IRM-5000P

insulation resistance meter

Vanguard Instruments Company, Inc.
www.vanguard-instruments.com

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The IRM-5000P is a microprocessor-based, high-voltage, insulation-test ohmmeter. The rugged and portable IRM-5000P is ideal for use in electric utility substations and for industrial applications. This sophisticated insulation tester uses a dual-microprocessor design. One microprocessor is dedicated to the control of the power supply and measuring circuitry, while the second is dedicated to the user interfaces and printer control. To ensure operator safety, the microprocessors communicate via an optical link, thus isolating the operator controls from the dangerous high test voltages inside the unit.

The 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 then displayed on the back-lit LCD screen. The IRM-5000P's built-in 2.5-inch wide thermal printer can print test reports in both tabular and graphic formats. Up to 100 test reports can be stored in the unit's internal memory. Test reports can also be transferred to a PC via the built-in RS-232C interface. The IRM-5000P can automatically perform industry-standard tests such as Polarization Index (PI) test, Step Voltage (ST) test, and Dielectric Discharge (DDS) test.

Test Voltage

The IRM-5000P can perform tests with preset voltages (500, 1000, 2500, 5000 Vdc), or with user-selectable voltages ranging from 50 Vdc to 5000 Vdc with a ±2 Vdc resolution.

Insulation Resistance Test

The test voltage for an insulation resistance test can be user-selected, and the test duration can range from 1 to 90 minutes. The IRM-5000P will then collect resistance readings throughout the selected test period. The resistance value, test voltage, leakage current, and capacitance are displayed on the back-lit LCD screen. The tabulated test report can be printed on the built-in 2.5-inch wide thermal printer. The report can also be printed as a graph of the resistance over time.

Polarization Index (PI) Test

PI tests can be run at preset voltages (500, 1000, 2500, 5000 Vdc) or at a user-specified voltage from 50 Vdc to 5000 Vdc. Test results can be printed in both tabular and graphic formats.

Step Voltage (ST) Test

The ST test measures insulation resistances in five equal voltage steps up to a final test voltage of 2500 Vdc or 5000 Vdc. The voltage is stepped up in 1/5 increments of the final test voltage every one minute, five minutes, or other user-defined time interval.

Dielectric Discharge (DDS) Test

The DDS test measures the dielectric absorption of an insulator. This test can be used to diagnose an insulation problem in cases where multi-layered insulation is used.

Capacitor Discharge

After each test, the IRM-5000P automatically discharges any test voltage left on the test material. An audible alarm and a message on the screen warn the operator of the shock hazard during each discharging period.

ordering information

Part number **IRM-5000P**	IRM-5000P, cables, and PC software
Part number **Paper-TP3**	2.5" wide thermal printer paper

IRM-5000P Controls & Indicators

Capacitance Display

The IRM-5000P automatically measures the capacitance of the device being tested. The capacitance-measuring range is from 0.01 µF to 10.0 µF.

Volt Meter

The IRM-5000P can also be used to measure voltages. Measurable input voltage ranges from 50 V to 1250 V, AC or DC.

User Interface

The IRM-5000P features a back-lit LCD screen (20 characters by 4 lines) that is viewable in both bright sunlight and low-light levels. A rugged, 16-key, membrane keypad is used to control the unit.

Built-in Thermal Printer

The IRM-5000P's built-in 2.5-inch wide thermal printer can print the test reports in both tabular and graphic formats.

Internal Test Record Storage

The IRM-5000P can store up to 100 test records in Flash EEPROM. Test records can be retrieved and printed on the built-in thermal printer, or they can be transferred to a PC via the unit's RS-232C interface.

Computer Interface

The IRM-5000P can be computer-controlled via its RS-232C interface. Windows®-based analysis software is provided with each unit. Using this software, test records can be retrieved from the IRM-5000P and then stored on the PC for future analysis and report generation. A special feature of the software can overlay several resistance curves on-screen and can be used to monitor the resistance deterioration of a test material over time. Additionally, test records can be exported in Excel format for further analysis.

Temperature Probe

A non-contacting, infrared, temperature sensor is provided with each unit for recording test material temperatures.

