell S&C airflow sensors offer enhanced performance in multiple potential applications, including HVAC system damper control, gas analysis, leak detection equipment, gas metering and chromatography, process control, and vent hoods. In the medical industry, potential applications range from respiratory equipment such as respirators, spirometers, anesthesia and oxygen delivery to sleep apnea equipment.



Honeywell Zephyr™ Airflow Sensors

	HAF Series-High Accuracy ±50 SCCM to ±750 SCCM	HAF Series-High Accuracy 20 SLPM or 200 SLPM
Signal conditioning	amplified, compensated	amplified, compensated
Technology	silicon die with thermally isolated heater	silicon die with thermally isolated heater
Flow/pressure range	±50 SCCM to ±750 SCCM	20 SLPM, 200 SLPM
Total error band	as low as ±0.25 %FSS	±0.5 %FS or ±4.0% of reading, whichever is greater
Output	analog (Vdc), digital (I ² C)	digital (I ² C)
Power consumption	3.3 Vdc: 40 mW typ. (no load) (analog) 23 mW typ. (no load) (digital) 5.0 Vdc: 55 mW typ. (no load) (analog) 38 mW typ. (no load) (digital)	3 Vdc: 60 mW max. 10 Vdc: 200 mW max.
Port style	long port, short port	manifold mount, 22 mm OD tapered male fitting, G 3/8 female threaded fitting
Media capability	non-corrosive dry gases	non-corrosive dry gases
Compensated temperature range	0 °C to 50 °C [32 °F to 122 °F]	0 °C to 50 °C [32 °F to 122 °F]
Operating temperature range	-20 °C to 70 °C [-4 °F to 158 °F]	-20 °C to 70 °C [-4 °F to 158 °F]



Airflow Sensors

AWM1000 Series

AWM2000 Series

AWM3000 Series

AWM5000 Series

Signal conditioning	unamplified, compensated	unamplified, compensated	amplified	amplified
Technology	silicon die	silicon die	silicon die	silicon die
Flow/pressure range	±200 SCCM 1000 SCCM to -600 SCCM ±5.0 mbar [2.0 in H ₂ O] ±10.0 mbar [4.0 in H ₂ O]	±30 SCCM ±1000 SCCM ±10.0 mbar [4.0 in H ₂ O]	30 SCCM, 200 SCCM, 1000 SCCM 0 mbar to 1.25 mbar [0 in H ₂ O to 0.5 in H ₂ O] 0 mbar to 5.0 mbar [0 in H ₂ O to 2 in H ₂ O] 5.0 mbar [2.0 in H ₂ O]	0 SLPM to 5.0 SLPM 0 SLPM to 10.0 SLPM 0 SLPM to 15.0 SLPM 0 SLPM to 20.0 SLPM
Output	analog	analog	analog	analog
Power consumption	30 mW typ.	30 mW typ.	50 mW or 100 mW typ.	100 mW max.
Port style	straight	straight	straight	1/4 in-18 NPT
Media capability	non-corrosive dry gases	non-corrosive dry gases	non-corrosive dry gases	non-corrosive dry gases
Compensated temperature range	-25 °C to 85 °C [-13 °F to 185 °F]	-25 °C to 85 °C [-13 °F to 185 °F]	-25 °C to 85 °C [-13 °F to 185 °F]	0 °C to 50 °C [32 °F to 122 °F]
Operating temperature range	-25 °C to 85 °C [-13 °F to 185 °F]	-25 °C to 85 °C [-13 °F to 185 °F]	-25 °C to 85 °C [-13 °F to 185 °F]	-20 °C to 70 °C [-4 °F to 158 °F]

Airflow Sensors Line Guide



Airflow Sensors

AWM700 Series

AWM40000 Series

AWM90000 Series

Signal conditioning	amplified	unamplified (compensated) or amplified	uncompensated
Technology	silicon die	silicon die	silicon die
Flow/pressure range	300 SLPM	±25.0 SCCM 1.0 SLPM, 6.0 SLPM	±200 SCCM ±5.0 mbar [2.0 in H ₂ O]
Output	analog	analog	analog
Power consumption	60 mW max.	60 mW max., 75 mW max.	50 mW typ.
Port style	22 mm tapered	manifold	parallel
Media capability	non-corrosive dry gases	non-corrosive dry gases	non-corrosive dry gases
Compensated temperature range	10 °C to 40 °C [50 °F to 104 °F]	-25 °C to 85 °C [-13 °F to 185 °F]	N/A
Operating temperature range	-25 °C to 85 °C [-13 °F to 185 °F]	-40 °C to 125 °C [-40 °F to 251 °F] (inclusive)	-25 °C to 85 °C [-13 °F to 185 °F]

