

CLARKE®



DIGITAL MULTIMETER

MODEL NO: CDM45C

PART NO: 4501155

OPERATING INSTRUCTIONS

UK
CA | CE



ORIGINAL INSTRUCTIONS

DL0723 iss 3

INTRODUCTION

Thank you for purchasing this CLARKE product.

Before attempting to use this product, please read this manual thoroughly and follow the instructions carefully. In doing so you will ensure the safety of yourself and that of others around you, and you can look forward to your purchase giving you long and satisfactory service.

GUARANTEE

This product is guaranteed against faulty manufacture for a period of 12 months from the date of purchase. Please keep your receipt which will be required as proof of purchase.

This guarantee is invalid if the product is found to have been abused or tampered with in any way, or not used for the purpose for which it was intended.

Faulty goods should be returned to their place of purchase, no product can be returned to us without prior permission.

This guarantee does not effect your statutory rights.

ENVIRONMENTAL RECYCLING POLICY



Through purchase of this product, the customer is taking on the obligation to deal with the WEEE in accordance with the WEEE regulations in relation to the treatment, recycling & recovery and environmentally sound disposal of the WEEE.

In effect, this means that this product must not be disposed of with general household waste. It must be disposed of according to the laws governing Waste Electrical and Electronic Equipment (WEEE) at a recognised disposal facility.

SAFETY INFORMATION



WARNING: TAKE CARE WHEN USING THIS METER. IMPROPER USE CAN RESULT IN ELECTRIC SHOCK OR DAMAGE TO THE METER. TAKE ALL NORMAL SAFETY PRECAUTIONS AND FOLLOW THE SAFEGUARDS SUGGESTED IN THIS MANUAL.

BEFORE USE

1. When using the meter, the user must observe all normal safety rules concerning:
 - General protection against electric shock.
 - Protection of the meter against misuse.
2. When the meter is delivered, confirm it has not been damaged in transit.
3. The test leads must be kept in good condition. Before using, check that the insulation on the test leads has not been damaged or any wire exposed.
4. Use only the test leads supplied to ensure operational safety. If necessary, they must be replaced with test leads of the same model or class.

