

Handling & Installation of Platinum RTD Sensors from Heraeus Sensor Technology GmbH

Handling

1. Sensors must be handled carefully to avoid damage. Plastic or plastic coated metal tweezers are recommended.
2. Pliers or clamps should not be used. The element should not be subjected to any clamping forces.
3. To avoid lead strain, the lead wires should not be bent in the vicinity of the sensor body.
4. Avoid frequent bending or repositioning of lead wires.

Connection techniques

1. The preferred connection technologies are welding, brazing, or soft soldering, depending upon the lead wire and temperature rating of the element. Recommended connection techniques are specified on each thin film element data sheet. Generally, welding is recommended for Ni or Pt coated Ni lead wires, and soft soldering is recommended for silver alloy or gold-plated lead wires.
2. For elements with gold-alloy lead wires, such as the C416 type, only solder alloys specifically designed for use with gold should be used. Other alloys not specifically recommended for use with gold wire may cause irreversible lead wire damage.
3. Connection method details:
 - Laser welding: A laser lap or butt weld is the preferred connection technique.
 - Ultrasonic welding: Prior to welding, bend the leads away from the plane of the element body to eliminate internal damage.
 - Spot welding/resistance welding: A widely used, reliable connection technique.
 - Crimping: High-quality gas-tight crimping is recommended to avoid high contact resistance.
 - Soft soldering: Insure that solder alloy is compatible with lead wire material, and melting point is higher than maximum application temperature. All flux must be removed from the element and lead wires.
 - Brazing: During the brazing operation, the element body temperature must not exceed the maximum rated temperature. Heat sink the element leads, if necessary, during brazing, to avoid overheating. The brazing time should be less than 3 seconds.

Lead wire length

The nominal resistance of the sensor element is measured on the wire 8mm from the element body. Cutting the lead wire will decrease the resistance and shift the calibration. Similarly, adding extension leads will increase the resistance. A 3 or 4 wire connection at the 8mm point may be used to compensate for the additional lead length.

Encapsulation and Potting

1. The thermal expansion coefficient of the potting material should match the expansion coefficient of alumina ceramic, the sensor substrate material, to avoid measurement errors or part failure due to thermal expansion mismatch.
2. Rigid epoxies should be avoided, especially when the maximum operating temperature exceeds the glass transition temperature of the potting material.

3. End-users have reported successful use of thermally conductive non-rigid silicone potting materials.
4. Encapsulation materials must be chemically neutral. In particular, ceramic potting materials containing fluorine compounds should be avoided.
5. If the element is potted in a housing, the housing should be free from contaminants, such as flux, organics, etc., to avoid element damage at elevated temperature.
6. Please refer to individual data sheets for any requirements specific to a particular element type.

Storage

1. Platinum sensing elements should be stored in a corrosive-free environment.
2. The elements should be stored with adequate protection against shock, bending or crushing forces, etc.
3. In high humidity environments, it may be necessary to dry the sensor before installation.
4. Please refer to individual data sheets for any special handling or storage requirements.