

MEASURING JUNCTION



GROUNDING JUNCTION

The **grounded** thermocouple junction is an integral part of the thermocouple sheath tip.

Advantages:

- fast response time in relation to ungrounded and isolated junctions.
- protects the wires from environmental chemicals and corrosives.
- prolongs the operational life of the thermocouple. Longer lifespan than the exposed junction thermocouple.
- it is recommended for high pressure applications.
- it is the least expensive construction.

Disadvantages:

- thermal expansion of sheath material may differ from element to cause mechanical stress and work hardening of metals.
- ground loops may cause interference with instruments.
- faults in insulation are more difficult to detect.



UNGROUNDING JUNCTION

The **ungrounded** thermocouple junction is electrically insulated and electrically isolated from the outer sheath material. In a dual ungrounded thermocouple, one common junction is electrically insulated from the outside sheath.

Advantages:

- the thermocouple junction is isolated from the ground.
- defects in the MgO insulation can be detected by measuring resistance from loop to sheath.
- long term drift under cycling conditions is minimized.

Disadvantages:

- response time is usually slower than grounded thermocouples.
- more expensive than grounded thermocouples.

Dual exposed junctions are common, except for 8 awg



EXPOSED JUNCTION

The **exposed** thermocouple junction extends beyond the protective metallic sheath.

Advantages:

- recommended for measurement of noncorrosive static gas, or air.
- very fast response time, faster than grounded junction.

Disadvantages:

- cannot be used in an environment with a high percentage of solids, high pressure, or flowing material since the junction is exposed to this environment.



ISOLATED JUNCTION

Isolated thermocouple junctions are used in a dual or triple thermocouple when the junctions are isolated from the outer sheath material as well as from each other.

Advantages:

- the elements are insulated from ground.
- performs better than ungrounded or grounded junctions in a thermal cycling environment.

Disadvantages:

- slower response time than a grounded dual thermocouple.

*For tip sensitivity information, see page 3-8.