EN

Original Instructions
Version 1 – January 2024

DRAPER®

TOUCH SCREEN
DIGITAL MULTIMETER

16232

UK CA CE

1. Preface

These are the original product instructions. This document is part of the product; retain it for the life of the product, passing it on to subsequent holders. Read this manual in full before attempting to assemble, operate or maintain this product.

This Draper Tools manual describes the purpose of the product and contains all the necessary information to ensure its correct and safe use. Following all the instructions and guidance in this manual will ensure the safety of both the product and the operator and increase the lifespan of the product.

All photographs and drawings within this manual are supplied by Draper Tools to help illustrate correct operation of the product.

Every effort has been made to ensure the information contained in this manual is accurate. However, Draper Tools reserves the right to amend this document without prior warning. Always use the latest version of the product manual.

1.1 Product Reference

User Manual for: Touch Screen Digital Multimeter,
Stock No.: 16232

Part No.: DMM500

1.2 Revisions

Version 1: January 2024
First release

Please visit **drapertools.com/manuals** for the latest version of this manual and the associated parts list, if applicable.

1.3 Understanding the Safety Content of This Manual

WARNING! – Situations or actions that may result in personal injury or death.

CAUTION! – Situations or actions that may result in damage to the product or surroundings.

Important: – Information or instructions of particular importance.

1.4 Copyright © Notice

2. Contents

3. Product Introduction

3.1 Intended Use

This device is designed to measures current, resistance, capacitance, frequency, temperature, diode and non-contact voltage. It can also automatically identify and measure AC/DC voltage and resistance.

Any other application beyond the conditions established for use will be considered misuse. Draper Tools accepts no responsibility for improper use of this product.

Read this manual in full before operating or maintaining the product and retain it for later use.

3.2 Specification

Stock No.:	16232
Part No.:	DMM500
Multimeter rating:	CAT III, 600V
Dimensions:	W 75 × H 150 × D 24 mm
Battery:	1 × 3.7V/2800mA USB-C Rechargeable
Weight:	220g
Circuit protection:	Fuse
Overload protection:	250V DC or AC (RMS)
DC voltage:	
Input resistance:	10MΩ
Input sensitivity:	0.8V
Maximum input voltage:	1000V
Measurement range:	0.001V to 1000V,
Accuracy:	<60V = +/-(0.5% +3) >60V = +/-(0.8% +10)
Max Resolution:	0.001V
AC voltage:	
Input resistance:	10MΩ
Input sensitivity:	0.8V
Maximum input current:	10A DC or AC RMS
Measurement range:	0.001V to 750V,
Accuracy:	<60V = +/-(0.8% +3) >60V = +/-(1.0% +10)
Max Resolution:	0.001V
AC/DC current:	
Overload protection:	FF20A/250V fuse
Current Range:	1mA to 10A (5A for 15 seconds maximum)
Accuracy:	<6000mA = +/-(1.0% +5) >6000mA = +/-(2.5% +10)
Max Resolution:	1mA
Resistance:	
Measurement Range:	0.1Ω to 60MΩ
Accuracy:	<600Ω = +/-(0.8% +3), 6MΩ = +/-(1.2% +3) >6MΩ=+/-(2.5% +5)
Max Resolution:	- 0.1Ω
Capacitance:	
Measurement Range:	0.01nF to 100.0mF
Accuracy:	<6.000mF = +/-(4.0% +20) 60.00mF = +/-(5.0% +5) >60.00mF =For reference
Max Resolution:	- 0.01nF
Frequency:	
Measurement Range:	0.001Hz to 999.9kHz
Accuracy:	+/-(0.8% +3)
Max Resolution:	0.001Hz
Diode check:	
Test current Forward DC:	1mA typical
Test Current Reverse DC:	3.2V typical
Measurement range:	3.2VDC typical
Circuit On/Off Test	
Open circuit voltage:	1V typical
Temperature Test	
Measurement Range: (Excluding probes)	-20 to +1000°C -4 to +1832°F
Accuracy:	0.1 – 1°C/1°F
Operating conditions:	
Operating temperature:	18–28°C
Storage Temperature	10 - 50°C

4. Explanation of Symbols


Read the instruction manual


Do not abandon in the environment


Keep out of the reach of children


Warning!


