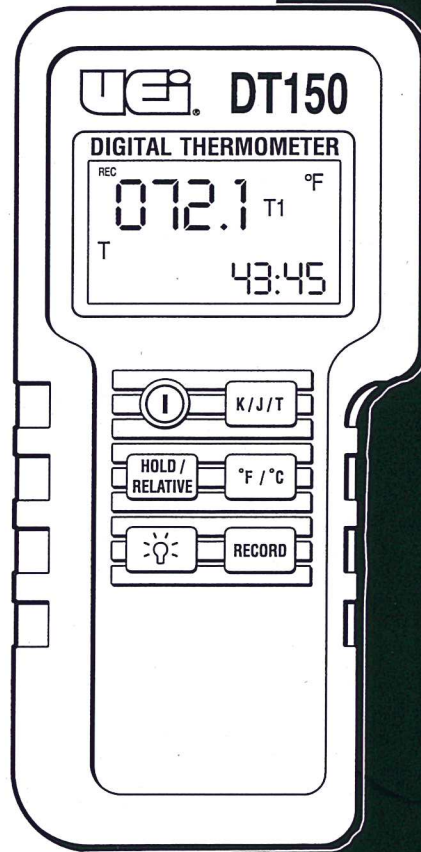


DT150

INSTRUCTION MANUAL



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INTRODUCTION

Forward

Congratulations on your purchase of the DT150 by UEi! This single input digital thermometer is among the highest quality, most accurate hand-held temperature testers available. The affordable value of this thermometer extends beyond the initial purchase. You'll find cost savings and increased productivity with features such as three thermocouple selections that allow you to choose the most appropriate and economical type thermocouple that your process requires. You can even use the relative time stamp, which works like a stopwatch, to record when the highest and lowest temperatures occurred. It also has a back-lit display that makes reading the LCD easy even in low-light areas.

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

Materials Supplied

This package contains:

- The DT150 digital thermometer
- An impact resistant rubber boot
- One thermocouple - (type-K with DT150, type-J Oven-Clip with DTO150)
- Installed battery
- This instruction manual

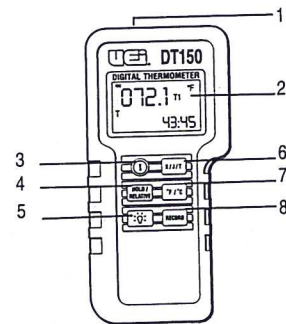
SAFETY

Practicing Safety

This instrument is designed for professionals who know the hazards associated with their trade. The equipment you service, as well as the environment you're working in, can be hazardous. Read all safety and operation information provided in the manufacturer's service manuals when working on appliances and machinery. As the results of your measurements are often critical to your safety as well as your customer's, please follow these practices that are designed to help you attain accurate and reliable measurements:

- Place **ONLY** thermocouples (type K, J, or T) in the DT150 thermocouple ports

- Make sure your DT150 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 according to the schedule provided and calibrate it regularly



CONTROLS AND INDICATORS

DT150 Controls

Key:

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

Functional Description

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 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 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:

1. Press and hold down the hold/relative button.
2. Press the power-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.

OPERATING INSTRUCTIONS (CONT.)

K/J/T Selection

The button marked K/J/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 from your DT150, 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:

- Submersible (two wire junction fully enclosed in a metal jacket)
- Contact (two wire junction exposed and mounted to make solid contact with a surface)
- 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 miniature 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

OPERATING INSTRUCTIONS (CONT.)

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.



Application note:

To determine the temperature rise in an 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  pushbutton 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.

OPERATING INSTRUCTIONS (CONT.)

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)

The clock will indicate how many hours and/or minutes passed from the time the record mode was initiated to the time the minimum or maximum temperature was measured. The clock will display up to 100 hours of data, however, the battery life limits useful recording time.

MAINTENANCE

Cleaning

Use a damp cloth and mild soap to clean the case of your DT150. Do not use harsh detergents or abrasives as these may mar the finish or damage your unit's case with an adverse chemical reaction.

