

DT173 DT175 DIGITAL THERMOMETERS

INSTRUCTION MANUAL



⚠ ALWAYS READ THESE INSTRUCTIONS BEFORE PROCEEDING

Thank you for buying one of our products. For safety and a full understanding of its benefits please read this manual before use. Technical support is available from 01923 441717 and support@martindale-electric.co.uk.

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1. SAFETY INFORMATION

⚠ REMEMBER: SAFETY IS NO ACCIDENT

These instructions contain both information and warnings that are necessary for the safe operation and maintenance of this product. It is recommended that you read the instructions carefully and ensure that the contents are fully understood. Failure to understand and to comply with the warnings and instructions can result in serious injury, damage or even death.

Particular attention should be paid to the Warnings, Precautions and Technical Specifications.

Please keep these instructions for future reference. Updated instructions and product information are available at: www.martindale-electric.co.uk

1.1 Meaning of Symbols and Markings

⚠ Caution - risk of danger and refer to instructions

⚠ Caution - risk of electric shock

⚡ Direct and alternating current (AC & DC)

CE Equipment complies with relevant EU Directives

♻ End of life disposal of this equipment should be in accordance with relevant EU Directives

1.2 Precautions

This product has been designed with your safety in mind, but please pay attention to the following warnings and cautions before use.

Warnings

This unit must **NOT** be connected to CAT II, CAT III or CAT IV circuits.

Before use check the unit for cracks or any other damage. Make sure the unit is free from dust, grease and moisture. Also check any associated leads and accessories for damage. Do not use if damaged.

Do not use if the battery cover is not fitted.

To avoid electrical shock, and damage to the instrument, do not use this instrument and the associated temperature probe when voltages at the measurement surface exceed 24V DC or AC rms.

Cautions

To avoid burns or damage to equipment, do not take temperature measurements inside microwave ovens.

Repeated sharp flexing can break the thermocouple leads. To prolong lead life, avoid sharp bends in the leads especially near the connector.

Avoid severe mechanical shock or vibration and extreme temperature.

To avoid possible corrosion from leaking batteries, remove the batteries if discharged, or when the unit is not in use for an extended period.

2. INTRODUCTION

2.1 Inspection

Examine the shipping carton for any sign of damage. Inspect the unit and any accessories for damage. If there is any damage then consult your distributor immediately.

2.2 Description

The DT173 and DT175 are portable, 3½ digit, compact thermometers for use with Type K thermocouples.

The DT175 is dual input and may be used in differential mode when thermocouples are connected to both inputs.

The DT173 and DT175 have the following functions and features:

- ◆ Temperature range -50°C to 1372°C (-58°F to 1999°F)
- ◆ Thermocouple compensation adjustment
- ◆ Max/Min function
- ◆ Relative function
- ◆ Data hold function
- ◆ Backlight
- ◆ Auto power off
- ◆ Rubberised outer jacket

2.3 Accessories

The DT173 and DT175 come with the following accessories:

- ◆ Type K bead thermocouple (x2 for DT175)
- ◆ 4 x 1.5V AAA alkaline batteries
- ◆ Instructions


2.4 Battery Installation

Refer to Section 4.1 (Battery Replacement) for the battery installation instructions.


3. OPERATION

3.1 General

If the thermometer displays **OL** then the measurement limits of the range have been exceeded.

 The maximum temperature measurement of the DT173/DT175 is 1372°C (1999°F), but the thermocouple probe being used may only be specified to 260°C (500°F). Be sure that the thermocouple probe is adequate for the measurement being made.

3.2 Low Battery Indication












If the  symbol is displayed the battery needs replacing (See section 4.1 Battery Replacement).



DT173

DT175

3.3 Description of Press Buttons

	Power on/off button
	Selects the temperature scale
	Turns on/off the backlight
	Selects the thermocouple compensation adjustment function
	Increments thermocouple compensation adjustment value Selects /deselects the relative mode
	Decrements thermocouple compensation adjustment value Selects/deselects the data hold function
	Selects/deselects auto power off function (DT173 only)
	Selects individual thermocouple inputs or the differential mode (DT175 only)
	Selects the record function
	Saves the thermocouple compensation adjustment value (DT173 only)
	Hold for >2s to select/deselect auto power off function (DT175 only) Saves the thermocouple compensation adjustment value

3.4 Description of LCD Symbols

RECORD	Record function is active
MAX	Maximum recorded reading is displayed
MIN	Minimum recorded reading is displayed
MAX-MIN	Maximum – minimum recorded reading is displayed
AVG	Average recorded reading is displayed

REL	Relative mode is selected
HOLD	Hold function is selected
°C	Celsius temperature scale is selected
°F	Fahrenheit temperature scale is selected
T1	Thermocouple T1 input is selected (DT175 only)
T2	Thermocouple T2 input is selected (DT175 only)
T1-T2	Differential input mode is selected (DT175 only)
	Indicates battery is low
APO	Indicates auto power off is activated

3.5 Backlight

Press to turn ON/OFF the backlight.

