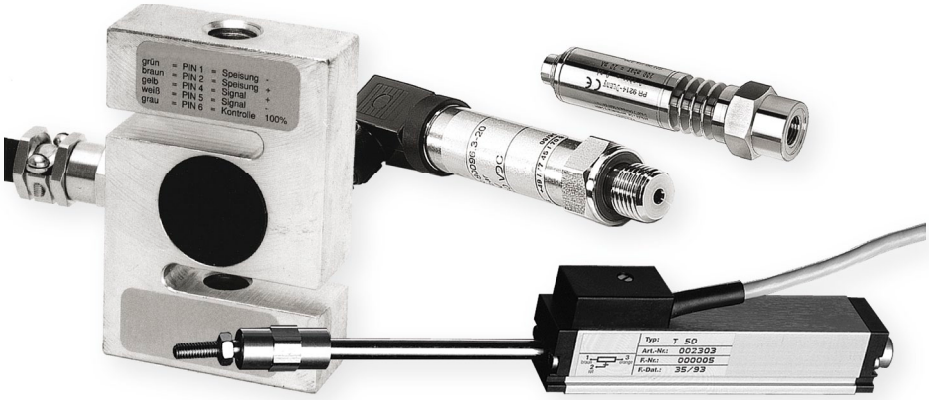


The Right Pressure Sensor For Any Measuring Task

Different methods are usually used for manufacturing pressure sensors that have been adapted to the corresponding application.

- Thick-Film Sensors
- Thin-Film Sensors
- Piezo-Resistive Sensors

Pressure transducers are principally available with 4 pressure calibrations:

- Relative pressure: Pressure related to the environmental pressure
- Absolute pressure: Pressure related to vacuum (0bar)
- Overpressure: Pressure related to atm. pressure at manufacturing (approx. 1bar)
- Differential press.: Pressure related to a second, variable pressure

Thick-Film Sensors

The expansion-sensitive elements are applied to a special steel membrane by screen printing technology.

Advantage:
Compact design, particularly suitable for use in simple monitoring and control circuits.

Disadvantage:
Limited operating temperature range, measured values are subject to a long-term variation

Thin-Film Sensors

In a demanding manufacturing process, the wire strain gauges are directly formed on a passivated special steel membrane by a chemical vapour deposition process.

Advantage:
Very compact and homogeneous design, high long-term stability and dynamic load capacity, particularly suitable for operation in harsh industrial environments in the range of medium and high relative pressures.

Disadvantage:
Very expensive manufacturing process.

Piezo-Resistive Sensors

A silicone membrane with ‚diffused in' expansion-sensitive resistors is used as the pressure-sensitive element. Due to its compatibility with many substances silicone would limit the use of the sensor. Therefore, a pressure transmission system, consisting of a filling liquid and a special steel membrane has been integrated. The pressure measuring cell is temperature-compensated and is manufactured in demanding vacuum processes.

Advantage:
High accuracy within a wide temperature range, particularly suitable for use in high sophisticated measurement and control tasks, especially for measurement of absolute pressure and low to medium relative pressure.

Disadvantage:
Generally, an expensive manufacturing process, however, cost-efficient when produced in large quantities.

Two mechanical designs are available in the ALMEMO® sensor range:

- Pressure sensors for hose connection: The measuring cell is housed in a compact plastic housing with two connecting fittings. The pressure sensors are available for wall mounting or as pressure modules that can be directly plugged into measuring instruments, with measuring ranges for relative or differential pressure measurement in gases, and also for atmospheric pressure measurements.
- Built-In Pressure Transducers: The measuring cell is suspended in an oil-filled, all-welded special steel enclosure. All parts that come into contact with a substance are made from special steel. Therefore, these transducers are also suitable for use in chemically aggressive substances in various industrial applications.

Temperature Measurement with Pressure Sensors for Refrigerants

Option SB0000R

All ALMEMO® Version V5/V6 devices, including ALMEMO® data loggers and data acquisition systems, can be used for continuous temperature measurement (resolution 0.1K) with absolute pressure sensors (resolution 0.001 bar compulsory !). Both, pressure and temperature can be selected or continuously indicated and recorded. (cf. page 10.08)