

Industrial Thermocouples

Thermo Sensors Industrial thermocouples are widely used in process industry applications. Thermocouples are generally selected by determining the particular conditions under which it must perform. These conditions which have recommended wire and material selections and are grouped in types.



Thermo Sensors thermocouple element types include:

- Type E Chromel-Constantan Thermocouple
- Type J Iron-Constantan Thermocouple
- Type K Chromel-Alumel Thermocouple
- Type N Nicrosil-Nisil Thermocouple
- Type R Platinum-Platinum 13% Rhodium Thermocouple
- Type S Platinum-Platinum 10% Rhodium Thermocouple
- Type B Platinum 6% Rhodium-Platinum 30% Rhodium Thermocouple
- Type T Copper- Constantan Thermocouple

The wire gauge and recommended temperature ranges are of various sizes as well.

Please refer to our order guide to assist in determining your needs. We can also provide technical design assistance and application suggestions. Give us a call.

Installation and Maintenance

Thermocouple Installation

1. Carefully select the location and insertion depth at a point where the temperature is most likely representative of the process temperature. It is important to avoid stagnant areas of the measured media which do not have representative temperatures.
2. Locating the thermocouple where the hot end can be seen assures visual confirmation of the junction location.
3. Immerse the thermocouple far enough to ensure that the measuring junction is entirely included in the temperature area to be measured. a depth ten times that of the diameter of the protection tube is recommended. Heat which is conducted away from the hot junction will cause a lower reading due to "stem loss."
4. Keep the connecting head and cold junction in coolest ambient temperature available.
5. To prevent breakage due to thermal shock, never insert a ceramic tube into a hot area rapidly. Preheat gradually while installing.
6. Avoid direct flame impingement on protecting tube. Impingement shortens the tube life and causes temperature readings to be inaccurate.
7. When measuring high temperatures, install the thermocouple vertically, whenever possible. Such installation minimizes sagging of the tube or sheath.

Extension Wire Installation

1. Be sure to select the correct type of extension wire for a given calibration of thermocouple. (See Bulletin 300).
2. Use the color coding of individual wires as a guide for connecting the negative wire to the negative-wire terminal at both the thermocouple connection head and the instrument. Red is always Negative (-).
3. To prevent spurious EMF due to electrostatic and electromagnetic noise, never run thermocouple extension wire in same conduit, parallel to the conduit or near any power source. Keep thermocouple wire at least 12" from power source.
4. In "high noise" areas, use thermocouple extension wire with twisted and shielded conductors and a drainwire.
5. Select the proper insulation to meet the specific conditions under which it must perform. (See Bulletin 300).

General Maintenance

1. Monthly maintenance checks are usually sufficient for base metal thermocouples. Individual conditions, however, may require more frequent checks.
2. Keep rotary switches clean and free of oxidation at contact points.
3. When reinserting a thermocouple, it is extremely important that the depth of insertion not be changed. Be especially careful not to decrease the depth. Wires which are not homogeneous, due to exposure to the process, will cause errors in regions of temperature gradients.
4. A type K thermocouple should not be exposed to temperatures of 1600° F or higher if it is to be used for accurate measurements below 1000° F.
5. Do not use thermocouples with burned-out protecting tubes. Thermocouples can become damaged with contamination if allowed to remain within tubes of poor condition.
6. If thermocouples are to be connected in series, parallel or differential, refer to the diagrams on Page 3.