3.6 Auto Power Off

If the thermometer is inactive for a period of 30 minutes it will automatically power off (except in the record mode).

On the DT173, press to deactivate/activate the auto power off function.

On the DT175, press for >2s to deactivate/activate the auto power off function.

The **APO** symbol will no longer be displayed when deactivated.

3.7 Temperature Scale Selection

Readings are displayed in either degrees Celsius (°C) or degrees Fahrenheit (°F).

Press to change the scale. The °C or °F symbol will be displayed.

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On power up, the instrument defaults to the scale last selected before power down.

3.8 Relative Mode

The relative function is used to remove an offset or residual value from a measurement.

Pressing will set the display to **0.00**. The **REL** symbol will be displayed.

To exit the relative function, press for >2s.

3.9 Data Hold

To hold a displayed reading, press . The **HOLD** symbol will be displayed.

To exit data hold press again.

3.10 Record Function

Press to select the record function. The **RECORD** symbol will be displayed.

Press as required to display the following:

Maximum recorded reading. The **MAX** symbol is displayed.

Minimum recorded reading. The **MIN** symbol is displayed.

Difference between maximum and minimum recorded readings.

The **MAX-MIN** symbol is displayed.

Average of the recorded readings. The **AVG** symbol is displayed.

When in the record function, pressing will pause the recording. Press again to resume recording.

Press for >2s to exit the record function.

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Note: When in the record function to avoid the loss of recorded data all buttons are disabled except for HOLD and the backlight. The **APO** function is also disabled.

3.11 Temperature Measurement

Connect a Type K thermocouple probe, suitable for the type of temperature measurement and temperature range being made, to the thermocouple input socket (T1 or T2 or both on the DT175).

For the DT175, press to select the thermocouple input to be used. The **T1** or **T2** symbol will be displayed according to the input selection.

Taking all necessary safety precautions position the thermocouple at the surface or in the medium to be measured and read the measured temperature from the display.

Note: Repeated flexing can break the thermocouple leads. To prolong lead life, avoid sharp bends in the leads, especially near the connector.

3.12 Differential Temperature Measurement (DT175 Only)

Connect Type K thermocouple probes, suitable for the type of temperature measurement and temperature range being made, to the thermocouple input sockets T1 and T2.

Taking all necessary safety precautions position the thermocouples at the surfaces or in the mediums to be measured.

Press as required, to select the T1-T2 differential mode. The T1-T2 symbol will be displayed.

The difference between the measured temperatures of thermocouples T1 and T2 will be displayed.

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3.13 Thermocouple Offset Adjustment

The offset adjustment allows an individual Type K thermocouple to be optimised for the best measurement accuracy at a chosen reference temperature.

The adjustment span is $\pm 6.0^{\circ}\text{C}$ ($\pm 10.8^{\circ}\text{F}$).

On the DT175 set the required input, **T1** or **T2**.

Connect the thermocouple to the input socket.

Place the thermocouple in a known, stable temperature environment at the reference temperature. E.g. Triple point of ice, calibrated temperature bath, etc.

Allow the readings to stabilize.

Press , the **SET** symbol will be displayed and the temperature reading will flash.

Use or to set the indicated temperature to the known reference temperature.

Leave sufficient time between adjustments to allow for measurement lag.

Press to exit the adjustment mode and save the offset value. The **SET** symbol will no longer be displayed and the temperature reading will cease flashing.

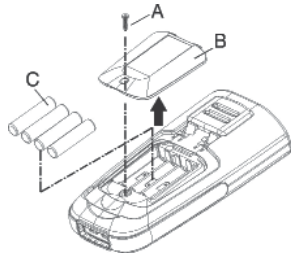
The thermometer-thermocouple combination is now optimized for measurements at the reference temperature.

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4. MAINTENANCE

4.1 Battery Replacement

⚠ To avoid shock or injury, disconnect the thermocouple/s from any external surface and remove before proceeding.



Remove the screw from the battery compartment cover, and lift it off.

Fit 4 new 1.5V, AAA alkaline batteries (IEC LR03, NEDA 24A) observing correct polarity.

Replace the battery compartment cover and screw.

Note: Do not mix old and new batteries.

4.2 Calibration

To maintain the integrity of measurements made using your instrument, Martindale Electric recommends that it is returned at least once a year to an approved Calibration Laboratory for recalibration and certification.

Martindale Electric is pleased to offer you this service. Please contact our Service Department for details.

Email: service@martindale-electric.co.uk

Tel: 01923 650660

4.3 Cleaning

If contamination is found, clean with a damp soft cloth and if necessary a mild detergent or alcohol. Do not use abrasives, abrasive solvents, or detergents which can cause damage to the

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unit. If a mild detergent is used, the unit should subsequently be thoroughly cleaned with a water dampened soft cloth. After cleaning, dry and allow to remain in a dry environment for 2 hours before use.

