

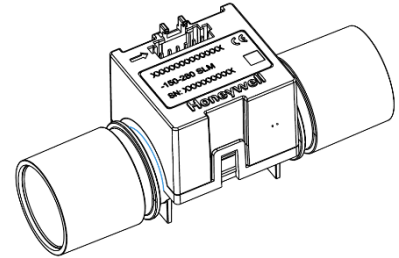
## X112509-AF

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### Mass Flow Sensor

#### Key Features

- More compact size for better installation adaptability
- Fully flow calibrated and temperature compensated
- Both digital and analog output of flow
- Both digital and analog output of temperature as an optional
- High reliability and stability
- Local manufacturing and R&D team for safer supply chain and faster technical support



#### Product Description

The X112509-AF is designed based on the Honeywell new generation airflow sense die. The sensor provides both digital output and analog output for reading airflow over -150~280SLM. The sensor is designed to measure mass flow of air and other non-corrosive gases, such as Oxygen (O<sub>2</sub>).

The X112509-AF is fully calibrated, and temperature compensated over the specified flow range. The X112509-AF has a linearized flow output over the temperature range of 0°C to 60°C and operates across a temperature range of -20°C to 85°C. The sensor also has a linearized temperature output over the range of -20°C to 85°C(optional).

The sensor operates on the heat transfer principle to measure mass airflow. It provides the customer with enhanced reliability, high accuracy, repeatable measurements and the ability to customize sensor options to meet many specific application needs.

## Specifications

### Operating Specifications for Flow Output

Parameter	Condition	Digital output	Analog output	Units
Supply voltage		3.3 ~ 5.5		V
Measurement range	Air	-150 ~ 280		SLM <sup>1</sup>
Gas calibration available		Air/O <sub>2</sub> <sup>2</sup>		
Accuracy <sup>3</sup>	Zeropoint (-1.7~1.7SLM)	0.05		SLM
	Span (-60~60SLM)	3		% reading
	Span (-150~-60SLM)	3	4	% reading
	Span (60~150SLM)	3	4	% reading
	Span (150~280SLM)	4	5	% reading
Accuracy Shift due to Temperature Variation	Zeropoint (-1.7~1.7SLM)	0.02		SLM /10°C
	Span (-150~280SLM)	0.5		% reading /10°C
Offset stability	1000 hours @ 25°C	0.01		SLM
Digital output signal		I2C <sup>4</sup>	n.a.	
Analog output signal		n.a.	0.3 ~ 2.7	V
Resolution		16bits	14bits	
Output update rate		1500	n.a.	Hz
Warm-up time		50 ~ 500		ms
Flow step response time <sup>5</sup>		≤3		ms

### Operating Specifications for Temperature Output

Parameter (optional)	Condition	Digital output	Analog output	Units
Measurement range		-20 ~ 85		°C
Accuracy	0°C ~ 60°C	2		°C
	otherwise	3		°C
Digital output signal		I2C	n.a.	
Analog output signal		n.a.	0.3 ~ 2.7	V
Resolution		0.01	0.01	°C
Output update rate		7.5	n.a.	Hz

## Environmental Specifications

Operating temperature range	-20°C to 85°C
Calibration temperature range <sup>6</sup>	0°C to 60°C
Operating humidity range	0% to 95% RH, non-condensing
Storage temperature range	-40°C to 85°C
Operating Pressure	0~6bar Gauge

## Materials

Wetted materials	glass reinforced thermoplastic polymer, gold, silicon, silicon nitride, epoxy, NBR
Compliant with	RoHS

Note 1 – Standard for mass flow rate units is SLM, which has reference conditions of 0 °C and 1 atm.

Note 2 – Contact Honeywell for requirements with other custom gases for calibration.

