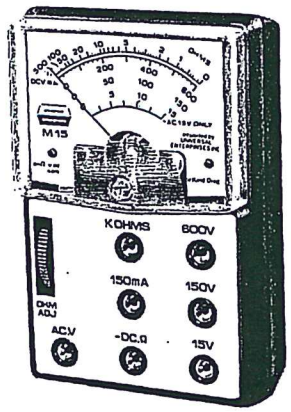
Implied Warranties: Any implied warranties; including implied warranties of merchantability and fitness for a particular purpose, are limited in duration to one year from date of purchase. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

To the extent any provision of this warranty is prohibited by federal, state, or municipal law and cannot be preempted, it shall not be applicable. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

UNIVERSAL ENTERPRISES, INC.
8030 SW Nimbus
Beaverton, OR 97008

universal enterprises

M15
OPERATING INSTRUCTIONS



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/E

FEATURES

- Impedance protected ohm circuit
- Color coded meter scale and front panel

SPECIFICATIONS

AC Voltage: ±4% of full scale 0-15, 150, 600 volts
DC Voltage: ±3% of full scale 0-15, 150, 600 volts
Direct Current: ±3% of full scale 0-150 mA
Resistance: ±3% of scale length 0-500KΩ
Internal Battery: 1.5V. size AA

USING THE M15

The M15 multitester is a precision instrument and care should be taken to protect it against damage due to mechanical shock.

WARNING: When measuring any high voltage circuit observe all safety precautions.

AC VOLTAGE: Insert one test lead in the "AC.V" jack. Insert the other test lead in the appropriate jack: "15V, 150V, or 600V." **NOTE:** always start with the 600V range if unsure of the magnitude of voltage present.

CAUTION: always remove the test leads from the circuit under test before disconnecting from front panel of M15.

DC VOLTAGE: Insert the black test lead in the "-DC.Ω" jack. Insert the red test lead in the appropriate jack: "15V, 150V, or 600V." The red test lead is connected to the positive voltage point. The black test lead is connected to the negative voltage point. **NOTE:** always start with the 600V range if unsure of the magnitude of voltage present.

CAUTION: always remove the test leads from the circuit under test before disconnecting from front panel of M15.

DIRECT CURRENT: The M15 may be used to measure direct current up to a maximum of 150mA (0.15 Amps). To do this, the M15 must be connected **in series** with the wire, or circuit element, in which the current is to be measured. Remove power to the circuit under test before connecting the M15. Insert the black test lead between the "-DC.Ω" jack on the M15 and the ground, or low voltage, side of the circuit under test. Insert the red test lead between the "150mA" jack on the M15 and the high voltage

side of the circuit under test. Apply power to circuit under test.

RESISTANCE: CAUTION: always remove power to any circuit in which resistance measurements are to be made. The M15 uses an internal battery to supply power to the circuit under test. Access to the battery is provided by removing the single screw in the back of the case and removing the case back. Observe polarity markings when replacing battery.

Insert one test lead in the "-DC Ω" jack and the other test lead in the "KOHMS" jack. Touch the free ends of the test leads together and note that pointer will swing to the right side of the scale.

(Note: if the pointer does not move all the way to the right the battery may be weak and need replacing.) Use the green OHM ADJ. knob to set the pointer to zero on the green meter scale. This completes the calibration of the resistance measuring circuit. This test should be performed each time resistance tests are to be made to assure that the OHM ADJ. knob has not been inadvertently moved.

To make the resistance measurement, connect the free ends of the test leads across the element to be measured. The measured resistance value will be the

green numeral on the resistance scale times 1000. For example, if the pointer is on the numeral 2, the resistance is 2,000 ohms (2K ohms).

TESTING DIODES/TRANSISTORS: A simple check of diode or transistor quality may be made with the M15. Using the same test procedures as for measuring resistance, connect one test lead to one end of the diode and the other test lead to the other end of the diode. Note the resistance reading. Then reverse the test leads and again note the reading.

If the two readings differ by a factor of ten then the diode, (or transistor junction) is probably good. If the two readings are approximately the same then the diode is shorted. If a reading cannot be obtained in either direction the diode is probably open.

ACCESSORIES	*Stock No.*
Soft carrying case	AC15
Rigid carrying case	AC20
Test leads (set)	ATL3
Alligator clip adapters for test leads with vinyl insulator (pr.)	AAC
Battery 1.5V, size AA	AB1

MAINTENANCE

BATTERY :
The internal 1.5V battery affects only the OHMS function. It should be replaced when it is no longer possible to zero the pointer with the OHM ADJ control. Remove battery if M15 is not to be used for a long period of time. Remove single screw in rear of case for access to battery. Observe polarity.

MECHANICAL ZERO ADJUSTMENT :
The pointer should indicate 0 at the left hand edge Of the scale with no input and M15 placed face up on a flat surface.
To reset pointer, carefully adjust clear plastic screw located in meter face.

LIMITED ONE YEAR WARRANTY

This product is warranted to the purchaser against defects in material and workmanship for one year from the date of purchase.

What is covered: Repair parts and labor, or replacement at the company's option. Transportation charges to the purchaser.

What is not covered: Transportation charges to the company. Damages from abuse or improper maintenance, see operating instructions. Any other expense. Consequential damages, incidental damages, or incidental expenses, including damages to property. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

How to Obtain Warranty Performance: Attach to the product your name, address, description of problem, phone number and proof of date of purchase, package and return to:

Service Center
Universal Enterprises, Inc.
14270 N.W. Science Park Drive
Portland, Oregon 97229