



**TC-253B**  
**Temperature Converter**

**User Manual**

## Limited Warranty and Limitation of Liability

Your Amprobe product will be free from defects in material and workmanship for 1 year from the date of purchase. This warranty does not cover fuses, disposable batteries or damage from accident, neglect, misuse, alteration, contamination, or abnormal conditions of operation or handling. Resellers are not authorized to extend any other warranty on Amprobe's behalf. To obtain service during the warranty period, return the product with proof of purchase to an authorized Amprobe Test Tools Service Center or to an Amprobe dealer or distributor. See Repair Section for details. THIS WARRANTY IS YOUR ONLY REMEDY. ALL OTHER WARRANTIES - WHETHER EXPRESS, IMPLIED OR STATUTORY - INCLUDING IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, ARE HEREBY DISCLAIMED. MANUFACTURER SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, ARISING FROM ANY CAUSE OR THEORY. Since some states or countries do not allow the exclusion or limitation of an implied warranty or of incidental or consequential damages, this limitation of liability may not apply to you.

## EXPLANATION OF SYMBOLS



Attention! Refer to Operating instructions.



Ground connection.



Battery.

## WARNING AND PRECAUTIONS

This instrument is 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 Thermocouple supplied with the thermometer.
- Inspect DMM, TC-253B, and thermocouple cable before every use. Do not use any damaged part. Never ground yourself when taking measurements.
- Do not touch exposed circuit elements or probe tips.
- Do not operate instrument in an explosive atmosphere.
- Voltages applied to the COM connector may be present on all other input connectors.
- Do not use this piece or any piece of equipment without proper training.

## **⚠ WARNING!**

- TO AVOID ELECTRICAL SHOCK, DO NOT USE THIS INSTRUMENT WHEN VOLTAGES AT THE MEASUREMENT SURFACE EXCEED 24V r.m.s. AC OR 60V DC.
- TO AVOID DAMAGE OR BURNS – DO NOT MAKE TEMPERATURE MEASUREMENTS IN MICROWAVE OVENS.

## **UNPACKING AND INSPECTION**

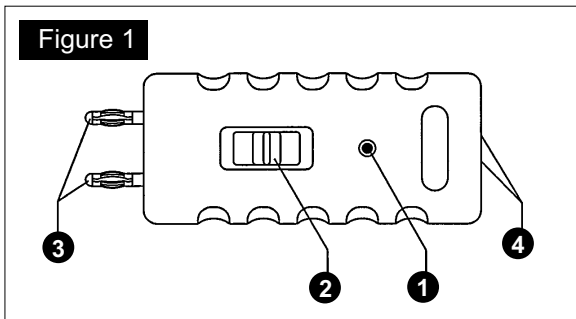
Upon removing your new Temperature Converter from its packing, you should have the following items:

1. Temperature Converter
2. K-type Bead Thermocouple
3. Operator's Manual

## **FRONT PANEL**

Refer to Figure 1 and the following numbered steps to familiarize yourself with the meter's front panel controls and connectors.

1. Red LED: Flashing while turned ON.
2. Function Switch: Slide switch used to select measuring function.
3. Output plugs: Voltage output.
4. Thermocouple Input Connector.



## PREPARATION AND CAUTION BEFORE MEASUREMENT

1. Before measurement, warm up for at least 30 seconds, after connecting the thermocouple to the connector of the Temperature Converter.
2. If the instrument is used near noise generating equipment, be aware that the Voltage output may become unstable or indicate large errors.
3. Check TC-253B battery. The multimeter should read > 7.1 volts in the OFF position.

## TEMPERATURE MEASUREMENTS

1. Warning! do not measure the temperature of any surface that the potential exceeds 60 Vdc or 24 Vrms.
2. Connect the plug of the thermocouple to the connector of the thermometer.
3. Select the °C/°F function desired.
4. Insert the "Output Plugs (V and COM)" to the input terminals of Multimeter. Set the Multimeter to "DC mV or V" range.
5. Place the sensing point of thermocouple on the surface or environment to be measured.
6. Wait until the reading stabilizes.

## GENERAL SPECIFICATIONS

This Temperature Converter conforms to the temperature/voltage tables of the National Bureau of Standards and to the IEC 584 Standards for K-type.

1. Temperature Scale: Celsius or Fahrenheit user selectable.
2. Input: Single K-type thermocouple.
3. Output to Meter: 1mVdc per °C or °F.
4. Measurement Range: -50°C to 1000°C – (-58°F to 1832°F).
5. Low Battery Indication: if the reading is less than 7.1V.
6. Temperature Coefficient: 0.15 x (specified accuracy) / °C, (<18°C or >28°C).
7. Power Requirements: Standard 9V battery, NADA 1604, JIS 006P, or IEC6F22 Size.
8. Battery Life: Alkaline 300 hours.
9. Dimensions: 122mm(L) x 46mm(W) x 30mm(D).
10. Weight (including battery): 114 grams.
11. Accessories: K-type bead thermocouple, battery (installed), operators



EMC: This product complies with requirements of the following European Community Directives: 89/336/EEC (Electromagnetic Compatibility) as amended by 93/68/EEC (CE Marking). Directive 73/23/EEC (Low Voltage) does not apply to this product. However, electrical noise or intense electromagnetic fields in the vicinity of the equipment may disturb the measurement circuit. Measuring instruments will also respond to unwanted signals that may be present within the measurement circuit. Users should exercise care and take appropriate precautions to avoid misleading results when making measurements in the presence of electronic interference.

