Positron Insulator Tester

Safe, Simple and Accurate

The Positron Insulator Tester is a revolutionary analytical approach to evaluating suspension insulators, station posts, bushings and lightening arresters. It tests for the electrical integrity of live insulators, and automatically measures and records the electrical field along the insulator. It works on all types of insulators (porcelain, composite, glass, etc.) and is a safe, simple and accurate insulator testing tool.

The operational integrity of high voltage insulators is a priority, particularly when you consider that a damaged, electrically deficient insulator can lead to system failure, serious injury, or loss of life. Positron’s Insulator Tester represents a major advancement in insulator maintenance, in that it allows for the safe and reliable evaluation of high voltage insulators.

Why is insulator testing so important?

• Outages due to insulator failure are costly
• Live-line work requires that the insulators be in good condition for lineman safety
• Critical failure can cause long term damages as well as equipment and financial loses

Benefits

• Allows early detection of leaking insulation
• Provides assessment of rate of degradation over time
• Field readings can be stored in a database for future reference and analysis
• Includes insulator counting and location coordination
• Enhanced operator safety
• Single button operation makes it easy to use
• No direct electrical contact therefore danger is minimized
• Allows for the testing of all types and sizes of insulators in use today

Detects the following types of problems:

• Punctured insulators
• Leaking insulators
• Surface contamination
• Carbon tracking
• Captive moisture
Positron Uses the Electric Field

Positron’s Insulator Tester allows for the diagnostic evaluation of both Porcelain and Composite insulators.

- The Insulator Tester measures the AC electric field surrounding porcelain and composite insulators
- The field is proportional to the voltage across an insulator and drops at a defect location
- The electric field is read and stored on each insulator

How it Works

The image below depicts the use of an Insulator Tester on a V String

Steps to follow:
1. The operator positions himself and presses the push button on the probe and the logger (optional).
2. The tester is placed on the string a few insulators below the grounded end.
3. The tester is slid back to the beginning of the string and kept stationary for at least 10 seconds until a long beeping sound is heard.
4. The tester is slid to the line end of the string and then back to the starting point. The buzzer sounds each time a reading is taken at each insulator.
5. The tester is removed from the string by making sure a continuous sound is heard (indicating a successful scan) and then the push button is pressed to store the data.

Key Features

Microprocessor Based Technology
Test results are acquired and stored by an onboard microprocessor allowing readings to then be uploaded to any PC-based workstation for graphical display, analysis and long term comparisons.

Compatible with Standard Field Equipment
All units include a universal hot stick mounting bracket compatible with standard industry hot sticks.

Tests Porcelain, Composite, Station Post and other Insulator Applications
Three easy to use portable Tester units allow for the testing of all types and sizes of insulators in use today.

Lightweight and Durable
The Positron Insulator Testers are lightweight, durable and engineered to withstand field conditions. They come secure in a ruggedized carrying case for convenient portability and field durability.

Optional Data Logger
The data logger is used to identify each insulator string to be tested, eliminating the need to take on-site handwritten notes while testing. The logger stores the information from each insulator string tested.
Composite Insulator Tester

Single button operation makes the Composite Tester very easy to use. The operator simply turns on the unit, slides the Tester across the string and the test is complete. There is no direct electrical contact so danger is minimized on marginal insulators.

- Used for Polymer or Composite insulators
- Sled mounted (custom design sled available)
- Best for insulators of more than 4 skirts
- Captures up to 15,000 readings
- Rechargeable battery
- Adjustable skid for different insulator diameters from 4.3” to 6.7” (10.9 to 17 cm)

Data Port - The Tester unit’s data port allows uploading of data to a PC-based workstation for graphical display, analysis and storage. ON/OFF power switch located under cover.

Skid - Adjustable skid for different insulator diameters

Universal Hot Stick Mounting Bracket

Bluetooth Transmitter

Field Probe

Data Logger

Push Button
Red Light

Sled
Porcelain Insulator Tester

Single button operation makes the Porcelain Tester very easy to use. The operator simply turns on the unit, slides the Tester across the string and the test is complete. There is no direct electrical contact so danger is minimized on marginal insulators.