(respiratory monitoring), sleep apnea machines, spirometers, ventilators, and laparoscopy, as well as industrial air-to-fuel ratio, analytical instrumentation (spectrometry, chromatography), fuel cells, gas leak detection, VAV system on HVAC systems, gas meters, and HVAC filters.

HONEYWELL ZEPHYR™ AIRFLOW SENSORS

HAF Series-High Accuracy.

20 SLPM or 200 SLPM

Features: Total Error Band is ± 0.5 %FS or ± 4.0 of reading, whichever is greater

- High accuracy
- Fast response time
- Wide range of airflows
- Full calibration and temperature compensation
- High sensitivity at very low flows
- Linear output
- Customizable flow ranges and configurable package styles
- High stability
- Low pressure drop
- High 12 bit resolution
- Flexible regulated powers
- ASIC-based I²C digital output
- Insensitivity to mounting direction
- RoHS-compliant materials
- Choice of port styles
- Optimized calibration for many gases

Benefits: Total Error Band is ± 0.5 %FS or ± 4.0 of reading, whichever is greater, allows for precise airflow measurement, often ideal for demanding applications with high accuracy requirements. High accuracy (± 3.5 reading) often ideal for demanding applications. Fast response time allows a customer's application to respond quickly to airflow change. Measures mass flow with standard flow ranges of 20 SLPM and 200 SLPM or custom flow ranges, increasing the options for integrating the sensor into the application. Full calibration and temperature compensation typically allow the customer to remove additional components associated with signal conditioning from the PCB, reducing PCB size as well as costs often associated with those components (e.g., acquisition, inventory, assembly). High stability at very low flows provides for faster response time at the onset or cessation of flow. Customizable flow ranges and configurable package styles to meet specific end-user needs. High stability

reduces errors due to thermal effects and null shift to provide accurate readings over time, often eliminating need for system calibration after PCB mount and periodically over time. Low pressure drop typically improves patient comfort in medical applications, and reduces noise and system wear on other components such as motors and pumps. High 12-bit resolution increases ability to sense small airflow changes, allowing customers to more precisely control their application. Flexible regulated powers from 3 Vdc to 10 Vdc give the designer the flexibility to choose what supply voltage works best in the system. ASIC-based I²C digital output compatibility eases integration to microprocessors or microcontrollers, reducing PCB complexity and component count. Insensitivity to mounting orientation allows customer to position sensor in most optimal point in the system, eliminating concern for positional effects. RoHS-compliant materials meet Directive 2002/95/EC. Choice of port styles (manifold mount, 22 mm OD tapered male fitting, and G 3/8 female threaded fitting) provide flexibility to choose the pneumatic connection that is best for the customer's application. Optimized calibration for many gases, including dry air, helium, argon, nitrogen, nitrous oxide, and carbon dioxide eliminates the need to implement gas correction factors. Designed for use in medical equipment such as anesthesia delivery machines, ventilators, ventricular assist devices (heart pumps), patient monitoring systems (respiratory monitoring), spirometers, laparoscopy, as well as industrial analytical instrumentation (spectrometry, chromatography) air-to-fuel ratio, fuel cells, fume hoods, gas leak detection and gas meters.

AWM1000 Series.

Features: Precision silicon micromachining

- Sensitivity to low flows (200 SCCM to 1000 SCCM)
- Enhanced response time
- Low power consumption
- Analog output
- Cost-effective
- Bi-directional sensing capability
- Sensor to sensor interchangeability
- Unamplified
- Laser trimmed
- Mass flow and low differential pressure sensing

Benefits: Cost-effective microbridge technology for potential applications including HVAC damper control, process control, respirators, oxygen concentrators, gas metering, and chromatography. Differential amplifier circuitry provides output gain and/or introduces voltage offsets to sensor output.