Warning! Risk of shock


Do not incinerate or throw onto fire


For indoor use only; do not expose to rain

Fuse protective device


Class II construction (Double insulated)


Measures DC Voltage


Measures AC Voltage


Measures resistance


Measures diode forward voltage drop


Measures capacitors

Measures frequency


Measures temperature

Measures battery voltage up to 9V


Buzzer

USB C rechargeable battery


European conformity

UK Conformity Assessed


WEEE – Waste Electrical & Electronic Equipment

Do not dispose of Waste Electrical & Electronic Equipment in with domestic rubbish

5. Health and Safety Information

Important: Read all the Health and Safety instructions before attempting to use this product. Non-compliance may result in serious injury or death.

WARNING! Contact with live circuits can result in severe electrical shock. When measuring voltage above 30A, current above 10mA or AC power with an inductive load:

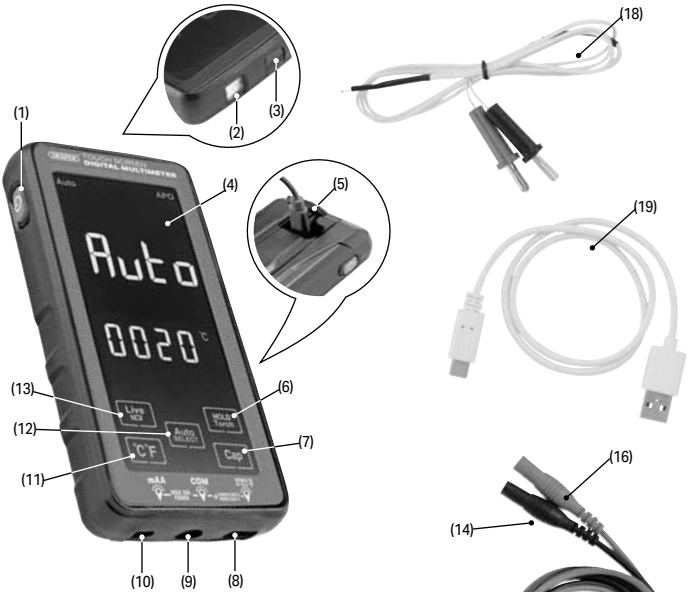
- **DO NOT enter voltages above 1000V DC or 750V AC (RMS).**
- **DO NOT apply voltages above 1000VAC or 750WAV between the common terminal and Earth ground.**
- **DO NOT measure the current on a circuit when the open circuit voltage and ground exceeds 250V.**
- **Discharge all high-voltage capacitors before measuring capacitance.**

- **Take care not to touch the exposed contacts as they may give a serious electric shock.**
- **ONLY** trained and competent personnel may operate this device.
- Use this product **ONLY** as instructed in this manual.
- This product is safe to use on three-phase distribution circuits with overvoltage of up to 1,000V.
- Use **ONLY** accessories and spare parts supplied by Draper Tools.
  - **DO NOT** use any other leads with this product than those supplied. Contact Draper Tools for replacement options if the leads become damaged.
  - **DO NOT** attempt to replace the rechargeable battery as it is non-replaceable.
- Observe all standard precautions and good practice when working with live electrical currents.
- Inspect the product for damage before every use, particularly the contact tips.
  - **DO NOT** use this product if the device or test leads are damaged in any way.
  - **DO NOT** operate this device with the casing open, missing or damaged.
- Ensure that the device is clean, dry and free from grease before use.
- Ensure that the correct function is selected before switching on the device.
- **DO NOT** use this product if it is functioning abnormally. Have it checked by a qualified and authorised technician before next use.
- **DO NOT** exceed the maximum rated capacity per function for this device as it may expose you to a shock hazard.
- Ensure that the test lead contacts are disconnected from the load or test circuit before selecting a function.
- **DO NOT** measure resistors, capacitors and diodes whilst they are charged. Discharge fully before carrying out a measurement.
- Assess any specific additional risks to the operator before each use.
- **DO NOT** expose this product to excessive ambient temperature, high humidity, flammable substances or environments that produce a strong magnetic field.
- **DO NOT** use this this product around explosive gases, vapours or dust.
- **DO NOT** immerse this device in water or expose it to wet conditions.
- **ALWAYS** wear protective insulated gloves while using this product.
- **ALWAYS** keep your fingers behind the guards on the test lead contact at all times during use.
- **NEVER** insert the test lead contacts into the device terminals.
- **DO NOT** attempt to repair this device; it contains no user-serviceable parts.
- Keep this product out of reach of children.

