

Positron Insulator Testers for High Voltage Live Line Testing

Specifications



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 losses

Benefits

- Enhanced operator safety
- Allows early detection of leaking insulators
- Provides assessment of rate of degradation for future reference and analysis
- Includes insulator counting and location coordination
- 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



Detects the following types of problems

- Leaking insulators
- Punctured insulators
- Surface contamination
- Carbon tracking
- Captive moisture

Safe, Simple and Accurate

The Positron Insulator Testers are revolutionary, simple to use lightweight tools that record defects and dangerous conditions on energized suspension insulators, station posts, bushings and lightning arresters. They measure the electric field along the insulators, record the electrical field and all conductive insulator defects. They can be used on all types of insulators (Porcelain, Composite, Glass* for contamination assessment, etc.) and are safe, simple and accurate.

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 Testers are a major advance in insulator maintenance, they allow for the safe and reliable evaluation of high voltage insulators. Simply slide the tester sled along the insulator or insulator string and the results are automatically processed and available.

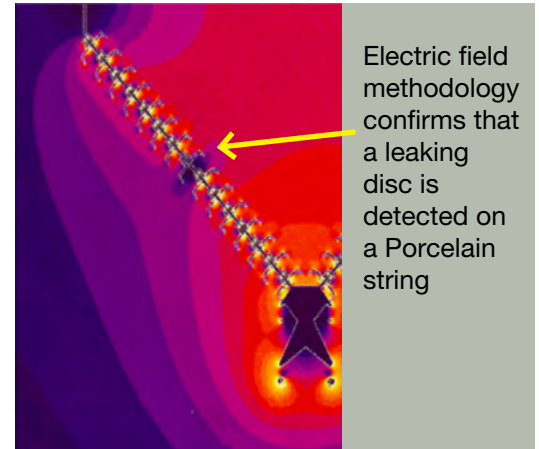
Electric Field Methodology

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

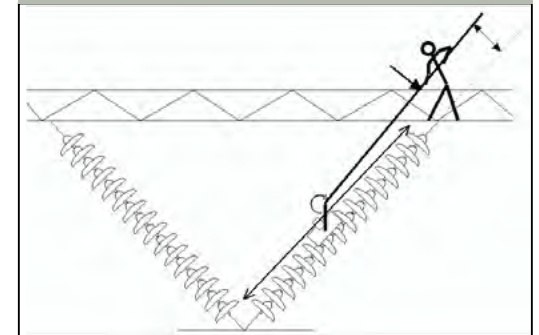
- The Insulator Tester measures the AC electric field surrounding porcelain and composite insulators
- The field is proportional to the voltage across an insulator and drops at a conductive defect location
- The electric field is read and stored on each disc or skirt

How it works (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.



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



Features

Microprocessor Based Technology

Test results are acquired and stored by an onboard microprocessor allowing readings to then be uploaded to any PC-based laptop 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, Glass, Station Post and other Insulators

Tester units allow for the testing of all types and sizes of insulators.

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 (Mini Laptop)

