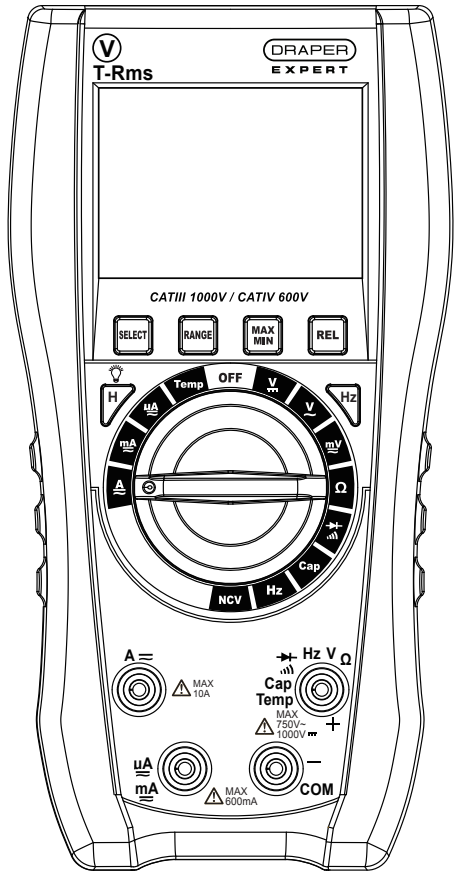
DRAPER
EXPERT

EN
Original Instructions
Version 1: July 2024

DIGITAL
MULTIMETER
30629



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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 Multimeter

Stock No: 30629

Part No: DMM-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 for carrying 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.	30629
Part No.	DMM-RAC
Multimeter rating:	**CAT III, 1,000V /CAT IV 600V**
Battery Type Required:	1 x 9V /Type PP3 (not supplied)
Fuse Type Required:	1 X 10A/250V & 1 X 1A/250V
Sample Rate:	3 times/second
Operating conditions:	
Ambient temperature:	0–50°C
Storage temperature:	- 10 - 60°C
Humidity:	<80% RH

3. Product Introduction

Measurement	Range	Accuracy	Resolution
DC Voltage	60.00mV	±1% reading, ±2digits	0.01mV
	600.0mV		0.1mV
	6.000V		0.001V
	60.00V		0.01V
	600.0V		0.1V
	1000V		1V
AC Voltage /True RMS	60.00mV	±1% reading, ±2digits	0.01mV
	600.0mV		0.1mV
	6.000V		0.001V
	60.00V		0.01V
	600.0V		0.1V
	750V		1V
DC Current	600.0uA	±1.5% reading, ±6digits	0.1uA
	6000uA		1uA
	60.00mA		0.01mA
	600.0mA		0.1mA
	10A	±2% reading, ±10digits	0.01A
AC Current	600.0uA	±1%±6digits	0.1uA
	6000uA		1uA
	60.00mA		0.01mA
	600.0mA		0.1mA
	10A	±2%±6digits	0.01A
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%±3digits	0.1Ω
	6.000kΩ		0.001kΩ
	60.00kΩ	±1%±1digits	0.01kΩ
	600.0kΩ		0.1kΩ
	6.000MΩ		0.001MΩ
	60.00MΩ	±2%±3digits	0.01MΩ
Frequency (HZ)	9.999Hz	±1% reading, ±2digits	0.001Hz
	99.99Hz		0.01Hz
	999.9Hz		0.1Hz
	9.999KHz		0.001KHz
	99.99KHz		0.01KHz
	999.9KHz		0.1KHz
	9.999MKz		0.001MHz
Diode and Continuity	Diode forward voltage drop: 0 – 3.3V		
	Buzzer beeps when resistance between two probes <50Ω. **'OL'** on screen when resistance between two probes >600Ω.		
Temperature	-55°C - 400°C	±2% reading, ±3digits	1°C
	-67°F - 750°F		1°F
	400°C - 1300°C	±2% reading, ±5digits	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. When measuring voltage above 40V/AC and 60V/DC, current above 10mA or AC power with an inductive load, take care not to touch the exposed contacts as they may give a serious electric shock.

