DRAPER EXPERT

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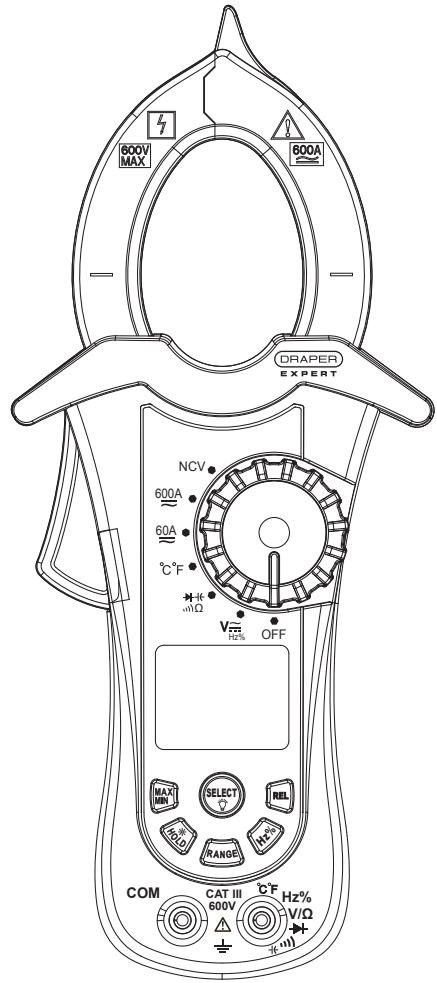
Original Instructions
Version 1: July 2024

DIGITAL CLAMP METER

30641



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: Digital Clamp Meter

Stock No: 30641

Part No: DCM-RAC

1.2 Revisions

Version 1: July 2024
First release

As our manuals are continually updated, always ensure that the latest version is used.

Please visit **drapertools.com/manuals** for the latest version of this manual.

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 meter is designed to measure voltage, current and resistance across AC and DC circuits. It can also measure capacitance, frequency, diode, continuity, temperature and carry out non-contact voltage sensing.

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 attempting to assemble, operate or maintain the product, and retain it for later use.

3.2 Specification

Stock No.	30641
Part No.	DCM-RAC
Meter rating:	**CAT III 600V/600A**
Battery type required:	4 x AAA (not supplied)
Operating conditions:	
Ambient temperature:	0–50°C
Storage temperature:	-10 - 60°C
Humidity:	<80% RH

Measurement	Range	Accuracy	Resolution
DC Voltage	600.0mV	±1% reading, ±2digits	0.1mV
	6.000V		0.001V
	60.00V		0.01V
	600.0V		0.1V
AC Voltage /True RMS	6.000V	±1% reading, ±2digits	0.001V
	60.00V		0.01V
	600.0V		0.1V
AC/DC Current	0.3 - 60A	±2.5% reading, ±8digits	0.01A
AC/DC Current	0.5 - 600A	±2.5% reading, ±5digits	0.1A
Capacitance (F)	6.000nF	±3% reading, ±10digits	0.001nF
	60.00nF		0.01nF
	600.0nF		0.1nF
	6.000uF		0.001uF
	60.00uF		0.01uF
	600.0uF		0.1uF
	6.000mF		0.001mF
	60.00mF		0.01mF
Resistance (Ω)	600.0Ω	±1% reading, ±3digits	0.1Ω
	6.000kΩ		0.001kΩ
	60.00kΩ	±1% reading, ±1digit	0.01kΩ
	600.0kΩ		0.1kΩ
	6.000MΩ		0.001MΩ
	60.00MΩ	±2% reading, ±3digits	0.01MΩ
Frequency (HZ)	9.999Hz	±1% reading, ±2digits	0.001Hz
	99.99Hz		0.01Hz
	999.9Hz		0.1Hz
	9.999KHz		0.001KHz
Diode and Continuity	Diode forward voltage 0 – 3.3V		
	Continuity buzzing when resistance is <50Ω		
Duty Cycle	0 – 100%	±1% reading, ±5digits	0.1%
Temperature	-55°C - 400°C	±2% reading, ±3digits	1°C
	-67°F - 750°F		1°F
	400°C - 1300°C		1°C
	752°F - 2372°F		1°F

4. Health and Safety Information

Important: Read all the Health and Safety instructions before attempting to use this product. Failure to follow these instructions may result in serious injury or death.

