THERMOCOUPLE SELECTION AND CALIBRATION

Each OMEGA® Series 7000 analog pyrometer is marked on the faceplate with the type of thermocouple and the total external resistance for which it is calibrated. Use of any other type of thermocouple, or one with a higher resistance than marked will result in incorrect readings. A complete selection of thermocouples and thermocouple wire is available from the latest copy of the OMEGA Temperature Measurement Handbook and Encyclopedia®.

All standard pyrometers are calibrated for ten ohms external thermocouple resistance and are provided with a ten ohm calibrating resistor bobbin. (See Figure 1). Nonstandard pyrometers are usually calibrated for the specific external resistance ordered and no resistor bobbin is supplied. This resistor bobbin must be adjusted so that the total resistance of the thermocouple and the bobbin add up to ten ohms in order to maintain calibration accuracy. Therefore, for a five-foot, 20-gage, Iron-Constantan thermocouple, the resistance of the thermocouple would be approximately 1.75 ohms and this resistance must be subtracted from the calibrating bobbin. For greater accuracy, make a resistance measurement for each thermocouple used. Do not use standard tables. Each turn of the wire on the resistor bobbin represents 0.5 ohms and for this example, 3½ turns would be removed. The total resistance of the thermocouple plus the resistor bobbin would then add up to ten ohms. For other values of thermocouple resistance, simply remove more or less turns to adjust for the total value of external resistance marked on the pyrometer dial. Extra ten ohm resistor bobbins may be ordered.

For best accuracy, the external thermocouple resistance should be adjusted to within one percent of the resistance of the measuring circuit (internal resistance plus external resistance). For scale spans of 500 degrees or more, adjustment accuracy should be better than ±0.5 ohms. For scale spans of 300 degrees, adjustment accuracy should be better than ±0.25 ohms.

It is very important that the resistor wire be properly soldered after adjusting.

NOTE

When thermocouples with external resistance higher than ten ohms are used, a special pyrometer is required. The use of other than thermocouple wire for leads or extensions may result in improper ambient compensation.
ZERO SETTING

Pyrometers with automatic cold-junction compensation have a small coiled bimetallic spring which moves the zero setting of the pointer to agree with the internal temperature of the meter. It may need adjustment from time to time. This is done by turning the zero adjustment screw on the front of the pyrometer. Make this adjustment only after the pyrometer has been in a room with even temperature for several hours. Disconnect the thermocouple leads and adjust the pointer to read actual room temperature. Reconnect the thermocouple leads.

ALL THERMOCOUPLE CONNECTIONS MUST BE TIGHT. A LOOSE CONNECTION OR BAD THERMOCOUPLE JUNCTION WILL CAUSE ERRATIC READINGS.

CONNECTION OF THERMOCOUPLE

Pyrometers are polarity sensitive and must have the thermocouple connected to the proper terminals to indicate properly. On all OMEGA pyrometers, the left terminal (viewed from the rear) is positive. See Figure 1 for further clarification.

![Diagram](image.png)

Figure 1. Series 7000 Pyrometer Rear View
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WARRANTY/DISCLAIMER

OMEGA warrants this unit to be free of defects in materials and workmanship for a period of 12 months from date of purchase. OMEGA Warranty applies for a period of 12 months from the date of purchase. The warranty is void if the unit is not returned to the factory for examination by OMEGA. If the unit is found to be defective it will be repaired or replaced at no charge. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. However, the warranty is void if the unit has been damaged due to misuse or abuse; if it has been exposed to high temperature, humidity, or to moisture or to vibration; if it has been damaged by improper installation or transportation; or if it has been damaged by improper handling or to failure to follow the operating instructions of the product. OMEGA is pleased to offer suggestions on the use of its various products. Nevertheless, OMEGA only warrants that the product manufactured by it will be as specified and free of defects.

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RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department, BEFORE RETURNING ANY PRODUCTS TO OMEGA. PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA’S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and enclosed with any correspondence.

FOR WARRANTY RETURNS, please have the following information available BEFORE contacting OMEGA:

1. P.O. number under which the product was PURCHASED.
2. Model and serial number of the product under warranty.
3. Repair instructions and/or specific problems relative to the product.

FOR NON-WARRANTY REPAIRS OR CALIBRATION, consult OMEGA for current re-calibration charges. Have the following information available BEFORE contacting OMEGA:

1. P.O. number to cover the cost of the re-calibration.
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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