## ENVIRONMENTAL CONDITIONS:

1. Indoor Use.
2. Operating Ambient: 0% to 80% R.H. (0 to 35 °C); 0% to 70% (35 to 50°C) R.H.
3. Storage Temperature: -20 to 60°C, 0 to 80% R.H. with battery removed from Temperature Converter.

## ELECTRICAL SPECIFICATIONS:

MEASUREMENT RANGE		ACCURACY	INPUT PROTECTION
-50°C	-20°C	$\pm(2.0\% \text{ rdg} + 2^\circ\text{C})$	60Vdc & 24Vrms
-19°C	350°C	$\pm(0.5\% \text{ rdg} + 2^\circ\text{C})$	
351°	C 500°C	$\pm(2.0\% \text{ rdg} + 2^\circ\text{C})$	
501°C	1000°C	$\pm(2.9\% \text{ rdg} + 2^\circ\text{C})$	
-58°F	-4°F	$\pm(2.0\% \text{ rdg} + 4^\circ\text{F})$	
-3°F	662°F	$\pm(0.5\% \text{ rdg} + 4^\circ\text{F})$	
663°F	932°F	$\pm(2.0\% \text{ rdg} + 4^\circ\text{F})$	
933°F	1832°F	$\pm(2.9\% \text{ rdg} + 4^\circ\text{F})$	

## ACCESSORIES:

- TP-255A Replacement Bead Probe
- TP-254A Immersion Probe with Handle
- MH101KA Master Handle Probe
- TP110KA Immersion Probe \*
- TP120KA Surface Probe \*
- TP130KA Air Probe \*

\*(TP110KA, TP120KA, & TP130KA require MH101KA Handle)

## TP-255A Bead Thermocouple:

Temperature Range:	-40°C to 204°C (-40°F to 400°F).
Tolerances:	= (2.2°C or 0.75%) from 0°C to 204°C = (2.2°C or 2.0%) from 0°C to -40°C
Wire Length:	1 meter, with miniature plug. Teflon tape insulated.

## MAINTENANCE:

### **⚠WARNING!**

TO AVOID ELECTRICAL SHOCK REMOVE TEST THERMOCOUPLE BEFORE OPENING THE COVER.

## GENERAL MAINTENANCE:

1. The case can be cleaned with a mild solution of detergent and water. Apply sparingly with a soft cloth and allow the TC-253B to dry completely before using. Do not use hydro carbon or chlorinated solvents or abrasives for cleaning.
2. All calibration and repair should be performed by an authorized service center or by other qualified instrument service personnel. To maintain a thermocouple in good condition, observe the following items.
  - Avoid excess bending.
  - Don't overheat the thermocouple.
  - Avoid chemical reactions that can damage the thermocouple.

## BATTERY CHECKING AND REPLACEMENT:

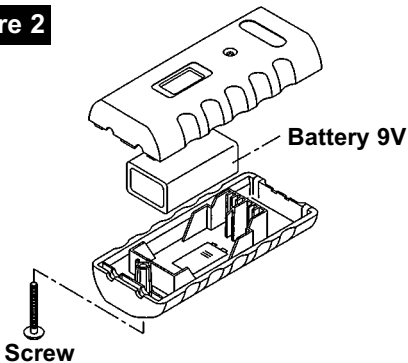
To check the battery:

1. Turn the TC-253B OFF.
2. Insert the "output plugs (V and COM)" to the input terminals of multimeter to "DCV" for autoranging type meter or 20 VDC or greater for manual ranging type meter.
3. Read the display on the multimeter. Replace the battery, if the reading is less than 7.1V.

To replace the battery, refer to Figure 2 and use the following procedure.

1. Turn the TC-253B OFF and disconnect the multimeter and thermocouple.
2. Position the TC-253B face down. Remove the screw from the bottom case.
3. Remove the bottom case.
4. Carefully disconnect the battery from bottom case

**Figure 2**



## REPAIR

Read the warranty located at the front of this manual before requesting warranty or nonwarranty repairs. For warranty repairs, any multimeter claimed to be defective can be returned to any authorized Amprobe Distributor or to a Amprobe Service Center for an over-the-counter exchange for the same or like product. Nonwarranty repairs should be sent to a Amprobe Service Center. Please call Amprobe or inquire at your point of purchase for the nearest location and current repair rates. All Instruments returned for warranty or non-warranty repair or for calibration should be accompanied by the following information or items: company name, customer's name, address, telephone number, proof of purchase (warranty repairs), a brief description of the problem or the service requested, and the appropriate service charge (for non-warranty repairs). Please include the test leads with the meter. Service charges should be remitted in the form of a check, a money order, credit card with expiration date, or a purchase order made payable to Amprobe or to the specific service center. For minimum turn-around time on out-of-warranty repairs please phone in advance for service charge rates. The Temperature converter should be shipped with transportation charges prepaid to one of the addresses/service centers shown on the rear cover.



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