STATE OF THE ART MOTOR TESTER & WINDING ANALYZER

iTIG II-MINI

THE EASIEST TO USE TESTERS ON THE MARKET DELIVERING A NON-DESTRUCTIVE TEST-SET THAT FINDS MORE FAULTS

The iTIG II-MINI motor tester and winding analyzer combines multiple testing technologies into a single light-weight portable instrument. Micro-ohm winding resistance to high frequency surge tests are available with DC Hipot and Surge tests up to 6kV, and higher voltages when used with a Power Pack.

Why Consider an Electrom Motor Tester?

- Find more faults with state of the art high frequency surge test technology.
  - Customers find faults they do not find with other lower-frequency surge testers.
- The easiest tester to use according to our customers, manual to automatic models.
- Powerful time saving trend analysis, reporting tools and data transfer options.
- Modular construction, designed to be upgraded to higher level models without purchasing a new tester.
- Test to voltages as high as 40kV with the addition of a Power Pack for the lightest high voltage test package available on the market.

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WHO USES ELECTROM MOTOR ANALYZERS?

The Electrom Instruments motor testers and winding analyzers are used worldwide throughout industries that use, service, repair, rewind and manufacture electrical rotating machinery, coils, transformers and sensors.

iTIG II-MINI

iTIG II-MINI & Power Pack II

iTIG II & Power Pack II

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Some Advantages for Industrial Users and Motor Repair Companies

Easy to Use: According to our customers the iTIG II is the easiest tester to use. With automated models, each test can be done the same way every time regardless of operator. Preset test parameters and templates are available, and assembled motors can be surge tested without turning the rotor.

Portable, Rugged & Light Weight: The iTIG II-MINI is the lightest automatic 4kV and 6kV motor analyzer available at 25lbs/12kg.

It can control the PP-II which is the only truly portable 18kV to 40kV POWER PACK. With weight less than 50 lbs/23kg at max 30kV/45J surge tests, and less than 90 lbs/41kg at 40kV/120J, the MINI/PP-II test set is ideal for field testing.

Reports: Complete reports are automatically generated, named and stored by the tester with a click of the print button. They can also be generated on a PC.

Information: Information is only entered once and is organized well to meet both motor shop and industrial user needs.

Motor Shops: Reports can be transferred to job number folders in Motor Shop Software directly from the tester via WiFi.

Reliability and Maintenance Programs: In addition to reports with multi-test graphs and tables, test results can be stored automatically in a summary file that opens in Excel or database software on a PC. Each row is a test-set making trend analysis easy.

Training: DON'T USE THE TESTER OFTEN? Our training program will surprise you!

Motor Manufactures and OEMs

Whether you manufacture motors, generators, alternators, reactors, various types of transformers, solenoids or any type of coil, large or small, we usually have a good solution for winding tests.

OUTPUTS

30kV Power Pack II

The iTIG II-MINI coil and motor testers come with DC Hipot and Surge test max output voltages of 4kV and 6kV.

For 12kV and 15kV testers see the iTIG II brochure.

Power Packs with maximum output voltages from 18kV to 40kV for testing large higher voltage motors and generators can be added at any time to iTIG II-MINI models B, C and D. Our Power Packs are the smallest, most portable, high voltage test sets available on the market. See the Power Pack brochure for more information.

PORTABLE, MODULAR, BASIC TO AUTOMATIC

The iTIG II-MINI comes in basic to automatic versions.

High voltage tests can be part of an automated test sequence with the Model D. High accuracy milli-Ohm or micro-Ohm winding resistance measurements are done with a 4-wire Kelvin clamp lead-set.

Model A is a basic tester that does IR, DC Hipot and Surge tests. It has one energized output lead plus ground leads. When testing a 3-phase motor in surge test mode, the “hot” lead is rotated between the three surge tests.

Model B, C and D have a lead switching matrix and 3 output leads that can be energized.

All models can be upgraded to higher level models later, with more automation, more features and higher output voltages.

