Beckman Industrial™

An Affiliate of Emerson Electric Co.

MODEL DM78
DIGITAL MULTIMETER
OPERATOR'S MANUAL

P/N 3000-940-205A

SPECIFICATIONS (23°C ± 5°C, 80% RH Max)*

1. **DISPLAY**
   a. Numerical display: 3½ digit LCD, 10mm high, maximum reading 1999
   b. Unit and Sign: V, KΩ, ⇥⇤ , [B] AC, - and decimal point
2. **RANGE SELECTION:** Autoranging
3. **OVERRANGE INDICATION:** MSD "1" blinks
4. **POLARITY:** Autopolarity, (−) sign when minus
5. **BATTERY WARNING::** " [B] " sign when battery voltage goes down below 1.25V ± 0.1V
6. **SAMPLING RATE:** 2 times per second
7. **OPERATING TEMPERATURE & HUMIDITY:** 0 to 40°C, less than 80% RH non-condensing
8. **STORAGE TEMPERATURE & HUMIDITY:** −20°C to 60°C, less than 70% RH non-condensing
9. **BATTERY TYPE:** Two 1.5V (LR-44) Batteries
10. **BATTERY LIFE:** 70 hours continuous operation
11. **DIELECTRIC STRENGTH:** 1.5kV for one minute
12. **CONTINUITY TEST:** Buzzer Warning and ⇥⇤ sign on LCD
    a. Threshold Level: approx. 1.5kΩ to 15kΩ
    b. Response Time: approx. 1msec.
    c. Open Circuit Voltage: approx. 1.5V
13. **DIODE CHECK:** GOOD or BAD judged by the displayed value
14. **DIMENSIONS & WEIGHT:** 4.25 in (108 mm) H x 2.13 in (54 mm) W x 0.40 in (10.2 mm) D, 99 g (incl. carrying case)
15. **INCLUDED WITH METER:** Two 1.5V (LR-44) Batteries, Operator's Manual, Carrying Case

DC VOLTAGE

Range	Accuracy	Resolution	Input Impedance	Max. Input Voltage
2.000V	±(0.7%rdg + 4dgt)	1mV	≒ 12MΩ	450V
20.0V	±(1.3%rdg + 4dgt)	10mV	≒ 11MΩ	
200.0V		100mV		
450 V		1 V		

AC VOLTAGE

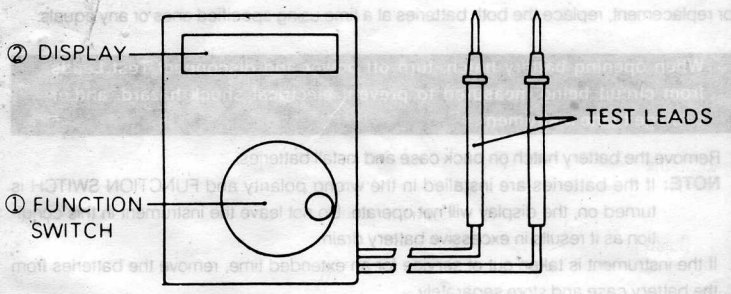
Range	Accuracy	Resolution	Input Impedance	Max. Input Voltage
2.000V	±(2.3%rdg + 4dgt) (40 Hz to 500 Hz)	1mV	≒ 12MΩ	250V RMS
20.00V		10mV	≒ 11MΩ	
200.0V		100mV		
250 V		1 V		

RESISTANCE

Range	Accuracy	Resolution	Open Circuit Voltage	Max. Input Voltage
2.000kΩ	±(2.0%rdg + 4dgt)	1Ω	≦0.45V	DC 250V AC 250V RMS
20.00kΩ		10Ω		
200.0kΩ		100Ω		
2000 kΩ		1kΩ		

*Specifications are subject to change without notice.

FUNCTION INDICATIONS



① **FUNCTION SWITCH:** Functions and POWER on and off are selected with this rotary switch.
   a. V⎓ position: 0 to 450V DC in 4 ranges
   b. V~ position: 0 to 250V AC in 4 ranges
   c. Ω position: 0 to 2000kΩ in 4 ranges
   d. ⇥⇤ position: continuity test and diode check

② **DISPLAY:** 3.5 digit max. 1999 display with decimal point, minus polarity, overrange and low battery.

③ **TEST LEADS:** One pair of TEST LEADS consisting of a Red Test Lead and a Black Test Lead used to make contact with the circuit being measured. Black Test Lead is contacted to negative side of the circuit and Red Test Lead to positive side.

④ **BUZZER WARNING:** Buzzer is available in the following usage.
   a. Switch Warning: Buzzer sounds whenever FUNCTION SWITCH is turned or the range is going up on the V range functions.
   b. Continuity Test: Buzzer sounds when continuity resistance is less than Threshold Level, approx. 1.5kΩ to 15kΩ.