AWM2000 Series.

Features: Precision silicon micromachining

- Sensitivity to low flows (30 SCCM to 1000 SCCM)
- Enhanced response time
- Low power consumption
- Analog output
- Cost-effective
- Bi-directional sensing capability
- Unamplified
- Laser trimmed
- Sensor to sensor interchangeability
- Mass flow and low differential pressure sensing

Benefits: Cost-effective microbridge technology for potential applications including process control, respirators, ventilators, oxygen concentrators, and leak detection equipment. Differential amplifier circuitry provides output gain and/or introduces voltage offsets to sensor output.

AWM3000 Series.

Features: Precision silicon micromachining

- Sensitivity to low flows (30 SCCM to 1000 SCCM)
- Enhanced response time
- Low power consumption
- Analog output
- Cost effective
- Laser trimmed
- Amplified
- Mass flow and low differential pressure sensing
- Sensor to sensor interchangeability

Benefits: Amplified signal conditioning increases gain and introduces voltage offsets to sensor output. On-board heater control circuit. Laser trimmed for improved sensor interchangeability. Potential applications include HVAC damper control, process control, respirators, leak detection equipment, gas metering, and chromatography.

AWM5000 Series.

Features: Precision silicon micromachining

- Sensitivity to low flows (5 SLPM to 20 SLPM)
- Enhanced response time
- Low power consumption
- Analog output
- Cost-effective
- On-

board signal conditioning • Venturi type flow housing • Remote mounting capability • Laser trimmed • AMP-compatible connector • Rugged plastic package • Amplified • Mass flow pressure sensing • Sensor to sensor interchangeability

Benefits: Performs amplification, linearization, temperature compensation, and gas calibration. Separate gas calibration types (nitrogen, carbon dioxide, nitrous oxide or argon). Microbridge chip in direct contact with flow stream reduces error due to orifice or bypass channel clogging. In-line flow measurement potential applications including HVAC damper control, oxygen concentrators, leak detection equipment, gas metering, and chromatography. 1 Vdc to 5 Vdc linear output possible regardless of flow range or calibration gas. Active laser trimming improves interchangeability. AMP-compatible connector often provides reliable connection in demanding applications.

AWM700 Series.

Features: Precision silicon micromachining • Sensitivity to low flows (200 SLPM to 300 SLPM) • Enhanced response time • Low power consumption • Analog output • Cost-effective • High flow range capability in a small package • Highly stable null and full-scale • Compact package design • Extremely low hysteresis and repeatability errors • AMP-compatible connector • Amplified • Mass flow and differential pressure sensing • Sensor to sensor interchangeability

Benefits: Performs amplification and temperature compensation. Specially designed bypass flow housing provides in-line flow measurement. Provides enhanced reliability, accuracy, and

precision operating characteristics for use in potential medical ventilation equipment and medical and analytical instrumentation applications. Low power consumption for portable devices and battery-powered applications. Enhanced accuracy over life reduces need for recalibration. Snap-in AMP-compatible connector provides reliable connection.

AWM40000 Series.

Features: Precision silicon micromachining • Sensitivity to low flows (25 SCCM to 6 SLPM) • Enhanced response time • Low power consumption • Analog output • Cost-effective • Repeatable response • Laser trimmed • Standard mounting centers • Amplified and unamplified • Mass flow pressure sensing • Sensor to sensor interchangeability

Benefits: Sensitive to low flows, adaptable for use with higher flows for potential applications including process control, respirators, ventilators, oxygen concentrators, gas metering, and chromatography. Low power consumption for portable devices and battery-powered applications. Laser-trimmed thick-film and thin-film resistors designed to provide consistent interchangeability from one device to the next.

AWM90000 Series.

Features: Precision silicon micromachining • Sensitivity to low flows (200 SCCM) • Low power consumption • Analog output • Cost-effective • Bi-directional sensing capability • Enhanced response time • Uncompensated • Mass flow and differential pressure sensing

Benefits: Proven thermal bridge technology. Two versions available, mass flow and differential pressure. Potential applications include HVAC damper control, process control, respirators,

ventilators, oxygen concentrators, leak detection equipment, gas metering, and chromatography. Low power consumption for portable devices and battery-powered applications.

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