



# DIGITAL THERMOCOUPLE THERMOMETERS

## USER'S MANUAL



Single  
Thermocouple



Dual  
Thermocouple

## DT80-1 and DT80-2

*Please read this manual carefully and thoroughly before using this product.*

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# INTRODUCTION

Thank you for purchasing a Thermocouple type J/K digital thermometer from General Tools & Instruments. We suggest that you read this user's manual carefully and thoroughly before using the instrument.

The DT80-1 and DT80-2 are thermocouple-type J/K digital thermometers. The DT80-1 is designed to be used with a single thermocouple; the DT80-2 is designed to be fed by two thermocouples configured to deliver a temperature differential.

Each model uses a high-resolution analog-to-digital converter chip and a microprocessor to convert input temperature signals to digital form and display them on a dual-display, 5-digit black-and-white liquid crystal display measuring 1.5 by 1.5 inches.

These two thermocouple thermometers have a measurement accuracy of  $\pm(0.05\%$  of reading +  $1.4^{\circ}\text{F}$ ) with an unmatched measurement range. For example, the DT80-1 and DT80-2 can measure and read out temperatures from  $-328^{\circ}$  to  $1922^{\circ}\text{F}$  ( $-200^{\circ}$  to  $1050^{\circ}\text{C}$ ) using a J-type thermocouple, and temperatures from  $-328^{\circ}$  to  $2498^{\circ}\text{F}$  ( $-200^{\circ}$  to  $1370^{\circ}\text{C}$ ) using a K-type thermocouple. This very wide measuring range, plus a fast response time make these thermocouple thermometers suitable for a wide range of commercial and industrial applications requiring measurement of very high and low temperatures. Examples include applications in the food and chemical processing industries, HVAC (heating, ventilation and air-conditioning), power generation, and paper production.

Simplicity is another asset of thermocouple thermometers. Thermocouples work by measuring the potential difference produced at the junction of two wires made of different metals but exposed to the same temperature. Since the junction is very small, a thermocouple thermometer can be used to measure the temperature at a point reachable by a probe. The probes used are inexpensive and easily replaceable.

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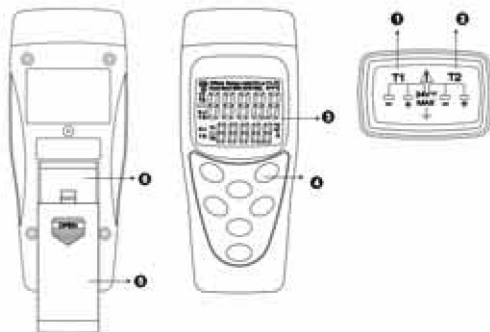
## KEY FEATURES

- Dual 5-digit liquid-crystal display
  - Measurement range:  $-328^{\circ}$  to  $1922^{\circ}\text{F}$   
( $-200^{\circ}$  to  $1050^{\circ}\text{C}$ ) using a J-type thermocouple;  
 $-328^{\circ}$  to  $2498^{\circ}\text{F}$  ( $-200^{\circ}$  to  $1370^{\circ}\text{C}$ )  
using a K-type thermocouple
  - Measurement accuracy:  
 $\pm(0.05\%$  of reading  $+1.4^{\circ}\text{F}$ )
  - Operating temperature range:  
 $40^{\circ}$  to  $104^{\circ}\text{F}$  ( $5^{\circ}$  to  $40^{\circ}\text{C}$ )
  - Power Source: 1 “9V” battery
-

# OPERATING INSTRUCTIONS

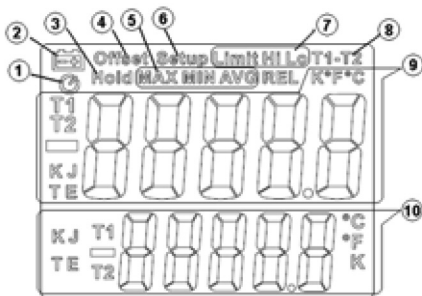
Familiarize yourself with the nomenclature in the following two illustrations before using the DT80-1 or DT80-2.

## BACK, FRONT AND TOP VIEWS



- 1 Thermocouple T1 input
- 2 Thermocouple T2 input (DT80-2 only)
- 3 Display (see next illustration)
- 4 Function keys
- 5 Battery cover
- 6 Battery compartment

# DISPLAY ELEMENTS












- ① Auto power off icon
- ② Low battery indicator
- ③ Hold (freeze) display indicator
- ④ Offset change indicator
- ⑤ Enable Maximum, Minimum and Average recording; also indicates Current Mode.
- ⑥ Offset Setup Mode indicator
- ⑦ Limit indicates that the alarm function is enabled; Hi and Lo indicate the reason why alarm sounded.
- ⑧ T1 - T2: Indicates differential temperature mode (DT80-2 only).
- ⑨ Primary display: Indicates state of channels, selected temperature unit and thermocouple type.
- ⑩ Secondary display: Indicates state of channels, selected temperature unit and thermocouple type.

