
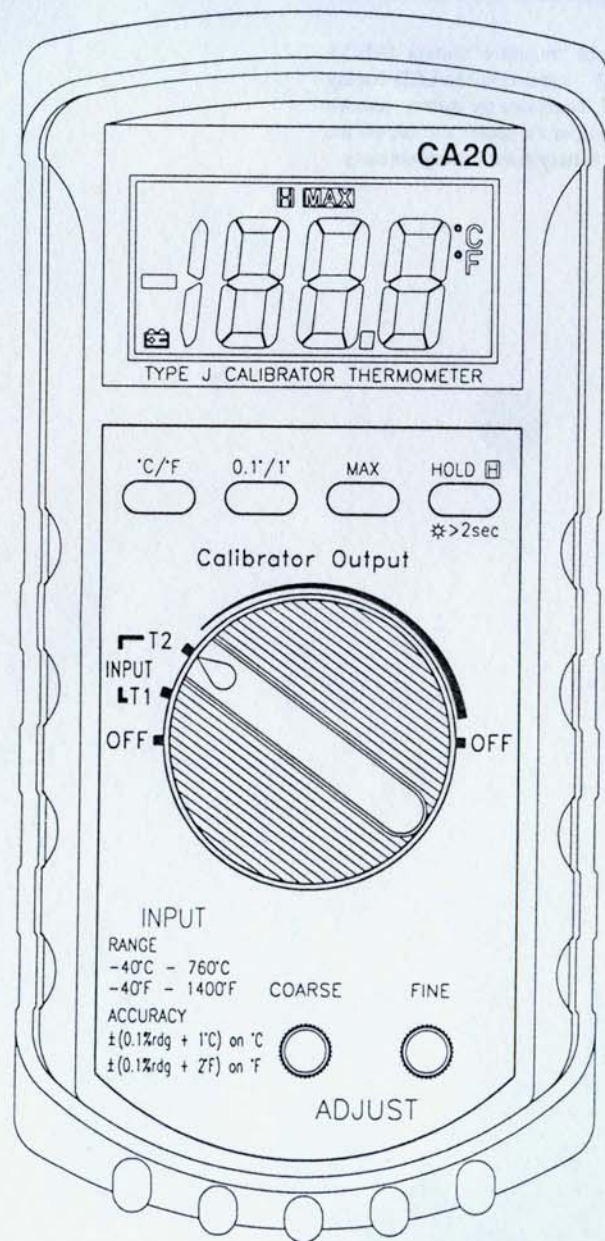


**OPERATING INSTRUCTIONS**  
**MODEL CA20**   
**DIGITAL THERMOMETER & CALBRATOR**



## INTRODUCTION

This instrument is a portable 3½ digit, compact-sized digital thermometer designed to use external J-type thermocouple as temperature sensor. Temperature indication follows Reference Temperature/Voltage Tables (N.I.S.T. Monograph 175 Revised to ITS-90) for J-type thermocouples.

## 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 DC.

### WARNING

To avoid damage or burns, do not make temperature measurement in microwave 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  $\Delta$  symbol on the instrument indicates that the operator must refer to an explanation in this manual.

## ENVIRONMENTAL

### Ambient Operating Ranges:

0°C to 50°C (32°F to 122°F) < 80% R.H.

### Storage Temperature:

-20°C to 60°C (-4°F to 140°F) < 70% R.H.

## GENERAL

### Display:

3½ digit liquid crystal display (LCD) with maximum reading of 1999.

### Battery:

Standard 9V battery.

### Battery Life:

200 hours typical.

### Dimensions:

190.7mm(H) x 90mm(W) x 53.4mm(D).

### Weight: 440g.

## SPECIFICATIONS

### ELECTRICAL

**Temperature Scale:** Celsius or Fahrenheit user-selectable

**Measurement Range:** -40°C to 760°C, (-40°F to 1400°F)

**Calibration Range:** -210°C to 1200°C, (-328°F to 2192°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.

±(0.1% rdg + 1°C) on -40°C to 760°C

±(0.1% rdg + 2°F) on -40°F to 1400°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:

24V dc or 24V ac rms 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).

## 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 "°C/°F" key.

### 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 corresponding "0.1°/1°" key.

### Back-Light and Data-Hold Switch (✳ > 2sec), (H):

Press this button briefly to activate DATA-HOLD mode. The "H" annunciator is displayed.

Press this button for 2 seconds to turn the Back-Light on. As this also activates the DATA-HOLD mode, briefly press the button to return to normal display. To turn the Back-Light off press again for 2 seconds.

## MAX Mode

Pressing the Max key to enter the MAX mode. The thermometer then records and updates the maximum absolute values and the MAX annunciator appears on the display. Pressing the MAX key again to exit the MAX recording mode.

## T1 , T2 Temperature Measurement

1. The function switch indicates which input is selected for display; T1 thermocouple, T2 thermocouple.
2. Connect a type J thermocouple to the jack on the instrument. Place the probe or thermocouple tip on or in the material to be measured and take the temperature reading directly from the display.

## Thermocouple Calibration

1. Connect the proper J-type thermocouple wire and miniature male SMP connector to the CA20 output.
2. Connect the other end of the thermocouple wire to the instrument to be calibrated.
3. Using the range switch and the COARSE / FINE adjust knobs set the CA20 to the output required as read on the LCD.
4. If output over  $-40^{\circ}\text{C}$  to  $760^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$  to  $1400^{\circ}\text{F}$ ) range, Please refer to Other Type Thermocouple Calibration.

## Other Type Thermocouple Calibration


1. Connect the two proper thermocouple wires and miniature male SMP connector to the CA20 output.
2. Connect the other end of one thermocouple wire to the instrument to be calibrated and other end of one thermocouple wire to the monitoring reference thermometer.
3. Using the range switch and the COARSE / FINE adjust knobs set the CA20 to the output required as read on the indicating thermometer.

## 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 two screws from the back of the meter and lift off the battery cover. Remove the battery from battery contacts.

