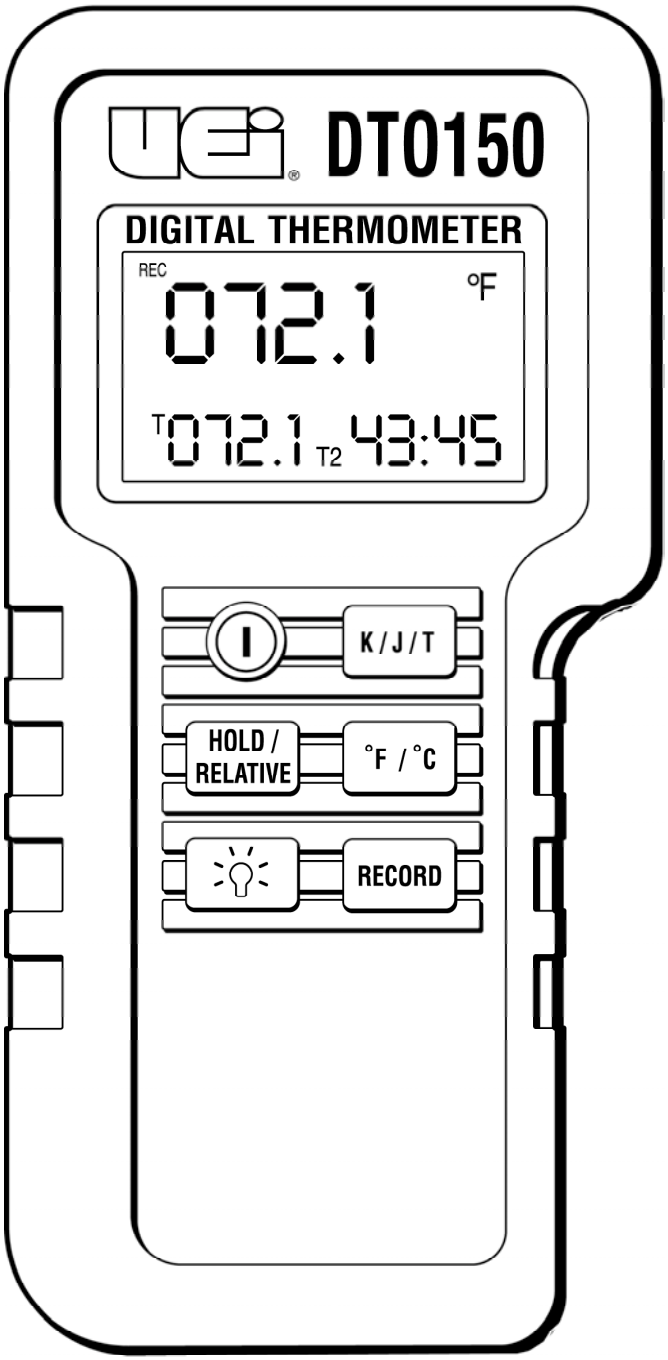
INSTRUCTION MANUAL

DT150/DT0150

Digital Thermometer



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Introduction

The DT150 or DTO150 is ideal for technicians working in HVAC/R maintenance, appliance repair, laboratory environmental monitoring, process control, agriculture, and numerous other purposes.

Features include

- Measures from -328 to 2498˚F (-200 to 1370˚C)
- Record mode with relative clock
- Relative zero displays change in temperature
- Hold function
- Switchable ˚F or ˚C
- Back light

Safety Notes

Before using this meter, read all safety information carefully. In this manual the word **"WARNING"** is used to indicate conditions or actions that may pose physical hazards to the user. The word **"CAUTION"** is used to indicate conditions or actions that may damage this instrument.

WARNING!

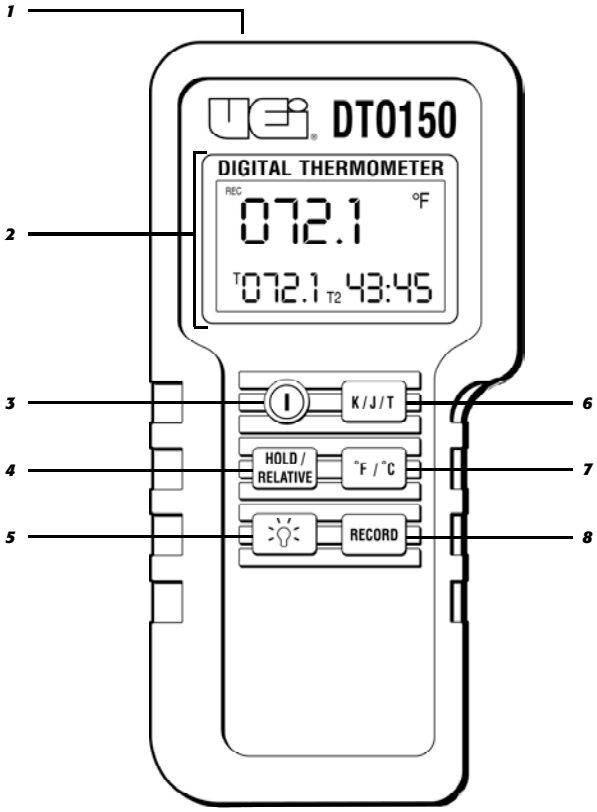
Exceeding the specified limits of this meter is dangerous and can expose the user to serious or possibly fatal injury.