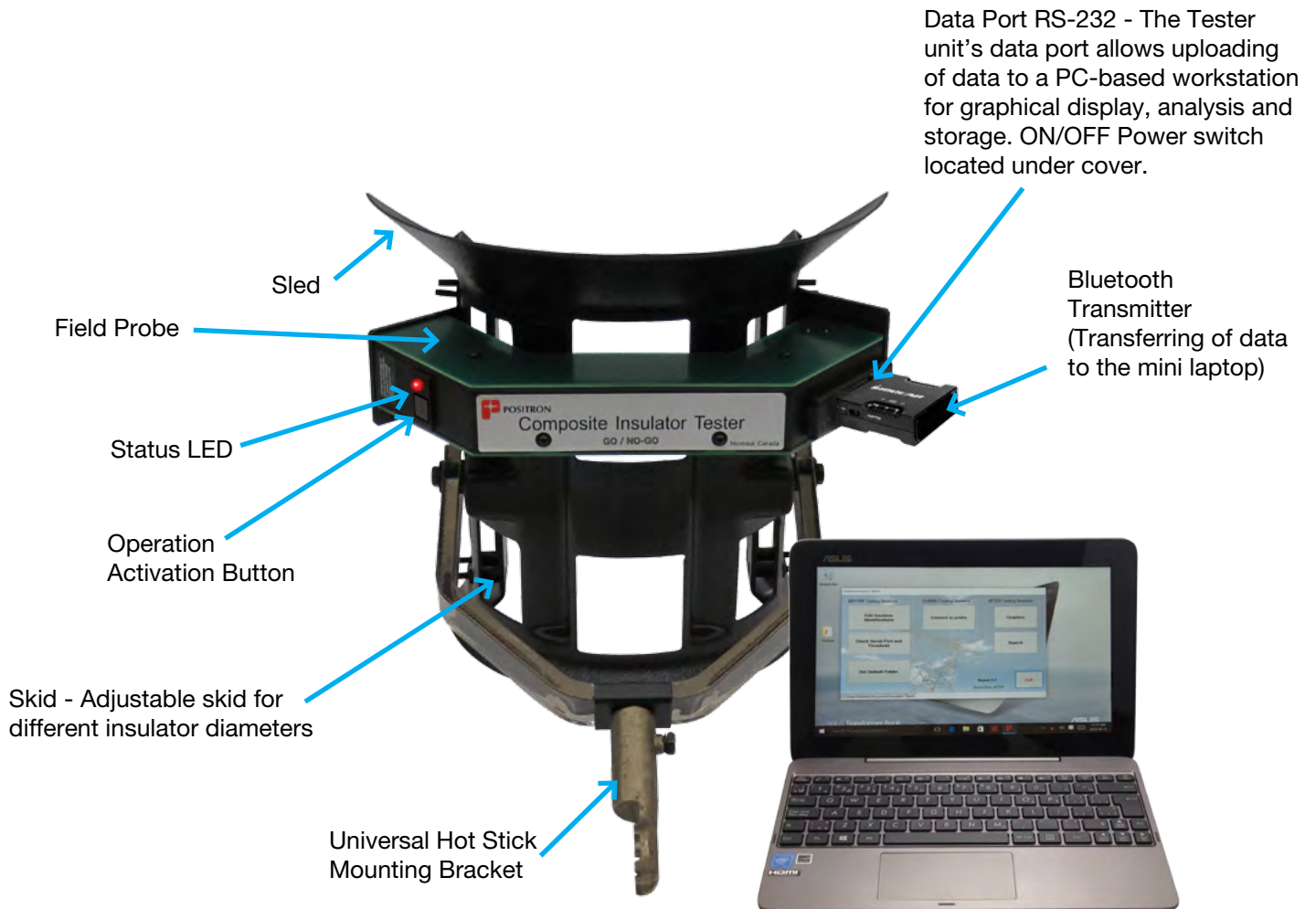
The data logger is used to identify each insulator string to be tested, eliminating the need to take on-site handwritten notes while testing. The logger stores the identification of each insulator string tested.

* for contamination assessment

Composite Insulator Tester

Single button operation makes the Composite Tester easy to use. The operator simply turns on the unit, slides the tester along the insulator string. There is no direct electrical contact so danger is minimized on marginal insulators.