WARNING! ALWAYS ensure that the operator is not in contact with the ground while taking measurements, use insulating materials to prevent the current from earthing.

6. Identification and Unpacking

6.1 Product Overview

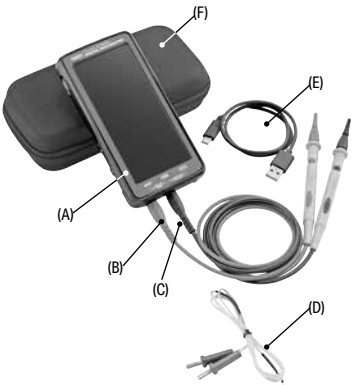


1. Power button
2. Torch & function indicator
3. NCV zone
4. LCD touch screen
5. USB charging port cover
6. Hold or Torch button
7. Capacity (CAP) button
8. Voltage, resistance, circuit on/off, frequency, temperature terminal
9. Common earth probe terminal
10. maA probe terminal
11. Temperature °C/°F button
12. Auto/ Function Select button
13. Live Non-Contact Voltage (NCV) button
14. Negative (black) test lead
15. Negative contact tip cover
16. Positive (red) test lead
17. Positive contact tip cover
18. Temperature probe
19. USB C charging cable

6.2 What's in the Box?

Carefully remove the product from the packaging and examine it for any signs of damage that may have occurred during shipment.

Before assembling the product, lay the contents out and check them against the parts listed below. If any part is damaged or missing, do not attempt to use the product. Please contact the Draper Helpline; contact details can be found at the back of this manual.



A. 1 × Digital multimeter
B. 1 × Positive (red) test lead
C. 1 × Negative (black) test lead
D. 1 × Temperature probe
E. 1 × USB C charging cable
F. 1 × Carry case

Please visit **drapertools.com** for our full range of accessories and consumables.

6.3 Packaging

Keep the product packaging for the duration of the warranty period in case the product needs to be returned for repair.

WARNING! Keep packaging materials out of reach of children. Dispose of packaging correctly and responsibly and in accordance with local regulations.

7. Operating Instructions

Important: Before operating this product, read and understand all the safety instructions listed in this manual.

Important: Inspect the device for signs of damage, particularly the probes and and insulated test leads. Replace faulty leads immediately.

For each measurement type, connect the negative test lead (14) to the common earth probe terminal (9) and connect the positive test lead (16) to either the voltage, resistance, circuit on/off, frequency, temperature terminal (8) or amperage probe terminal (10).

Remove the contact covers (15) and (17) before use.

If a negative value is shown on the display, check the polarity of the test leads at the component contacts and the device terminals.

7.1 Charging the Multimeter

Important: The rechargeable battery is not replaceable.

1. Open the USB cover (5) and connect the USB cable (19). Then connect the other end to a suitable USB power outlet.

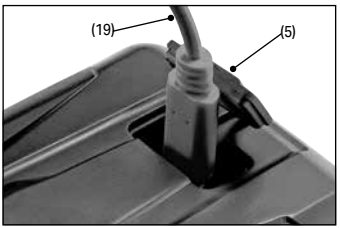


Fig. 1

3. The Torch indicator light (2) will be red when charging and will turn green when fully charged.
4. Always charge when the low battery warning is displayed.

