

Operator's Manual

Model 262A-1

Portable Surface Resistivity Meter with Resistance to Ground Feature

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WARRANTY

Monroe Electronics, Inc. warrants to the Owners, each instrument and sub-assembly manufactured by them to be free from defects in material and workmanship for a period of one year after shipment from the factory. This warranty is applicable to the original purchaser only.

Liability under this warranty is limited to service, adjustment or replacement of defective parts (other than tubes, fuses or batteries) on any instrument or sub-assembly returned to the factory for this purpose, transportation prepaid.

This warranty does not apply to instruments or sub-assemblies subjected to abuse, abnormal operating conditions, or unauthorized repair or modification.

Since Monroe Electronics, Inc. has no control over conditions of use; no warranty is made or implied as to the suitability of our product for the customer's intended use.

THIS WARRANTY SET FORTH IN THIS ARTICLE IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES AND REPRESENTATIONS, EXPRESS, IMPLIED OR STATUTORY INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS. Except for obligations expressly undertaken by Monroe Electronics, in this Warranty, Owner hereby waives and releases all rights, claims and remedies with respect to any and all guarantees, express, implied, or statutory (including without limitation, the implied warranties of merchantability and fitness), and including but without being limited to any obligation of Monroe Electronics with respect to incidental or consequential damages, or damages for loss of use. No agreement or understanding varying or extending the warranty will be binding upon Monroe Electronics unless in writing signed by a duly authorized representative of Monroe Electronics.

In the event of a breach of the foregoing warranty, the liability of Monroe Electronics shall be limited to repairing or replacing the non-conforming goods and/or defective work, and in accordance with the foregoing; Monroe Electronics shall not be liable for any other damages, either direct or consequential.

RETURN POLICIES AND PROCEDURES

FACTORY REPAIR:

Return authorization is required for factory repair work. Material being returned to the factory for repair must have a Return *Material Authorization* number. To obtain an RMA number, call 716-585-2254 and ask for Customer Service.

Material returned to the factory for warranty repair must be accompanied by a copy of a dated invoice or bill of sale, which serves as a proof of purchase for the material.

Repairs will be returned promptly. Repairs are normally returned to the customer by UPS within ten working days after receipt by Monroe Electronics, Inc. Return (to the customer) UPS charges will be paid by Monroe Electronics on warranty work. Return (to the customer) UPS charges will be prepaid and added to invoice for out-of-warranty repair work.

EXPEDITED FACTORY REPAIR:

All material returned to the factory by air or by an overnight service will be expedited. Expedited factory repairs will be returned to the customer by the same mode of transportation by which the material was returned to the factory for repair (i.e., material returned to the factory by an overnight service will be returned to the customer by an overnight service).

NOTE: Return (to the customer) transportation expenses for expedited factory repairs will always be at the expense of the customer despite the warranty status of the equipment.

FACTORY REPAIRS TO MODIFIED EQUIPMENT:

Material returned to the factory for repair that has been modified will be not tested unless the nature and purpose of the modification is understood by us and does not render the equipment untestable at our repair facility. We will reserve the right to deny service to any modified equipment returned to the factory for repair regardless of the warranty status of the equipment.

INTRODUCTION:

The Monroe Electronics Model 262A-1 Portable Surface Resistivity Meter combines fast repeatable measurements of both surface resistivity and resistance to ground in one versatile instrument.

With automatic ranging from 10^4 to 10^{14} ohms per square in the surface resistivity mode, 10^4 to 10^{14} ohms in the resistance mode and an accuracy of $\pm 1/2$ decade, Model 262A-1 conveniently checks resistivity specifications for static control products such as antistatic bags, static dissipative mats and conductive work surfaces and checks resistance of work surfaces to ground.

Small size and rugged construction make this portable meter ideally suited for applications in a manufacturing environment.

FEATURES:

- * Measures both surface resistivity and resistance to ground.
- * Easy to use - no adjustments required.
- * Portable - powered by rechargeable battery.
- * Wide range of direct readings in ohms per square for surface resistivity measurement and in ohms for resistance to ground.
- * Parallel bar sensing element.
- * Conforms to widely accepted ASTM-D257 standard.

MODEL 262A SPECIFICATIONS:

RANGE:	Resistivity - Automatic from 10^4 ohms per square to 10^{14} ohms per square.
	Resistance- Automatic from 10^4 ohms to 10^{14} ohms.
ACCURACY:	$\pm 1/2$ decade.
INTERNAL SUPPLY:	100 volts, 1mA above 10^5 ohms or ohms per square.
	10 volts, 10mA for 10^4 and 10^5 ohms or ohms per square.
DISPLAY:	LED's, one per decade.

POWER: Built-in rechargeable battery with 120VAC (230VAC optional) adapter/charger supplied. For power line voltages other than 120 or 230 VAC a separate charging supply must be provided by the customer. Power input requirements are 13VAC at 0.6A or 15VDC at 0.5A. Center pin is negative. Connector OD is 5.0mm; ID is 2.5mm. Battery operation is 4-8 hours continuous use.

DIMENSIONS: 4" wide x 3 1/2" high x 5 3/4" long.

HOW MODEL 262A WORKS:

On the insulating base of the instrument are two metal rails that have slightly compressive strips of conductive elastomeric material imbedded in them.

The size and position of these rails are such that when the unit is placed on the flat surface of the material whose resistivity is to be tested, five "squares" of the material lie between the contact lines in a parallel configuration.

