TROUBLE-SHOOTING

If a thermocouple is giving erroneous readings, the following steps should be taken to spot the error.

A. Check Circuit

Check the polarity of the thermocouple at each connection. They can often be identified by magnetism or colour coding. The negative thermocouple wire should connect to the negative extension wire, and in turn, to the negative side of the meter. This should also be true for the positive connections.

B. Check Instrumentation

After checking the circuit, turn your attention to control meter or recording instrument. Make sure the instrument in set to the proper thermocouple type. Check the room temperature setting (cold junction compensation). Do this by removing the extension wires and placing a jumper wire across the meter connection terminals. The reading should coincide with the room temperature. If problems still arise, compare the reading of a test thermocouple with known accuracy (also connected to a meter of known accuracy) with the thermocouple in question. Make sure the test thermocouple is placed as close to the original as possible to ensure they are measuring the same temperature.

C. Check Thermocouple

Thermocouples are always susceptible to a change in composition which could cause faulty readings. This could be due to many factors such are oxidation, corrosion, or contamination that often come from such things as brazing alloys and fluxes. Check the working thermocouple by hooking it up to a test meter of known accuracy. If the working meter reading is the same as the previous test reading of known accuracy, then the working thermocouple is not the problem.

D. Test Meter and Extension Wires

Connect the extension wires to a test thermocouple of known accuracy and observe the reading. If the reading is different than obtained with the test meter, then the fault lays in either the working meter or extension wires.

Checking all of these components of the system can often result in diagnosing the problem and finding a solution. If the error is directly due to a faulty thermocouple, then it should be removed and inspected. If the thermocouple is severely corroded or oxidized then it should be replaced. It is often better to replace an inaccurate thermocouple than to risk a loss or product or time due to temperature problems.