

Handling, Warning and Safety Instructions

Pressure & Force Sensors

Piezoelectric sensors are high precision measurement devices based on the piezoelectric effect. The use of these sensors shall therefore be restricted to experts and trained personnel.

Introduction

- The following instructions cover general guidelines for the installation and operation of the sensors.
- Read carefully to ensure proper handling, installation and operation of the sensors.
- For specific information on the different sensor types please see the individual datasheets.
- All work connected with the sensor has to be carried out according to general and local safety requirements.

Warnings and Safety Instructions

- The product may only be used and operated by qualified personnel capable of observing the necessary safety precautions.
- Only use certified or approved tools (e.g. for mounting) and accessories (cables, thermo shields, ...)
- The operating principle of this product is such, that the accuracy of the measurement results depends not only on the correct operation and functioning of the product, but also on a variety of peripheral conditions beyond the control of the manufacturer. The results obtained from this product therefore must be examined by an expert (e.g. for plausibility) before any action is taken that is based on the results.

- All repairs of the product are to be carried out by the manufacturer or qualified service personnel only.
- When the product is in use, an expert must ensure that neither the test object nor the testing equipment is operated under conditions that could lead to damage of affairs or injury of human.
- Be aware that the sensor can produce a non negligible amount of charge. Heating up or hitting the membrane might excite sparks (internally and externally). If you use a summing unit to combine signals be aware, that the amount of charges increases. The sensor must therefore be electrically connected to a piezo-amplifier at any time of its use.

Handling Instructions

- Store transducers at a dry place, ideally with silica gel.
- The membrane of the sensor has to be protected from mechanical damages (scratches, dents, etc.). These damages may deform the membrane permanently and measurement accuracy may decrease irreversibly.
- Keep the connector clean and dry to ensure a high insulation resistance of the device.
- The contacts of the connector must be protected from corrosive gases.
- For sensors equipped with sensitivity identification a flawless condition of the contacts is crucial for a proper detection of the sensor. Any oxidation or contamination of the contacts must be avoided.
- Don't remove dirt e.g. soot mechanically. Use cleaning fluid based on leach, which is appropriate for the respective material.

- Don't expose the sensor or cable to an environment outside its specified operating range (pressure, force, strain, temperature, acceleration).
- The sensor should be installed at a place that supports its working principle and does not introduce any artifacts like stationary waves or other noise.
- Before installing a sensor please check the installation dimensions, tolerances and condition of the intended mounting position. If necessary rework with suitable tools e.g. multistage drill, reamer.
- All dimensions, tolerances and surface roughness of the mount as indicated in the datasheet must be satisfied.
- The sensor must be in contact with the measurand in its intended way on its defined surfaces.
- Any force shunt other than defined by the mounting position must be avoided.
- When Sensors are machined in their mounting position like in injection molding applications the precision stamp and protective sleeve should be protected from deformation and transverse strain. Any force shunt, from abrasion and residues of the machining or molds with low viscosity in between sleeve and stamp has to be avoided.
- Heat transfer necessary for cooling (e.g. thread or sealing) must be ensured whereas unwanted heat bridges must be avoided.
- For water cooled sensors ensure that the cooling is enabled before the test bed or the like is taken into operation. Due to possible limestone deposits only use distilled water.
- Only use original seals as specified. Seal and thread of sensor as well as of the mount must be in optical flawless condition.
- The use of flame arrestors can improve the thermodynamic accuracy and the durability of the sensor only if the arrestor is clean from soot and other particles. Contamination can clog the small gas passages of the arrestor which can lead to a changed Performance. Therefore flame arrestors should be cleaned regularly and should not be used on diesel engines.
- For easier deinstallation the use of a high temperature mounting paste is recommended.
- All sensors have to be installed with a torque wrench with the tightening torque that is mentioned in the specification sheet. A wrong torque may change the measurement features and can even damage the sensor.
- For pressure transducers the tightness of the mounting has to be ensured before it is taken into service. Be aware, that sealing conditions may change due to differences in thermal expansion.
- Check that the sensor or the cable don't interfere with any moving parts.
- The cable has to be strain relieved and mounted according to the respective bending radii. Mechanical and electromagnetic stress should be avoided and the cables only be operated within their specified temperature range.
- If the sensor is mounted on a moving part, the cable has to have enough room to compensate any movements.
- While installing the cable please pay attention to sufficient distance to energized cable.
- Cables must not be shortened and cannot be repaired.
- Case insulated sensors need to be connected to a matching amplifier, to guarantee a clean measurement signal. If not grounded, the device can behave like an antenna and pick up electric noise.