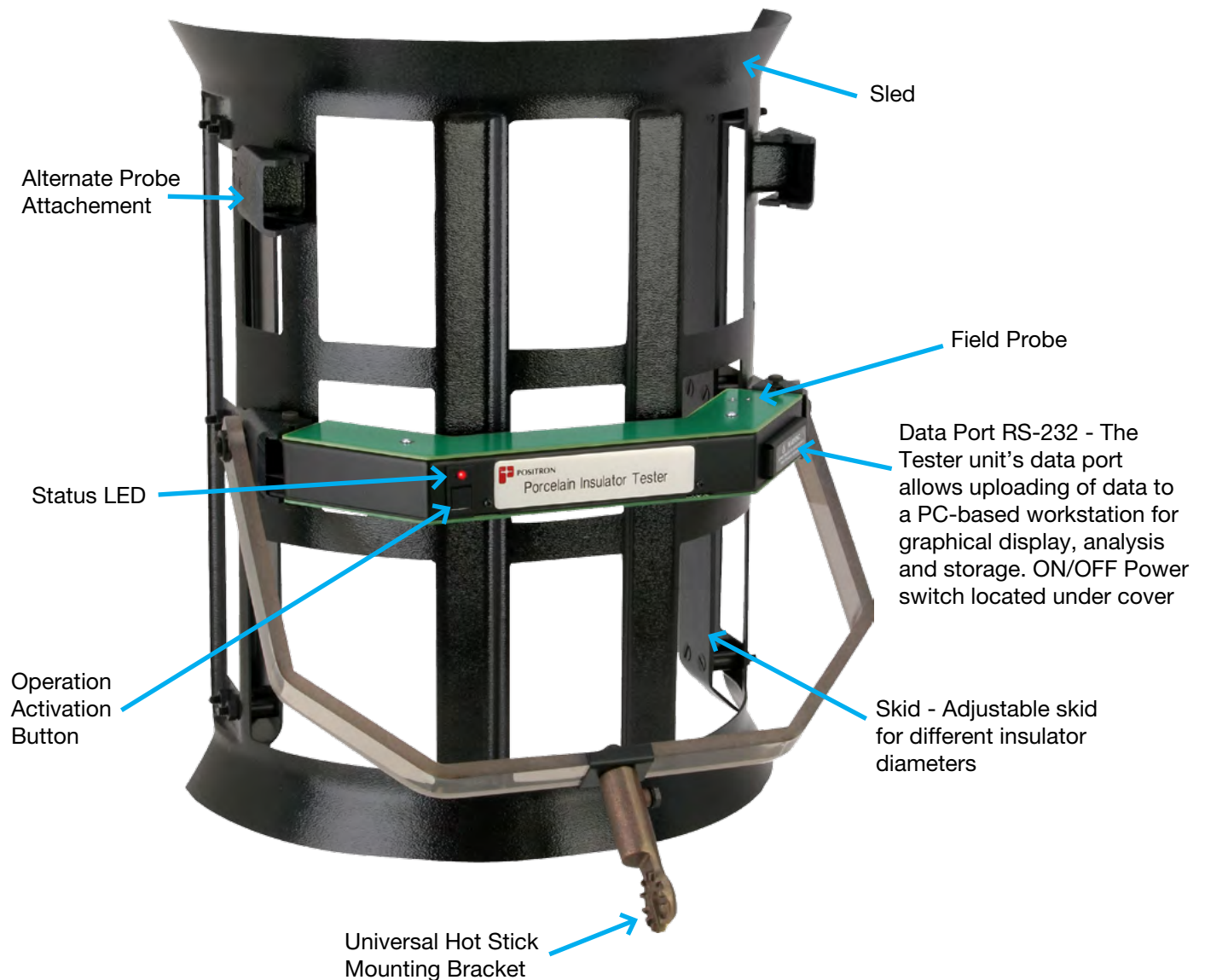
- Used for Polymer or Composite NCI (Non Ceramic Insulators)
- Sled mounted (custom design sled available)
- Best for insulators of more than 10 skirts
- Captures up to 15,000 readings
- Rechargeable battery
- Adjustable skid for different insulator diameters from 4.3" to 6.7" (10.9 to 17 cm)
- Also available with GO/NO-GO feature capable of determining if it is safe for transmission personnel to perform work on live AC transmission power lines



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 insulator discs. 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)
- Provides instant status reporting and danger conditions



