

A Reliable, Microprocessor Based Insulation Resistance Meter



Vanguard Instruments Company, Inc.

Safety, Durability, Portability. The Vanguard IRM

Dual Microprocessors, Sophisticated Design.

Vanguard Instrument Company's Model IRM-5000 Megohmmeter is a micro-processor-based, high-voltage, insulation-test meter. The Model IRM is rugged and portable, making it ideal for use in electric-utility substations and for industrial application.

This sophisticated insulation tester uses a dual-microprocessor design. One micro-processor is dedicated for the control of the power supply and measuring circuitry. The second microprocessor is dedicated for the display, printer control, and user interfaces. These microprocessors interface with each other via an optical link to ensure the operator's safety and isolation from the high test voltages inside the unit.

The Model IRM-5000 measures the insulation resistance of a test material by applying a known test voltage and measuring the resultant leakage current. The measured insulation resistance is shown on a backlit LCD display screen.

Test reports, in both tabulated and graphics format are printed on a 2.5-inch-wide paper by a built-in thermal printer. Up to 100 test reports can be saved in internal memory for later analysis. Alternatively, these test reports may be downloaded to an IBM PC for subsequent analysis. Industry-standard tests (i.e., Polarization Index [PI] test, Step Voltage [SV] test, and Dielectric Discharge [DD] test) can be run automatically.

Test Voltage

The Model IRM-5000 can run tests with preset voltages (500, 1000, 2500, and 5000 Vdc), or can be run with user-selectable voltages ranging from 50V to 5000V dc with a ± 2 Vdc resolution.

Insulation Resistance Test

The user can select the test voltage and a test duration ranging from 1 to 90 minutes. The Model IRM-5000 will collect resistance readings throughout the selected test period. Resistance value, test voltage, leakage current, and capacitance value are displayed on the back-lit LCD screen. This tabulated report can also be printed on the 2.5" built-in thermal printer. The user can obtain a thermal printout of a test report in the graphic plot, which shows a resistance plot over time.

Polarization Index (PI) Test

PI tests can be run at any of the following preset voltages: 500, 1000, 2500, and 5000 Vdc. The user can also select a specific test voltage for a PI test. A hard copy of test results in both graphic and tabulated form can be obtained using the built-in thermal printer.

Step Voltage (SV) Test

The SV test allows the user to test insulation resistances in five equal voltage steps up to 2500 Vdc or 5000 Vdc. The voltage steps up in 1/5 increments (of the final test voltage) every one minute, five minutes, or other user-defined time.

Dielectric Discharge (DD) Test

This test measures the dielectric absorption of an insulator. This test can be used to diagnose an insulation problem in the case of multi-layered insulation.

Capacitor Discharge

The Model IRM-5000 will automatically discharge any test voltage left on the test material after each test. An audible alarm and a message on the display screen warns the operator of the shock hazard during each discharging period.

4x20 Backlit LCD Display

External Temperature Probe Input

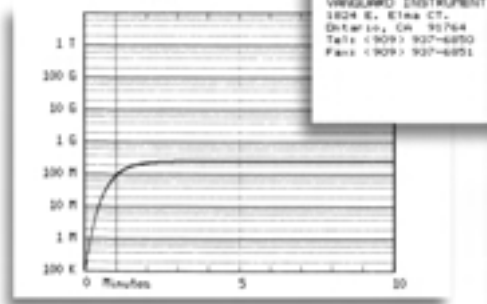
Rugged 16-Key Membrane Keypad Allows User to Enter Test Parameters

RS-232C Interface



Model IRM-5000

Typical Resistance Plot ▼



-5000 Megohmmeter.



Continuous Power via
Built-in Battery or AC
Power Source

Thermal Printer
2 1/2 inch Paper Width



Capacitance Display

The Model IRM-5000 will automatically measure capacitance of the device under test. The capacitance-measuring range is from 0.01 μF to 10.0 μF

Volt Meter

The Model IRM-5000 may also be used to measure voltages. Measurable voltage input ranges from 50 to 1250 V, ac or dc.

User Interface

An alpha-numeric keypad lets users enter test ID and control functions. A backlit 4-line by 20-character LCD readout displays user messages.

Built-in Thermal Printer

A 2.5-inch-wide built-in thermal printer prints test reports in both tabular and graphic formats on 2.5-inch-wide thermal paper

Test-Report Storage Capabilities

The Model IRM-5000 uses Flash Electrical Erasable PROMs (EEPROM) to store test reports in memory. Stored test reports can be recalled later by the user to re-analyze test data, to print test reports, or to transfer data to an IBM-compatible PC for record keeping. Up to 100 test report can be stored in the EEPROM.

Computer Interface

An RS-232C port interfaces the Model IRM-5000 with an IBM-compatible PC. A Windows-based Insulation Resistance analysis program lets the user retrieve test reports stored in the IRM-5000. Thus, the user can generate test reports with an office-based computer. A special feature of the software allows the user to overlay several resistance curves on a color monitor. This feature allows the user to monitor the resistance deterioration of a test material over time.

Temperature Probe

A non-contacting Infrared temperature sensor allows the user to record test material temperatures. An on-board temperature sensor measures ambient temperature.

Power Source

The Model IRM-5000 can operate from its internal, sealed, rechargeable, lead-acid batteries or it can be operated from an external power source. The user can select 110/120 V, 50/60 Hz or 220/240 V, 50/60 Hz power sources.



▲ Tabulated Reports



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Reliability Through Instrumentation



**Vanguard Model IRM-5000
Megohmmeter**

FEATURES

- Perform PI, SV & DD Tests Automatically
- Test Duration from 1 to 90 Minutes
- Automatically Discharges Test Voltage
- Measures Capacitance of DUT
- Store Up to 100 Test Reports
- IR Temperature Probe
- Built-in 2½-inch Thermal Printer
- RS-232C Interface

SPECIFICATIONS

TYPE	Insulation Resistance Meter, Y2K Compliant
SIZE	18"L x 15"W x 7"H
WEIGHT	18lbs
RESISTANCE RANGE (0°C to +30°C)	±5% 1 MΩ to 1 TΩ @ 5 kV ±5% 1 MΩ to 100 GΩ @ 500 V ±5% 1 MΩ to 10 GΩ @ 50 V ±20% 100 KΩ to 1 MΩ @ 5 kV ±20% 1 TΩ to 5 TΩ @ 5 kV ±20% 100 KΩ to 1 MΩ @ 500 V ±20% 100 GΩ to 500 GΩ @ 500 V
TEST VOLTAGE	Selectable from 50V to 5 kVdc, in 2 Vdc step
OUTPUT VOLTAGE ACCURACY (0°C to +30°C)	±2% ±1v of selected voltage with load resistance >100 MΩ
SHORT CIRCUIT CURRENT	2mA max
LEAKAGE CURRENT RANGE	0.03 nA to 1 mA Accuracy ±5% ±0.2 nA (0°C to +30°C)
CAPACITANCE RANGE	0.01 μF to 10.0 μF (Test voltage >100V) Accuracy ±15% ±0.03 μF (0°C to +30°C)
VOLTAGE READING RANGE	50-1250 Vac (rms) or dc Accuracy ±5%, ±1V (0°C to +30°C)
CAPACITOR DISCHARGE	<2 Sec/μF, Automatic at the end of test.
HUM REJECTION	2mA rms maximum
BATTERIES	Two 12V, 2.2 Ah Sealed, Lead Acid batteries. Battery life: typical 6 hrs, continuous testing. The unit can be used during charging period
AC INPUT	110-120 Vac 50/60Hz or 220-240 Vac 50/60Hz, selectable