- **DO NOT measure voltages above 1000V DC or 750V 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** measure maximum current 10A for more than 10seconds.
- **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 fuses must be replaced, use an identical item with the same specification.
  - 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 function 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 during use.
- Ensure the selector dial is in the correct function mode before taking any measurements.
- **ALWAYS** turn the function 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.

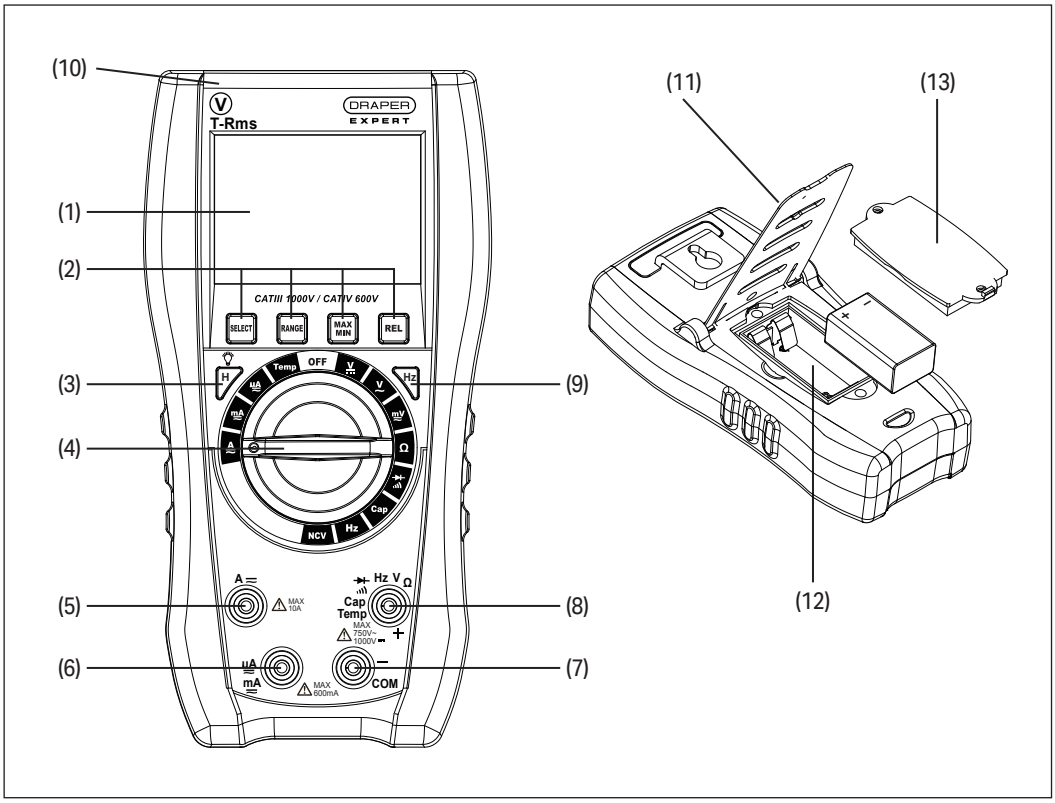
WARNING! ALWAYS ensure that the operator is not in contact with the ground while taking measurements, using insulating materials to prevent the current from earthing.

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.