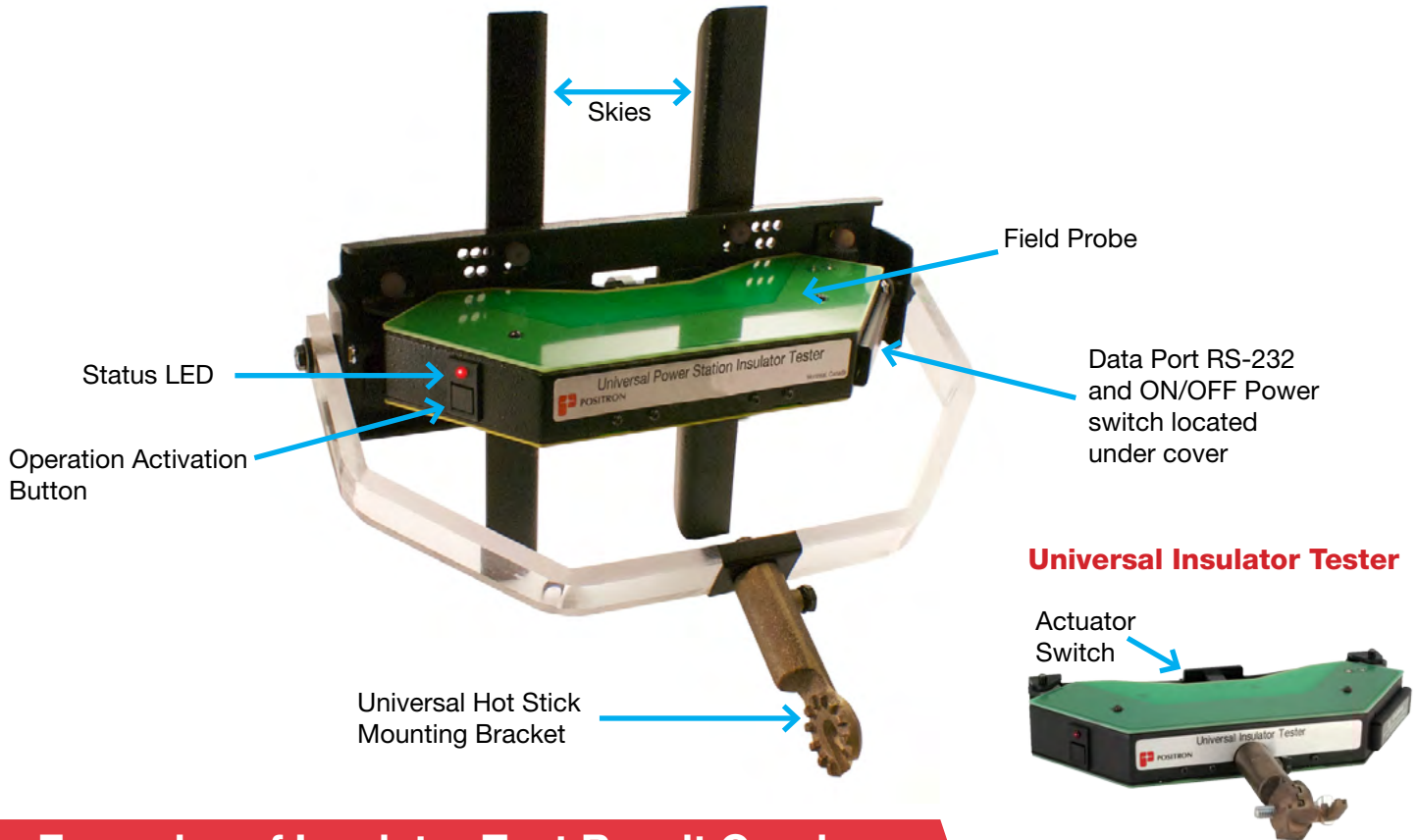
* for contamination assessment

Universal Insulator Tester

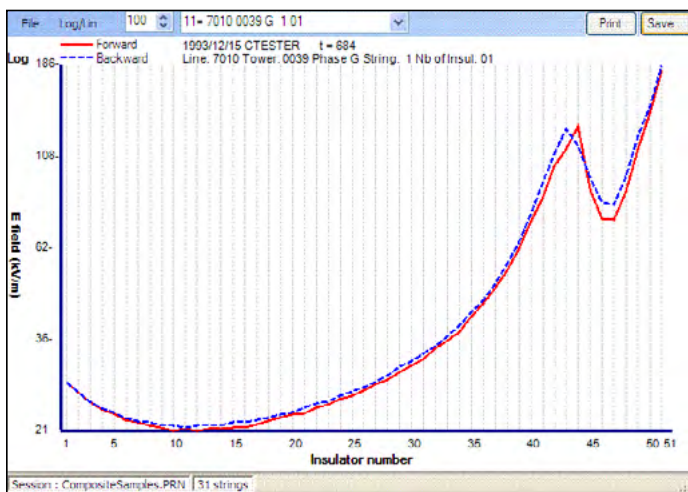
The Universal Tester can be used for various shapes of insulators and on lower voltage applications (from 7 kV to 115 kV). The Universal Tester uses an actuator switch instead of a sled.

