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Hemnal Street, Epping, Essex CM16 4LG

Clarke[™]

DIGITAL MULTIMETER

MODEL CDM-50

Part No.4500065

OPERATING INSTRUCTIONS





DATA HOLD FUNCTION

When this button is pressed, the last reading to be taken will be held on the display, and D-H will appear alongside it, until either the button is pressed again, or the function switch is used.

MAINTENANCE

Battery and/or fuse replacement should only be done after the test leads have been disconnected, and power is OFF.

BATTERY AND FUSE REPLACEMENT

Note the condition of the 9-volt battery using the procedure described above. If the battery needs to be replaced, unscrew the three screws and remove the back cover. Replace the spent battery with one of the same type (NEDA. 1604, 6F22 or equiv).

The same procedure is used to replace the fuses. Ensure the replacement is of the same size and value as the original. 0.3A/250V or 10A/250V DC, fast blow type.

REPLACEMENT PARTS

1. Test Leads (pair) Part No. CH5001
2. Holster (Size AA) Part No. CH5004
3. Fuse (0.3A/250V) Part No. CH5002
Fuse (10A/250V) Part No. CH5003

CE STANDARDS

This unit complies with 73/23/EEC, 89/336/EEC.

PARTS & SERVICE CONTACTS

For Spare Parts and Service, please contact your nearest dealer,
or CLARKE International, on one of the following numbers.

PARTS & SERVICE TEL: 020 8988 7400

PARTS & SERVICE FAX: 020 8558 3622

or e-mail as follows:


PARTS: Parts@clarkeinternational.com

SERVICE: Service@clarkeinternational.com



When disposing of this product, do not dispose of with general waste. It must be disposed of according to the laws governing Waste Electrical and Electronic equipment, at a recognised disposal facility.

Continuity/Diode Measurement

1. Connect the BLACK test lead to the COM jack and the RED test lead to the V/ Ω /F jack.
2. Set the FUNCTION switch to the  Position and push the Button to select continuity or diode test mode.
3. In continuity testing, if the resistance is less than 20 Ω , the built in buzzer will sound.
4. If testing diodes, connect the test leads across the diode under test, (red to the anode). Display shows the approx forward voltage of this diode.

Transistor hFE Test

1. Set the FUNCTION switch to the hFE range.
2. Determine whether the transistor is NPN or PNP and locate the Emitter, Base and Collector leads. Insert the leads into the proper holes in the socket on the front panel.
3. Display will read approx. hFE value at the test condition/Base Current 10 μ A VCE 3.2V

Measuring Range Control Button

AC/DC voltage AC/DC current ranges (μ A and mA only),

Resistance and Frequency, can be set manually using this feature as follows.

1. Switching power ON, or changing FUNCTION, will set the Measuring Range to automatic mode.
2. To select "Manual", press range button (1) once, briefly. The letters "R-H" will appear on the LED.

By pressing range button (1) again, briefly, (less than 1 sec), the range will change as seen by the decimal point on the scale, moving to indicate x100 x1000 etc. Pressing the same button for approx 3 seconds, will return to "auto" mode.

Thank you for purchasing this Clarke Multi-Range Digital Multimeter.


This instrument is a compact, rugged, battery operated hand held, digital multimeter. It is designed to measure AC and DC voltage, AC and DC current, Resistance, Diode, Capacitance, for testing Transistors, and has an Audible Continuity function. The display is a 3 $\frac{1}{2}$ digit, 3260 count LCD, and a linear bargraph. The dual-speed A-D converter ensures a high speed, accurate performance. It is an ideal instrument for use in the field, workshops, and for hobby and home applications.

GUARANTEE

This product is guaranteed against faults in manufacture for 12 months from purchase date. Keep your receipt as proof of purchase. This guarantee is invalid if the product has been abused or tampered with in any way, or not used for the purpose for which it is intended. The reason for return must be clearly stated. This guarantee does not affect your statutory rights.