4.4 Repair & Service

There are no user serviceable parts in this unit other than those that may be described in section 4. Return to Martindale Electric if faulty. Our service department will quote promptly to repair any fault that occurs outside the guarantee period.

Before the unit is returned, please ensure that you have checked the unit, batteries and thermocouple/s.

4.5 Storage Conditions

The instrument should be kept in warm dry conditions away from direct sources of heat or sunlight, and in such a manner as to preserve the working life of the unit. It is strongly advised that the unit is not kept in a tool box where other tools may damage it.

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5. WARRANTY AND LIMITATION OF LIABILITY

This Martindale product is warranted to be free from defects in material and workmanship under normal use and service. The warranty period is 2 years and begins on the date of receipt by the end user. This warranty extends only to the original buyer or end-user customer, and does not apply to fuses, disposable batteries, test leads or to any product which, in Martindale's opinion, has been misused, altered, neglected, contaminated, or damaged by accident or abnormal conditions of operation, handling or storage.

Martindale authorised resellers shall extend this warranty on new and unused products to end-user customers only but have no authority to extend a greater or different warranty on behalf of Martindale.

Martindale's warranty obligation is limited, at Martindale's option, to refund of the purchase price, free of charge repair, or replacement of a defective product which is returned to Martindale within the warranty period.

This warranty is the buyer's sole and exclusive remedy and is in lieu of all other warranties, expressed or implied, including but not limited to any implied warranty of merchantability or fitness for a particular purpose. Martindale shall not be liable for any special, indirect, incidental or consequential damages or losses, including loss of data, arising from any cause or theory.

Since some jurisdictions do not allow limitation of the term of an implied warranty, or exclusion or limitation of incidental or consequential damages, the limitations and exclusions of this warranty may not apply to every buyer. If any part of any provision of this warranty is held invalid or unenforceable by a court or other decision-maker of competent jurisdiction, such holding will not affect the validity or enforceability of any other provision or other part of that provision.

Nothing in this statement reduces your statutory rights.

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Specification
DT173 DT175
Digital Thermometers



ELECTRICAL

All specified accuracies are at 23°C ± 5°C, <75% RH for 1 year, not including thermocouple error.

Temperature coefficient: 0.1 x (applicable accuracy) per °C. (0°C to 18°C, 28°C to 50°C)

Temperature scale: Celsius or Fahrenheit, user-selectable

Thermocouple type: K

Measurement range: -200°C to 1372°C. (-328°F to 1999°F)

Note: Measurement range will be limited by the range of the thermocouple probe used.

Resolution: 0.1° to 199.9°C/°F, 1° ≥ 200°C/°F

Temperature accuracy:

Range	Accuracy
-200°C to -60°C	± (0.1% of rdg + 2°C)
-60°C to 1372°C	± (0.1% of rdg + 1°C)
-328°F to -76°F	± (0.1% of rdg + 4°F)
-76°F to 1999°F	± (0.1% of rdg + 2°F)



Specification
DT173 DT175
Digital Thermometers

Input protection: 24V DC or AC rms maximum input voltage on any combination of input pins.

Input connector: Accepts standard miniature thermocouple connectors (flat blades spaced 7.9mm. center to center).

Supplied thermocouple probe:

4-foot Type K thermocouple bead probe (teflon tape insulated).

Maximum insulation temperature: 260°C (500°F).

Probe accuracy: ± 2.2°C or ± 0.75% of reading (whichever is greater).

GENERAL

Display:

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

Measurement rate: 2.5 times/second

Polarity: Automatic, positive implied, '-' for negative polarity indication

Overrange: (OL) is displayed

Power: 4 x 1.5V, AAA alkaline batteries (IEC LR03, NEDA 24A)

Battery life: 200 hours typical with alkaline batteries

Low battery indication: Low battery symbol is displayed

Auto power off: After 30 minutes

Dimensions: 160 mm (H) x 83 mm (W) x 38 mm (D).

Weight: Approx. 240g, including batteries

Includes: Type K bead thermocouple (x2 for DT175), 4 x 1.5V AAA alkaline batteries and instructions



Specification
DT173 DT175
Digital Thermometers

ENVIRONMENTAL

Temperature & Humidity:

(Operating): 0°C to 50°C, <70% R.H.

(Storage): -20°C to 60°C, 0 to 80% R.H., batteries removed

Altitude: up to 2000m

Pollution degree: 2

SAFETY

Conforms to: BS EN 61010-1

Class II, double insulation

EMC

Conforms to BS EN 61326-1

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- Phase Rotation Testers
- Proving Units
- Socket Testers
- Thermometers & Probes
- Test Leads
- Voltage Indicators
- Specialist Metrohm Testers (4 & 5kV)
- Specialist Drummond Testers



Martindale Electric Company Limited
Tel: +44(0)1923 441717 Fax: +44 (0)1923 446900
E-mail: sales@martindale-electric.co.uk
Website: www.martindale-electric.co.uk

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