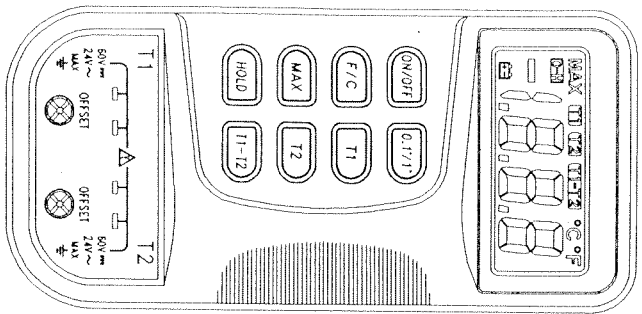


OPERATING INSTRUCTIONS

MODEL 307

DIGITAL THERMOMETER



INTRODUCTION

This instrument is a portable 3 1/2 digit, compact-sized digital thermometer designed to use external K-type thermocouple as temperature sensor. Temperature indication follows National Bureau of Standards and IEC 584 temperature/voltage tables for K-type thermocouples. Two K-type thermocouples are supplied with the thermometer.

SAFETY INFORMATION

It is recommended that you read the safety and operation instructions before using the thermometer.

WARNING

TO AVOID ELECTRICAL SHOCK, DO NOT USE THIS INSTRUMENT WHEN VOLTAGES AT THE MEASUREMENT SURFACE EXCEED 24V AC OR 60V DC.

WARNING

TO AVOID DAMAGE OR BURNS, DO NOT MAKE TEMPERATURE MEASUREMENTS IN MICRO-WAVE OVENS.

CAUTION

Repeated sharp flexing can break the thermocouple leads. To prolong lead life, avoid sharp bends in the leads, especially near the connector.

The Δ symbol on the instrument indicates that the operator must refer to an explanation in this manual.

SPECIFICATIONS

ELECTRICAL

Measurement Range:

-50°C to 1300°C, (-58°F to 2000°F)

Resolution: 1°C or 1°F, 0.1°C or 0.1°F

Accuracy:

Accuracy is specified for operating temperatures over the range of 18°C to 28°C (64°F to 82°F), for 1 year, not including thermocouple error.

$\pm 2^\circ\text{C}$	-----	-50°C to 0°C
$\pm 4^\circ\text{F}$	-----	-58°F to 32°F
$\pm (0.3\% \text{ rdg} + 1^\circ\text{C})$	-----	0°C to 1000°C
$\pm (0.5\% \text{ rdg} + 1^\circ\text{C})$	-----	1000°C to 1300°C
$\pm (0.3\% \text{ rdg} + 2^\circ\text{F})$	-----	32°F to 2000°F

Temperature Coefficient:

0.1 times the applicable accuracy specification per °C from 0°C to 18°C and 28°C to 50°C (32°F to 64°F and 82°F to 122°F).

Input Protection:

60V dc or 24V rms ac maximum input voltage on any combination of input pins.

Reading Rate: 2.5 times per second.

Input Connector:

Accepts standard miniature thermocouple connectors (flat blades spaced 7.9mm, center to center).

ENVIRONMENTAL

Ambient Operating Range:

0°C to 50°C (32°F to 122°F)

Storage Temperature:

-20°C to 60°C (-4°F to 140°F)

Relative Humidity:

0% to 80% (0°C to 35°C) (32°F to 95°F)
0% to 70% (35°C to 50°C) (95°F to 122°F)

GENERAL

Display:

3 1/2 digit liquid crystal display (LCD) with maximum reading of 1999

Battery:

Standard 9V battery (NEDA 1604, IEC 6F22)

Battery Life:

200 hours typical with carbon zinc battery

Dimensions:

147 mm (H) x 70 mm (W) x 39 mm (D)

Weight: 7.6 oz (215g)

Supplied Probe:

4-foot type "K" thermocouple bead probe (self tape insulated). Maximum insulation temperature 260°C (500°F). Probe accuracy $\pm 2.2^\circ\text{C}$ or $\pm 0.75\%$ of reading (whichever is greater) from 0° to 800°C.