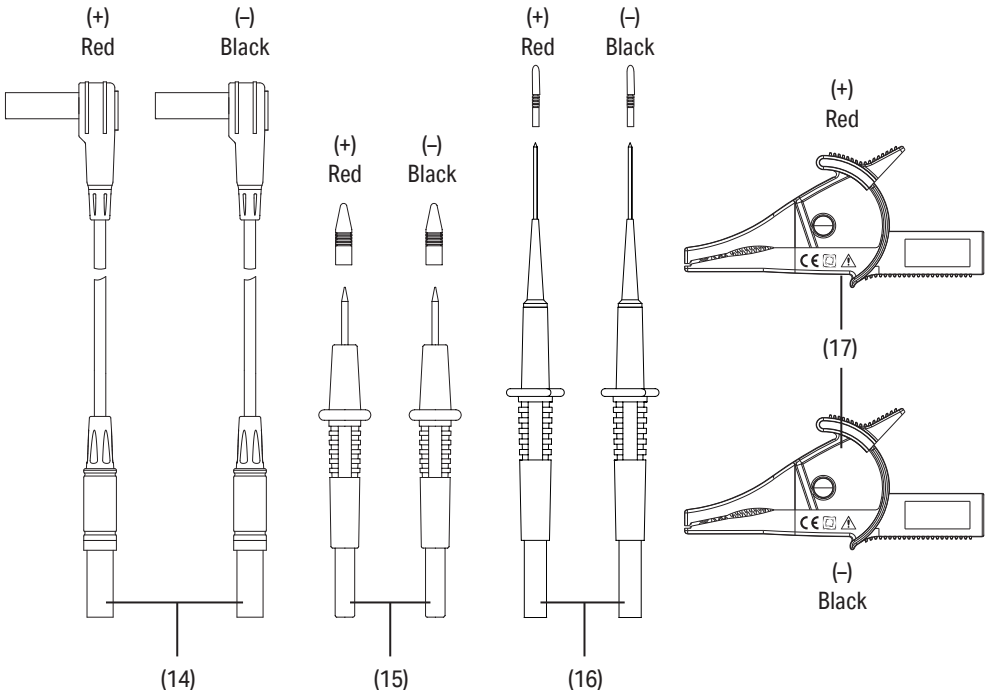
If any part is damaged or missing, do not attempt to use the product. Please contact the Draper Helpline; contact details can be found at the back of this manual.



(1) LCD display
(2) Function buttons (Select, Range, Max/Min, REL).
(3) (H) Value hold/Back light
(4) Measurement selector dial
(5) 10A current terminal
(6) <600mA current terminal
(7) (COM) Common earth probe (-) terminal
(8) Voltage/Resistance/Capacitance/Frequency/ Temperature/Continuity/Diode (+) terminal
(9) Hertz (Hz) button
(10) NCV Sensor
(11) Back cover/stand
(12) Battery compartment
(13) Battery compartment cover

5. Identification and Unpacking

5.2 Accessories



(14) 1 X Test lead set (30677)
(15) 1 X Test probe set (30643)
(16) 1 X Needle probe set (30675)
(17) 1 X Crocodile clip set (30676)
(18) Storage case (not shown)

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

5.3 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.

6. Installing/Replacing the Battery

6.1 Fitting the Battery - Fig. 1

Important: Use **ONLY** a 9V (Type PP3) battery (not supplied).

Replace the battery when the low battery icon appears on the display screen.

