DranISO 5000D
Digital High-Voltage Insulation Tester

- Large measuring range from 0.4 MΩ ... 1 TΩ
- Variable test voltages, or in fixed steps of 100 V, 250 V, 500 V, 1.0 kV, 1.5 kV, 2.0 kV, 2.5 kV, 5.0 kV
- Polarization index and absorption ratio
- Voltage measurements to 1000 V
- Frequency measurement from 15 Hz to 1 kHz
- Capacitance measurement from 0.1 to 5 µF
- Measurement of electrical discharge
- Guard terminal for the compensation of surface currents
- 5 m extension cable included as accessory
- Supply power from mains, internal set of storage batteries or external 12 V supply
- Backlit dot matrix display
- Digital display of measured values and limit values, characteristic curve display for polarization index
- Timer function: 1 second to 100 minutes
- DKD calibration certificate

Applications
Insulation measurement in large systems, and for cables, motors, generators etc.

Features

Test Voltages to 5000 V

The instrument is suitable for non-destructive measurement of insulation resistance in electrical systems, as well as in machines, transformers, cables and electrical equipment utilized in, for example, locomotives, street cars and ocean going vessels with selectable test voltages of up to 5 kV.

Voltage Measurement to 1000 V

Testing for absence of voltage at the device under test in systems of up to 1 kV can be performed with the voltage measuring range.

Discharging Capacitive Devices Under Test

Capacitive devices under test such as cables and coils, which may be charged by the test voltage, are discharged by the measuring instrument. The falling voltage value can be observed at the display.

Measurements per EN 61 557 Parts 1 and 2 (VDE 0413)

Nominal current amounts to 1 mA at a test voltage of 100 V, 250 V, 500 V or 1000 V.

Highly Insulated Measurement Cables

The highly insulated measurement cables are permanently connected for safety reasons, and due to technical measuring considerations. Danger resulting from inadvertently disconnected cables, for example in the event of charging caused by capacitive devices under test, is thus avoided.

Polarization Index

A polarization index test is recommended for electrical machines. This procedure involves expanded testing of insulation resistance. DC measuring voltage from the DranISO 5000D is applied to the insulation for a duration of 10 minutes. Measured values are documented after one minute, and after ten minutes. If the insulation is good, the value measured after ten minutes is higher than the value measured after one minute. The relationship between the two measurement values is the polarization index. Charged material within the insulation is aligned due to the application of measuring voltage over a long period of time, resulting in polarization. The polarization index indicates whether or not the charged material contained in the insulation can still be moved, thus allowing for polarization. This, in turn, is an indication of the condition of the insulation.

Data Management and Report Generation

The data of each measurement can be stored under a selected object number. Furthermore, a description for this object can be entered via the keyboard of the optional PSI module (Feature I1). The data management function allows for individual measurement data of a previously selected object to be displayed and to be deleted if required, or for previously entered objects to be deleted.

Depending on the number of stored objects (max. 254), up to 1,600 measurements can be stored. The current memory occupancy is continuously displayed as a bar graph.

DranISO 5000D
Digital High-Voltage Insulation Tester

Characteristic Values

Measuring Ranges:

Standard	DIN EN 61557-1:1998-05 DIN EN 61557-2:1998-05
VDE Regulation	VDE 0413 Part 1:1998-05 VDE 0413 Part 2:1998-05

Insulation Resistance

Display Range [Ω]	Measuring Range	Test Voltage	Intrinsic Accuracy	Measuring Accuracy
0.00 M ... 50.0 G	0.60 M ...10.0 G	100 V ... 250 V	±(7% rdg. + 6d)	±(10% rdg. + 8 d)
	>10.0 G ... 50.0 G		±(7% rdg. + 6d)	±(10% rdg. + 8 d)
0.00 M ... 250 G	0.40 M ... 50.0 G	> 250 V ... 1.00 kV	±(7% rdg. + 6d)	±(10% rdg. + 8 d)
	>50.0 G ... 250 G		±(7% rdg. + 6d)	±(10% rdg. + 8 d)
0.00 M ... 999 G	0.40 M ... 200 G	>1.00 kV ... 5.00kV	±(7% rdg. + 6d)	±(10% rdg. + 8 d)
	>200 G ... 999 G		±(7% rdg. + 6d)	±(10% rdg. + 8 d)