Key Features	Model A	Model B	Model C	Model D
High Frequency Surge Test	✓	✓	✓	✓
High Voltage Lead Switching		✓	✓	✓
DC Hipot Test	✓	✓	✓	✓
Insulation Resistance	✓	✓	✓	✓
4-Wire Winding Resistance		✓	✓	✓
µΩ Resistance			Optional	✓
Reports		Basic	Advanced	Advanced
Advanced Multi-Coil Tests			Optional	✓
Individual Automatic Tests			✓	✓
Fully Automatic Sequence of High Voltage Tests				✓
Available With Power Packs	Optional	Optional	Optional	Optional

Learn more

REAL EASE OF USE

Application of advanced user interface design techniques and software algorithms creates an intuitive and easy-to-use Windows™ based tester - even with complex testing requirements. According to our customers it is the easiest to use tester they have seen.

The many time saving features include:

- Surge wave voltage range and sweep are automatically set, no need to hold buttons during any tests.
- Report generation done by the tester.
- Automatically track test results over time for reliability and maintenance programs.
- Assembled motor surge test without the need to turn the rotor.
- Preset test templates with all test parameters and limits.
- Single button multi-coil test capability and master coil comparisons.
- Automated analysis features such as armature shorting bar pattern detection.
- Push one button to have a series of tests done automatically, the same way every time.

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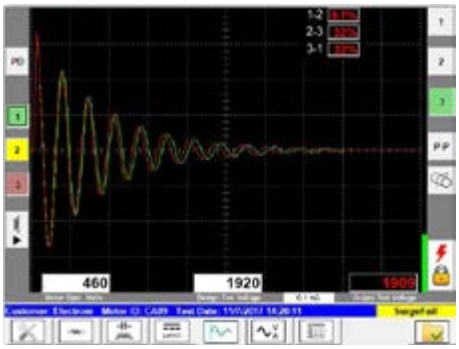
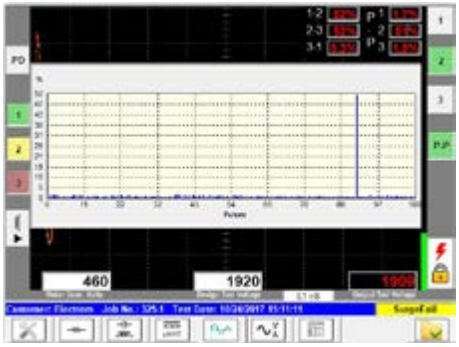
NON-DESTRUCTIVE SURGE AND HIPOT TESTS

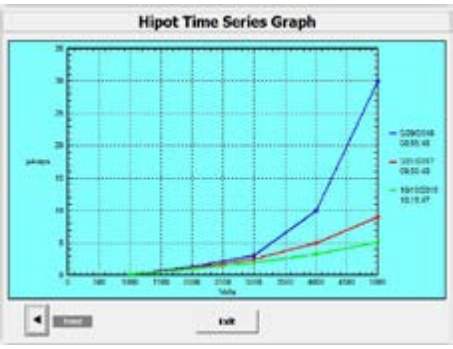
Both the DC Hipot and Surge tests are non-destructive when done correctly because of the low arc energy should one occur. Fast rising Surge test pulses are generated according to IEEE 522 with IGBT switches. The surge tests are automatic, voltage range and sweep (time base) are set by the tester.



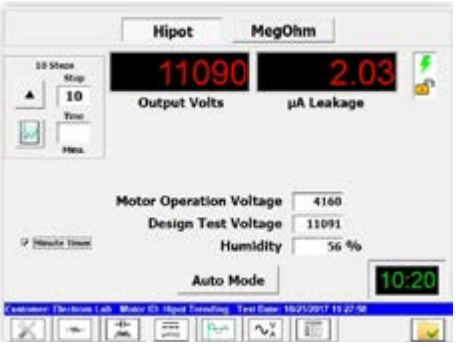
L-L Surge test failure



PtoP surge test, tall bar = phase 2 failure



3 Hipot step tests, breakdown in 3rd test



DC Hipot test screen with MINI controlling a Power Pack

- ## Superior High Frequency Surge Pulses

  The iTIG II and the iTIG II-MINI are the only surge testers capable of generating fully automatic software-controlled surge voltage pulses at high pulse rates up to **50 Hz.** This eliminates ionization dissipation present in low frequency surge testers such as those pulsing at 5Hz and lower. As a result, the iTIG II finds more cases of weak insulation and faults, and at lower voltages than low frequency testers.