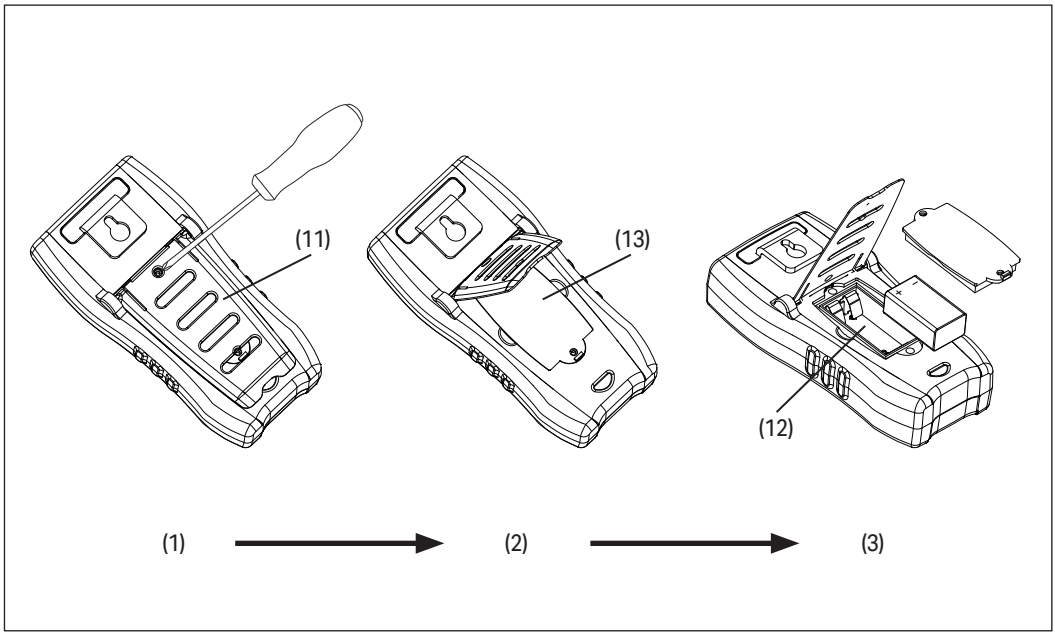


Fig. 1

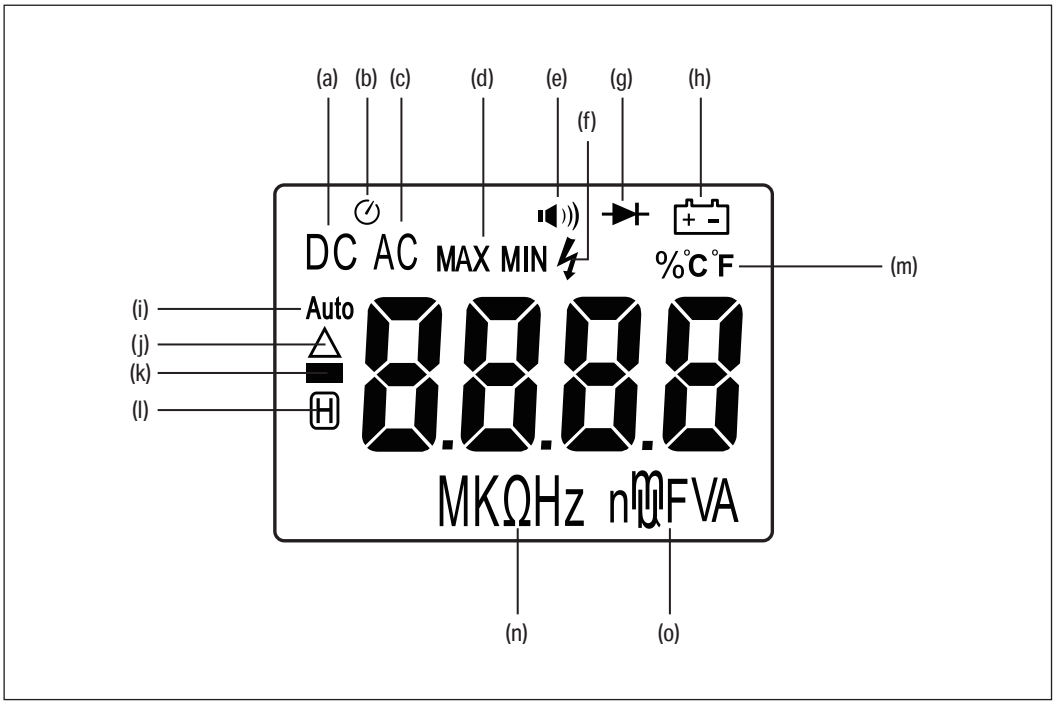
1. Disconnect the test probes and ensure the selector dial (4) is in the **'OFF position'** before installing or removing the battery.
2. Undo the top screw in the back cover (11) first. Then lift the back cover up and undo the screw in the battery compartment cover (13). Remove the cover. Fit the battery in the compartment (12), check that it is in the correct +/- orientation when installed.
3. Refit the compartment cover and screw the compartment and back covers back on.