DURING USE

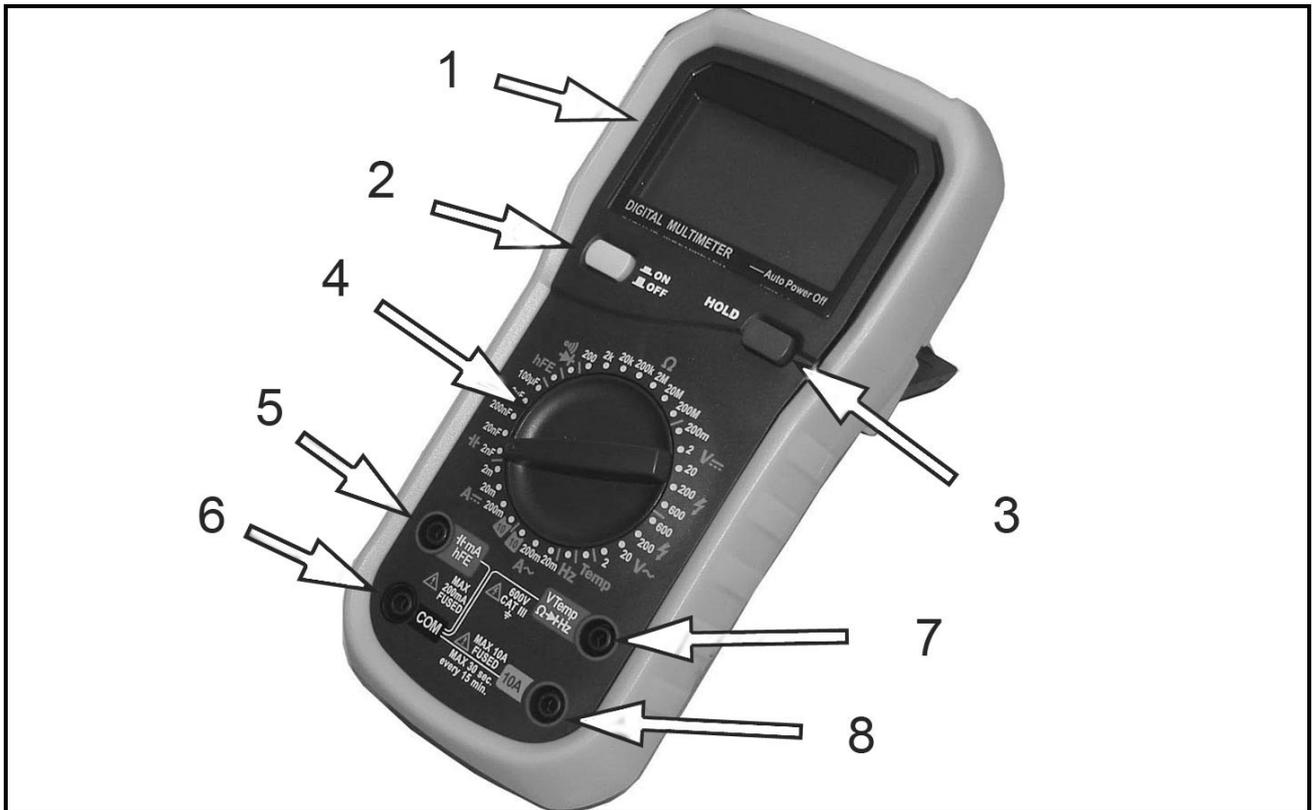
1. Never take measurements that exceed the maximum values for this meter.
2. Do not touch the metal probes of the test leads when the meter is connected to the circuit being measured.
3. Keep your fingers behind the probe barriers when taking measurements.
4. Do not take voltage measurements if you suspect the value exceeds 600V.
5. If the appropriate value range is unknown, select the highest range on the scale.
6. Disconnect the test leads from the circuit under test before turning the rotary function selector.
7. Do not measure the resistance, diode or continuity of live circuits.
8. Do not connect the meter to any voltage source while the rotary selector is in the Current, Resistance, Diode or Continuity range.
9. Do not use the meter near explosive gases or steam.
10. Stop using the meter if any abnormalities or faults are observed.
11. Do not use the meter unless its rear case and battery cover is correctly and securely fastened.

12. Do not store or use the meter in areas exposed to direct sunlight, at high temperature or with high relative humidity.
13. To avoid false readings, replace the batteries as soon as the Low Battery indicator appears.
14. Before use, verify the meter operation by measuring a known voltage.
15. Never touch exposed wiring, connections or any live circuit while taking any measurements.
16. Keep your body isolated from ground by using dry clothing, rubber shoes, rubber mats or any approved insulating material.

SPECIFICATIONS

Product dimensions: (L x W x H)	195 x 95 x 52 mm
Weight (inc battery)	425 g
Test leads length (inc probes)	990 mm
Max voltage between input & earth	600V
Fuses	F1 400mA/600V, F2 10A/600V
Power	PP3 type 9V battery
Maximum display value	1999
Over-range indication	"1"
Polarity display	"-" for negative polarity
Detects and measures voltages	DCV 200m/2/20/200 \pm 0.5%, 600 \pm 0.8% ACV 2/20/200 \pm 0.8%, 600 \pm 1.2%
Detects and measures resistance	Ohm 200 Ω \pm 0.8%, 2k/20k/200k, 2M \pm 8%, 20M \pm 1%, 200M \pm 6%
Detects and measures current	DCA 2m, 20m \pm 8%, 200m \pm 1.5%, 10 \pm 2% ACA 20m \pm 1%, 200m \pm 1.8%, 10 \pm 3%
Detects and measures frequency	Hz 20k \pm 2%
Detects and measures capacitance	F 2n, 20n, 200n, 2 μ \pm 4%, 100 μ \pm 6%
Detects and measures temperature	C $^{\circ}$ -20 to 0 \pm 5%, 1-400 \pm 2%, 401-1000 \pm 2%
Operating temperature	0-40 $^{\circ}$ C
Storage temperature	0 $^{\circ}$ C to 60 $^{\circ}$ C
Auto power-off time	20 min