Test duration: automatic (until measured value is stable),
manual (1 to 120 s) or continuous measurement (lock function)

Polarization Index (PI), Absorption Ratio (DAR)

	t1 [min]	t2 [min]	Limit [min]
PI	00:00 ... 01:00 ... 99:50 min	00:00 ... 10:00 ... 99:50 min	0.10 ... 4.00 ... 9.80 min
DAR	00:00 ... 00:30 ... 99:50 min	00:00 ... 01:00 ... 99:50 min	0.10 ... 1.60 ... 9.80 min

PI and DAR are calculated values. The specifications of the insulation measurement are applicable.

Insulation Test Voltage

Nominal Values of Test Voltage	Variable Test Voltage	Nominal Current	Intrinsic Accuracy
100 V, 250 V, 500 V, 1.00 kV		≥ 1.0 mA	0 ... +25% rdg.
1.50 kV, 2.00 kV, 2.50 kV		≥ 0.4 mA	± 5% rdg.
5.00 kV		≥ 0.1 mA	± 3.5% rdg.
	100 V...1.00 kV	≥ 1.0 mA	± 15% rdg.
	> 1.00 kV...2.50 kV	≥ 0.4 mA	± 5% rdg.
	> 2.50 kV...5.00 kV	≥ 0.1 mA	± 3.5% rdg.

Variable test voltages are adjustable in increments of 50 V
Short-circuit current up to 1.00 kV, test voltage ≤ 2 mA

Voltage Measurement

Measuring range	Impedance	Intrinsic Accuracy	Measuring Accuracy
50 V ... 5.00 kV test voltage		±(2.5% rdg. + 5 d)	±(5% rdg. + 5 d)
50 V ... 1.00 kV ac/dc	1 MΩ	±(2.5% rdg. + 2 d)	±(5% rdg. + 5 d)

Frequency of measuring quantity: 15 Hz...1 kHz

Frequency Measurement

Measuring Range	Impedance	Intrinsic Accuracy	Measuring Accuracy
15.0 Hz … 1.00 kHz	1 MΩ	±(0.5% rdg. + 2 d)	±(1% rdg. + 2 d)

Voltage of measuring quantity: 50 V ... 1 kV

Breakdown Voltage

Parameters	Setting Range	Intrinsic Accuracy	Measuring Accuracy
Voltage range	100 … 5000 V	±(10% rdg. + 8 d)	±(15% rdg. + 10 d)
Rise time	5 … 300 s	—	—
Measuring time	1 … 120 s / auto / cont. measurement	—	—

Capacitance Measurement

Display Range	Measuring Range	Test Voltage	Intrinsic Accuracy	Measuring Accuracy
0.00 …10.0 µF	0.10 …5.00 µF	100…450 V	±(10% rdg. + 5 d)	±(15% rdg. + 8 d)
		500…5 kV	±(5% rdg. + 5 d)	±(10% rdg. + 8 d)

Dielectric Discharge (DD)

	Limit
DD	0.10 ... 2.00 ... 9.80

Reference Conditions

Ambient temperature	+73 °F(+23 °C) ± 2 °
Relative humidity	40 ... 60%
Measured quantity frequency	50 Hz ±10 Hz (during voltage measurement)
Line voltage waveshape	Sinusoidal, deviation between RMS and rectified value < 1%

Power Supply

Line voltage	207 V … 253 V / 49 Hz … 61 Hz *or (depending on country-specific version)* 108 V … 132 V / 59 Hz … 61 Hz
Power consumption	< 18 VA
Storage batteries	NiMH 9.6 V, 3 Ah, charging period 6 hours
Number of measurements at nominal current as per VDE 0413	700

Ambient Conditions

Accuracy	+32 °F (0 °C) ... + 104 °F (+ 40 °C)
Operating temperature	+23 °F (−5 °C) ... + 104 °F (+ 40 °C)
Storage temperature	+ 4 °F (−20 °C) ... + 140 °F (+ 60 °C) (without batteries)
Relative humidity	max. 75%, no condensation allowed
Elevation	6500 ft (2000 m)
Deployment	indoors, outdoors: only in the specified abient conditions

