

## THERMOCOUPLE SELECTION

Selecting the proper thermocouple and installing it correctly will provide you with more accurate results and give the device a longer life time. The following are some helpful tips for selecting and maintaining thermocouples.

### **A. Thermocouples should be protected.**

Many external factors can affect the composition of the thermocouple materials causing skewed readings and shortened lifetime. Evaporation, oxidation, contamination, corrosion, diffusion, and induced EMF must all be considered when a thermocouple is being put into service. Protective sheaths can be used in the construction to protect the device. If the thermocouple contains a bare wire, it is important that the protection tubes are clean and have the proper diameter and length to allow proper ventilation inside.

### **B. Select practical and large wire.**

Wire that contains heavier wire is often more stable in a high temperature environment when compared with a lighter gauge. However, fine gauge wire provides rapid response and flexibility. A compromise must be made using these factors to determine the largest wire possible to meet the specifications.

### **C. Select proper location for installation.**

Thermocouple must be installed in an area that properly represents the temperature of the equipment or substance that is being measured.

### **D. Ensure proper thermocouple depth.**

Since heat can be transferred away from the thermocouple sensor, it is important to ensure the thermocouple has sufficient depth to gain an accurate reading.

### **E. Maintain a constant immersion depth.**

Imperfections in the thermocouple wires can result from factors such as oxidation, corrosion, and evaporation. These imperfections can cause inaccurate readings if the depth of the thermocouple is altered.

### **F. Heating cycles can affect accuracy.**

It is recommended that the thermocouples be used at a single temperature or increasingly higher temperatures to maintain high accuracy. However, this is not always the case. It must be accounted for that there will be some error when cyclic heating occurs. The error can be reduced by using thermocouples which are still in good condition.

### **G. Check equipment regularly.**

It is important to check and repair the thermocouples, protection tubes, and extension wires for any damage. Checks should occur as frequent as necessary, however, once a month is usually sufficient. Check to see if the protection tubes are burnt out or damaged to prevent harm to the thermocouple. Check thermocouples in place if possible. If not, they should be reinserted to at least the same depth to avoid error. Make sure the external wire reaches the resistance equipment.