**Note:** When a thermocouple is not plugged into the instrument, the display reads "OL"


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
# FUNCTION KEYS OVERVIEW



-  Pressing toggles between Celsius and Fahrenheit temperature units (scale chosen is saved upon shutdown and becomes the default of next power up cycle).
-  Pressing enables/disables holding (freezing) of display and updating of data. Pressing and holding enables/disables auto power off function (indicated by .
-  In normal operating mode, toggles to select J- or K-type thermocouple. In offset setup mode, increases the offset value.
-  In normal operating mode, selects display of maximum, minimum, or average temperatures. In offset setup mode, pressing  saves setting and exits that mode.
-  Pressing and holding enters offset setup mode.
-  In normal operating mode, pressing turns instrument on or off. In offset setup mode, pressing decreases offset value.
-  (DT80-2 only). Pressing enables/disables T1 minus T2 function. Pressing and holding swaps T1 and T2 readings between primary and secondary displays.



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# SPECIFIC OPERATING INSTRUCTIONS


To display maximum, minimum or average temperature, push the  key repeatedly until the corresponding icon appears above the reading in the primary display. The primary display shows the current channel reading of MAX, MIN or AVG. The secondary display shows the current channel reading of actual temperature. When the instrument powers off, the value chosen is saved and becomes the default value for the next power up cycle.

To select the thermocouple type, press the  key (in normal operating mode) until the correct letter (K or J) appears on the left side of the primary display. In the case of the DT80-2, use the  key to also set the correct thermocouple type in the secondary display. Both the DT80-1 and DT80-2 will save their setting(s) upon shutdown and make them the default when they next power up.


To hold (freeze) the display and stop updating measurements, press the  key. Press it again to unfreeze the display. When the HOLD function is enabled, all function keys (except for the ) are disabled.

**Using the REL key to subtract readings.** Pressing the  key cancels out a relative reading, changes the display to “0” and saves the previous reading as the standard relative reading. For example, if the primary display is reading 25°C, pressing the  key changes the display to “0” and saves 25°C as






the standard relative reading. Then, if the temperature rises to 30°C, the display will show 5°C (30° – 25°C). If the temperature falls to 20°C, the display will show - 5°C (20° – 25°C). Pressing the  key again disables this function and restores the actual temperature reading to the display.




The primary display shows the current channel reading of REL. The secondary display shows the current channel reading of actual temperature.

In the case of the DT80-2, to show the current channel reading of REL on the secondary display, press and hold the  key to swap T1 and T2.

**To display T1 minus T2 temperature (DT80-2 only),** press the  key. Press the key again to disable this function.

The primary display shows the T1-T2 temperature. The secondary display shows the current channel reading of actual temperature. To swap channels, press and hold the  key.

**To enable/disable the 15-minute Auto Power Off function,** press and hold the  key (with the instrument in normal operating mode) until the  appears or disappears at the upper left of the screen.

**To power the instrument on and off,** press the  key. If pressing the key fails to shut off the unit, that means it is in offset setup mode. Exit this mode by pressing the  key, and then push the  key again.

**To compensate for thermocouple error**, you must first set the offset value. To do so (recommended each time the thermocouple probe is changed):

1. Press and hold the **REL** key.
2. Use the **TYPE** and **ⓘ** keys, respectively, to increase or decrease the offset value. The allowable adjustment range is  $\pm 9^{\circ}\text{F}$  ( $\pm 5^{\circ}\text{C}$ ).
3. Press the **MAX MIN** key to save the setting and exit offset setup mode.

To adjust the offset of the secondary channel in the DT80-2, press the **T1-T2** key and repeat steps 2 and 3.

The instrument will automatically save the offset value upon shutdown, and default to it upon the next startup.