- ## Automatic Quick Surge™ and Surge Guard™

  Enables the user to push a button and let the iTIG II run the test with a controlled and limited number of pulses. Quick Surge™ and Surge Guard™ technology make the tests faster, and ensures the right number of surge pulses are applied for optimal non-destructive performance.

- ## Pulse to Pulse Surge Test

  The PtoP surge test automatically raises the surge voltage in small steps at a pulse rate of about 20Hz. The voltage is raised to the design test voltage, and the % wave difference between steps is calculated at each step. The final L-L difference is also displayed. The picture has a graph of the results, one bar per voltage step. The tall bar shows a failure at about 1850V in phase 2.
  The test eliminates the need to turn rotors in assembled motors with rotor influence. It is also used in applications with normal differences in the phase-to-phase surge waves, such as with many concentric wound stators, and in applications where there are no other coils/phases to compare to.

- ## Master Coil and Multi-Coil Tests

  These modes make it easy to surge test a large number of any type of coil, DC armature or stator. Results can be displayed in multiple ways for easy analysis. The iTIG II-MINI D can be set up specifically as a single coil tester by the user, and can automatically surge test a single coil in both directions.

- ## Manual or Automated IR, PI and DC Hipot Tests

  Results can be temperature corrected. Multi-point test graphs for PI, hipot step voltage and ramp tests, and comparisons to previous tests for trend analysis or pre/post repair results are available.

Learn more

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WINDING RESISTANCE

Winding resistance is an important measurement because other tests and measurements will not find some of the problems a resistance measurement will. The measurement is used to find open windings, shorts to ground, wrong turn count, wrong wire gauge, resistive connections, round wire(s) in hand that are not connected in a coil, connection mistakes, resistance imbalance between phases, and in some cases shorted turns.

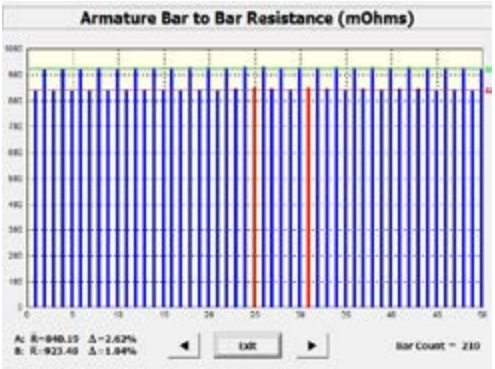
4-wire measurements

All iTIG II winding resistance measurements are done with a highly accurate 4-wire system using Kelvin clamp leads. The measurements can be in milli-Ohms or micro-Ohms depending on the model. Temperature corrected resistance from a few µΩ to 2kΩ is available.

DC Armature Equalization Detection

For bar-to-bar resistance measurements on DC armatures, the iTIG II-MINI D will detect what percent equalization the armature has (option for Model C). If there are two levels of resistance, it calculates an average for each level and the max delta between the high and low measurements for each level. A bar graph is created, the averages are drawn and the faulty bars that exceed failure limits are colored red. The ARP-02 4-wire resistance probes and µΩ measurement are required.

µΩ measurement of 3-phase motor



2 resistance levels; out of spec results are red

Learn more

DC MOTOR TESTING

DC motors are tested with the same instrument used for AC motor tests. The tests used are the same, but the test procedures are different. To make the tests easier, the iTIG II has dedicated user interface screens for DC motor tests.

Multi-coil tests are available. Options for presentation of winding resistance and surge test data include bar graphs.

DC MOTOR TEST ACCESSORIES

ATF-11: ARMATURE TEST FIXTURE

The ATF-11 is used to do Span Surge Tests of DC motor armatures. A span test is done across multiple bars on the commutator.

ASP-22 SURGE PROBE-SET

The ASP-22 is an alternative to the ATF-11 for surge tests across multiple bars (span test).

FS-12: FOOT SWITCH

For starting tests and allowing hands off operation of the iTIG II surge tester. Works with all models.

ARP-02: ARMATURE RESISTANCE PROBES

The 4-wire ARP-02 is mainly used with the multi-coil feature (opt. on the model C, std. on the D) to measure the resistance bar-to-bar on armatures.

Micro Ohm (µΩ) measurements are required since bar-to-bar and equalizer measurements typically are below 1mΩ.