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



(a) DC power source
(b) Auto shut down function
(c) AC power source
(d) MAX/Min indicators
(e) Continuity
(f) High voltage warning
(g) Diode
(h) Low battery indicator
(i) Auto unit mode
(j) REL indicator
(k) DC polarity
(l) Value hold indicator
(m) Temperature unit/duty cycle units
(n) Resistance/Frequency unit
(o) Voltage, current, capacitance unit

7.2 Auto Shut Down Function

1. The device will shut down and automatically go into sleep mode after 15 minutes without any operation. Press any button to restart the device.
2. To switch off the auto-shut down function, press and hold then **'SELECT'** button, then turn on the power. "⏲" will not show on LCD if the function is switched off.

7.3 The Function buttons (2), (3) & (9)

Note: The selector dial (4) needs to be turned to the required position before pressing a function button.

Button	Function
'SELECT'	• Switch between DCmV / ACmV at mV measurement. • Switch between diode / continuity measurement at measurement. • Change the temperature unit during temperature measurement. • Switch between DC / AC current at uA , mA and A measurement. • Cancel **'Auto Shut Down'** function by pressing and hold this button, then turn on the power; the buzzer shall beep.
'RANGE'	• Switch between **'AUTO'** and **'MANUAL'** range. The default is **'AUTO'** mode. • This button only operates for uA, mA, A, mV, both direct and alternating voltage and resistance measurements. • Press the button to change to **'MANUAL'** mode to select the range manually. • To return to **'AUTO'** press and hold the button for more than 2seconds.
'MAX/MIN'	• Press once for **'MAX'** mode and the maximum value measured will remain on the screen. • Press twice for **'MIN'** mode and the minimum value measured will remain on the screen. • **'REL', 'HOLD'** and **'SELECT'** will not operate if **'MAX/MIN'** mode is selected. • Press the **'RANGE'** button or hold and press the **'MAX/MIN'** button for more than 2 seconds to cancel **'MAX/MIN'** mode.
'REL'	**Relative Value Measurement Function** • This function can be used when measuring voltage, current, temperature, resistance, and capacitance. When this function is selected the current measured value will be the reference value. The next value measurement displayed will be the difference between the measurement and reference value. • The **'REL'** function only work with **'MANUAL'** range. • To cancel the **'REL'** function press the button again. • Pressing the **'REL'** button whilst **'HOLD'** mode is selected will cancel **'HOLD'** and the value on the screen will become the reference value. • Press the **'REL'** button again or turn the selector dial to cancel the 'REL' measurement ('REL' will disappear from the screen).
(3) 'H' Hold/Light	• Press to hold the value shown on the screen. • To cancel press the button again or turn the selector dial. **Backlight** • To switch on the backlight – press and hold the **'H'** button for more than 2seconds. • The light will switch off automatically after 30seconds.
(9) 'Hz' Frequency	• Press to switch measurements between frequency and duty cycle.

7. Operating Instructions

7.4 Using the Test leads and Probe Sets. - Fig. 2, Fig. 3

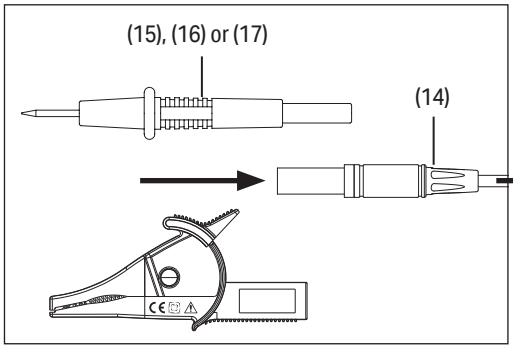


Fig. 2

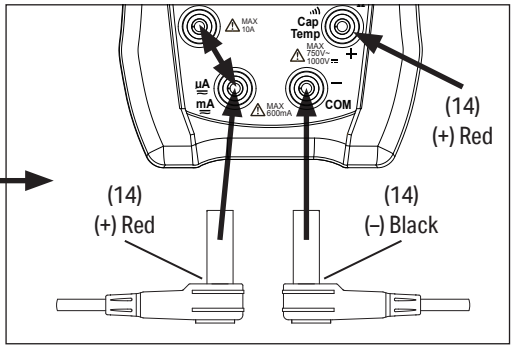


Fig. 3

1. Remove the protective covers from both ends of the test leads (14).
2. Fit the required probe or clip sets over the end of the test leads - ensuring the correct polarity (+) red and (-) black matches the lead and the terminals (5), (6), (7) & (8).
3. Remove the protective covers from the test end of the probes before measuring. Always replace after use.