FEATURES OF THE METER



	Feature	Description/Use
1	Display	Digital LCD
2	Power Button	Power ON/OFF
3	Data Hold Button	Press the HOLD button. The LCD will hold the last reading measured and display the 'H' symbol. When the button is released, the meter will return to normal.
4	Rotary Switch	Selects different functions and range.
The four input sockets are used as follows:		
5	mA \rightarrow hFE	Positive input socket for current, mA, capacitance and diode tests (connected via red test probe or used as a dedicated multifunction test socket).
6	COM	All common inputs to be measured are connected with via the black test probe. Also used as a dedicated multifunction test socket.
7	VTemp $\Omega \rightarrow$ Hz	Positive input socket for voltage, resistance, frequency, diode, buzzer and temperature tests (connected using red test probe).
8	10A	Positive input for 10A circuit (connected using red test probe).

MEASUREMENT FEATURES OF THIS METER

- Alternating voltage measurement:- **V~**
- Direct voltage measurement:- **V=**
- Alternating current measurement:- **A~**
- Direct current measurement:- **A=**
- Resistance measurement:- **Ω**
- Diode measurement:- **→|**
- Continuity:- **•)))**
- Capacitance:- **⌈**
- Frequency measurement:-**Hz**
- Temperature:- **Temp**
- Transistor Gain:- **hFE**

ITEMS SUPPLIED

- Multi-meter c/w polymer holder and fold-out stand
- Pair of test lead/probes (1 red/1 black)
- 9-volt battery
- Type K fine wire thermocouple
- HFE temperature measurement connector adaptor

SAFETY SYMBOLS

Please read all of the safety and operating instructions carefully before using this product. The following safety symbols may be found on the product.

	General hazard warning		High voltage
	Earth		Class II wiring without earth conductor.
	Possibility of high voltage		

OPERATION

Before taking the measurement of voltage with the probe, make sure there is no electronic device connected to the test socket of the instrument.

PREPARATION

1. Switch on the power by turning the rotary switch. If the battery voltage is lower than 7V, the  symbol will appear and the battery should be replaced.
 - The " " symbol next to the input lead shows that the input voltage or current should not exceed the specified value in order to protect the internal circuit from damage.
2. Turn the rotary switch to the required function and range to be measured.
3. Choose the highest range when the value to be measured is unknown.
 - When making a connection, connect the black common test lead first and then the positive red test lead.
4. Remove the positive test lead first when disconnecting.

READING HOLD

1. Press "**HOLD**" button to hold the readings of current measurement.
2. Press the "**HOLD**" button again to release the hold.

DC/AC VOLTAGE MEASUREMENT



WARNING: USE CAUTION WHEN MEASURING HIGH VOLTAGE CIRCUITS TO AVOID ELECTRICAL SHOCK AND INJURY. DO NOT TEST VOLTAGES HIGHER THAN 600V DC/600V AC.

1. Plug the black test lead into the "**COM**" jack and the red test lead into the "**VTempΩ →+ Hz**" jack.
2. Set the rotary switch to the "**V=**" position for DC measurement and "**V~**" for AC measurement and at the proper range.
3. Connect the test leads to the voltage source or load for measurement.
4. Read the value on the main indicator of the LCD. The polarity symbol denotes the polarity of the end connected by the red test lead.

NOTE: At small voltage ranges, unsteady readings will appear before the test leads make contact with the circuit. This is normal since the meter is highly sensitive. When the test leads are connected to the circuit, the true reading will be shown.

When "1" is shown on the LCD, it means the measurement has exceeded the allowable range and a higher range should be selected.

When the scale of the value to be measured is unknown, select the highest range first and lower the range accordingly.

DC/AC CURRENT MEASUREMENT



WARNING: USE CAUTION WHEN MEASURING HIGH VOLTAGE CIRCUITS TO AVOID ELECTRICAL SHOCK AND INJURY. DO NOT TEST VOLTAGES HIGHER THAN 600V DC/AC.

TO AVOID ELECTRICAL SHOCK AND INJURY POWER OFF THE CIRCUIT AND DISCHARGE THE CAPACITANCE BEFORE MEASURING CURRENT

1. Plug the black test lead into the "COM" jack.
2. When the current to be measured is under 200mA, plug the red test lead into the "mA" jack; when the current to be measured is over 200mA but under 10A, plug the red test lead into the "10A" jack.
3. Set the rotary switch to the "A $\overline{\text{---}}$ " position for DC measurement and "A~" for AC measurement and at the proper range.
4. Connect the test leads to the circuit.
5. Read the value on the display.

