

# IRM-5000P

## Insulation Resistance Meter



**Vanguard Instruments Company**

**H.V. TEST (PTY) LTD**

3 Gaiety Ave, Robindale, Randburg, South Africa, 2010

Tel: +27(11) 782 1010 Fax: +27(11) 782 2770

P.O. Box 651287, Benmore, 2010

Email: sales@hvtest.co.za

Website: www.hvtest.co.za



# IRM-5000P™

Vanguard Instrument Company's Model IRM-5000P is a microprocessor based, high-voltage, insulation-test ohm-meter. The Model IRM-5000P 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 microprocessor is dedicated to the control of the power supply and measuring circuitry. The second microprocessor is dedicated to 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-5000P 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 [ST] test, and Dielectric Discharge [DDS] test) can be run automatically.

## **Test Voltage**

The Model IRM-5000P 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  $\pm 2$ 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-5000P 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 be printed on the 2.5" built-in thermal printer. The user can also obtain a thermal printout of a test report in a 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 (ST) Test**

The ST 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 (DDS) 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-5000P 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.

## **Capacitance Display**

The Model IRM-5000P will automatically measure capacitance of the device under test. The capacitance-measuring range is from 0.01  $\mu$ F to 10.0  $\mu$ F.

## **Volt Meter**

The Model IRM-5000P 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-5000P 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-5000P with an IBM-compatible PC. A Window 95/98/NT/2000/XP analysis software lets the user retrieve test reports stored in the IRM-5000P. 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 (provided with each unit) allows the user to record test material temperatures.

## **Power Source**

The Model IRM-5000P can operate continuously for 6-hours from its internal rechargeable SLA 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.

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# Measure *Insulation Resistance* Quickly and Safely



Continuous Power via  
Built-in Battery or AC  
Power Source

4x20 Backlit  
LCD Display

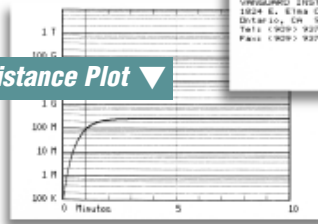
High Voltage Terminals

RS-232C Interface

Thermal Printer  
2.5-inch Paper Width

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

Typical Resistance Plot ▼



TEST NUMBER: 63
DATE-TIME: 02-23-99 19:14:53
COMPANY: VANGUARD INSTRUMENTS
LOCATION: ONTARIO, CALIFORNIA
TEST DISC: BURESD CABLE
OPERATOR:
TEST TYPE: POLARIZATION INDEX
PI RATIO: 2.51
RES @ 1:00 =
RES @ 10:00 =
TEST VOLTAGE:
TEST CAPACITANCE:
TEST DURATION:
D.U.T. TEMPERATURE:

TEST NUMBER: 52
DATE-TIME: 02-22-99 11:27:00
COMPANY: VANGUARD INSTRUMENTS
LOCATION: ONTARIO, CALIFORNIA
TEST DISC: BURESD CABLE
OPERATOR:
TEST TYPE: STEP VOLTAGE
RES @ 1:00, 500V: 1.29 G
RES @ 2:00, 1000V: 1.45 G
RES @ 3:00, 1500V: 1.27 G
RES @ 4:00, 2000V: 1.02 G
RES @ 5:00, 2500V: 695 M
STEP INTERVAL: 1:00 MIN
TEST CAPACITANCE: 0.13 uF
TEST DURATION: 5:00 MIN
D.U.T. TEMPERATURE: 75 F

TEST NUMBER: 47
DATE-TIME: 02-22-99 10:02
COMPANY: VANGUARD INSTRUMENTS
LOCATION: ONTARIO, CALIFORNIA
TEST DISC: 3HP MOTOR
OPERATOR:
TEST TYPE: DIELECTRIC DISCHARGE
DD RATIO: 0.96
I @ TEST +3 MIN: 1.28 uA
TEST VOLTAGE: 500V
TEST CAPACITANCE: 0.28 uF
TEST DURATION: 30:00 MIN
D.U.T. TEMPERATURE: 77 F

▲ Tabulated Reports

## FEATURES

- Perform PI, ST & DDS Tests Automatically
- Test Duration from 1 to 90 Minutes
- Automatically Discharges Test Voltage
- Measures Capacitance of DUTY
- Store Up to 100 Test Reports
- IRA Temperature Probe
- Built-in 2.5-inch Thermal Printer
- RS-232C Interface



## SPECIFICATIONS

<b>TYPE</b>	Insulation Resistance Meter
<b>PHYSICAL SPECIFICATIONS</b>	19"W x 7H x 15"D, (48 cm x 17 cm x 38 cm), Weight 24lbs (10.9 kg)
<b>INPUT POWER</b>	110-120 Vac 50/60Hz or 220-240 Vac 50/60Hz, selectable
<b>RESISTANCE READING RANGE (0°C to +30°C)</b>	100 K-ohm to 1 M-ohm ±20%, 1 M-ohm to 1 T-ohm ±5%, 1 T-ohm to 5 T-ohm ±20% , 5kV 100 K-ohm to 1 M-ohm ±20%, 1 M-ohm to 100 G-ohm ±5%, 100 G-ohm to 500 G-ohm ±5%, 500 V 1 M-ohm to 10 G-ohm ±5%, 50 V
<b>TEST VOLTAGE</b>	Selectable from 50V to 5 kVdc, in 2 Vdc step
<b>OUTPUT VOLTAGE ACCURACY (0°C to +30°C)</b>	±2% ±1v of selected voltage with load resistance >100 MΩ
<b>SHORT CIRCUIT CURRENT</b>	2mA max
<b>CURRENT READING RANGE</b>	0.03 nA to 2 mA; Accuracy ±5% ±0.2 nA (0°C to +30°C)
<b>CAPACITANCE READING RANGE</b>	0.01 μF to 10.0 μF (Test voltage >100V), Accuracy ±5% ±0.03 μF (0°C to +30°C)
<b>VOLTAGE READING RANGE</b>	50-1250 Vac (rms) or dc, Accuracy ±5%, ±1V (0°C to +30°C)
<b>CAPACITOR DISCHARGE</b>	<2 Sec/μF, Automatic at the end of test.
<b>HUM REJECTION</b>	1mA per 1kv of Fast Voltage, 2mA rms maximum
<b>BATTERIES</b>	Two 12V, 2.0 Ah Sealed, Lead Acid batteries. Battery life: typical 6 hrs, continuous testing. The IRM-5000P can be used while charging
<b>SAFETY</b>	UL Certified (UL 61010A-1), CAN/CSA Certified (C22.2 No. 1010.1-92)
<b>ENVIRONMENT</b>	Operating: -10° to 50° C (15° to +122° F); Storage: -30° C to 70° C (-22° to +158° F)
<b>CABLE</b>	One 6' cable set, One 30' cable set, ground cable, power cord and cable bag
<b>OPTIONS</b>	Transportation Case
<b>WARRANTY</b>	One-Year on Parts and Labor

Note: The above specifications are valid at nominal voltage and ambient temperature of +25°C (+77°F), Specifications are subject to change without notice.

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