The models come with the following resistance measurements:

Model B: mΩ || C: mΩ, µΩ optional || D: µΩ

The Model D (optional for Model C) has report software that automatically generates reports with Pass/Fail results for each bar-to-bar measurement in a test-set. The results are presented in a bar graph.

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WHAT TYPES OF TEST CAN BE DONE WITH THE iTIG II-MINI AND WHAT WEAKNESSES/FAILURES ARE FOUND

The table below shows some of the measurements and tests that can be done with the iTIG II-MINI winding analyzer. For some, test profiles can be programmed along with default settings and default test voltage formulas.

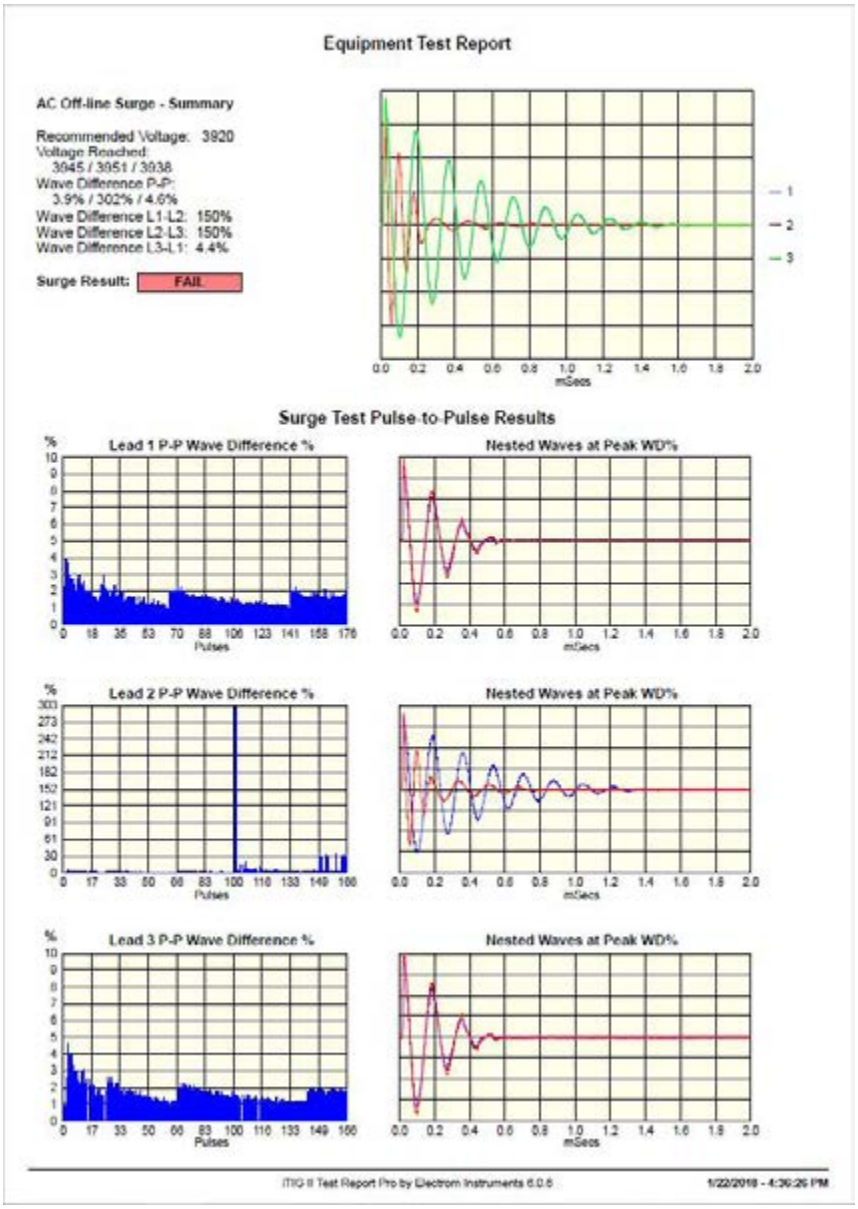
Failure/Test	Surge	DC Hipot	Step Voltage	IR	Low R (μΩ)
Weak Insulation turn to turn, coil to coil, phase to phase	✓				
Shorts turn to turn, coil to coil, phase to phase	✓				✓
Weak ground wall	✓	✓	✓	✓	
Dielectric ground wall strength		✓	✓		
Dirty or moist windings		✓	✓	✓	
Phase unbalanced	✓				✓
Open coils	✓				✓
Reversed coils	✓				
Motor lead connections					✓
Power cable faults	✓	✓	✓	✓	