WARNING! Contact with live circuits can result in severe electrical shock. Take care not to touch the exposed contacts as they may give a serious electric shock.

- **DO NOT** measure voltages above 600V DC or AC (RMS).
- **DO NOT apply voltages to the probes whilst measuring current, diodes, continuity or capacitors.**
- **Discharge all high-voltage capacitors before measuring capacitance.**
- Do not clamp both the live and neutral wires at the same time during the measurement.
- Remove the test leads from the meter when measuring using the clamp.

- **ONLY** trained and competent personnel may operate this device.
- Use this product **ONLY** as instructed in this manual.
- 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.
  - If the battery must be replaced, use one with the same specification.
- 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 probe leads are damaged in any way or if there is evidence of battery leakage.
  - If battery acid comes into contact with your skin, wash it off immediately with plenty of clean water.
  - If battery acid comes into contact with your eyes, flush them with plenty of clean water and seek immediate medical attention.
- Ensure that the device is clean, dry and free from grease before use.
- **DO NOT** use this product if it exhibits abnormal behaviour and 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.
- **DO NOT** measure resistors, capacitors and diodes whilst they are charged. Discharge fully before carrying out a measurement.
- Ensure that the probe contacts are disconnected from the load or test circuit before moving the selector dial.
- 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 probes and clamp during use.
- Ensure the selector dial is in the correct function mode before taking any measurements.
- **ALWAYS** turn the selector dial to the **'OFF'** position and remove the probe leads from the device before opening the battery compartment cover.
- **DO NOT** operate this device with the rear housing open or missing and **DO NOT** use it if the rear housing cannot be closed properly.
- **NEVER** insert the probe contacts into the device terminals.
- **DO NOT** abuse, mutilate or burn the battery.
- Remove the batteries when the product is stored for extended periods.
- **DO NOT** attempt to repair this device; it contains no user-serviceable parts.
- Keep this product out of reach of children.