DranISO 5000D
Digital High-Voltage Insulation Tester

Electrical Safety

Standard	IEC 1010-1:1990, IEC 1010-1/A2:1995 EN 61010-1:1993, EN 61010-1/A2:1995
VDE regulation	VDE 0411 Part 1, 1994-03
Pollution degree	2
Protection	IP 40
Overvoltage category	Insulation measurement – 5000 V DC – no overvoltage Voltage measurement – 600 V – CAT III Voltage measurement– 1000 V – CAT II
Safety class	II

CE CAT IV

Electromagnetic Compatibility (EMC)

Product standard: EN 61326-1: 1997
EN 61326: 1997/A1: 1998

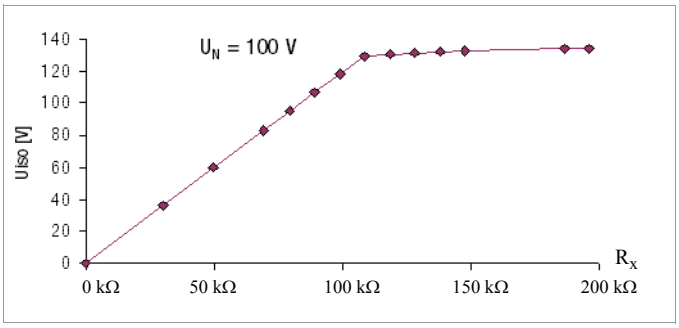
Interference Emission		Class
EN 55022		A
Interference Immunity	Test Value	Power Feature
EN 61000-4-2	Contact/Air - 4 kV/8 kV	B
EN 61000-4-3	10 V/m	C
EN 61000-4-4	Mains Connection - 2 kV	B
EN 61000-4-5	Mains Connection - 1 kV	B
EN 61000-4-6	Mains Connection - 3 V	B
EN 61000-4-11	0.5 Period / 100%	A

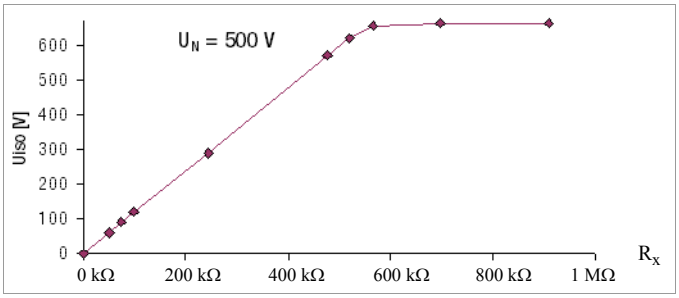
Mechanical Design

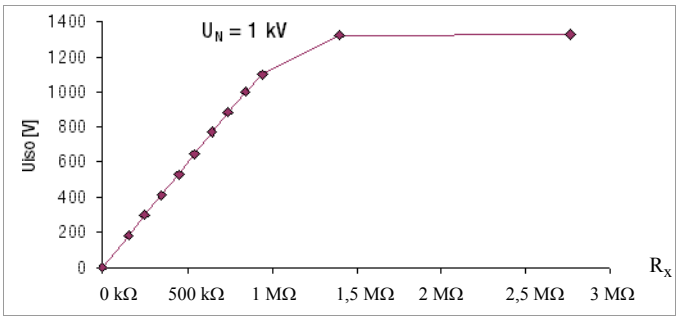
Display	Multiple display with dot matrix 128 x 64 pixels
Dimensions	W x H x D: 10 x 5.25 x 9.5 in (255 mm x 133 mm x 240 mm)
Weight	approx. 11.0 lbs (5 kg) with batteries

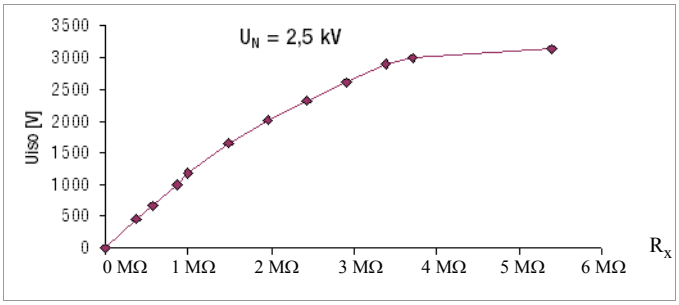
Voltage applied to DUT during Insulation Resistance Test