- Read the safety precautions associated with the equipment being tested and seek assistance or advice when performing unfamiliar tasks.
- Place ONLY thermocouples (type K, J, or T) in the DT150 or DTO150 thermocouple ports.
- Make sure your DT150 or DTO150 is set for the proper thermocouple type you are using.
- Be sure the thermocouple you are using can withstand the temperature extreme it may be exposed to in your service task.
- Maintain your DT150 or DTO150 according to the schedule provided and calibrate it regularly.

International Symbols

Dangerous Voltage	Ground
AC Alternating Current	Warning or Caution
DC Direct Current	Double Insulation (Protection Class II)
Either AC or DC	Fuse
Not Applicable to Identified Model	Battery

Controls and Indicators



1. **Thermocouple Port:** Polarized blades from miniature thermocouple probe plugs in here.
2. **LCD Display:** Displays temperature and relative clock information.
3. **Power Switch:** Powers instrument on and off.
4. **Hold/Relative Switch:** Quick press freezes temperature data. Long press switches instrument to the relative-zero display mode.
5. **Back Light:** Powers back light on and off.
6. **K/J/T Thermocouple Select Switch:** Changes input reference for thermocouple type.
7. **˚F/˚C Mode Select Switch:** Toggles display mode from degrees Celsius to degrees Fahrenheit.
8. **Record Mode Select Switch:** Starts record mode (relative clock). Cycles display to indicate either the current temperature, the maximum temperature, or the minimum temperature along with the hour and minute it was recorded.

Operating Instructions

The DT150 is a single input digital thermometer that measures temperature using appropriate thermocouples. Tables indicating the range and accuracy of this thermometer are provided in the specification section. The type and quality of your thermocouple will limit the range and accuracy of this thermometer are provided in the Specification section. The type and quality of your thermocouple will limit the range and accuracy of your measurement. The LCD display indicates the temperature being measured along with relative clock and mode selections. If no thermocouple is plugged in, four dashes will appear in the temperature data screen. A low battery indicator is also displayed as appropriate. This instrument operates and updates silently.

Thermocouples use two dissimilar metals in their wiring to develop a voltage that changes under varying temperature conditions. The DT150 uses this voltage to determine the temperature at the thermocouple's two-wire junction. It is therefore critical to the accuracy of your reading that any uninsulated portion of the thermocouple does not come in contact with a live electrical circuit of even minimal voltage.

When the thermocouple type and the temperature scale selections are used for more than 10 seconds, they are stored in memory and will be set as the default the next time the instrument is turned on.

Power ON/OFF
Press the power "**ON/ OFF**" button briefly to turn the instrument on or off. The Auto-Power-Off function will come on unless deliberately overridden.

Auto-Power-Off
The DT150 or DTO150 will shut off automatically in approximately 90 minutes. For recording or operating over longer periods of time you can override the auto power off function. To override the Auto-Power-Off function. To override the Auto-Power-Off function:

1. Press and hold down the "**Hold/Relative**" button.
2. Press the "**ON**" button - Observe an "**N**" in the middle of the screen, indicating the "**Auto-Power-Off**" function has been overridden.
3. Release the "**Hold**" button.

K/J/T Selection
The button marked "**K/K/T**" is used to match the DT150 with the type of thermocouple you are using. After initial power-up, press the "**K/J/T**" button to cycle through those configuration options until the proper selection is displayed on the left side of the LCD. This selection must be matched with the type thermocouple installed for accurate readings.

This selection can not be changed while the record mode is active.

To get the most form your DT150 or DTO150, use a thermocouple that best suits your needs. The material you're measuring and its accessibility will determine which thermocouple is right for the job. Thermocouples are often divided into these three categories:

1. Submersible (two wire junction fully enclosed in a metal jacket).
2. Contact (two wire junction exposed and mounted to make solid contact with a surface).
3. Air (two wire junction recessed in a thermally insulated air baffle).

