Sensors for a digital world – Data for Control, Monitoring and Diagnostics

Press Release

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KMW PRESENTS IMPROVED COMBUSTION PRESSURE SENSOR FOR LARGE ENGINES

Following intensive development work, Kaufbeurer Mikrosysteme Wiedemann (KMW) has introduced a higher performance version of its Z01 sensor for measuring cylinder pressure in large diesel, gas and dual-fuel engines.

"The further developments centre on the measuring capability, accuracy and robustness of our Z01 sensors," KMW project manager Daniel Maaß explains. "To facilitate the measurement of higher combustion pressures and to contribute to overall robustness, we have increased the temperature resistance of the sensing elements we use in the Z01 sensors. At the same time, new connection technology aims to improve overall resistance to both temperature and vibration. Finally, to enable the Z01 to reliably create high definition pressure signals, we have developed signal pre-processing electronics which provide a maximum signal cut-off rate of 40 kHz."

KMW Z01 cylinder pressure sensors cover applications in the cylinders of combustion engines where the hot combustion gases impinge on the sensing element diaphragm. "To cope with the high temperatures present, we have developed both a new design of diaphragm and an optimised combination of functional, insulation and passivation layers. These raise the permissible temperature at the diaphragm to as much as 400 °C," Maaß notes.

KMW points out that these improvements come at a time when peak pressures are rising in combustion engines due to developments such as two-stage turbocharging and very high-pressure common-rail fuel injection. There is also a clear need for higher definition signals from sensors for key operating values. Among these values, cylinder pressure is capable of giving deep insights into both engine performance and condition. As a result, the data are finding innovative uses in control, monitoring and diagnostic equipment for engines in ships, locomotives, power plants and compressor stations, such as cylinder power balancing to save fuel and wear, and the continuous calculation of NOx formation as a further means of optimising fuel consumption.

As a further route to improving overall engine performance, reliability, availability and economics, engine data transmitted to remote locations can assist decisions regarding the timing and extent

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of service and repair interventions. Similarly, for engine and component manufacturers, the round-the-clock cylinder pressure signals created by KMW's Z01 cylinder pressure sensors are a becoming a vital input to improving overall engine designs.

Caption:

Kaufbeurer Mikrosysteme Wiedemann (KMW) has released a new version of its Z01 thin-film pressure transmitters for measuring cylinder pressure in large diesel, gas and dual-fuel engines. The new sensors feature improved resistance to temperature and vibration, including the ability to withstand of up to 400 °C at the sensing element diaphragm. New pre-processing electronics enable a maximum signal cut-off rate of 40 kHz.

About KMW

KMW's contribution to advanced data acquisition centers on our custom-designed, high precision sensors employing thin-film technology. As well as their accuracy, stability and reliability, thin-film sensors from KMW are capable of delivering simultaneous signals for both temperature and pressure. Their robust construction makes them readily adaptable to operation under high pressures and temperatures in exacting fields of application, while their long effective life means that their

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exchange intervals are counted in millions of cycles, even in the most demanding applications. Most importantly, KMW thin film sensors can be produced in batch quantities on an industrial scale, adding economic production to their precise and reliable data gathering.

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