- The polarity symbol denotes the polarity of the red test lead.

NOTE: When '1' is shown on the LCD, it means the measurement has exceeded the allowable range; a higher range should be selected.

NOTE: When the scale of the value to be measured is unknown, select the highest range first and then lower the range accordingly.

NOTE: "⚠" indicates the maximum current of the mA jack is 200mA and the maximum current of the 10A jack is 10A. At either jack, current exceeding the limit will blow the fuse.

RESISTANCE MEASUREMENT



WARNING: TO AVOID ELECTRICAL SHOCK AND INJURY POWER OFF THE CIRCUIT AND DISCHARGE THE CAPACITANCE BEFORE MEASURING RESISTANCE.

1. Plug the black test lead into the "COM" jack and the red test lead into the "VTemp Ω \rightarrow Hz" jack.
2. Set the rotary switch to the " Ω " position and at the proper range.
3. Connect the test leads to the ends of the resistor or circuit.

4. Read the value on the LCD.

NOTE: When the input is open, "1 " is displayed on the LCD to indicate overload. For measuring resistance above $1M\Omega$, it may take a few seconds to get a steady reading. This is normal for high resistance measurement.

DIODE

1. Plug the black test lead into the "**COM**" jack and the red test lead into the "**VTemp Ω \rightarrow KHz**" jack.
2. Set the rotary switch to the " **\rightarrow** " position.
3. Connect the red test lead to the anode and the black test lead to the cathode of the diode for testing.
4. Read the value on the LCD.

NOTE: The meter will show approximate forward voltage drop of the diode.

NOTE: When the test leads are reversed or opened, '1' will appear on the LCD.

CONTINUITY



WARNING: TO AVOID ELECTRICAL SHOCK AND INJURY POWER OFF THE CIRCUIT AND DISCHARGE THE CAPACITANCE BEFORE TESTING CONTINUITY.

1. Plug the black test lead into the "**COM**" jack and the red test lead into the "**VTemp Ω \rightarrow Hz**" jack.
2. Set the rotary switch to the " **\bullet)**" position.
3. Connect the test leads to two ends of the circuit. If resistance of the circuit is less than 50Ω , the built-in buzzer will sound.

CAPACITANCE



WARNING: TO AVOID ELECTRICAL SHOCK AND INJURY POWER OFF THE CIRCUIT AND DISCHARGE THE CAPACITANCE BEFORE TESTING CAPACITANCE.

1. Plug the black test lead into the "**COM**" jack and the red test lead into the "**hFE \rightarrow mA**" jack.
2. Set the rotary switch to the " **\rightarrow** " position and at the proper range.

3. Connect the test leads to two ends of the circuit/ capacitor and read the value on the LCD.

FREQUENCY MEASUREMENT

1. Plug the black test lead into the "**COM**" jack and the red test lead into the "**VTemp Ω \rightarrow Hz**" jack.
2. Set the rotary switch to the "**Hz**" position.
3. Connect test leads to the two ends of the circuit for measurement.
4. Read the value on the LCD.

TEMPERATURE



WARNING: TO AVOID ELECTRICAL SHOCK AND INJURY DO NOT MEASURE THE SURFACE OF AND OBJECT WITH AN ELECTRICAL POTENTIAL HIGHER THAN 60V DC/ 24V AC

1. Plug the red end of the K-type thermocouple into the the "**VTemp Ω \rightarrow Hz**" jack and the black end into the "**COM**" jack.
2. Set the rotary switch to the "**Temp**" position.
3. Touch the surface of the object or area with the temperature sensor for measurement.
4. Read measured value from the LCD.

TRANSISTOR GAIN



WARNING: TO AVOID ELECTRICAL SHOCK AND INJURY DO NOT TEST WITH VOLTAGES HIGHER THAN 250V DC/AC.