7.5 Measurements

- For each measurement type, connect the positive (+) red probe to the voltage, resistance and temperature probe terminal (8) or 'A' current terminals (5) or (6), and connect the negative probe (-) black to the common earth probe terminal (7).
- If a negative value is shown on the display, check the polarity of the probes at the component contacts and the device terminals.
- Turn the measuring selector dial (4) to select the required measurement mode. Always return the dial to the **'OFF'** position once measuring is complete.

Measurement	Measuring Selector Dial Position	Action
DC Voltage		1. **'AUTO'** and **'DC'** will be displayed. 2. Press the **'RANGE'** button to change manually between 6V, 60V, 600V and 1000V. 3. Contact the probes with the testing point. The voltage value and polarity will be displayed on the LCD screen (1). **CAUTION!** • If **'OL'** is displayed during manual range, the measured value is higher than the current range selected. Increase the range. • Do not measure voltage higher than 1000V. • Avoid direct contact with body during the high voltage measurement.
AC Voltage		1. **'AUTO'** and **'AC'** will be displayed. 2. Press the **'RANGE'** button to change manually between 6V, 60V, 600V and 750V. 3. Contact the probes with the testing point. The voltage value will be displayed on the LCD screen (1). **CAUTION!** • If **'OL'** is displayed during manual range, the measured value is higher than the current range selected. Increase the range. • Do not measure voltage higher than 750V. • Avoid direct contact with body during the high voltage measurement.

7. Operating Instructions

Measurement	Measuring Selector Dial Position	Action
AC/DC Milli-Voltage	mV ≂	1. **'AUTO'** and **'DC'** will be displayed. 2. Press **'SELECT'** to switch between DC and AC voltage. 3. Press **'RANGE'** to manually change between 60mV and 600mV. 4. Contact the probes with the testing point. The voltage value and polarity will be displayed on the LCD screen (1). ⚠ **CAUTION!** • Do not measure voltage higher than 1V.
Current DC/ AC True RMS	uA ≂ mA ≂ A ≂	1. Connect the red positive probe to either the 10A (5) or uA/mA (6) terminal. • The maximum current is 6000uA for uA, 600mA for mA, and 10A for A. 2. Press the **'SELECT'** button to switch between DC or AC true RMS. 3. Connect the two probes to the testing points in series. The current value and polarity will be shown on the display. ⚠ **CAUTION!** • If unsure of the measured current range, start from 10A. • If **'OL'** is displayed the measured value is higher than the current range. Increase the range. • Maximum input current is 600mA or 10A (depending on terminal selected). Over current will damage the device. • Do not measure maximum current 10A for longer than 10 seconds. • Do not apply any voltage to the probe during the current measurement.
Capacitance	**'CAP'**	1. Contact the capacitor with the probes; It will take a few seconds for the device to measure the capacitor and shown a stable reading. • 60.00mf capacitors will take about 30 seconds to obtain a stable reading. ⚠ **CAUTION!** • Discharge the capacitor before taking the measurement. • Do not apply any voltage to the probes during the capacitor measurement.