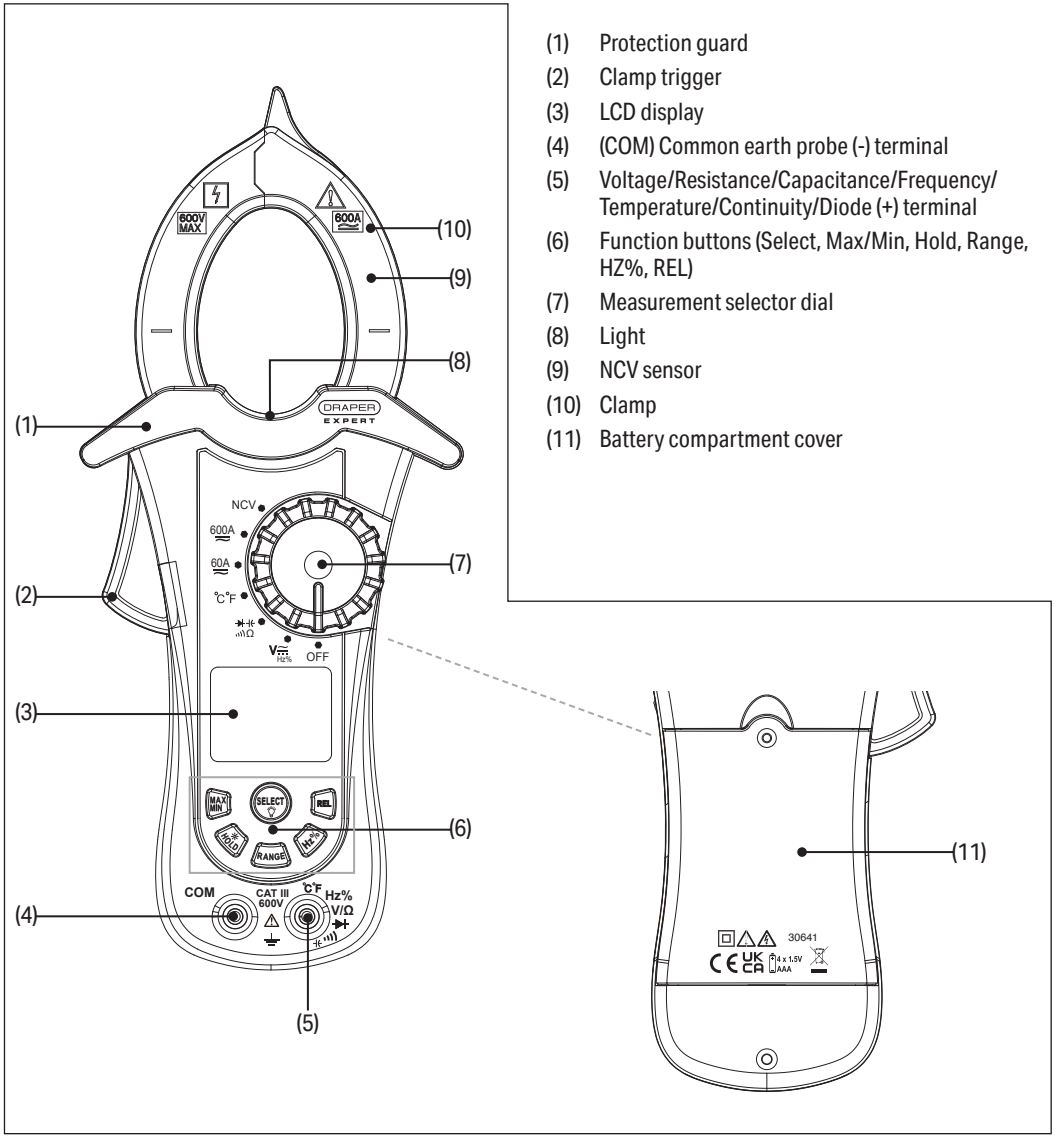
WARNING! ALWAYS ensure that the operator is not in contact with the ground while taking measurements, using insulating materials to prevent the current from earthing.

5. Identification and Unpacking

5.1 Product Overview

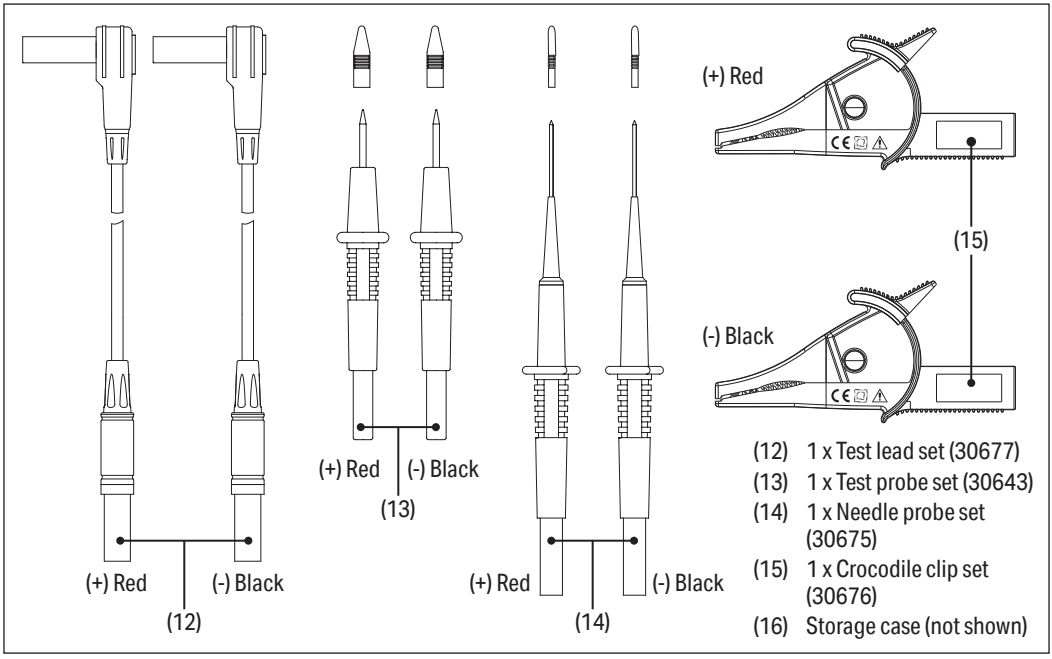
Carefully remove the product from the packaging and examine it for any signs of damage that may have occurred during shipment.

