

PRESSURE MEASUREMENT ON ENGINE TEST STANDS

Application Note

Today's engine test stands require high performing pressure sensors to deliver repeatable, reliable, and accurate pressure measurements.

BACKGROUND

Engine hydraulics and pneumatics operate faster and more often, with higher pressures and temperatures. Accordingly, the pressure sensors are required to be reliable and rugged in order to mitigate possible downtime. Certain specifications in a pressure sensor should be considered in order to achieve the best results in a given application.

SOLUTION

The Honeywell Model FP5000, a next-generation media-isolated pressure sensor, is built on Honeywell's history of high-quality piezoresistive silicon sensing technology and is designed to offer more repeatable, reliable, and accurate pressure measurements over time even in a variety of harsh environments.

Highly configurable, the FP5000 Series' fully analog reduced-noise signal path provides continuous output resolution in order to measure finite pressure changes or resolve a signal to infinite parts – which translates into greater accuracy. The sensor is designed with a faster response and higher resolution of 3500 Hz.

The FP5000 Series is engineered with True Zero Output capability for its voltage-output sensors. Most three-wire voltage-output sensors cannot reduce to 0 V (zero volts) due to output saturation, which may result with tens of millivolts of output voltage error when the output tries to swing to 0 V (zero volts). An output signal that saturates at 50 mV corresponds to +1 %FS error on a 0 V to 5 V output sensor.

The FP5000 transducer has on-board circuitry on its voltage-output versions (0 V to 5 V, 0 V to 10 V) that allows the output signal to reach ground (True Zero) and even a little below it (~-0.2 V). This allows the sensor to be more accurate, by having the ability to detect slight changes in pressure as well.

FP5000

Pressure Transducers



Gage and absolute pressure ranges from 10 in-H₂O [0.36 psi] up to 5000 psi

Higher accuracy to 0.1 %FSS BFLS

Multiple output types: 0 Vdc to 5 Vdc, 0 Vdc to 10 Vdc, 4 mA to 20 mA

Fully analog reduced-noise signal path provides continuous output resolution

Ha C276 and 316L stainless steel wetted parts offer more enhanced durability with abrasive or corrosive media

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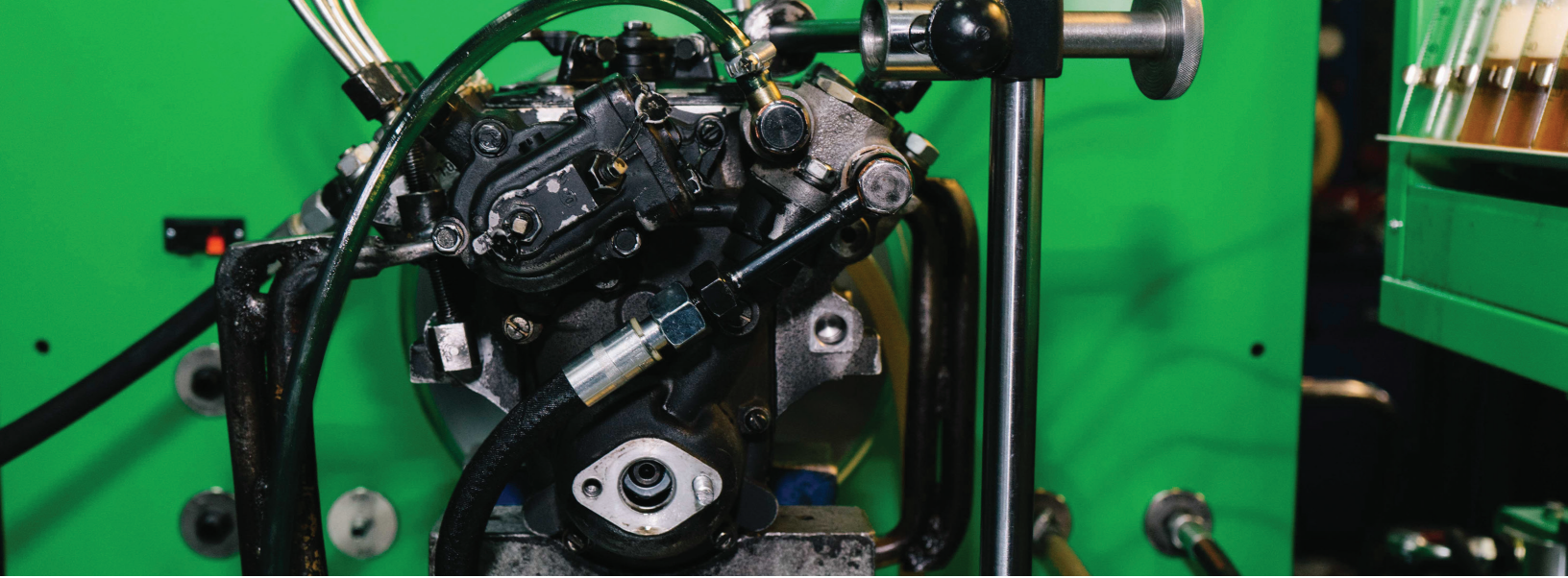


Image 1: Engine Testing

Model FP5000 pressure sensors can fulfill many measuring and monitoring applications on engine test stands.

- **Engine oil pressure** – To ensure lubrication system integrity, operators often want to correlate oil pressure with time and crankshaft position. The FP5000 accurately measures oil pressure and ensures crankshaft position.
- **Coolant pressure** – Coolant pressure is a measure to determine how well the cooling system is working. The FP5000 can monitor the coolant pressure and alert the operator of a non-performing system.
- **Fuel pressure** – Honeywell FP5000 pressure sensors measure fuel pressure during fuel pump and pressure regulator tests.
- **Cylinder compression (cold test)** – To measure this parameter, a gage sensor is inserted into each cylinder's spark plug hole. By correlating cylinder pressure with cranking torque, crank angle, and timing, the sensor can detect piston ring, valve, or crank problems.
- **Pressure decay** – By measuring how quickly the pressure decays inside a pressurized cavity, a sensor can detect damaged or missing gaskets and O-rings, emission valve problems, and other leaks. A differential pressure sensor may also be used to measure pressure decay.

FOR MORE INFORMATION

Honeywell Advanced Sensing Technologies services its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing, or the nearest Authorized Distributor, visit sps.honeywell.com/ast or call:

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