Power Source

The IRM-5000P can operate continually for up to 6-hours using its internal rechargeable SLA batteries, or it can be operated with an external power source.

outstanding features

- Performs PI, ST, and DDS test automatically
- Test duration from 1 to 90 minutes
- Automatically discharges test voltage
- Measures capacitance of duty
- Stores up to 100 test records
- Infrared temperature probe
- Built-in 2.5" wide thermal printer
- RS-232C PC interface

IRM-5000P *thermal printer output*

TEST NUMBER: 1

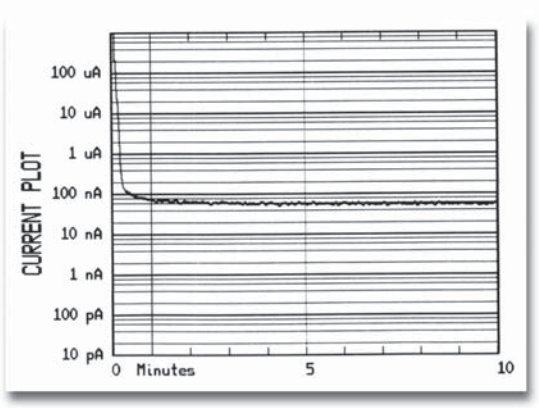
DATE/TIME: 04/09/12 08:03:46

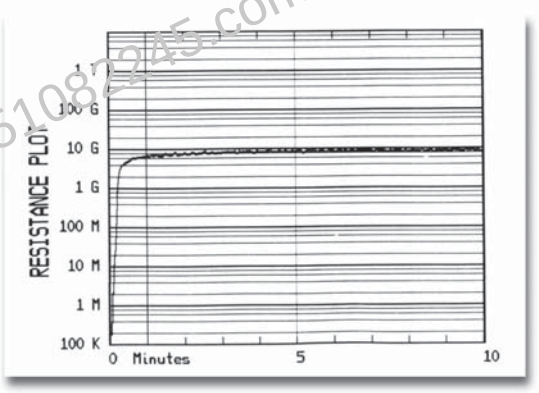
COMPANY:
LOCATION:
TEST DESC:
OPERATOR:

TEST TYPE: POLARIZATION INDEX

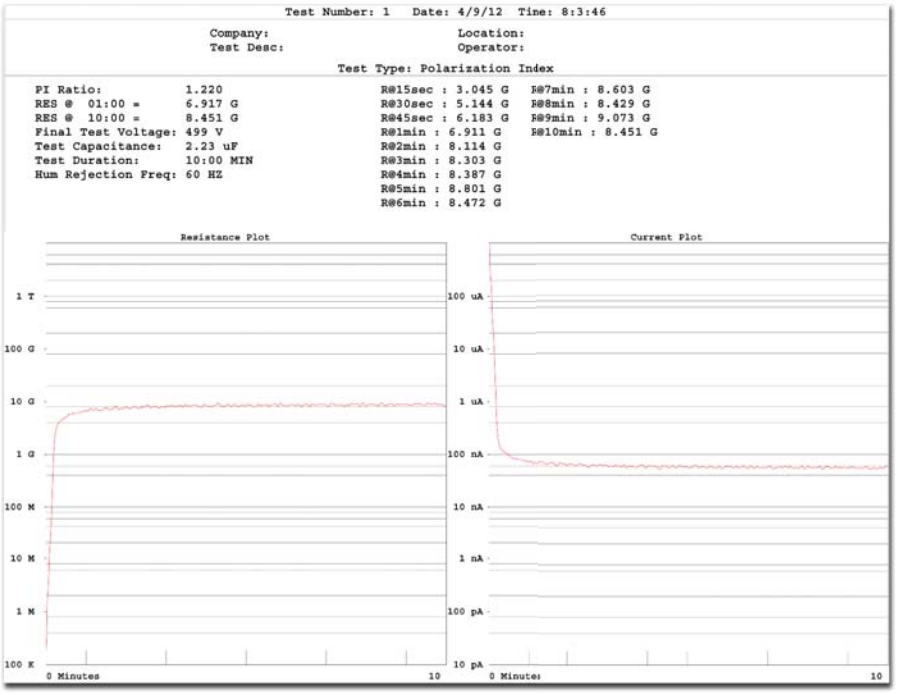
PI RATIO:	1.22
FINAL TEST VOLTAGE:	499 V
TEST CAPACITANCE:	2.23 uF
TEST DURATION:	10:00 MIN
HUM REJECTION FREQ:	60 Hz

RES @ 0:15 =	3.0445 G
RES @ 0:30 =	5.144 G
RES @ 0:45 =	6.183 G
RES @ 1:00 =	6.917 G
RES @ 2:00 =	8.114 G
RES @ 3:00 =	8.303 G
RES @ 4:00 =	8.387 G
RES @ 5:00 =	8.801 G
RES @ 6:00 =	8.472 G
RES @ 7:00 =	8.603 G
RES @ 8:00 =	8.429 G
RES @ 9:00 =	9.073 G
RES @ 10:00 =	8.451 G