Within these categories you'll find numerous design differences that can improve the accuracy or temperature range of your measurement. Your DT150 accepts thermocouples that employ quick connecting minature plugs. These plugs are generally color-coded to identify the thermocouple type (K, J or T) you are using. The following table illustrates the color codes and advantages of the optional thermocouples that can be used:

Type K	Yellow	Wide range (-328˚ to 2498˚F with good accuracy throughout range
Type J	Black	High accuracy from 32˚ to 940˚F Chromium free
Type T	Blue	High accuracy from -328˚ to 730˚F Economical material for distant runs

Hold/Relative Operation
Quickly press and release the button marked "**Hold/Relative**" to freeze (hold) the data displayed on the screen. "**HOLD**" will appear at the top of the display. Data will remain on the screen until it is pressed again. This feature is blocked while the record mode is active.

To display the change in temperature only (relative zero), press and hold-down the "**Hold/Relative**" button for approximately two seconds. "**REL**" will appear at the top of the display. If there is no change in temperature the display will remain at zero. Any rise in temperature will be displayed as positive numbers and any decrease will be displayed as negative numbers. Thermocouple and scale selections are locked in place when the relative mode is selected. Briefly press the "**Hold/Relative**" button again to return to real-time temperature measurement.

NOTE: *To determine the temperature rise in a air conditioner's evaporator, place a thermocouple firmly on the refrigerant line at the inlet of the evaporator and initiate the relative function. Move the thermocouple to the outlet and note the reading. Measurements should be taken as close to the radiator as possible. Keep in mind that any change in outlet temperature may be preceded by a change in inlet temperature. Additional readings may be required.*

Changing Temperature Scales
Temperature readings are easily toggled between the Fahrenheit and Celsius scales by pressing the "**˚F/˚C**" button. Scales cannot be changed when either the relative or record mode is active.

Backlight Operation
Press the " " push-button to view on-screen data in low light areas. The internal backlight illuminates the LCD for 30 seconds then shuts itself off. Pressing the " " button again will NOT turn off the light.

Recording Measurements
Temperature information can be recorded using the integral relative-time-clock. When "**RECORD**" is selected a stopwatch-style clock appears in the lower right portion of the screen displaying the total time (starting at 00:00) in hours and minutes since the "**RECORD**" button was pushed. The icon "**REC**" also appears along the top of the display. All selections except the backlight and power are locked in place until you exit the record mode.

Press "**RECORD**" once to initiate the record mode. The real-time temperature reading is displayed along with a relative clock that indicates how long the record mode has been running.

Cycle through the currently measured temperature and the maximum and minimum recorded temperatures by repeatedly pressing the record button. Icons will appear on the display to indicate which mode you are viewing:

- Maximum (REC and MAX icons)
- Minimum (REC and MIN icons)
- Current Temperature (REC icon only)

Maintenance

Periodic service

WARNING!
Repair and service of this instrument is to be performed by qualified personnel only. Improper repair or service could result in physical degradation of the meter. This could alter the protection from electrical shock and personal injury this meter provides to the operator. Perform only those maintenance tasks that you are qualified to do.

These guidelines will help you attain long and reliable service from your meter:

1. Calibrate your meter annually to ensure it meets original performance specifications.
2. Keep your meter dry. If it gets wet, wipe it dry immediately. Liquids damage electronic circuits.
3. Whenever practical, keep the meter away from dust and dirt, which can cause premature wear.
4. Although your meter is built to withstand the rigors of daily use, it can be damaged by severe impacts. Use reasonable caution when using and storing the meter.

NOTE: *When servicing the meter, use only the replacement parts specified.*

Battery: 9V, NEDA 1604 or IEC 6LR 61

Cleaning and Decontamination
Periodically clean your meter's case using a damp cloth. **DO NOT** use abrasives, cleaning solvents or strong detergents, as they may damage the finish or affect the reliability of the structural components.

Battery Replacement
Always use a fresh replacement battery of the specified size and type. Immediately remove the old or weak battery from the meter and dispose of it in accordance with your local disposal regulations. Old or defective batteries can leak chemicals that corrode electronic circuits.

WARNING!
To avoid electric shock, be sure to turn off the meter's power before you remove or install batteries.

To install a new battery, follow these procedures:

1. Remove the thermocouple from the top of the instrument.
2. Remove the rubber boot by sliding the instrument out toward the top faceplate cut-out.
3. Lay the instrument face down on a clean, flat surface.
4. Remove the battery cover.
   - Apply inward pressure on the side of the battery cover at the recessed point, toward the slit, while sliding it out.
5. Remove and replace the battery, observing indicated polarity.

