LM-4A & LM-40A
DIGITAL MULTIMETERS

INSTRUCTIONS

INTRODUCTION.

The LM Series Digital Multimeter is the finest instrument of its kind available. With reasonable care and usage, it should provide years of practical and useful voltage, resistance and current measuring service. Its compact size, rugged construction, low cost and wide measurement capability make it truly a "Volksmeter."

SPECIFICATIONS

Range Selection: Manual

Polarity Selection: Automatic

Decimal Point: Set by Power/Range switch

Display: 0.3" high, LED, red

Overload Indication: The numeral 1 followed by all zeros, with the numeral 1 flashing, is displayed for all inputs exceeding full scale. Appropriate polarity and decimal point are displayed.

Overload Protection:

VDC & VAC: 1000 VDC or AC peak may be applied on any range.

DCmA & ACmA: Internal one-ampere fuse

k/MΩ: Thermistor protection up to 500 VDC or 500 VRMS AC.

Operating Temperature: 0° C to +45°C.

Size: 1.9"H x 2.7" W x 4.0" D.

Weight: 9.2 ounces (with batteries)

Power:

Battery Operation: 3.6V (nominal) @ approximately 200 mA.

Rechargeable: Three type-AA NiCad cells. Capable of over two hours of continuous operation from full charge. Recharge from a complete discharge state is less than 14 hours. Continuous charging will not damage batteries.

Non-Rechargeable: Three type-AA zinc carbon or alkaline cells may be used. The latter typically provide over three hours of continuous operation.

PREPARATION FOR USE.

Your Digital Multimeter was shipped from the factory with three type-AA NiCad batteries installed. To ensure that the batteries are fully charged, plug the charger cord into the receptacle at the left rear of the instrument.

Plug the charger into the AC line power source and allow 16 hours with the meter not operating to reach full charge. For 115 VAC, the charger should be NLS Part No. 39-438-1. For 230 VAC, the charger should be NLS Part No. 39-438-2. Using any other charger may damage the instrument.

CAUTION

If batteries other than NiCad are used for instrument power, NEVER try to charge them as they may explode.

The meter will operate from the self-contained rechargeable batteries with or without the charger unit connected.

Operation with the charger unit connected will also charge the batteries. However, full charge cannot be reached under these conditions.

OPERATION.

Voltage Measurement.

1. Set Power/Range switch to desired range position.
2. Allow 20 seconds for instrument warm-up.
3. Insert test lead plugs into HI and LO jacks on front panel (Red to HI, Black to LO).
4. Set Function switch to VAC (AC measurements) or VDC (DC measurements).
5. Connect black test lead to common of voltage source and red test lead to voltage source
6. If selected range is suitable, meter will display applied voltage.
7. If selected range is too low, meter will display overload indication described under "Specifications". To obtain a normal display, rotate Power/Range switch clockwise until a suitable range is reached. The lowest range which does not cause overload will provide the most accurate measurement.

Resistance Measurement.

1. Perform the steps set forth in paragraphs 1, 2 and 3 under "Voltage Measurement".
2. Set Function switch to k/MΩ.
3. Connect test leads to terminals of resistance to be measured.
4. If selected range is suitable, instrument will display resistance in kilohms (1, 10, 100 and 1000 ranges) or megohms (MΩ range).
5. See paragraph 7 under "Voltage Measurement".

Current Measurement.

1. Set Power/Range switch to desired range position.

MODE	RANGE	ACCURACY LM-4A	ACCURACY LM-40A	RESOLUTION	INPUT RESISTANCE	TEST CURRENT
VOLTS DC*	1 10 100 1000	±0.03% Reading (±2 Digits)	±0.1% Reading (±2 Digits)	100 µV 1 mV 10 mV 100 mV	10 MΩ	
VOLTS AC*	1 10 100 1000	±0.2% Reading (±10 Digits) 50-400 Hz	±0.3% Reading (±10 Digits) 50-400 Hz	100 µV 1 mV 10 mV 100 mV	10 MΩ, 20 pF	
KILOHMS**	1 10 100 1000 10000	±0.1% Reading (±2 Digits)	±0.2% Reading (±2 Digits)	100 mΩ 1 Ω 10 Ω 100 Ω 1 kΩ		1 mA 100 µA 10 µA 1 µA 100 nA
CURRENT	1 mA 10 mA 100 mA 1 A	±2% Reading (±2 Digits)	±2% Reading (±2 Digits)	100 nA 1 µA 10 µA 100 µA	1 kΩ 100 Ω 10 Ω 1 Ω	

* 1000 vdc or peak ac maximum any range.
**Test Voltage (Ohms): 1 vdc Full Scale.

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2. Allow 20 seconds for warm-up.
3. Insert test lead plugs into 1A and LO jacks on front panel (Red to 1A, Black to LO).
4. Set Function switch to ACmA (AC measurements) or DCmA (DC measurements).
5. Connect test leads to current to be measured.
6. If selected range is suitable, meter will display value of current.
7. See paragraph 7 under "Voltage Measurement".

BATTERY REPLACEMENT.

To replace batteries:

1. Snap off rear cover of instrument with the blade of a small screwdriver. Two small slots on each side have been provided for this purpose.
2. Remove meter assembly from its case by gently pushing the two switch-knobs on front panel.
3. Install the three batteries in cavity on bottom side of meter assembly.

NOTE

Ensure correct installation by observing polarity indications shown on battery box.

CALIBRATION.

Connect charger unit to meter and plug charger unit into 115 VAC. If batteries are low, allow sufficient time for fully recharging. Calibration of meter should always be performed with batteries fully charged or with new non-rechargeable batteries.

To calibrate the instrument, perform the following steps. (See figure 1.)

1. Remove rear cover and meter assembly as set forth in paragraphs 1 and 2 under "Battery Replacement".
2. Place Function switch in VDC position and Power/Range switch in 1 position.
3. Connect input leads and apply +0.0010 VDC.
4. Adjust R18 until readout displays +.0010.
5. Apply +0.9000 VDC and adjust R1 until readout displays +.9000.
6. Place Function switch in k/MΩ position and Power/Range switch in 100 position.
7. Apply 90.00 kΩ and adjust R5 until readout displays 90.00.

FUSE.

A one ampere fuse provides input protection during current measurements. This fuse is located on the meter's left side next to the LO input jack. It plugs into one of the printed circuit boards in the Rollaball switch assembly. The part number of the fuse is 275001, manufactured by Littlefuse, Inc.

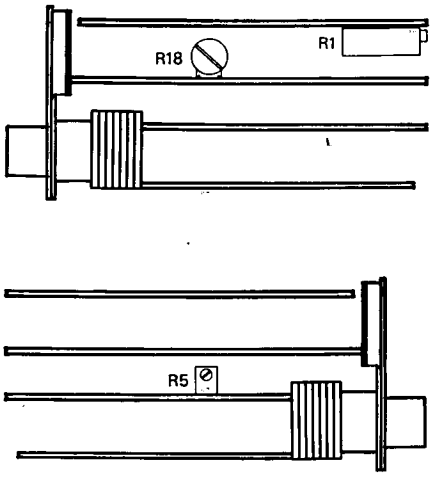

Figure 1. Component Location

To replace the fuse:

1. Remove meter from case by performing steps 1 and 2 under "Battery Replacement".
2. Carefully remove fuse from its sockets and gently insert new fuse, making sure fuse terminals are firmly seated in their sockets.
3. Reassemble instrument.

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Specifications Subject to Change without Notice

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