



AP squared SENSORS™ PRODUCTS

Air Conditioning Applications

TAKING PRESSURE SENSING TO A NEW LEVEL

A patented square sense element and conditioning electronics provide field-proven EMC tolerance and reliability, including excellent performance in high-noise environments. Multiple packaging configurations are available for easy system integration. For those looking to optimize A/C system control, the AP² sensor design ensures high-quality, world-class performance.

Superior pressure sensing is required for highly efficient A/C loop systems that enable reduced fuel consumption and improved emissions. Sensata's AP (Automotive Pressure)² sensor is the low-cost, lightweight solution for accurate and robust pressure sensing in under-hood applications such as engine load management and compressor protection. With an aluminum port fitting and automotive grade connector, its corrosion protection is second to none. A new, patented square sense element and conditioning electronics provide excellent EMC tolerance and reliability. Multiple packaging configurations are available for easy system integration.

Features

Square Sense Element

Flexible Packaging

High reliability in noisy environments, balanced circuit design

Aluminum hexport

Generation II or III conditioning electronics

Ratiometric output

Designed for under-hood environment

Benefits

Lower cost solution, lighter weight

Available in a wide range of connectors and port fittings

Ease of system integration

EMC protection to 200 V/m

2x lighter in weight

4x improvement in corrosion protection

Accuracy $\pm 1\%$ Vcc; temperature compensation

Ease of system integration, eliminates error in supply voltage fluctuations

Operating temperature range -40°C to 135°C , fluid compatibility

Applications

Optimized A/C performance

- High-pressure compressor protection
- Multiple stage fan control
- Low-temperature compressor operation

Engine load management

- Improved control around idle boost
- Reduced fuel consumption to meet C.A.F.E. standards
- Reduced emissions

Diagnostics at service centers

Technical Specifications

Operating Pressure Range

Pressure range¹ 100-3400 kPa

Performance

Accuracy $\pm 1.0\%$ of Vcc (25°C)

Linearity 1.0% of Vcc (-40°C to 135°C)

Temperature effect $\pm 0.01\%$ of Vcc/ $^{\circ}\text{C}$

Total error band $\pm 2\%$ of Vcc (0 to 100°C)
 $\pm 3\%$ of Vcc (-40°C to 135°C)

Electrical

Supply Voltage (Vcc) 4.75 to 5.25 Vdc

Supply Current² 10 mA max.

Output range⁵ 5-95% of Vcc

Output current³ 5 mA max.

Output response time (90%)⁴ 1 ms min.

Output ripple 0.2% of Vcc

Overvoltage Protection 16.5 Vdc

Reverse voltage protection -14 vdc

Radiated immunity 100-200 V/m

ESD withstand 15 kV

Durability

Cycle life 10 million cycles

Proof pressure 1.5x (5300 kPa)

Burst pressure 2.5x (8700 kPa)

Environmental

Operating temperature -40 to 135°C

Storage temperature -40 to 150°C

¹ other ranges available

² with no load output

³ max., sink or source

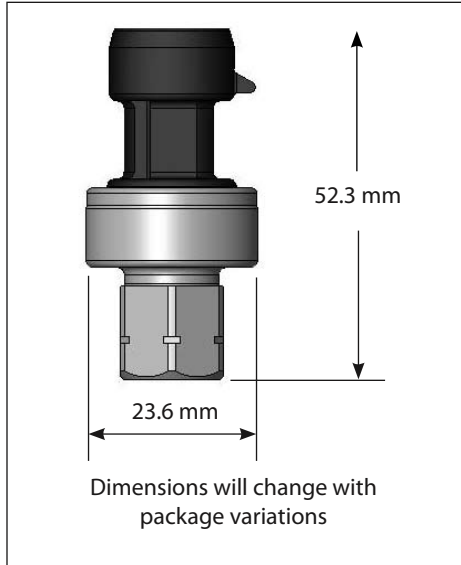
⁴ 100% input, 0-90% response time

⁵ can be adjusted to application need

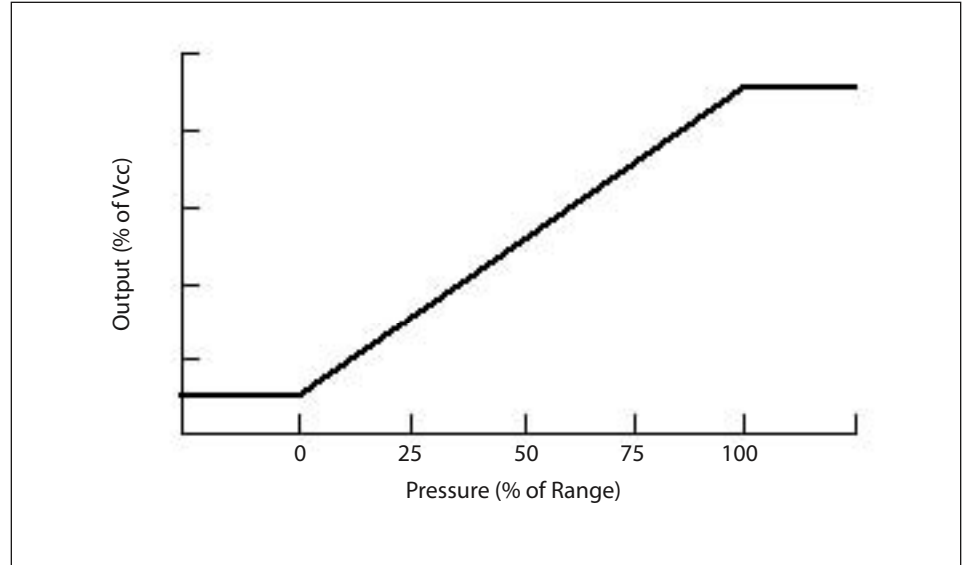
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Dimensions (mm)



Typical Output Characteristics



AP Squared Flexibility

Connectors

- Sensata can provide a wide range of electrical connectors (e.g., Packard, Amp, Yazaki, Framatome)



Fluid Port

- Flexible port designs to meet customer needs
- External, internal threads – English or metric
- Fluid port materials include aluminum, brass, steel, plastic



Diagnostic Band & Transfer Function

- High rail and low rail values can be adjusted by circuit component population
- Transfer function changed by calibration software settings

Size Restriction

- Device diameter can be as small as 24mm



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