7.2 Operating the Multimeter

1. To turn on the Multimeter, press and hold the **POWER** button (1) for 3 seconds.
2. **AUTO** mode will be displayed on the screen. In this mode AC/DC voltage and resistance are automatically detected and measured.
3. To select the functions manually press the **AUTO SELECT** button then scroll through until the required mode is selected. **Note:** Always disconnect the test leads when changing between functions.

- **Automatic Power OFF** – The Multimeter will automatically switch off after 15 minutes if no operation has occurred. There will be 5 beeps before it shuts down.
- **Buzzer** – will sound when switching on or any button is pressed, or a function is selected. It will also sound if the reading is over the specified range of the Multimeter.

7.3 AC/ DC Voltage and Resistance Test Measurements

1. Use the **AUTO** mode or press the **SELECT** button (12) to select the required measurement type.
2. Connect the negative test lead (14) to the common earth probe terminal (9) and connect the Positive test lead (16) to the voltage, resistance, circuit on/off, frequency, temperature terminal (8).
3. Position the test lead contacts across the source of the circuit to be measured, observing the correct polarity.
4. Enable the power to the circuit to be measured. The voltage value is displayed on the LCD screen (4) along with the voltage polarity if reversed.

Resistance

– If the resistance to be tested is part of a circuit, switch the circuit off, disconnect the power and allow all capacitors to discharge before measurement.

WARNING! NEVER measure resistance across a voltage source or on a powered circuit.

– Touch the probe contacts at either side of the resistance to be measured.
– The current value is displayed on the LCD screen (4).

7.4 AC/DC Current Measurement

1. Press the **AUTO SELECT** button (12) to select the required measurement type.
2. Connect the negative test lead (14) to the common earth probe terminal (9) and connect the Positive test lead (16) to MaA terminal (10).
3. Open the circuit to be measured and connect the test leads in series, using the correct polarity, to bridge the gap.
4. Enable the power to the circuit to be measured. The current value is displayed on the LCD screen (4).

Note: If the input exceeds 10A the display screen will show 'OL'.

7.5 Diode Testing

1. Press the **AUTO SELECT** button (12) until the diode test function is selected.
2. Touch the test lead contacts against the contacts of the diode, observing the correct polarity.
3. The approximate forward voltage drop of the diode is displayed on the LCD screen (4); a typical diode functioning normally will deliver a reading of 0.5–0.8V.

Note: If the polarity of the test probes is reversed the display screen will show 'OL'.

7.6 Capacitance Measurement

1. Press the **CAP** button (7) to select the capacitance test function.
2. Connect the negative test lead (14) to the common earth probe terminal (9) and connect the positive test lead (16) to the voltage, resistance, circuit on/off, frequency, temperature terminal (8).
3. Completely discharge the capacitor before connecting the probes.
4. The current value is displayed on the LCD screen (4).

Note:
– When measuring large capacitance, it will take time for the reading to stabilise.
– When measuring polar capacitors, pay attention to the corresponding polarity to avoid damaging the Multimeter.

7.7 Temperature Measurement

1. Press the **°C°F** button (11) to select the temperature function and select between Celsius or Fahrenheit.
2. To use the temperature probe (18) connect the negative black test lead to the common earth probe terminal (9) and connect the positive red test lead to the voltage, resistance, circuit on/off, frequency, temperature terminal (8).
3. The temperature will be displayed on the LCD screen (4).

Note: K-type thermocouples can measure up to a maximum of 250°C.

7.8 Frequency

1. Press the **AUTO SELECT** button (12) until the frequency (Hz) test function is selected.
2. Connect the negative test lead (14) to the common earth probe terminal (9) and connect the positive test lead (16) to the voltage, resistance, circuit on/off, frequency, temperature terminal (8).
3. The current value is displayed on the LCD screen (4).

7.9 NCV Test Function

1. Press the **LIVE NCV** button (13) to select the non-contact voltage test function. 'EF' will be displayed on the screen.
2. Place the NCV zone (3) close to the live line of AC voltage (less than 5mm).
   - '- - L' will be displayed and the indicator light (2) will come on if the signal detected is weak.
   - While the red indicator light is on '- - H' will be displayed and an alarm will sound when closer to the AC voltage line.