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## SPECIFICATIONS

- **Display:** dual 5-digit LCD
- **Temperature units:** Degrees Celsius or Fahrenheit
- **Display resolution:** 0.1
- **Measurement range:**  $-328^{\circ}$  to  $1922^{\circ}\text{F}$  ( $-200^{\circ}$  to  $1050^{\circ}\text{C}$ ) using a J-type thermocouple;  $-328^{\circ}$  to  $2498^{\circ}\text{F}$  ( $-200^{\circ}$  to  $1370^{\circ}\text{C}$ ) using a K-type thermocouple
- **Measurement accuracy:**  $\pm(0.05\%$  of reading +  $1.4^{\circ}\text{F}$ )
- **Supplied Probe(s) Range:**  $50^{\circ}$  to  $500^{\circ}\text{F}$  ( $-45^{\circ}$  to  $260^{\circ}\text{C}$ )
- **Operating temperature range:**  $40^{\circ}$  to  $104^{\circ}\text{F}$  ( $5^{\circ}$  to  $40^{\circ}\text{C}$ ), below 80% RH
- **Storage temperature range:**  $14^{\circ}$  to  $140^{\circ}\text{F}$  ( $-10^{\circ}$  to  $60^{\circ}\text{C}$ ), below 70% RH

- **Input protection:** Maximum 24V DC or AC
  - **Battery:** 1 “9V” (NEDA 1604, IEC 6F22)
  - **Battery life:** Approximately 200 hours
  - **Weight:** 6 oz. (170g)
  - **Dimensions:** 5.12(L) x 2.2(W) x 1.50(H) in. (130(L) x 56(W) x 38(H) mm)
  - **Auto power off:** after 15 minutes of no activity
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## **MAINTENANCE & TROUBLESHOOTING**

### ***REPLACING THE BATTERY***

If the icon  appears on the display, turn off the instrument and replace the battery immediately.

### ***ROUTINE MAINTENANCE***

The DT80-1 and DT80-2 require no maintenance other than periodic cleaning. To clean the instrument, use a soft dry cloth. Never use a wet cloth, solvents or water.

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## **REPLACEMENT PARTS**

The DT80-1 ships with a carrying case and one general-purpose K-type thermocouple probe with a beaded tip General P/N TPK500. The DT80-2 ships with two of these probes. To order additional probes of this type, or other specialty thermocouple probes, refer to page I-38 of General’s Full Line or Professional Test Instruments catalogs or visit [www.generaltools.com](http://www.generaltools.com).

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## WARRANTY INFORMATION

DT80-1 and DT80 Thermocouple type J/K from General Tools & Instruments (General) is warranted to the original purchaser to be free from defects in material and workmanship. Subject to certain restrictions, General will repair or replace this instrument if, after examination, the company determines it to be defective in material or workmanship. The warranty period begins on the date of purchase. You are encouraged to register your product online. General will extend your warranty an additional 60 days if you register at [www.generaltools.com/ProductRegistry](http://www.generaltools.com/ProductRegistry).

This warranty does not apply to damages that General determines to be from an attempted repair by non-authorized personnel or misuse, alterations, normal wear and tear, or accidental damage. The defective unit must be returned to General Tools & Instruments or to a General-authorized service center, freight prepaid and insured.

Acceptance of the exclusive repair and replacement remedies described herein is a condition of the contract for purchase of this product. In no event shall General be liable for any incidental, special, consequential or punitive damages, or for any cost, attorneys' fees, expenses, or losses alleged to be a consequence of damage due to failure of, or defect in any product including, but not limited to, any claims for loss of profits.

Register now at [www.generaltools.com/ProductRegistry](http://www.generaltools.com/ProductRegistry) to receive a 60-day extension to your warranty.

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# GENERAL'S RETURN FOR REPAIR POLICY

Every effort has been made to provide you with a reliable, product of superior quality. However, in the event your instrument requires repair, please contact our Customer Service to obtain a RGA# (Return Goods Authorization) before forwarding the unit via prepaid freight to the attention of our Service Center at this address:

General Tools & Instruments  
80 White Street  
New York, NY 10013  
212-431-6100

Remember to include a copy of your proof of purchase, your return address, and your phone number and/or e-mail address.

The DT80-1 or DT80-2 are warranted to be free of defects in materials and workmanship for one year after the date of purchase.

This warranty applies to all repairable instruments that have not been tampered with or damaged through improper use, including unauthorized opening of the unit.

## DISPOSAL

This symbol (on the rear of the case) indicates that the DT80-1 and -2 contain materials that should be recycled or disposed of correctly disposal, rather than landfilled.



## ***NOTES***

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# **Specialty Tools & Instruments**

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**DT80-1 and DT80-2 User's Manual**

**Specifications subject to change without notice**

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**NOTICE - WE ARE NOT RESPONSIBLE FOR**

**TYPOGRAPHICAL ERRORS.**

**MAN# DT80-1 and DT80-2**

**3/13/14**