

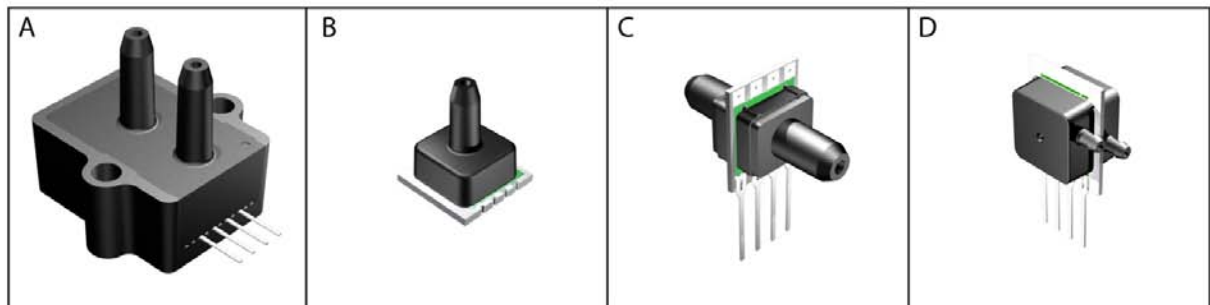
All Sensors **Pressure Points** are application tips to simplify designing with microelectromechanical (MEMS) pressure sensors and avoiding common pitfalls.

Pressure Point 5: Special Considerations for Mounting and Handling Pressure Sensors

Successfully applying a pressure sensor requires more than ensuring that it meets design specifications. Ignoring the sensor supplier’s recommendations for proper handling of the pressure sensor during the user’s manufacturing process can cause both immediate and latent problems. Since the environmental challenges that pressure sensor face in end applications expose them to more hazards than other sensors, users need to be especially careful with these products. This Pressure Point discusses the most common considerations for low pressure (0-150 psi) sensors in plastic packages.

Mounting to Minimize Package Stress

Housed in durable, printed circuit board (PCB) mountable packages, All Sensors pressure sensors are offered in a variety of packages as shown in Figure 1. For screw-attached packages such as Figure 1 a, care should be taken to avoid excessive torque when installing the sensor or its calibration and/or zero may shift. To ensure proper installation torque, the zero shift can be checked after installing. Barbed mounting clips such as the Christmas Tree™ design from [ITW Fastex](http://www.itw.com) can be used for applications under 5 PSI and nylon screws can be used for applications above 5 PSI.



Note: packages not to scale

Figure 1: Package types A,B, C and D from All Sensors require different mounting and handling considerations.

Media Compatibility/Harsh Media Issues

All Sensors pressure sensors are specifically intended for use with non-corrosive, non-ionic working fluids such as air, and dry gases. All Sensors recommends evaluating sensors in their intended environment to determine if added protection from the environment is required.

Pressure Connections

For pressures above 30 psi, barbed ports or threaded connections are typically used to ensure proper pressure sealing. Many of All Sensors pressure sensors target low pressure applications (less than 30 inches H₂O), where a port without a barbed connection is sufficient. The pressure tubing should be fully inserted to avoid vibration from disconnecting the sensor during its usage.

Electrical Attachment

For leaded packages, connectors are available from connector suppliers that allow electrical attachment without making a solder connection. For sensors that are solder attached to a PCB, the maximum temperature limits of the package must not be exceeded.

For amplified sensors in Figure 1 (a and d package types), lead temperature soldering must occur within 2 to 4 seconds and at a maximum temperature of 250°C

For millivolt output sensors in Figure 1 (a package), lead temperature soldering must occur within 2 to 4 seconds and at a maximum temperature of 270°C.

All Sensors BASIC Series of pressure sensors use a ceramic surface mount configuration to provide the smallest footprint possible. For surface mount basic sensors such as Figure 1 b (LP and LF packages), lead temperature soldering must occur within 2 to 4 seconds and at a maximum temperature of 270°C.

Wave soldering and/or surface mount solder reflow requires additional consideration. The recommendations of the “IPC Association Connecting Electronics Industries and JEDEC Moisture/Reflow Sensitivity Classification for Nonhermetic Solid State Surface Mount Devices” (<http://www.ipc.org/TOC/IPC-JEDEC-J-STD-020C.pdf>) can be used to maintain package integrity of components during any heat exposure of board soldering and de-soldering.

Conclusion

With proper consideration to the mounting and handling requirements of MEMS pressure sensors in plastic packages, the end product can experience a long and useful life while operating within the data sheet parameters.