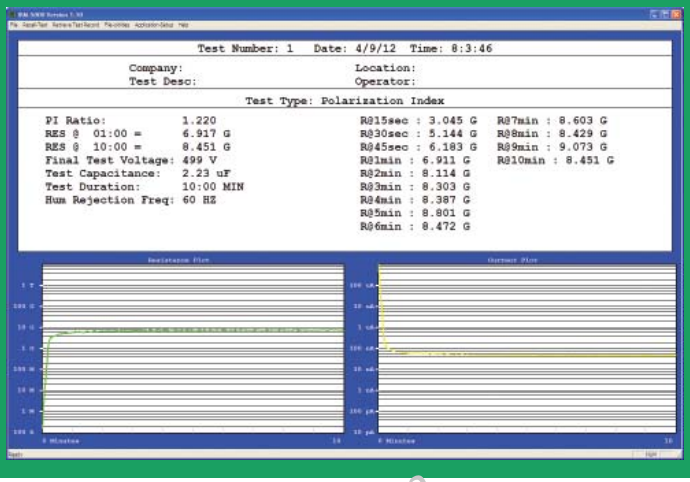


IRM-5000P *desktop printer output*



Computer control and analysis with included IRM-5000 Software

The IRM-5000P comes with the Vanguard IRM-5000 PC software. The IRM-5000 software can be used to retrieve test records from the IRM-5000P. Test records can also be exported in Excel format for further analysis. A special feature of the software can overlay several resistance curves on-screen and can be used to analyze the resistance deterioration of a test material over time.



IRM-5000P specifications

type	insulation resistance meter
physical specifications	19"W x 7"H x 15"D (48 cm x 17cm x 38 cm); Weight: 24 lbs (10.9 kg)
input power	100 – 120 Vac or 220 – 240 Vac (factory pre-set), 50/60 Hz
resistance reading range (0°C to +30°C)	100 K-ohms – 1 M-ohm ±20%, 1 M-ohm – 1 T-ohm ±5%, 1 T-ohm – 5 T-ohm ±20% , 5kV 100 K-ohms – 1 M-ohm ±20%, 1 M-ohm – 100 G-ohms ±5%, 100 G-ohms – 500 G-ohms ±5%, 500 V, 1 M-ohm – 10 G-ohms ±5%, 50 V
test voltage	selectable from 50Vdc – 5 KVdc, in 2 Vdc steps
output voltage accuracy (0°C to +30°C)	±2%, ±1v of selected voltage with load resistance greater than 100 M-ohms
short circuit current	2 mA max
current reading range (0°C to +30°C)	0.03 nA – 2 mA; Accuracy: ±5% ±0.2 nA
capacitance reading range (0°C to +30°C)	0.01 µF – 10.0 µF (Test voltage greater than 100V); Accuracy: ±5% ±0.03 µF
voltage reading range (0°C to +30°C)	50 – 1250 Vac (rms) or dc; Accuracy: ±5%, ±1V
capacitor discharge	Less than 2 Sec/µF, automatic at the end of test
hum rejection	1mA per 1kv of test voltage, 2mA rms maximum
batteries	two 12V, 2.0 Ah sealed lead acid batteries. Battery life: typical 6 hrs, continuous testing. The IRM-5000P can be used while charging
printer	Built-in 2.5-inch wide thermal printer can print test results in both tabulated and graphic formats
computer interface	one RS-232C port
internal data storage	can store up to 100 test records internally
pc software	Windows®-based software is included with purchase price
safety	UL Certified (UL 61010A-1), CAN/CSA Certified (C22.2 No. 1010.1-92)
environment	Operating: -10°C to +50°C (+15°F to +122°F); Storage: -30°C to +70°C (-22°F to +158°F)
humidity	90% RH @ 40°C (104°F) non-condensing
altitude	2,000 m (6,562 ft) to full safety specifications
cables	one 6-foot cable set, one 15-foot cable set, ground cable, power cord, cable bag
options	transportation case
warranty	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.

Instruments designed and developed by the hearts and minds of utility electricians around the world

Vanguard Instruments Company, (VIC), was founded in 1991. Currently, our 28,000 square-foot facility houses Administration, Design & Engineering, and Manufacturing operations. From its inception, VIC's vision was, and is to develop and manufacture innovative test equipment for use in testing substation EHV circuit breakers and other electrical apparatus.

The first VIC product was a computerized circuitbreaker analyzer, which was a resounding success. It became the forerunner of an entire series of circuitbreaker test equipment. Since its beginning, VIC's product line has expanded to include microcomputer-based, precision micro-ohmmeters, single and three phase transformer winding turns-ratio testers, transformer winding-resistance meters, mega-ohm resistance meters, and a variety of other electrical utility maintenance support products.

VIC's performance-oriented products are well suited for the utility industry. They are rugged, reliable, accurate, user friendly, and most are computer controlled. Computer control, with innovative programming, provides many automated testing functions. VIC's instruments eliminate tedious and time-consuming operations, while providing fast, complex, test-result calculations. Errors are reduced and the need to memorize long sequences of procedural steps is eliminated. Every VIC instrument is competitively priced and is covered by a liberal warranty.

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