Test Tips

- **Surge:** The only test that finds turn-to-turn faults that occur at high voltages, provides early warning if the fault is above peak operating voltage.
- **DC Hipot:** Can find phase-to-phase weaknesses when the phases are disconnected.
- **Step Voltage:** Finds at what voltage the ground insulation starts breaking down.
- **IR (megohm):** Mainly a contamination test; can include DAR and/or PI; PASS/FAIL informs whether or not to perform high voltage tests.
- **Low Resistance:** The only test that will find resistive connections, round wire(s) in hand that are not connected in a coil, partial blowout of some coils, and more.

TEST REPORTS

- Reports can be generated automatically on the iTIG II-MINI with a click of the print button, stored, and be transferred to a PC/server at any time later.
- Reports can also be generated on a PC using the TRPro report software.
- Reports are easily customized to include a cover page, your logo and other info, both tabular and graphical views of all the different types of test data, for example:
  - Pre and Post repair data can be included in one report.
  - Pulse-to-Pulse surge data can include both bar charts and nested wave graphs (see example below).
  - Multi-coil surge data can be presented in a summary bar chart and/or with detailed surge waveform graphs that can include other test results next to each surge graph.
  - Hipot step test and PI graphs can include multiple tests to show trends and pre/post repair results.
  - Armature resistance values displayed in bar charts show data grouped by shorting-bar pattern.
  - Your company logo is easily added to all report pages.
- Output formats include: printers, PDF, HTML and Microsoft Word™ format.
- Reports and screens on the testers are available in multiple languages.



Failed L-L and PtoP surge test, one of multiple report pages

TREND ANALYSIS CAPABILITIES

- A full set of built in trend data tables and multi-test graphs for Megohm, PI and Hipot/Step Voltage tests is available.
- Results for each test set can be automatically stored in a line item test summary file. They can be transferred to a server with one click of a button, or automatically with the Export software option.
- Transferred test summary files (test results over time) can be viewed in Excel or in a database program in a spreadsheet format. This makes trend analysis easy.
- The TRPro report software can be used to filter and sort the test data to compare results form multiple motors with the same specifications.

MODEL ID	DATE	DESCR.	OHMS FAIL	R 1-2	SURGE FAIL	WD% 1-2	SURGE VOLTS 1	MEGOHMS	PI/DAR
CA09	8.2.13	Stator	FALSE	1.7557	FALSE	0.051	1309	50000	5.4
CA09	2.20.14	Stator	FALSE	1.7581	FALSE	0.049	1300	50000	5.3
CA09	10.26.15	Stator	FALSE	1.7543	FALSE	0.052	1295	50000	5.1
CA09	12.15.16	Stator	FALSE	1.7591	TRUE	0.122	1305	50000	5.3

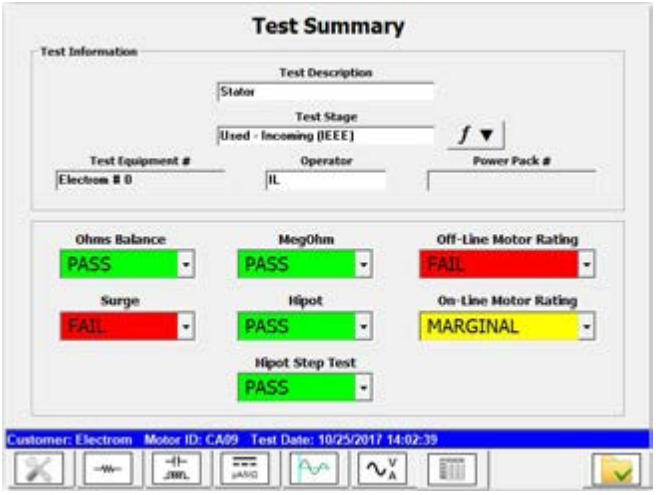
Some columns from the test summary CSV file. The file includes a total of 40 columns of data.