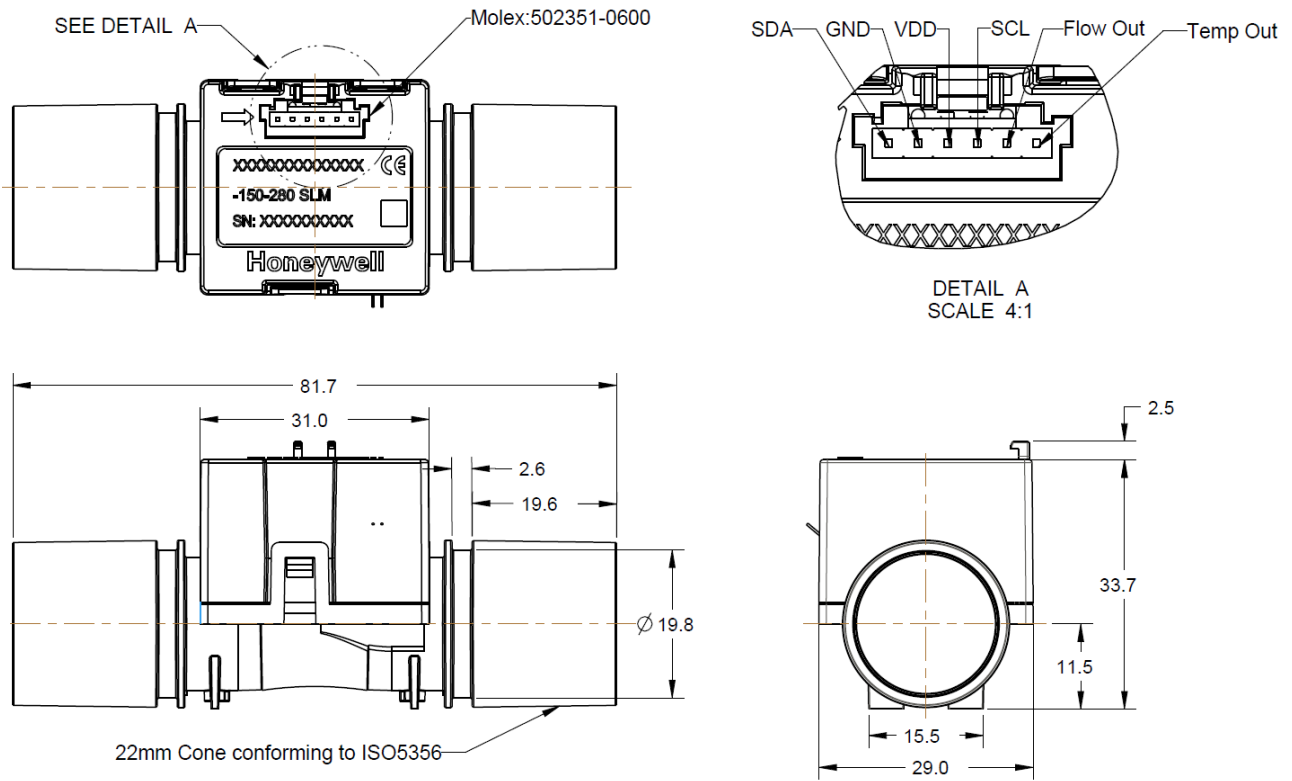
Note 3 – Accuracy is the maximum deviation in output from nominal over the entire calibrated flow range at 25 °C. Errors include Offset, Full Scale Span, Linearity, Flow Hysteresis, and Repeatability.

Note 4 – I2C protocol, rate, address and other details can be found in the Honeywell HAF2xxx operating manual.

Note 5 – 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).

Note 6 – Custom and extended calibrated temperature ranges are possible. Contact Honeywell for details.

## Product Outline Dimensions and Connector Pin Definition



Name	Description
VDD	Vs+
GND	GND
Flow Out	V (flow out)
Temp Out	V (temperature out)
SDA	I <sup>2</sup> C SDA
SCL	I <sup>2</sup> C SCL