1. Plug the multi-function socket with the "**IN**" end in the "**hFE \rightarrow mA**" jack and the "**COM**" end in the "**COM**" jack.
2. Set the rotary switch to the "**hFE**" position and at the proper range.
3. Determine if the transistor to be tested is either and NPN or PNP type, then insert the three pins of the transistor into the corresponding holes of the multifunction socket.
4. Read the approximate transistor gain on the LCD.

TECHNICAL SPECIFICATIONS

DC VOLTAGE

Range	Resolution	Accuracy
200mV	0.1 μ V	\pm 0.5% of reading, + 2 digits
2V	1mV	
20V	10mV	
200V	100mV	
600V	1V	\pm 0.8% of reading, + 2 digits

- Max input voltage: 250V DC at 200mV range, 600V DC elsewhere.
- Input impedance: 10M Ω .

NOTE: At low voltage ranges, unsteady readings will appear before the test leads make contact with the circuit. This is normal since the meter is highly sensitive. When the test leads connect to the circuit, the true reading will be shown.

AC VOLTAGE

Range	Resolution	Accuracy
2V	1mV	\pm 0.8% of reading, + 3 digits
20V	10mV	
200V	100mV	
600V	1V	\pm 1.2% of reading, + 3 digits

- Max input voltage: 250V AC at 200mV range, 600V AC elsewhere.
- Input impedance: 10M Ω
- Frequency response: 200Hz at 600V range, 40-400Hz
- Response: Average (RMS of sine wave)

NOTE: At low voltage ranges, unsteady readings will appear before the test leads make contact with the circuit. This is normal since the meter is highly sensitive. When the test leads connect to the circuit, the true reading will be shown.

DIRECT CURRENT

Range	Resolution	Accuracy
2mA	1 μ A	\pm 0.8% of reading, +1 digits
20mA	10 μ A	
200mA	100 μ A	\pm 1.5% of reading, +1 digits
10A	10mA	\pm 2% of reading, + 5 digits

- Overload protection: F1 400mA/600V Fuse F2 10A/600V
- 10A range: F2, 10A/600V fuse (quick acting).
- Max input current:
- mA jack (mA range): 200 mA
- 10A jack: 10A

AC CURRENT

Range	Resolution	Accuracy
20mA	10 μ A	\pm 1% of reading, + 5 digits
200mA	100 μ A	\pm 1.8% of reading, + 5 digits
10A	10mA	\pm 3% of reading, + 7 digits

- Overload protection: mA ranges: reset table fuse F1, 400mA/600V dc
- 10A range:F2, 10 A/600V fuse
- Max input current: mA jack (mA range) 200mA
- 10A jack: 10A
- Frequency range: 40Hz to 400Hz
- Display: Average (effective value of sine wave)

CAPACITANCE

Range	Resolution	Accuracy
2nF	1 μ F	\pm 0.4% of reading, \pm 3 digits
20nF	10 μ F	
200nF	0.1 μ F	
20 μ F	1 μ F	\pm 0.4% of reading, \pm 2 digits
100 μ F	100 μ F	\pm 6.0% of reading, +10digits

TEMPERATURE

Range	Resolution	Accuracy
-20C°- 0C°	1C°	± 5% of reading, + 4 digits
1C°- 400C°	1C°	± 2% of reading, + 3 digits
40C°- 1000C°	1C°	± 2% of reading, + 5 digits

RESISTANCE

Range	Resolution	Accuracy
200Ω	0.1Ω	± 0.8% of reading, +3 digits
2kΩ	1Ω	± 0.8% of reading, +2 digits
20kΩ	10Ω	
200kΩ	100Ω	
2MΩ	1kΩ	± 1.0% of reading, + 2 digits
20MΩ	10kΩ	
200MΩ	100kΩ	± 6.0% of reading, +10 digits

- Overload protection: 250V DC/AC Open circuit voltage: ≈ DC 2.8V.

DIODE TEST

Resolution	Function
1mV	Displaying approximate forward voltage of diode

CONTINUITY TEST

	Function
•))	Built-in buzzer will sound if resistance is lower than 50Ω

FREQUENCY

Range	Resolution	Accuracy
20kHz	10 Hz	± 2% of reading, ± 5 digits

TRANSISTOR

Range	Resolution	Accuracy
hFE	1hFE approximation (0-1000)	Base current 10μA Vce is about DC2.8V

MAINTENANCE

GENERAL CARE



WARNING: BEFORE REMOVING THE REAR COVER, DISCONNECT THE PROBES FROM THE CIRCUIT TO BE MEASURED. ENSURE THE COVER IS TIGHTLY SECURED BEFORE USING THE INSTRUMENT.