SAFETY

Read this information before using the meter, taking special care regarding any WARNING or IMPORTANT notices. The following safe practices and proper operating procedures should be followed when using any multimeter:

- Inspect the test leads for insulation damage or exposed metal. Damaged leads should be replaced.
- Select the proper function and range for your measurement.
- Avoid severe shocks and do not drop the multimeter.
- Do not allow the meter to be used if it is damaged or if its safety is impaired.
- **WARNING: TO AVOID ELECTRIC SHOCK, USE CAUTION WHEN WORKING ABOVE 40V DC OR 25V AC RMS. SUCH VOLTAGES POSE A SHOCK HAZARD.**
- Electrically disconnect the live, or hot, test lead before disconnecting the common test lead.
- Follow all equipment safety procedures. Disconnect the input power and discharge all high-voltage capacitors through a protective impedance before testing in Ω and  with the multimeter.
- Avoid working alone.
- When making a current measurement, turn the power off before connecting the multimeter in the circuit. Overloading a current shunt will cause excessive heat.
- When measuring transformer secondary or motor winding current, check the multimeter fuses first.
- When testing circuits take extra care not to touch any bare metal including the ends of the test probes.
- The use of makeshift fuses and the short-circuiting of fuse holders is prohibited.
- Whenever it is likely that the protection has been impaired, the meter shall be made inoperative and be secured against any unintended operation.
- Never attempt to measure a voltage or current higher than the maximum rating of the meter.

FEATURES

- Push button ON/OFF power switch.
- Single 13 position rotary switch for FUNCTION selection.
- Auto-Ranging.
- Data Hold function
- Automatic over-range indication, with "OL" being displayed on the display.
- Automatic reverse polarity indication on DC ranges.
- All ranges fully protected.
- DC Voltage measurement 100 μ V to 1000V
- AC Voltage measurement 1mV to 750V rms
- DC current measurement 0.1 μ A to 10A
- AC current measurement 0.1 μ A to 10A
- Resistance measurement 0.1 Ω to 32.6M Ω .
- Capacitance measurements 0.1nF to 32.6 μ F.
- Transistor hFE test with 10 μ A base current.
- Frequency Range from 10Hz to 200kHz
- Low Battery indication with $\left[\text{+} \right]$ being displayed on LCD
- Holster with 2 position stand, and test lead holders to ease the taking of readings whilst holding the meter.

SPECIFICATIONS

DC Voltage - (Auto ranging) Accuracies are \pm (% reading + No. of digits)

Range	Accuracy	Resolution
326mV	$\pm 0.5\%$ of rdg ± 2 digits	100 μ V
3.26V		1mV
32.6V	$\pm 0.3\%$ of rdg ± 2 digits	10mV
326V		100mV
1000V	$+0.5$ of rdg ± 2 digits	1V

Input Impedance: 10M Ω More than 100M Ω on 326mV range.

AC Voltage - (Auto ranging)

Range	Accuracy	Resolution
3.26V	$\pm 0.8\%$ of rdg ± 3 digits	1mV
32.6V		10mV
326V		100mV
750V		1V

Input Impedance: 10M Ω on all ranges. Frequency Range: 40Hz to 1000 Hz

Resistance Measurement

IMPORTANT. When checking-in circuit resistance, ensure the circuit under test has all power removed and that all capacitors are fully discharged.

1. Connect the BLACK test lead to the COM jack and the RED test lead to the V/ Ω /F jack.

Note: the polarity of the RED test lead is "+".

2. Set the FUNCTION switch to the position, and connect the test leads across the resistance to be measured.

Note:

1. The Meter may take a few seconds to become stable for resistance over 3.26M Ω . This is normal for high resistance readings.
2. When the input is not connected, i.e. an open circuit, the figure "OL" will be displayed for the over range condition.


Capacitance Measurements

IMPORTANT. When checking-in circuit capacitance, ensure the circuit under test has all power removed and that all capacitors are fully discharged.

1. Connect the BLACK test lead to the COM jack and the RED test lead to the mA/CX jack
 2. Set the function switch to nF or μ E position to be used.
- Note that the polarity of the red lead is "+".*
3. Connect test leads across the capacitor to be measured, ensuring correct polarity is observed.

Note: The range control mode in capacitance measurement is manual ranging, and only two ranges are provided - 326nF and 32.6 μ F.

OPERATION

1. Check the 9-volt battery by setting the ON-OFF switch to ON, if the battery is weak, a \pm sign will appear on the display. If this does not appear on the display, proceed as below. See MAINTENANCE if the battery has to be replaced.
2. The mark, or symbol,  next to the test lead jacks, is a warning that the input voltage or current should not exceed the indicated values, to prevent damage to internal circuitry.

AC/DC Voltage Measurement

WARNING: Use extreme caution measuring high voltages, and do not attempt to measure voltages greater than 1000 Volts, as this can damage internal circuitry.

1. Connect the BLACK test lead to the COM jack and the RED test lead to the V/ Ω /F jack.
 2. Set FUNCTION switch to V~ or V^{DC} range to be used and connect test leads across source or load.
- Reverse polarity is indicated by a “-” sign being displayed in front of the reading.