WARNINGS

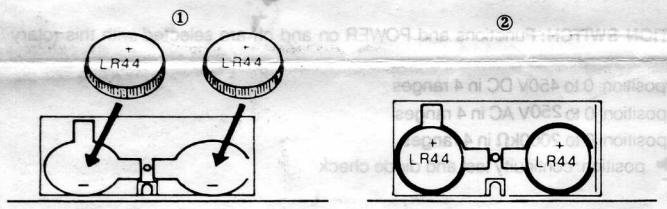
- Before measuring, make certain that FUNCTION SWITCH is set on correct position. When turning FUNCTION SWITCH, always disconnect Test Leads from the circuit being measured.
- Measurement of high voltages can be lethal. Use extreme caution when working with high-voltage sources. High-voltage transients may occur in nearly any defective electronic equipment.
- Maximum Input Voltage is 250V AC or 450V DC on VOLT range. Do NOT attempt to take any voltage measurement that might exceed 250V AC or 450V DC to avoid electrical shock hazard and/or damage to the instrument.
- Do NOT fail to confirm before every measurement that the body of this instrument and the handle insulator of the test leads have no cracks nor any other damage on it. Make sure that the body and the test leads are free of dust, grease and moisture.
- Before each use of the multimeter, inspect test leads, connectors, case and probes for cracks, breaks, or crazes in the insulation. If any defects are found, replace item immediately.
- To avoid electrical shock hazard, do not touch test leads, tips, or the circuit being tested while power is applied to the circuit being measured.
- Avoid severe mechanical shock or vibration, extreme temperature or very strong magnetic fields.
- Do NOT polish the tester case, or attempt to clean it with any cleaning fluid, gasoline, benzine, etc. If necessary, use silicon oil or antistatic fluid.

BATTERY REPLACEMENT

Two 1.5V type LR-44 batteries are furnished with this instrument.
For replacement, replace the both batteries at a time using specified ones or any equals.

When opening battery hatch, turn off power and disconnect Test Leads from circuit being measured to prevent electrical shock hazard, and or damage to the instrument.

1. Remove the battery hatch on back case and install batteries:
   NOTE: If the batteries are installed in the wrong polarity and FUNCTION SWITCH is turned on, the display will not operate. Do not leave the instrument in this condition as it results in excessive battery drain.
2. If the instrument is taken out of service for an extended time, remove the batteries from the battery case and store separately.



MEASUREMENT PROCEDURE

1. DC VOLTAGE (V⎓)

For safety, do not attempt to measure voltages greater than 450V AC DC.

(1) Set FUNCTION SWITCH to V⎓ position.
(2) Connect Black Test Lead to the negative side of the circuit being measured and Red Test Lead to the positive side.
The connection should be **IN PARALLEL** with the circuit being measured.
(3) Read the value on the display.

2. AC VOLTAGE (V~)

For safety, do not attempt to measure voltages greater than 250V AC DC.

(1) Set FUNCTION SWITCH to V~ position.
(2) Connect Black Test Lead to the negative side of the circuit being measured and Red Test Lead to the positive side.
The connection should be **IN PARALLEL** with the circuit being measured.
(3) Read the value on the display.

3. RESISTANCE (Ω)

Before taking any in-circuit resistance, remove power to the circuit *being tested and discharge all capacitors in the circuit.*

(1) Set FUNCTION SWITCH to Ω position. 1000KΩ appears on LCD with the most significant "1" digit blinking.
(2) Connect Test Leads to the circuit being measured.
(3) Read the value on the display.

4. CONTINUITY TEST • DIODE CHECK (⇥)

Before taking any continuity test, remove power to the circuit being tested and discharge all capacitors in the circuit.

(1) Set FUNCTION SWITCH to ⇥ position.
(2) **a. Continuity Test**
Connect Test Leads to the circuit to be tested.
Buzzer sounds and ⇥ sign appears on LCD when continuity resistance is less than the threshold level of 1.5kΩ to 15kΩ.

b. Diode Check
① Connect Black Test Lead to Anode and Red Test Lead to Cathode of the diode being measured.
Make sure that the reading is same as in open circuit.
② Reverse Test Lead connections with the device being checked. If the device is good, the LCD will read half the value at condition ①.

NOTE: 1. Diode Check should be done with the diode disconnected from the circuit or the other devices.
2. This tester can not check the diodes requiring a forward voltage higher than 1V.

WARRANTY

90-Day Limited Warranty
Model DM78 Multimeter is warranted in entirety against defects of material or workmanship which develop for any reason whatsoever, except abuse, within a period of 90 days following the date of purchase of the multimeter by the original purchaser. This warranty is extended by Beckman Industrial Corporation only to the original purchaser or original user of the multimeter.

In the event a defect develops during the warranty period, Beckman Industrial Corporation at their election will repair or replace the multimeter with a new or reconditioned model of equivalent quality. In order to obtain performance of any obligation of Beckman Industrial Corporation under the warranty, the original purchaser or original user must return the defective multimeter postage prepaid along with a handling charge of $3.00 to:

Instrumentation Products Division
Beckman Industrial Corporation
An Affiliate of Emerson Electric Company
3883 Ruffin Rd, Suite A
San Diego, CA 92123

In the event of replacement with a new or reconditioned model, the replacement unit will continue the warranty period of the original multimeter. The turnaround time for replacement units at the Service Center is typically only two (2) working days. Out of warranty repairs will be available at the Factory Service Center for a fee of $15.00.

ANY IMPLIED WARRANTIES ARISING OUT OF THE SALE OF A BECKMAN INDUSTRIAL MULTIMETER, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED IN DURATION TO THE ABOVE STATED 90-DAY PERIOD BECKMAN INDUSTRIAL CORPORATION SHALL NOT BE LIABLE FOR LOSS OF USE OF THE MULTIMETER OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES, EXPENSES OR ECONOMIC LOSS OR FOR ANY CLAIM OR CLAIMS FOR SUCH DAMAGE, EXPENSES OR ECONOMIC LOSS.

Some states do not allow limitations on how long implied warranties last or the exclusion or limitation of incidental or consequential damages so the above limitations or exclusions may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

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San Diego, CA

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