DATA TRANSFER

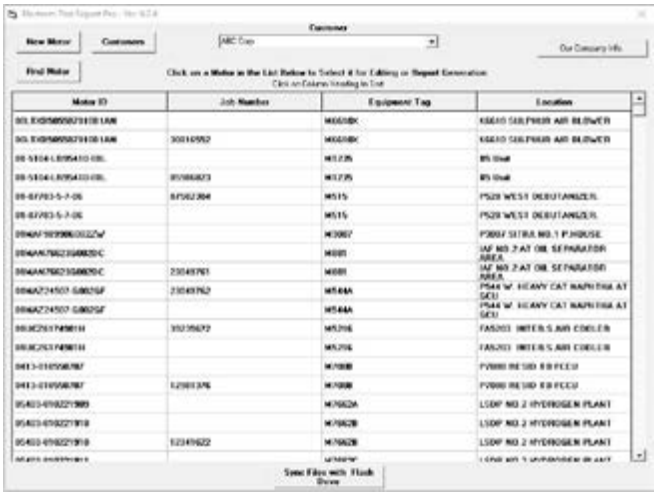
- Motor data, test data and complete reports can be exported from the iTIG II-MINI with one click using flash drives or Wi-Fi.
- Transfers to a PC or server can be accessed by multiple people.
- Reports can go directly to job number folders in systems like MotorBase® and ACS.

CUSTOMER OR MOTOR DATABASE IMPORT

When purchasing an ITIG II for the first time or for a new location, existing customer or plant data, motor or model data can be imported from databases or spreadsheets. This saves the operator time and eliminates entry mistakes and duplications.



Overview screen of test results, always available. Click tabs at the bottom to display results for each test. Repeat any individual test before the test set is closed.



Customer and motor list screen, TRPro report program for PCs. Easily search for key data and sort the table by column heading, similar to the motor list screen in the Model C & D.

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SPECIFICATIONS

Highest standards of instrumentation design.

Providing superior measurement accuracy in all phases of testing.

- High precision 4-wire µΩ winding resistance measurements.
- High precision leakage current measurement.
- Stable high precision high voltage generation.

iTIG II-MINI Specifications per Model	4kV	6kV
Models available: 1 output lead, 3 ground leads 3 output leads with switching matrix, 1 ground TRPro report software included with Models	 A B, C, D B, C, D	 A B, C, D B, C, D
Surge		
Max output Voltage	4 kV	6 kV
Pulse Repetition Rate	50 Hz	50 Hz
Surge Voltage Accuracy	10%	10%
Capacitance - discharge	40 nF	40 nF
Max Surge Energy	0.32 J	0.72 J
DC IR and Hipot		
Max Output Voltage	4 kV	6 kV
Voltage accuracy	2%	2%
Current resolution	0.01 µA	0.01 µA
Current accuracy	2%	2%
Max resistance	400 GΩ	600 GΩ
Min resistance	0.25 MΩ	0.25 MΩ
Resistance accuracy	4%	4%
Current trip-out	10-2,000 µA	10-2,000 µA
Winding Resistance		
Resolution, Model D	1 µΩ	1 µΩ
Accuracy 100µΩ - 2kΩ	0.5%-0.1%	0.5%-0.1%
Resolution, Models B & C (µΩ option for C)	1mΩ	1mΩ
Accuracy 1mΩ - 2kΩ	0.1%±0.5mΩ	0.1%±0.5mΩ
Power and Case Properties		
Input Power	100-240 VAC	100-240 VAC
Fuse size (250V)	5 A	5 A
Dimensions, cm	50 x 40 x 19	50 x 40 x 19
inches	19.8 x 15.6 x 7.5	19.8 x 15.6 x 7.5
Weight (model/option dependent)	25 lbs 12 kg	25 lbs 12 kg

GET IN TOUCH

If you have any questions about our products or services, please do not hesitate to reach out to us or one of our trusted distributors around the world.

For information on other Electrom Products please visit our website. Use the following links to find more information on the iTIG II with max outputs up to 15kV and Partial Discharge measurement capabilities, as well as the higher voltage portable Power Packs with Surge and DC Hipot outputs from 18kV to 40kV.

iTIG II & 30kV Power Pack II

iTIG II

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Quotes and information

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