AC/DC Current Measurement

WARNING: Do not attempt to measure a current in excess of 10 Amps

1. Connect the BLACK test lead to the COM jack and the RED test lead to the mA/CX jack for a maximum of 300mA. For a maximum of 10A move the red test lead to the 10A jack.
2. Set the FUNCTION switch to the μ A mA or A range to be used, and push \equiv /- button (3) to select D/C A or A/C A measuring mode.
3. Connect the test leads in series with the load in which the current is to be measured. Reverse polarity is indicated by a “-” sign being displayed in front of the reading.
4. The maximum input current is 300mA, or 10A depending on the jack used. Excessive current will blow the fuse which must be replaced. The fuse rating should be 300mA and 10A and no more to prevent damage to the internal circuitry.

DC Current - (Auto ranging for μ A and mA)

Range	Accuracy	Resolution
326 μ A	$\pm 1.2\%$ of rdg ± 3 digits	0.1 μ A
3260 μ A		1 μ A
32.6mA		10 μ A
326mA		0.1mA
10A	$\pm 2\%$ of rdg ± 5 digits	10mA

Overload Protection: 0.3A/250V and 10A/250V fuse

AC Current - (Auto ranging for pA and mA)

Range	Accuracy	Resolution
326 μ A	$\pm 1.5\%$ of rdg ± 5 digits	0.1 μ A
3260 μ A		1 μ A
32.6mA		10 μ A
326mA		0.1mA
10A	$\pm 3\%$ of rdg ± 7 digits	10mA

Overload Protection: 0.3A/250V and 10A/250V fuse.

Resistance - (Auto ranging)

Range	Accuracy	Resolution
326 Ω	$\pm 0.8\%$ of rdg ± 3 digits	0.1 Ω
3.26K Ω		1 Ω
32.6K Ω		10 Ω
326K Ω		100 Ω
3.26M Ω	$\pm 0.8\%$ of rdg ± 1 digit	1K Ω
32.6M Ω		10K Ω
	$\pm 1.2\%$ of rdg ± 2 digits	

Capacitance - (Manual Ranging)


Range	Accuracy	Resolution
326nF	±3.0% of rdg ± 5digits	0.1nF
32.6µF		10nF

Frequency

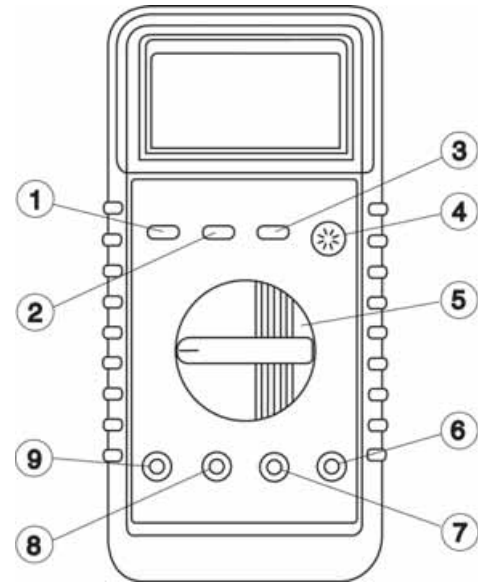
Range	Accuracy	Resolution
32.6kHz	± 1.2% of rdg ± 3 digit	10Hz
200kHz	± 2.5% of rdg ± 3 digit	100Hz

Sensitivity: 200mV up to 50k Hz, 1V from 50k Hz to 200k Hz


GENERAL CHARACTERISTICS

Display	:3260 counts (3¼ digits). 2/sec update.
Digital Bargraph	:32 segments, 12.5/sec update.
Measuring Method	:Dual-Speed integration A-D convertor system.
Overrange Indication	:Figure "OL" displayed on the LED.
Temperature Ranges	:Operating 0°C to 40°C, 32°F to 104°F. >75% RH. :Storage ~10°C to 50°C 14°F, to 122°F. >80% RH.
Power Supply	:One 9V battery (NEDA 1604, 6F22 type or equiv).
Low Battery Indication	:  On left of display.

DESCRIPTION OF PANEL



Nomenclature

- | | |
|--|----------------------|
| 1. Range Control Button. | 5. Function Switch. |
| 2. Data Hold Button. | 6. V/Ω/F Input jack. |
| 3. AC/DC Current or
 Selecting Button. | 7. COM Input jack. |
| 4. Transistor Test Socket. | 8. mA/Cx Input jack. |
| | 9. 10A input jack. |