

OPERATING INSTRUCTIONS

Electronic Module System Thermocouple Probe Set No. 32399

1. Introduction

The Thermocouple Probe set allows you to accurately measure high temperatures up to 1200°C. Operation requires a 32386 Amplifier Power Supply and a voltmeter capable of measuring between 0 and 1 volt, such as the 32381 Six-Range DC Meter.

2. Description

Each thermocouple consists of two metal wires, one made of chromel and one of alumel, wrapped together by an insulating shield for hand contact. The two wires are twisted together at the probe end. Chromel-alumel is the combination chosen for the wire because its output voltage characteristically varies linearly over the temperature range to which the probes are subjected. This type of thermocouple develops about 4.1mV for a temperature difference of 100°C. With the 32386 12VAC/DC Amplifier Power Supply set with a gain of 100, this voltage can be amplified to a level of .4 volts which is measurable on the 32381 Six Range DC Meter.

3. Operation

The amplifier power supply requires initial adjustment prior to measuring unknown temperatures. To make this adjustment, connect the two probes together at the two positive red jacks and plug them into the amplifier power supply by the negative black jacks. The amplifier gain should be adjusted to 100 and the DC offset adjusted until the amplifier output of the 32381 Six-Range DC Meter reads zero. A calibration curve (Fig. 1) shows the thermocouple response.

Now an unknown temperature can be determined by keeping one thermocouple at a known temperature (0°C, in an ice bath) and using the other thermocouple as the temperature probe. If, for example, the sensing probe is held in a flame, the 6-range voltmeter will give a voltage that can then be used on the calibration curve to determine the temperature difference between the two thermocouples. Since one probe is at 0°C, the sensing probe will be at the temperature equal to this difference.

4. Maintenance

The Thermocouple Probe Set needs no special maintenance. If you should experience any difficulty with a probe, please contact Central Scientific Company, giving details of the problem. To ensure better service, please do not return any apparatus to Central Scientific Company until we have sent you authorization.

Written 8/89