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.



(1) Protection guard
(2) Clamp trigger
(3) LCD display
(4) (COM) Common earth probe (-) terminal
(5) Voltage/Resistance/Capacitance/Frequency/ Temperature/Continuity/Diode (+) terminal
(6) Function buttons (Select, Max/Min, Hold, Range, HZ%, REL)
(7) Measurement selector dial
(8) Light
(9) NCV sensor
(10) Clamp
(11) Battery compartment cover

5. Identification and Unpacking



(12) 1 x Test lead set (30677)
(13) 1 x Test probe set (30643)
(14) 1 x Needle probe set (30675)
(15) 1 x Crocodile clip set (30676)
(16) Storage case (not shown)

5.2 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.

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

6. Installing/Replacing the Battery

Important: Use **ONLY** AAA batteries X 4 (not supplied).

Replace the battery when the low battery icon (k) appears on the display screen.

1. Disconnect the test probe leads and ensure the selector dial (7) is in the '**OFF**' position before installing or removing the battery.
2. Unscrew the battery compartment cover (11). Fit the batteries in the compartment, ensuring that they are installed in the correct +/- orientation.
3. Refit the compartment cover.

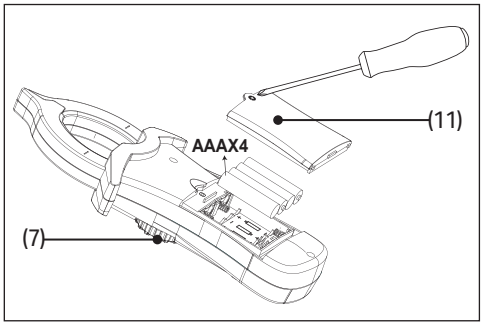


Fig. 1

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 insulated leads. Replace faulty leads immediately.

7.1 LCD Display Explained

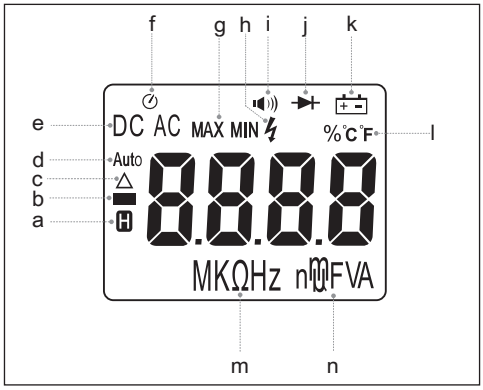


Fig. 2

a. Data hold

b. DC polarity indication

c. Relative value measurement

d. Auto range

e. AC/DC power indicator

f Auto shutdown mode

g. Maximum & Minimum

h. High voltage indicator

i. Continuity measurement

j. Diode measurement

k. Low battery indicator

l. Temperature unit/duty cycle

m. Resistance/Frequency unit

n. Voltage, current, capacitance units

7.2 Auto Shutdown Mode

- The device will shut down and automatically go into sleep mode after 15 minutes without any operation. Press the '**SELECT**' button to restart the device.
- To cancel the auto shutdown, press and hold then '**SELECT**' button, then turn on the device.

7. Operating Instructions

7.3 The Function Buttons (6)

Note: The selector dial (7) needs to be turned to the required position before pressing a function button.