WARNING!
*Under **NO** circumstance should you expose batteries to extreme heat or fire as they may explode and cause injury.*

NOTE: *If you do not plan to use the meter for a month or more, remove the battery and store it in an area that won't be damaged by a leaking battery.*

Calibration
When properly maintained, your DT150 will maintain an accuracy specification of up to 0.1% of the reading. To ensure your instrument is performing at its peak, send it to the UEi factory or a qualified instrument calibration facility for annual calibration.

Troubleshooting

This instrument contains no user serviceable parts beyond those listed in the troubleshooting table. In the event your instrument is physically damaged or does not function properly after taking the listed action, please return the instrument to UEi following the warranty and service instructions.

If I See This Malfunction	I Should Check For	Then Take This Corrective Action
Instrument does not turn on	Battery Voltage	Replace low battery
	Battery clip	Ensure clip grips battery posts tightly
Dashes appear in data screen	Thermocouple	Insert missing thermocouples
Dashes appear in data screen with thermocouples inserted	Thermocouples continuity	Measure resistance of thermocouple to ensure it is not broken internally - Replace if required
	Thermocouple connection ports	Clean corrosion of debris off of thermocouple - Reinsert
Temperature drifts from known value in a controlled environment	Thermocouple type	Ensure thermocouple type matches the displayed icon
	Moisture, corrosion or debris on thermocouple blade	Clean and dry thermocouple blades - Allow thermocouple plug to air dry
	Defective thermocouple	Confirm defect with known good thermocouple - Replace if required
Relative clock will not start when "**RECORD**" button is pressed	Thermocouple properly inserted	Record will not start without thermocouples inserted
Dashes appear during review of maximum recorded value	Open thermocouple	Check for intermittent or momentarily removed thermocouple
Data continues to update when "**HOLD**" or "**RECORD**" are initiated	"**HOLD/REC ORD**" is not being fully pressed	Observe "**HOLD**" or "**REC**" icons on LCD - Press button firmly
Instrument turns off during recording	Auto power off is shutting off instrument	Defeat auto-power-off - Follow procedures outlined in Operating Instructions

Specifications

Height x Length x Width (boot included)	7" x 3-3/8" x 1-7/8" (178 x 86 x 48 mm)
Weight	14.8 oz (420 g)
Battery	Standard 9 Volt (NEDA 1604, IEC 6LR61) Alkaline recommended
Supplied thermocouple	
Model DT150	4' type-K multipurpose wire probe (UEi P/N ATT29A)
Model DTO150	4' type-J oven clip thermocouple (UEi P/N ATT19)
Operating and storage conditions	32˚ to 122˚F (0˚ to 50˚C) at 0 to 85% RH

Optional Accessories

Optional

4' Standard oven clip (Type-J) ATT19
Liquid immersion probe w/pointed tip (Type-J) ATT26
Disposable/reusable 4' wire probe (Type-J) ATT27
Liquid immersion probe and handle, 8" pointed tip (Type-J) .ATT30
Air probe (Type-J) ATT49
4' Standard wire probe (Type-K) ATT29
4' Standard wire probe w/FDA approved insulation (Type-K) .ATT29A
Surface probe and handle and 8" tip (Type-K) ATT36
6" Liquid probe and handle (Type-K) ATT100
Soft Carrying Case AC315
Hard Carrying Case AC504
Hard Carrying Case AC506

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Limited Warranty

The DT150/DTO150 is warranted to be free from defects in materials and workmanship for a period of three years from the date of purchase. If within the warranty period your instrument should become inoperative from such defects, the unit will be repaired or replaced at UEi's option. This warranty covers normal use and does not cover damage which occurs in shipment or failure which results from alteration, tampering, accident, misuse, abuse, neglect or improper maintenance. Batteries and consequential damage resulting from failed batteries are not covered by warranty.

Any implied warranties, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the express warranty. UEi shall not be liable for loss of use of the instrument or other incidental or consequential damages, expenses, or economic loss, or for any claim or claims for such damage, expenses or economic loss. A purchase receipt or other proof of original purchase date will be required before warranty repairs will be rendered. Instruments out of warranty will be repaired (when repairable) for a service charge. Return the unit postage paid and insured to:

1-800-547-5740 • FAX: (503) 643-6322
www.ueitest.com • Email: info@ueitest.com

This warranty gives you specific legal rights. You may also have other rights which vary from state to state.

PLEASE
RECYCLE

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