

Pressure Sensor Handling & Assembly Instructions

This guide outlines the correct procedures for handling and assembling Superior Sensor Technology pressure sensors. The document provides essential information to ensure your pressure sensors are handled correctly and assembled efficiently, maintaining accuracy and extending their operational life. Whether you are a seasoned engineer or a newcomer to using these delicate instruments, the following sections will offer clear instructions and best practices crucial for safeguarding the integrity and performance of your pressure sensors throughout their lifetime.

Pressure Sensor Handling

Handling a MEMS-based (Microelectromechanical Systems) pressure sensor requires careful attention to avoid damage and ensure accurate performance. Here are some handling instructions:

1. **Static Sensitivity:** MEMS sensors are sensitive to electrostatic discharge (ESD). Always handle the sensor in an ESD-safe environment. Use an anti-static wrist strap and mat when handling the sensor.
2. **Temperature and Humidity Control:** Avoid exposing the sensor to extreme temperatures and humidity levels, as these can affect performance and longevity. Follow the data sheet specifications of your sensor series for the temperature and humidity limits.
3. **Mechanical Stress:** Avoid mechanical stress such as bending, dropping, or striking the sensor. Pressure sensors are delicate and can be damaged by impact or excessive force.
4. **Chemical Exposure:** Protect the sensor from exposure to chemicals, solvents, and gases that could corrode or otherwise damage the sensor elements or its packaging.
5. **Sensor Pads:** Do not touch the sensor pads to avoid possible damage or shorting of the pressure sensor.
6. **Storage:** All Superior pressure sensors are rated at Moisture Sensitivity Level 3 (MSL 3). The recommended shelf life of the devices in a sealed bag is 24 months at <40°C and <90% room humidity (RH). Sensors can be outside of dry storage for up to 168 hours before assembly (at <30°C and <60% RH).

Following these guidelines will help maintain the accuracy and extend the life of your MEMS-based pressure sensor.

PCB Assembly

All Superior Sensor Technology pressure sensors are SMT (Surface Mount Technology) parts soldered on the printed circuit board. Follow the steps below to ensure parts are installed correctly without compromising performance.

Storage

- 1) The following table provides a guideline for storage time depending on storage conditions for unopened moisture barrier bags. Storage of opened MBB should be done in a dry storage cabinet at $< 25^{\circ}\text{C}$ and $< 10\%$ R.H. to prevent any moisture absorption.

Storage Condition	Storage Time
$\leq 25^{\circ}\text{C} / \leq 50\% \text{ RH}$	3 years
$25^{\circ}\text{C} - 30^{\circ}\text{C} / 50\% - 70\% \text{ RH}$	2 years
$30^{\circ}\text{C} - 40^{\circ}\text{C} / 70\% - 85\% \text{ RH}$	1 year

Reflow Solder

- 1) Utilize no clean solder.
- 2) In addition, the preference is to use low-temperature, lead-free solder.
- 3) Follow the maximum profile temperature as prescribed in the data sheet.
- 4) Always perform part visual and electrical inspection on a test lot when there is a change in PCB size or configuration as thermal gradients in the reflow oven can change depending on the PCB configuration or loading.

Post Reflow

- 1) Some routers include high-pressure air streams; protect sensor ports with tape prior to exposure.
- 2) Use caution with high vacuum ICT tester; utilizing flow restrictors helps reduce sudden pressure differentials.

General Manufacturing

- 1) Ensure the sensor ports are well protected during assembly so no dust, solder flux, or other particles enter the ports.
- 2) Do not use solvents or liquids that can get into the pressure ports.
- 3) No mechanical stress should be applied to any part of the sensor during assembly.
- 4) Do not have any high-pressure streams go through the sensor during manufacturing (such as high-pressure streams used to clear particulates during router-based singulation).
- 5) If needed, perform spot cleaning by hand. Do not wash or submerge the sensor in cleaning liquid.

Offset Shift

- 1) Post SMT, offset shift has a settling time constant of approximately one week. For best performance, calibration is suggested after two to three time constants.
- 2) Alternatively, implement thermal cycling procedures (contact us for recommendations).

Adhering to these guidelines for handling and assembling pressure sensors from Superior Sensor Technology will ensure optimal performance and longevity. Remember that the precision and reliability of these sensors are paramount in applications where accurate measurements are crucial. By following the instructions outlined in this guide, you will minimize risks of damage and ensure the sensors function as intended. Should you have any further questions or require additional support, please get in touch with our support team at customersupport@superiorsensors.com.

Thank you for choosing Superior Sensor Technology for your sensor needs.