Button	Function
'SELECT'	• Press to switch between measurement functions: – AC or DC current. – Resistance, Capacitance, Diode or Continuity. • Press and hold to switch the light (8) function on or off. **Auto Shutdown mode:** • Press to wake the meter when in shutdown mode. • The device will buzz 5 times for 1 minute before shutting down. • To cancel; turn the selector dial (7) to the '**OFF** 'position. Then press and hold the button and turn the meter on. • If the auto shutdown mode is switched off the meter will buzz 5 times every 15 minutes. It will resume when the meter is switched back on.
'MAX/MIN'	• Press to display the maximum and minimum measured value.
HOLD	• Press to hold the value shown on the screen. • To cancel press the button again or press the '**SELECT**' button. **Backlight** • To switch on the backlight – press and hold the button. • The light will switch off automatically after 30 seconds.
'RANGE'	• Switch between '**AUTO**' and '**MANUAL**' range. The default is '**AUTO**' mode. • Press the button to change to '**MANUAL**' mode and set the range manually. • To return to '**AUTO**' press and hold the button for more than 2 seconds.
'Hz%' Frequency	• Press to switch measurements between frequency and duty cycle during AC current or AC voltage measurements.
'REL'	**Relative Value Measurement Function** • This function can be used when measuring voltage, current, temperature, resistance, and capacitance. • When selected the value measurement displayed on the screen will be the difference between the new measurement and the current reference value. • The '**REL**' function only operates with '**MANUAL**' range. • To cancel the '**REL**' function press the '**SELECT**' button.

7.4 Using the Test Leads and Probe Sets

1. Remove the protective covers from both ends of the test leads (12).
2. Fit the required probe or clip sets over the end of the test leads - ensuring the correct polarity (+) red and (-) black matches the leads (12) and the terminals (4) COM (-) and (5) (+).
3. Remove the protective covers from the test end of the probes (13) or (14) before measuring. Always replace after use.

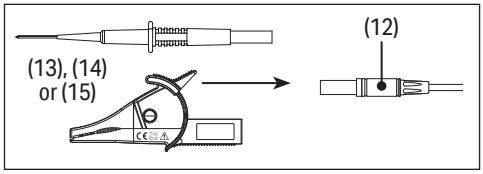


Fig. 3

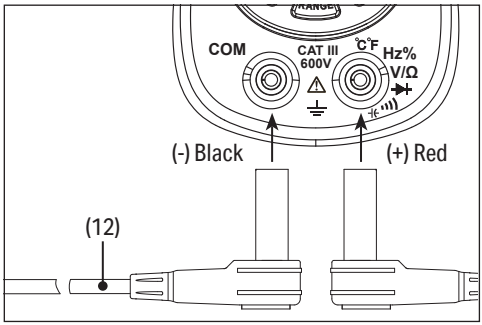


Fig. 4

7.5 Measurements

- Turn the selector dial (7) to select the required measurement mode. Always return the dial to the '**OFF**' position once measuring is complete.

Measurement	Function Dial Position	Action
AC/DC Voltage	V⎓≂ Hz%	1. Connect the positive red probe lead (+) to the (+) terminal (5) and the black negative probe lead (-) to the '**COM**' terminal (4). 2. Contact the probes with the testing point. The voltage value and polarity will be displayed on the LCD screen (3). ⚠ **CAUTION!** • **DO NOT** measure voltage higher than 600V. • Avoid direct contact with your body during the high voltage measurement.