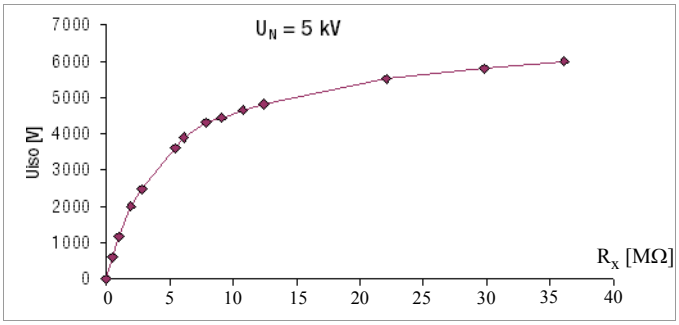
Measuring voltage U on DUT as a function of its resistance R_x at nominal voltages of 100 V, 500 V, 1000 V, 2400 V and 5000 V:







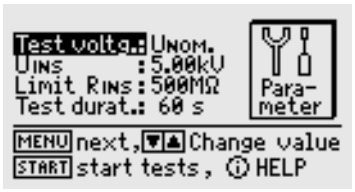


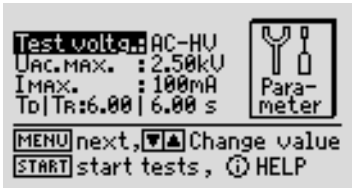


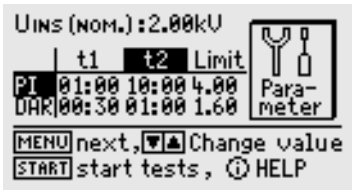
DranISO 5000D
Digital High-Voltage Insulation Tester

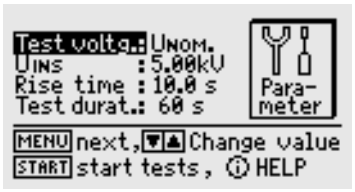
Test Selection

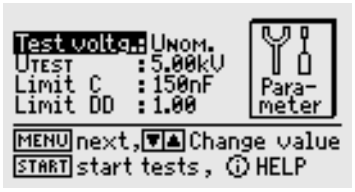
Setting of Parameters

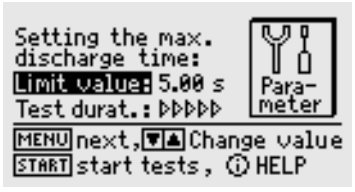






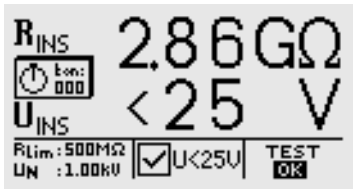






Display of Final Results

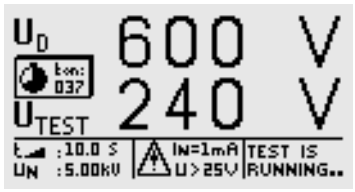
Insulation Test



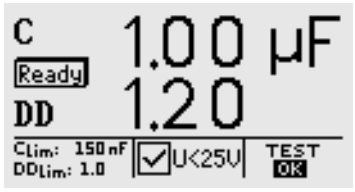
High-Voltage Test Feature B1/B2

Polarisation Index Test

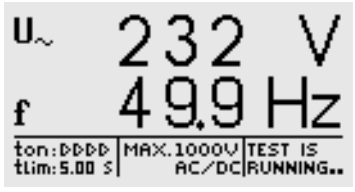
Measurement of Breakdown Voltage



Capacitance Measurement



Voltage Measurement



Included with Basic Instrument

1 high-voltage insulation measuring instrument with permanently connected measurement cables and test probes, 2 alligator clips (5 kV version)
1 mains power cable and 1 interface cable
1 operating instructions
1 DKD Calibration Certificate
(The test instrument can be recalibrated by our calibration service at any time.
We recommend a calibration interval of 1 to 2 years.)

DRANETZ BMI

Dranetz-BMI

1000 New Durham Road

Edison, NJ 08818 USA

Phone - 1 - 800 - 372 - 6832

Fax - 1 - 732 - 248 - 1834

sales@dranetz-bmi.com

www.dranetz-bmi.com