Never use the meter unless the rear cover is secure.

Clean the housing with a damp cloth dipped in a little detergent but never chemical solution.

In case of any abnormality, stop using the meter and send it for repair.

REPLACING THE BATTERY

1. Turn off the meter.
2. Unscrew battery cover and remove.
3. Remove the battery and replace with a new one.
4. Clip the battery compartment to the casing and tighten the screw.

REPLACING FUSES

Fuses rarely need replacement. Almost all fuse blows are the result of operator error. Fuses should be replaced by the Clarke Service Department with the type(s) stated on page 4.

TEST LEAD REPLACEMENT



WARNING: REPLACE THE TEST LEADS WITH IDENTICAL OR COMPATIBLE LEADS. LEAD SPEC: 1000V 10A.

Replace the leads if they become damaged.

DECLARATION OF CONFORMITY



Hennell Street, Epping, Essex, CM16 4LG

DECLARATION OF CONFORMITY

This is an important document and should be retained.

We hereby declare that this product(s) complies with the following legislation:

- The Batteries and Accumulators (Placing on the Market) Regulations 2008
- The Electromagnetic Compatibility Regulations 2016
- The Electrical Equipment (Safety) Regulations 2016
- The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

The following standards have been applied to the product(s):

- IEC 62321-1:2013, IEC 62321-2:2013, IEC 62321-3-1:2013, IEC 62321-4:2013+A1:2017, IEC 62321-5:2013, IEC 62321-6:2015, IEC 62321-7-1:2015, IEC 62321-7-2:2017, IEC 62321-8:2017, ISO 17075-1:2017, EN 61010-1:2010+A1:2019, EN 61010-2-0:30:2010, EN 61010-2-033:2012, EN IEC 61326-1:2013, EN IEC 61326-2-2:2013

The technical documentation required to demonstrate that the product(s) meet(s) the requirement(s) of the aforementioned legislation has been compiled and is available for inspection by the relevant enforcement authorities.

The UKCA mark was first applied in: 2023

Product Description: Multimeter
Model Number(s): CDM45C
Serial/Batch Number: Refer to product/package label
Date of Issue: 26/07/2023
Signed: 

J.A Clarke
Director

CDM45C UKCA Clarke DOC 072623

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Fitzwilliam Hall, Fitzwilliam Place, Dublin 2

DECLARATION OF CONFORMITY

This is an important document and should be retained.

We hereby declare that this product(s) complies with the following legislation:

- 2006/66/EC Battery Directive
- 2014/30/EU Electromagnetic Compatibility Directive
- 2014/35/EU Low Voltage Directive
- 2011/65/EU Restriction of Hazardous Substances (RoHS) Directive

The following standards have been applied to the product(s):

- IEC 62321-1:2013, IEC 62321-2:2013, IEC 62321-3-1:2013, IEC 62321-4:2013+A1:2017, IEC 62321-5:2013, IEC 62321-6:2015, IEC 62321-7-1:2015, IEC 62321-7-2:2017, IEC 62321-8:2017, ISO 17075-1:2017, EN 61010-1:2010+A1:2019, EN 61010-2-0:30:2010, EN 61010-2-033:2012, EN IEC 61326-1:2013, EN IEC 61326-2-2:2013

The technical documentation required to demonstrate that the product(s) meet(s) the requirement(s) of the aforementioned legislation has been compiled and is available for inspection by the relevant enforcement authorities.

The CE mark was first applied in: 2012

Product Description: Multimeter
Model Number(s): CDM45C
Serial/Batch Number: Refer to product/package label
Date of Issue: 26/07/2023
Signed: 

J.A Clarke
Director

CDM45C CE Clarke DOC 072623

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A SELECTION FROM THE VAST RANGE OF

Clarke®

QUALITY PRODUCTS



AIR COMPRESSORS

From DIY to industrial, Plus air tools, spray guns and accessories.

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Prime duty or emergency standby for business, home and leisure.

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