

New Sensors For Emissions Control

With an eye on both the recent October 1, 2002 "pull ahead" EPA emission standards for on-highway trucks, as well as future global on-highway and off-highway standards, Kavlico, Moorpark, Calif., has developed a variety of new pressure sensors and transducers to meet these emission-sensitive applications.

Kavlico's recent developments, which cover engine and equipment manufacturers in both Europe and North America, were also challenged by some manufacturers opting for an EGR (exhaust gas recirculation) strategy, while others have pursued exhaust aftertreatment approaches.

In both instances, Kavlico said it worked closely with the advanced engineering staff member of the specific manufacturer, including working on-site collaboratively to review data, reduce risks, and make decisions jointly. The result was specific products for each individual engine application.

The first of the new products is an EGR differential pressure sensor, rated 5.0 psid, that Kavlico said has been engineered to withstand high common line pressures (100 psi) in a high vibration, high soot and acid rich environment while continuously providing high output voltage accuracy.

The sensor is designed to measure pressure drops across an orifice and essentially provides the control system with a proportional measurement that is used to regulate EGR flow rate, which then reduces NO_x formation.

Other Kavlico sensors currently in use for monitoring and controlling



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exhaust pressure are based on ceramic capacitive technology. These sensors utilize a combination of unique internal features engineered to withstand very high temperatures and pressure pulses along with tolerance against a high soot and acid rich media. A pressure measurement from the exhaust sensor is used to open and close the EGR valve.

Kavlico's new charge-air pressure sensor is a manifold absolute pressure (MAP) sensor that is placed beyond the EGR mixing point. The sensor measurement is used to adjust air/fuel mixture entering into the intake cylinder. Kavlico said its ceramic sensing technology is especially applicable for this type of use, due to the additional soot, icing, and other harsh media elements generated in the system.

Due to benign downstream exhaust media characteristics, Kavlico was able



Kavlico has also developed a new pressure sensor for measuring particulate trap filters using micro-machined piezo-resistive technology. The signal provides a proportional measurement for filter clogging.



With the increased interest in using urea in SCR systems to reduce emissions, Kavlico has introduced two types of sensors for Urea level measuring. One sensor measures the changes in fluid level, while a second sensor measures the pressure of the fluid and provides a proportional voltage to fluid level. In combination, the two sensors can be used to both measure level and the concentrations of urea in the fluid.



to configure a new pressure sensor for measuring particulate trap filters utilizing its proprietary micro-machined piezo-resistive technology. The company said this cost-effective approach met its customer's overall objectives and complied with the more stringent particulate matter requirements. The signal provides a proportional measurement for filter clogging.

Fluid level measurements are important for manufacturers considering urea/water-based selective catalytic reduction (SCR) systems as an emissions reduction strategy. Injecting urea directly into the exhaust stream has been shown to reduce the formation of NO_x .

Toward this end, Kavlico has developed two types of sensors for urea level

measuring. One measures the changes in fluid level, by monitoring a dielectric change, allowing the sensor to provide a proportional voltage output to urea fluid level. A second sensor measures the pressure of the fluid and provides a proportional voltage to fluid level. In combination, the two sensors can be used to both measure level and the concentrations of urea in the fluid, Kavlico said. ★

@Kavlico... Our Sensors Are The Solution!

When it comes to aggressive, high vibration, broad temperature range environments, Kavlico OEM sensors and transducers are unequalled. Our high accuracy, field-proven designs offer reliable and cost-effective solutions for engine mounted and underhood applications for on/off-highway use. The sensors operate in hostile media environments, have an operating temperature range of -50°C to $+150^{\circ}\text{C}$, 1% accuracy and are available in ranges of $\pm 1'' \text{H}_2\text{O}$ to 8,000 psi gage, absolute, differential, and combined pressure and temperature.

- EGR Differential Pressure
- Barometric/Manifold (BAP/MAP)
- Engine Oil Pressure
- Common Rail Fuel Pressure
- Tilt
- Coolant Pressure
- Turbo Boost
- Oil Level/Quality
- Exhaust Back-Pressure
- Particulate Trap Differential
- Crankcase Pressure
- Compressed Air Pressure

When you have an engine or industrial vehicle application that demands the best in sensor performance, Kavlico sensors are the solution!

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14501 Los Angeles Avenue • Moorpark, CA 93021 • (805) 523-2000 • Fax (805) 523-7125
www.kavlico.com • e-mail: sales@kavlico.com