

PRESS RELEASE

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The KELLER M5 series. For static and highly dynamic pressure measurements up to 50 kHz

KELLER AG für Druckmesstechnik is setting new standards with the M5 series. All in all, the new sensor for static and highly dynamic measurements (up to 50 kHz) represents something totally unique when you consider the operating temperature range (up to 180°C), measurement accuracy ($\pm 0,1\%$ FS), installation size (M5 connection), and the remote, precise signal conditioning (0...10 V).

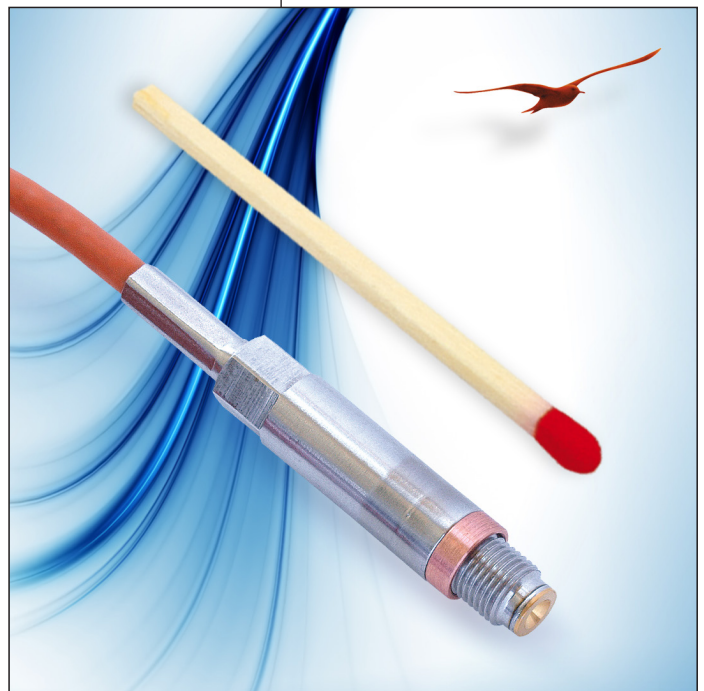
Ingenious design brings multiple benefits

The key to measuring highly dynamic pressure variance is to achieve, as far as possible, a direct connection between sensor element and medium. With this in mind, the development team at KELLER has come up with a micromechanical solution without media isolation diaphragm (with its damping effect), capillary tubing, sealants or adhesives. In the M5 series, the rear of the silicon sensor is soldered to a supporting element designed for excellent fluid dynamics, which in turn is secured flush at the front of the pressure connection.

This sophisticated design enables dynamic measurements with a bandwidth of 0...50 kHz and offers a number of additional benefits. These include excellent decoupling of mounting forces and structure-borne vibration, extensive media compatibility and the durability offered by the anti-oxidation coatings. Other impressive features of the M5 series are its overpressure protection of up to five times the measurement range and its pressure connection with an external thread of just $\varnothing 5$ mm for installations in space-limited locations.

Separation of sensor and signal converter

The pressure sensors in the M5 series are intended for operating temperatures between -40°C and $+180^{\circ}\text{C}$ with a narrow total error band (i.e. including temperature errors) of $\pm 1\%$. Without the remote signal converter, they come with a typical output signal range of 80 mV (based on a 1 mA supply) and an individual calibration certificate. The 3 bar, 10 bar and 30 bar measurement ranges are



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available for absolute pressure measurements. Separating the pressure sensor and the signal converter enables measurements at close proximity, even in units installed in cramped conditions and exposed to high temperatures.

A top-class signal converter

To avoid any reduction in the piezoresistive pressure sensor's broad dynamic range of 50 kHz, the development team at KELLER has opted not to digitise the measurement signal to be produced. Instead, the purely analogue signal path is adjusted in real time via the compensation electronics, which are fully controlled by a microprocessor. This ensures the output signal, amplified to 0...10 V, retains the full dynamic range of the sensor signal. The measurement system, consisting of the pressure sensor and signal converter, undergoes an end-to-end calibration at the factory once the customer-specific parameters have been determined. In addition, the operating temperature range of -40 to +125°C for the remote electronics satisfies the exceptional demands required by engine test benches, for instance.

Ideal for measurements at close proximity on engine test benches and in wind tunnels

The thermally ultra-robust pressure transducers in the KELLER M5 series support high-precision static and dynamic measurements up to a bandwidth of 50 kHz and at working temperatures of up to 200 °C at the pressure sensor. With its M5 connection thread, the remote pressure sensor – which contains no oil and associated isolation diaphragm and no sealant or adhesive in contact with the media – is ideal for taking highly dynamic measurements at close proximity. It can even do this at the very thin pipes used in engine test benches, in wind tunnels or during turbine blade tests.

Series M5 HB