7. Operating Instructions

Measurement	Measuring Selector Dial Position	Action
Resistance	**Ω**	1. Press the **'RANGE'** button to select either AUTO or manual. 2. Contact the probes to the resistor. **CAUTION!** • If unsure of measured resistance, start from the highest range. • If **'OL'** is displayed during manual range, the measured value is higher than the current range. Increase the range. The reading will take a few seconds to stabilise when measured resistance higher than 1M ohm. • If there is an open circuit, **'OL'** will be displayed. • Ensure all voltage sources are powered off and all capacitors have discharged before taking the measurement. • Do not apply any voltage to the probes during the resistance measurement.
Diode	**+ press 'SELECT' on LCD**	1. Contact the probes with the testing points. • **Forward Measurement:** Contact the red probe with anode, and black probe with cathode; LCD will show the voltage. • **Reverse measurement:** Contact the red probe with cathode, and black probe with anode; LCD will show **"OL".** • Diode forward voltage drop: 0 ~ 3.3V. **CAUTION!** • Do not apply any voltage to the probes during the diode measurement.
Continuity	**+ Press 'SELECT' until on LCD**	• Connect the probes with two sides of the circuit, if the resistance is <50Ω or >600Ω, the buzzer will sound. **CAUTION!** • Do not apply any voltage to the probes during the continuity measurement.

7. Operating Instructions

Measurement	Measuring Selector Dial Position	Action
Frequency	**'Hz'**	• Press **'Hz'** button (9) to switch between frequency and duty cycle measurements. • Peak Voltage for frequency measurement is ±600mV. ⚠ **CAUTION!** • There is only "AUTO" range for frequency measurement. • Use shielded wires for frequency measurement in noisy environment. • Do not measure voltage greater than 220VAC.
Temperature	**'TEMP'**	1. Connect K- type thermocouple (not supplied) to the 'COM' (7) and temperature terminal (8). 2. Change the temperature unit by pressing **'SELECT'**.
Non Contact Voltage Sensing	**'NCV'**	1. Move the sensor (10) towards the test area. 2 If voltage is detected the device will buzz and '-' will be displayed on the screen. The number of bars 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:
- 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; see **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.

8.2 Replacing the Fuse - Fig. 4

If the fuse must be replaced install an equivalent fuse in its place.

Important: This product requires two fuses - 1X 10A/250V and 1 X 1A/250V.

To replace the fuse

1. Turn the measuring selector dial to the **'OFF'** position and disconnect the probes.
2. Remove the protective casing from both sides and undo the four screws on the rear housing.
3. Replace the fuse and screw the housing back on completely and refit the protective side casing.

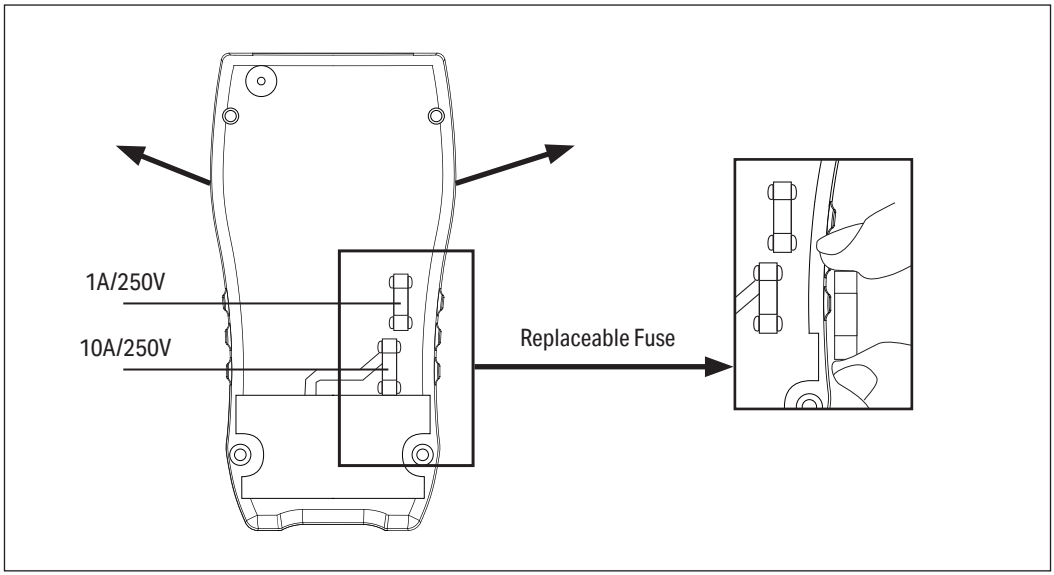


Fig. 4

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.

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.

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

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

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