

PRESS RELEASE

Ratiometric pressure transducers - hermetically embedded in the Faraday cage

Keller can offer exactly the right solutions for a vast range of different applications thanks to the modular structure of our EMC-resistant Series 21 C pressure transmitters. RoHS compliance and comprehensive protection against electromagnetic radiation are fundamental requirements in this field. The only sure way to eliminate concerns is to use type AISI 316L stainless steel in contact with the media to be measured (i.e. no internal seals) together with protection class IP67 externally.

Users in typical sectors such as HVAC, pneumatic and hydraulic engineering, compressors, ventilation plants, pumping systems or mechanical engineering in general are immediately appreciative of the hermetically enclosed electronics.

But experienced users are also well aware of one of the critical aspects of pressure sensor technology: dependence on temperature. Here too, Keller's Series 21 C offers something out of the ordinary: mathematical modeling of the sensor characteristic, which is determined individually in a multi-stage calibration process. In conjunction with Chip-in-Oil (CiO) technology, this approach is the key to optimal digital compensation.

The programmable measurement amplifier has been designed as a miniature ASIC, fitted with extremely short connection wires in the same oil filling, immediately adjacent to the measuring cell, and directly inside the hermetically sealed stainless steel measuring capsule. Excellent EMC protection is not the only advantage that this design offers. Temperature influences act equally on the sensor and the electronics, allowing integral compensation. With a 5 V power supply, the ASIC supplies a ratiometric output signal of 0.5...4.5 V. The ASIC is fitted with reverse polarity protection and is resistant to overvoltage of up to ± 24 V. No electronic components whatsoever are located outside of the oil-filled, hermetically sealed pressure measurement cell, thereby ensuring the highest possible protection from elements.

Chip-in-Oil (CiO) technology is the latest stage in the consistent development of integration and miniaturization in field of pressure sensor technology. Integration of the entire measurement chain (sensor and electronics) in one housing vastly reduces susceptibility to faults and interference. As well as reducing the size of the unit as a whole, this concept yields excellent in-production process reliability thanks to the high level of automation. In contrast to the fully integrated one-chip solution, this approach retains total flexibility in order to implement various measurement ranges and – ultimately – for adaptation to a wide range of different customer requirements. A highly accurate, standardized and amplified sensor signal is available at the output for universal onward processing. Measuring cells featuring CiO technology are also available from Keller as single components for temperature ranges from -50°C to $+150^{\circ}\text{C}$.

The clear separation of the pressure measuring element and the programmable amplifier (although they are fitted in one housing) offers maximum flexibility to implement different measurement ranges, and for adaptation to a wide range of different customer requirements. This flexibility is further enhanced by countless possible variations for mechanical and electrical connections.



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