- Used for Porcelain and Glass insulators
- Sled mounted (custom design sled available)
- Best for insulator strings of 4 bells or more
- Captures up to 15,000 readings
- Rechargeable battery
- Adjustable skid for different insulator diameters from 9” to 13” (22.9 to 33 cm)
Universal Insulator Tester

The Universal Tester can be used for various shapes of insulators on lower voltage applications (<100KV). The Universal Tester uses an actuator switch instead of a sled.

- Used on all types of insulators (Porcelain or Composite)
- Ideal for substation environments (conical shaped insulators, bushings, station posts, lightning arresters, etc)
Examples of Insulator Test Results

Graphical output of a damaged insulator (#15) of a string of Porcelain Insulators

Graphical output of 2 damaged composite insulators

Examples of Insulator Test Results

Graphical output of a damaged Composite Insulator (Carbon tracking of 8 skirts long)
## Insulator Tester Specifications

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>PORCELAIN</th>
<th>COMPOSITE</th>
<th>UNIVERSAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>378130/2 - 60Hz</td>
<td>378206/2 - 60Hz</td>
<td>378265/2 - 60Hz</td>
</tr>
<tr>
<td></td>
<td>378130/4 - 50Hz</td>
<td>378206/4 - 50Hz</td>
<td>378265/4 - 50Hz</td>
</tr>
<tr>
<td>Maximum insulators/skirts per string</td>
<td>55 insulators per string</td>
<td>150 skirts per insulator</td>
<td>40 (80 readings) tested points per insulator</td>
</tr>
<tr>
<td>Minimum insulators/skirts per string</td>
<td>4 insulators per string</td>
<td>5 skirts per insulator</td>
<td>3 (6 readings) tested points per insulator</td>
</tr>
<tr>
<td>Maximum corona protection</td>
<td>1 million Volts</td>
<td>1 million Volts</td>
<td>1 million Volts</td>
</tr>
<tr>
<td>Minimum electrical field</td>
<td>10 kV/meter</td>
<td>10 kV/meter</td>
<td>2 kV/meter</td>
</tr>
<tr>
<td>Maximum memory capacity</td>
<td>300 strings or 15,000 readings, whichever comes first</td>
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</tr>
<tr>
<td>Maximum scanning speed</td>
<td>6 insulators per second</td>
<td>5 skirts per second (Max)</td>
<td>0.5 skirts per second (Min)</td>
</tr>
<tr>
<td>Maximum time between uploading of cumulative data</td>
<td>12 days</td>
<td>12 days</td>
<td>12 days</td>
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<tr>
<td>Maximum time between battery charges</td>
<td>12 hours</td>
<td>12 hours</td>
<td>10 hours</td>
</tr>
<tr>
<td>Minimum time of battery recharging</td>
<td>10 hours (one night)</td>
<td>10 hours (one night)</td>
<td>10 hours (one night)</td>
</tr>
<tr>
<td>Time tag update interval</td>
<td>16 seconds</td>
<td>16 seconds</td>
<td>16 seconds</td>
</tr>
<tr>
<td>Operating temperature range for the probe</td>
<td>-22°F to 122°F (-30°C to 50°C)</td>
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<td>-22°F to 104°F (-30°C to 40°C)</td>
</tr>
<tr>
<td>Operating temperature for the logger</td>
<td>32°F to 122°F (0°C to 50°C)</td>
<td>32°F to 122°F (0°C to 50°C)</td>
<td>32°F to 122°F (0°C to 50°C)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>14” x 19” x 9” (35.5 x 48 x 23 cm)</td>
<td>12” x 11” x 6” (30.5 x 28 x 15 cm)</td>
<td>10.6” x 4.7” x 2” (27 x 12 x 5 cm)</td>
</tr>
<tr>
<td>Weight (logger excluded)</td>
<td>3.5 lbs (1.59 kg)</td>
<td>2.4 lbs (1.09 kg)</td>
<td>1.76 lbs (0.8 kg)</td>
</tr>
<tr>
<td>Size of insulator</td>
<td>9” to 13” (23 to 33 cm)</td>
<td>4.3” to 6.7” (11 to 17 cm)</td>
<td>Calibrated at factory, no subsequent calibration required</td>
</tr>
<tr>
<td>Calibration</td>
<td>Calibrated at factory, no subsequent calibration required</td>
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</tbody>
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**Note:** Application on AC lines only

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