7. Operating Instructions

7.5 Measurements

Measurement	Function Dial Position	Action
AC Current	600A ≂ **OR** 60A ≂	1. **Disconnect the testing probes from the meter**. 2. Turn the dial to either the 600A or 60A position. • Start the measurement from the highest range if uncertain of the measured value. 3. Push the trigger (2) to open the clamp, then pass either the live wire or neutral wire to be measured in the centre of the clamp. • **DO NOT clamp both wires at the same time**. 4. For best accuracy, ensure the wire is in the centre and vertical to the clamp.
DC Current	+ Press '**SELECT**' until '**DC**' **on LCD**	5. Release the trigger so the clamp forms a closed loop. 6. The value will be displayed on the screen (3). • Press the '**HZ%**' button to switch between frequency and duty cycle measurements. • Note: In order to obtain accurate results before measuring DC, press the 'REL' button to zero the displayed value. ⚠ **CAUTION!** • **DO NOT** turn the selector dial during the measurement. Release the clamp from the measured object before turning the dial.
Resistance	 Ω	1. Connect the positive red probe lead (+) to the (+) terminal (5) and the black negative probe lead (-) to the '**COM**' terminal (4). Then turn the selector dial. 2. Contact the probes with two terminals of the resistor. 3. The value will be displayed on the screen. ⚠ **CAUTION! To prevent electric shocks:** • Ensure all voltage sources are powered off and all capacitors have discharged before taking the measurement. • **DO NOT** measure voltage and current with this function.
Capacitance		1. Connect the positive red probe lead (+) to the (+) terminal (5) and the black negative probe lead (-) to the '**COM**' terminal (4). Then turn the selector dial. 2. Connect the probes with two terminals of the capacitor; red probe to the positive and black to the negative. 3. The measured value will be displayed on the screen (3). • 60.00 mF capacitance needs about 30 seconds to obtain a stable reading. ⚠ **CAUTION!** • Discharge the capacitor before taking the measurement. • **DO NOT** measure voltage and current with this function.
	+ Press '**SELECT**' until '**F**' **on LCD**	

Measurement	Function Dial Position	Action
Diode		1. Connect the positive red probe lead (+) to the (+) terminal (5) and the black negative probe lead (-) to the '**COM**' terminal (4). Then turn the selector dial. 2. Contact the red probes to the positive of the diode and black probe to the negative of the diode. 3. The forward voltage will be displayed on the screen (3).
	+ Press '**SELECT**' until  **on LCD**	**CAUTION! To prevent electric shocks:** • Ensure all the power is off and the capacitor is discharged before this measurement. • DO NOT measure voltage and current with this function.
Continuity		• The meter will buzz when the measured resistance is <50Ω. **CAUTION! To prevent electric shocks:**
	+ Press '**SELECT**' until  **on LCD**	• Ensure all the power is off and the capacitor is discharged before this measurement. • **DO NOT** measure voltage and current with this function.
Frequency/ Duty Cycle **(AC Voltage)**		1. Connect the positive red probe lead (+) to the (+) terminal (5) and the black negative probe lead (-) to the '**COM**' terminal (4). Then turn the selector dial. 2. Connect the probes with the signal source.
	+ Press **'HZ%'**	3. Press '**Hz"%**' button to switch between frequency and duty cycle measurements.
Temperature		1. Connect K- type thermocouple (not supplied) to the '**COM**' terminal (4) and (+) terminal (5). 2. Turn the selector dial. 3. Change the temperature unit by pressing the '**SELECT**' button.
Non Contact Voltage Sensing	NCV	1. Move the sensor (9) towards the AC voltage source. 2. If voltage is detected the device will buzz and '----' will display on the screen. • The number of bars shown will vary depending on the strength of the voltage detected. • **'EF' will be displayed on the screen if no AC voltage detected**.

8. Maintenance

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

8.1 General 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 probe leads **IMMEDIATELY** if they are damaged in any way or the conductors are exposed; contact Draper Tools for replacement options.

Important: Replacement leads and test probes must be rated as follows:
Leads: CAT IV 600V / 10A
Probes: CATII 1000V
Needle Probes: 600Vdc/Max 1A
Crocodile Clips: CAT III 1000V, CAT IV 600V, 10A

- If the low battery indicator is shown on the display, replace the battery as soon as possible; refer to **section 6. Installing/Replacing the Battery**.
- Remove the battery when storing the device for extended periods.
- Store the device in the case supplied in a cool, clean and dry environment, out of direct sunlight and out of reach of children.

9. Disposal

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

- **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.

10. Warranty

Warranty is 12 months from date of purchase.

Visit **drapertools.com/warranty** for more information.

11. Explanation of Symbols

Read the instruction manual

Warning!

Warning! risk of shock

Do not incinerate or throw onto fire

Class II construction
(Double insulated)

Alternating current

Earth

Direct current

Both direct & alternating current

Resistance in OHMS

WEEE –

Waste Electrical & Electronic Equipment

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

European conformity

UK Conformity Assessed

Contact Details

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