MAINTENANCE (CONT.)

Do not allow moisture to directly contact the thermocouple ports, or enter the instrument's housing. Remove the instrument from its boot to ensure moisture is not trapped during cleaning.

Replacing the battery

Replace your 9-volt alkaline battery when:

- The BAT icon appears on the right side of the LCD
- The instrument will not power on
- Use of the back-light causes the BAT icon to appear

Even if the battery was recently replaced, check its voltage level if you get no response from your instrument. Remove batteries from instruments that you do not plan to use for a month or more. Do not leave batteries in instruments that may be exposed to temperature extremes.

Always dispose of batteries in accordance with local land use regulations.

To replace the battery:

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 facedown 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 lifting it out
5. Remove and replace the battery, observing indicated polarity.

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

Troubleshooting fault table

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	Thermocouple's continuity	Measure resistance of thermocouple to ensure it is not broken internally – Replace if required
	Thermocouple connection ports	Clean corrosion or 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/Record 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

TROUBLESHOOTING (CONT.)

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.

SPECIFICATIONS

General

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

Accessory	UEi P/N	Description
Thermocouple Probes		
Type J Probes	ATT19	4' Standard oven clip
	ATT19A	4' Oven clip w/ FDA approved insulation
	ATT26	Liquid immersion probe w/pointed tip
	ATT27	Disposable/reusable 4' wire probe
	ATT30	Liquid immersion probe w/ handle and 8" pointed tip
	ATT47	Surface probe w/ handle and 8" tip
	ATT48	Right angle Surface probe w/ handle
	ATT49	Air probe with 8" tip
Type K Probes	ATT54A	Liquid immersion for heavy duty w/ handle and 4" tip
	ATT29	Standard 4' wire probe
	ATT29A	Standard 4' wire probe w/ FDA approved insulation
	ATT36	Surface probe w/ handle and 8" tip
	ATT37	Right angle Surface probe w/ handle
	ATT38	Air probe with 8" tip
	ATT50	Liquid immersion probe w/ handle and 8" pointed tip
	ATT59	Surface probe – heavy-duty w/ handle and 4" tip
ATT60	Air probe – heavy-duty w/ handle and 4" tip	
ATT61	Liquid immersion for heavy duty w/ handle and 4" tip	
Carrying cases		
Vinyl case	AC315	Standard zippered soft case
Deluxe vinyl case	AC317	Large heavy vinyl case with neck strap
Hard case	AC504	Standard hard case for instrument and accessory storage
Professional hard case	AC506	Large padded hard case for multiple instrument storage

WARRANTY AND SERVICE

DT150 / DTO150 Limited Warranty

Your DT150 / DTO150 is warranted to be free from defects in material and workmanship for a period of three years from the date of purchase. If, within this warranty period, your instrument should become inoperative from such defects, it will be repaired or replaced at UEi's option. This warranty does not cover batteries or damage resulting from improper maintenance, misuse, abuse, alteration, tampering, neglect or consequential damages. Proof of purchase is required for warranty repairs.

Service information

Service covered under warranty will be provided at no charge. Instruments out of warranty will be repaired, (when repairable) for a service charge. Return the unit postage paid and insured to UEi Service Department.

TABLE OF SPECIFICATIONS

Probe	Range	Resolution	Accuracy
K	-328 to 999°F	0.1°F	±(0.1% rdg +1.4°C)
	1000 to 2498°F	1°F	
	-200 to 650°C	0.1°C	±(0.1% rdg +0.7°C)
	640 to 1369°C	1°C	
J	-328 to 939°F	0.1°F	±(0.1% rdg +1.4°C)
	940 to 1400°F	1°F	
	-200 to 499°C	0.1°C	±(0.1% rdg +0.7°C)
	500 to 760°C	1°C	
T	-328 to 730°F	0.1°F	±(0.1% rdg +1.4°F)
	-200 to 499°C	0.1°C	±(0.1% rdg +0.7°C)

Specifications are for operating temperatures between 64 and 77 °F (18 to 25 °C)

Specifications valid for 1 year after calibration



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