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

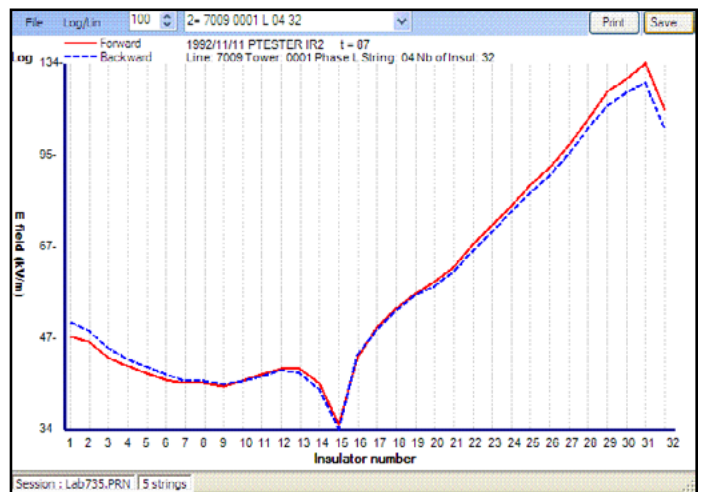
Universal Substation Insulator Tester



Examples of Insulator Test Result Graphs



Graphical output of a damaged Composite Insulator (Carbon tracking of 8 skirts long from #43 to #51)



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

Insulator Tester Specifications

	PORCELAIN	COMPOSITE	UNIVERSAL
Parameter	Model #		
	3781301P/60 - 60Hz 3781301P/50 - 50Hz	3782091C/60 - 60Hz 3782091C/50 - 50Hz	Universal Substation Tester (with skies) 3782652U/60 - 60Hz 3782652U/50 - 50Hz Universal Tester 3782651U/60 - 60Hz 3782651U/50 - 50Hz
Maximum discs/skirts per insulator string	55 discs per insulator string	150 skirts per insulator string	40 tested points per insulator (80 readings)
Minimum discs/skirts per insulator string	4 discs per insulator string	10 skirts per insulator string	3 tested points per insulator (6 readings)
Maximum corona protection	1 million Volts	1 million Volts	1 million Volts
Minimum electrical field	10 kV/meter	10 kV/meter	7 kV/meter
Maximum memory capacity	300 strings of insulators or 15,000 readings, whichever comes first	300 strings of insulators or 15,000 readings, whichever comes first	300 strings of insulators or 15,000 readings, whichever comes first
Maximum scanning speed	6 discs per second	5 skirts per second (Max) 0.5 skirts per second (Min)	Manual scanning
Maximum time between uploading of cumulative data	12 days	12 days	12 days
Maximum time between battery charges	12 hours	12 hours	10 hours
Minimum time of battery recharging	10 hours (one night)	10 hours (one night)	10 hours (one night)
Time tag update interval	16 seconds	16 seconds	16 seconds
Operating temperature range for the probe	-22°F to 122°F (-30°C to 50°C)	-22°F to 122°F (-30°C to 50°C)	-22°F to 122°F (-30°C to 50°C)
Operating temperature for the logger	32°F to 122°F (0°C to 50°C)	32°F to 122°F (0°C to 50°C)	32°F to 122°F (0°C to 50°C)
Dimensions	W: 14" x H: 19" x D: 9" (35.5 x 48 x 23 cm)	W: 12" x H: 11" x D: 6" (30.5 x 28 x 15 cm)	W: 10.6" x H: 4.7" x D: 2" (27 x 12 x 5 cm)
Weight (logger excluded)	3.5 lbs (1.59 kg)	2.4 lbs (1.09 kg)	1.76 lbs (0.8 kg)
Size of insulator	9" to 13" (23 to 33 cm)	4.3" to 6.7" (11 to 17 cm)	Any
Calibration	Calibrated at factory, no subsequent calibration required	Calibrated at factory, no subsequent calibration required	Calibrated at factory, no subsequent calibration required

Note: Application on AC lines only

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