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OPERATING INSTRUCTIONS

Selecting the Temperature Scale

Readings are displayed in either degrees Celsius (°C) or degrees Fahrenheit (°F). When the thermometer is turned on, it is set to the temperature scale that was in use when the thermometer was last turned off. To change the temperature scale, press the F/C key.

Single-Thermocouple Temperature Measurement

The thermometer displays the temperature of the thermocouple that is connected to the selected input. Press the T2 key to display the temperature of the thermocouple connected to the T2 input. Press the T1 key to display the temperature of the thermocouple connected to the T1 input. The input selection cursor indicates which input is selected.

Differential Temperature Measurement

Differential temperature measurement is selected by pressing the T1-T2 key. This causes the thermometer to display the temperature difference between the two thermocouples (the temperature of thermocouple T1 minus the temperature of thermocouple T2). The selection is indicated by the input selection cursor.

HOLD Mode

Press the HOLD key to enter the Data Hold mode, and the "D-H" annunciator is displayed.

When HOLD mode is selected, the thermometer holds the present T1, T2, and T1-T2 readings and stops all further measurements. Pressing the HOLD key again cancels HOLD mode, causing the thermometer to resume taking measurements.

MAX Mode

To select MAX mode, first select the desired input (T1, T2, or T1-T2), then press the MAX key. The thermometer then records and updates the maximum values for that input. The MAX annunciator appears on the display. Pressing the MAX key again to exit. In the MAX mode, press HOLD key to stop the reading, press HOLD again to resume recording.

Selecting the Display Resolution

The thermometer allows two choices of resolution:
High resolution: 0.1°C or 0.1°F
Low resolution: 1.0°C or 1.0°F
To select the alternate display resolution, press the (0.1°/1°) key.

OFFSET ADJUSTMENT

The OFFSET controls are set at the factory to allow for the variations found in standard thermocouples. By adjusting the OFFSET controls, you can optimize measurement accuracy for a particular thermocouple (or pair of thermocouples) at a particular temperature.

Adjusting for T1 or T2 Measurements

1. Connect the thermocouple to the T1 or T2 input connector and turn the thermometer ON. (If using T2, press the T2 key.)
2. Place the thermocouple in a known, stable temperature environment at or near the temperature you wish to measure, and allow the readings to stabilize.
3. Slowly adjust the OFFSET control that corresponds to the selected input (i.e., T1 or T2) so that the thermometer reading matches the temperature of the known environment. Leave sufficient time between adjustments to allow for measurement lag.
4. The calibration of the thermometer-thermocouple combination is now optimized for measurements near the temperature measured in step 2.

Adjusting for T1-T2 Measurements

1. Connect the thermocouples to the input connectors.
2. Turn the thermometer ON and select T1-T2.
3. Place both thermocouples in a stable temperature environment at or near the temperature you wish to measure, and allow the readings to stabilize.
4. Slowly adjust either one (but not both) of the OFFSET controls until the thermometer reads zero. Leave sufficient time between adjustments to allow for measurement lag.
5. The thermometer-thermocouple combination is now optimized for differential temperature measurement near the temperature used in step 3.

Resetting the OFFSET Controls

To return the OFFSET controls to their factory setting without having to recalibrate the thermometer, perform the following procedure:


1. Connect a thermocouple that is in good working order to the input that is to be adjusted.
2. Place the thermocouple in an ice-water bath and allow the readings to stabilize.
3. Slowly adjust the corresponding OFFSET control until the thermometer reads 0°C (32°F).

OPERATOR MAINTENANCE

WARNING

TO AVOID POSSIBLE ELECTRICAL SHOCK, DISCONNECT THE THERMOCOUPLE CONNECTORS FROM THE THERMOMETER BEFORE REMOVING THE COVER.

Battery Replacement

Power is supplied by a 9 volt "transistor" battery. (NEDA 1604, IEC 6F22). The "  " appears on the LCD display when replacement is needed. To replace the battery, remove the three screws from the back of the meter and lift off the front case. Remove the battery from case bottom.