



# M100A Metal Inspector

*Measure the Quality of Metals Quickly and Accurately  
with Non-Destructive Testing (NDT)*

MISTRAS Products & Systems M100A Resistivity Meter provides rapid, accurate measurements of electrical resistivity that yield either bulk or surface characteristics of the material component being tested. The M100A takes advantage of a special form of ohm's law by generating a pair of rapidly reversing direct current pulsing through the two outer probes of a four-point assembly placed on a test specimen. Resulting voltage measurements, taken from the inside points of the probe, are electronically converted to resistivity values for interpretation. This permits rapid evaluation of specific material characteristics. The resulting data is absolute (unlike most other NDT techniques).

Readings can be stored in a PC for automated data recording and/or process control. Effective depth of current penetration is controlled by changing probe configuration. The key to utilizing this technology for nondestructive evaluation is the change in resistivity values from one sample to another due to material processing or the presence of defects. Differences in resistivity values provide practical means for NDT inspection and process control including:



Figure 1. M100A shown measuring the quality of a laser seam weld.



## *Applications:*

- Alloy Sorting & Sprayed Coatings (Metal to Metal, Metal to Non-Metal)
- Flaw Detection
- Weld Integrity Assessment
- Stress Corrosion Cracking in Materials
- Crack Depth Measurement
- Case Hardening of Several Materials
- Thickness Measurement
- Spot/Laser Weld Control

*The theory of resistivity involves the ways that materials conduct or resist the flow of electricity and plays an important role in the study of metals and semiconductors. Every metal alloy has its unique level and characteristics of electrical resistivity. Within the same alloy specimen, resistivity varies with the composition of the material and internal structure and/or defects.*

**Specifications:****Measurements**

- Measurement Type: Absolute or relative resistivity of metallic and nonmetallic conductive material
- Measuring Current: Pulsed 2 amp reversing DC
- Measuring Time: <1 second (after triggering)
- Mode: Sheet, Block, or Index (to a relative value)
- Range: 0-200 micro-ohms centimeter

**Repeatability:**

- Manual Measurement: +/-3% of reading
- Fixture Measurement: +/-1% of reading

**Operation:**

- Triggering: Probe handle, front panel, optional remote start switch or remote interface

**Display:**

- Type: Four 1.6" (40.6 mm) digits liquid crystal LCD
- Digit Size: 1.5" High (38.1 mm)
- Decimal Points: 1 point for reading & English thickness, 2 for Metric
- Hold Time: Held until next reading
- Polarity: Auto

**Power:**

- Power Source: AC or Battery Powered
- AC Power: 100-240 VAC, 50/60 Hz
- Power Consumption: <50 Watts
- Battery Supply: Li-Ion, 7.4V, 3.6 Ahr
- Battery Charger: Internal

**Probes:**

- Probe Handle: Reversible High Impact ABS Plastic
- Connector: 8 pin shielded, 12 foot (3.6576 m) spring cord, soil & temperature resistant
- Probe Cartridge: High Impact ABS Plastic
- Probe Pins:
  - 100 mil (2.54mm) spacing (std) Gold Plated Hardened Steel
  - 175 mil (4.45mm) spacing (std)
  - 250 mil (6.35mm) spacing (std)
  - 50 mil (0.50) (0.127mm) spacing (optional) Rhodium Plated Hardened Steel
- Custom probes and fixtures available upon special order

**Mechanical:**

- Cabinet Material: T51 Aluminum, with carrying/set-up handle, impact isolated top
- Dimensions: 4.188" H x 14.75" W (w/handle) x 11.875" D (w/knobs) (106 x 375 x 302 mm)
- Weight w/Probe: 9 lbs. (4.1 kg)

**Warranty Period:** 1 Year**Options** (available upon special order):

- Spare battery pack
- Custom probes and fixtures
- 50 mil probe
- Industrial probe handle

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