When power is switched on a voltage is applied to one of the rails and the current flowing between the rails is detected by the other one, thus defining the resistivity characteristics of the material under test. Internal circuitry of the Model 262A-1 interprets this signal and provides a direct readout of the surface resistivity of the material under test in ohms per square. (Re. ASTM D257, para. 3.5)

In the resistance to ground mode, the test voltage is completely removed from the rail and is applied to ground via a test lead supplied with the instrument. Current flowing between ground and the sensing rail is detected and is converted to a direct readout of the resistance of the intervening path in ohms.

CAUTION

DO NOT TOUCH RAILS WHILE UNIT IS IN OPERATION

When in operation, one of the rails is at a potential of 100 volts and is capable of delivering an annoying shock to a person touching it.

Although current delivering capability is limited, a distinct hazard exists in the person's reaction to the shock.

BATTERY OPERATION:

Model 262A-1 was designed to operate continuously for 4 to 8 hours on its internal battery when fully charged. An LED on the panel indicates LOW BATTERY when the battery needs recharging. The charger furnished with the unit will renew full charge within 14 hours.

The instrument may be operated with the charger connected; however, if erroneous readings are suspected, the charger should be removed.

MODEL 262A-1 SHOULD BE SHUT OFF WHEN NOT IN USE.

CONFIDENCE CHECK:

A quick test for proper operation of the Model 262A-1 in the resistivity (OHMS/SQUARE) mode is as follows:

1. Stand the instrument on its end so that the panel is facing you and the contact rails protrude away from you.
2. Be sure that the function selector switch is in the OHMS/SQUARE position and that the grounding lead is **not** connected to the GND jack.
3. Switch power on. If the LOW BATTERY LED flashes more than once or twice, the battery requires charging.
4. The rightmost (10^{14}) LED should light after a few seconds and remain on.
5. Switch power off. Bend the leads of a two megohm, $\pm 5\%$ resistor into a "U" shape and wedge this between the metal electrode rails so that each lead makes contact with one of the rails and the resistor stays in place. Switch power on. The LED labeled " 10^7 " should light.

To test the grounding lead and the basic operation of the resistance (OHMS) test mode:

1. Shut power off and remove resistor installed above.
2. Stand the instrument on end(as above), set the function switch to "OHMS" and apply power. Within a few seconds, the 10^{14} LED should light and remain on.
3. Insert the small banana plug of the grounding lead into the jack marked "GND". Hold the other end of the lead by the insulated portion only. (Remember this leads has 100V applied to it!!!)

4. Touch (and hold) the tip portion of the lead to the left rail. The "10⁴" LED should light. No change in status indicates that either the wrong rail was touched or the lead is broken.

NOTE: It is normal for the indicator LED's to shift one or two decades as the tip of the lead is being moved in the vicinity of the sensing rail.

5. Shut the power off and remove the grounding lead from the jack.

OPERATION (Surface resistivity mode):

The function switch must be in the OHMS/SQUARE position and the grounding lead must be removed for surface resistivity tests.

Material samples to be tested must be able to be completely covered by both contact rails and must be flat in order for the elastomeric contacts to make a complete connection along their lengths.

NOTE: Sample specimens narrower than five inches may be tested with a corresponding degradation in accuracy. For example: a 2 ½ inch wide sample whose surface resistivity is actually 10¹⁰ ohms per square will be interpreted as 2 x 10¹⁰ ohms per square and will still be indicated as a static dissipative material -- adequate for many purposes. A ½ inch wide sample will produce a high reading of one full decade.

Sheet materials should be backed with a flat piece of clean plexiglas (or other good insulator) whose dimensions are greater than the area covered by the contact rails. The same (type of) backing material should be used for all testing of materials where results have to correlate.

After conditioning of sample material (if any) place Model 262A-1 on the selected area of the sample and apply power. Following the prescribed electrification period, note the reading and shut off power then continue this procedure with subsequent samples.

OPERATION (Resistance to ground mode):

The function switch must be in the OHMS position and the grounding lead must be connected between the GND jack on the instrument panel and Hard Ground (utility ground, system ground, vehicle ground, earth ground, etc. -- the designated reference).

Place Model 262A-1 on the selected area of the mat or other surface to be evaluated. Apply power and take reading.

HOW TO OBTAIN ASTM STANDARD:

Monroe Electronics does not supply copies of ASTM standards.

Copies of ASTM Standard D257 are available from:

ASTM International
100 Barr Harbor Drive
West Conshohocken PA 19428-2959
Phone: (610) 832-9585 Fax: (610) 832-9555
www.astm.org

SERVICING:

As delivered, Model 262A-1 is ready to use. It has been adjusted, tested and may be expected to remain so except for necessary cleaning and battery charging. Servicing of defective instruments should be referred to qualified technical personnel.

Complete service information is available. Unauthorized repairs will void the warranty. Factory service is recommended.

MAINTENANCE TIPS:

The case of the Model 262-1A may be cleaned using a soft cloth saturated with a solution of warm water and a small amount of mild detergent and wrung out. Care should be taken not to get detergent solution on any part of the base.

The black plastic base and contact rails should be cleaned whenever any accumulation of contaminants is noted. Leakage paths between the rails across the base material will cause lower than normal readings and foreign material on the contact portion of the rails may cause higher than normal indications. These parts should be cleaned with isopropyl alcohol and blown dry with a clean low pressure compressed air source.

STORAGE:

When not in use, Model 262A should be stored standing on one end -- not resting on its electrodes -- to prevent permanent damage to the electrode material.

Battery should be charged at least every six months.

Specifications subject to change without notice.
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