7.10 Live Circuit Recognition

1. Press the **LIVE NCV** button (13) twice and connect the positive test lead (16) to the voltage, resistance, circuit on/off, frequency, temperature terminal (8). {Li uE} will be displayed on the screen.
2. Once a reliable contact is made the display screen will show '---H' and the buzzer will sound.

7.11 Data Hold

When taking measurements to retain the reading on the screen, press the **HOLD/TORCH** button (6) once to lock the value. To unlock press the **HOLD/TORCH** button again.

7.12 Torch Feature

1. Press and hold the **POWER** button (1) for 3 seconds to turn on the Multimeter.
2. Press the **HOLD/TORCH** (6) for 3 seconds to turn the torch on. Press again to turn off the torch.

8. Product Care and Disposal

Important: Disconnect the test leads from the terminals and any other source of voltage before performing any maintenance on this product.

8.1 Maintenance and Storage

- Keep the product clean and free from dust, debris and grease.
- Use a dry cloth **ONLY** to clean the housing of this device.

CAUTION! DO NOT use abrasives, solvents or other aggressive chemicals as these may damage plastic or insulated parts.

- Replace the test leads **IMMEDIATELY** if they are damaged in any way or the conductors are exposed; contact Draper Tools for replacement options.
- **Important:** Replacement test leads must be rated CAT III 1,000V.
- If the low battery indicator is shown on the display charge the battery - , Refer to section 7.1 charging the multimeter.
- Store the device in a cool, clean and dry environment, out of direct sunlight and out of reach of children.

8.2 Disposal

For spare parts, servicing, and repair and replacement options, please contact the Draper Tools Product Helpline for details of your nearest authorised agent.

Draper Tools will endeavour to hold any spare parts, if applicable, for seven years from the date that it sells the final matching stock item.

Any servicing or repairs carried out by unauthorised personnel or installation of spare parts not supplied by Draper Tools will invalidate your warranty.

At the end of its working life, dispose of the product responsibly and in line with local regulations. Recycle where possible.

- **DO NOT** dispose of this product with domestic waste; most local authorities provide appropriate recycling facilities.
- **DO NOT** burn or mutilate batteries; this may release toxic or corrosive substances.
- Dispose of batteries separately and in accordance with local regulations.

9. Warranty

Draper Tools products are carefully tested and inspected before shipment and are guaranteed to be free from defective materials and workmanship.

Should the tool develop a fault, return the complete tool to your nearest distributor or contact Draper Tools directly. Contact information can be found at the back of this manual.

Proof of purchase must be provided.

If, upon inspection, it is found that the fault occurring is due to defective materials or workmanship, repairs will be carried out free of charge. This warranty period covers parts and labour for 12 months from the date of purchase. Where tools have been hired out, the warranty period covers 90 days from the date of purchase.

This warranty does not apply to any consumable parts, batteries or normal wear and tear, nor does it cover any damage caused by misuse, careless or unsafe handling, alterations, accidents, or repairs attempted or made by any personnel other than the authorised Draper Tools repair agent.

In all cases, to make a claim for faulty workmanship or materials within the standard warranty period, please contact or return the product to the place of purchase. Proof of purchase may be required.

If the place of purchase is no longer trading or if you experience any difficulties with your warranty, please contact Customer Services with the product details and your proof of purchase. Contact details can be found at the back of this manual.

If the tool is not covered by the terms of this warranty, repairs and carriage charges will be quoted and charged accordingly.

This warranty supersedes any other guarantees expressed or implied and variations of its terms are not authorised.

Your Draper Tools guarantee is not effective until you can produce, upon request, a dated receipt or invoice to verify your purchase within the guarantee period.

Please note that this warranty is an additional benefit and does not affect your statutory rights.

Draper Tools Limited

Notes

Contact Details

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Please contact the Draper Tools Product Helpline for repair and servicing enquiries.