UltraTEV Plus²™

Make Partial Discharge discovery simple

www.eatechnology.com

The UltraTEV™ Plus² brings together techniques and a wealth of experience and insight to make it easier than ever to avoid failures on your high voltage network.

This latest hand-held Partial Discharge (PD) instrument is easy to use, and combines additional sensing capabilities with real time advanced analytical features. The ability to distinguish true PD from noise and other interference means that you can make better decisions, save time, money and enhance safety.

Business Benefits

- Detect problems early by using the in-built PD classification and interpretation tools to avoid dangerous and damaging failures and minimise network outages
- Accurately measure and locate PD activity, enabling you to identify potential faults before they lead to failures
- Optimise maintenance cycles and asset life through a better understanding of asset condition, comparing PD results over time to identify trends
- Increase on-site productivity by using Survey mode to rapidly collect key condition information in an accurate and consistent manner
- Detect PD in a wide range of plant, cable and overhead line assets using a single instrument with dedicated accessories
- Easy to use with an intuitive and user friendly interface meaning little training is needed to become competent
- Identify deteriorating assets and trends by comparing current measurements to previous results stored locally on 'smart' Near Field Communication (NFC) tags
- Integrate PD surveys into your asset management process by seamlessly transferring data via zip or CSV file into your corporate system

User Features

- Provides numerical and audible ultrasonic readings for classification of PD
- Provides numerical and audible TEV readings for interpretation of PD
- Use the Locator probe accessory to accurately locate multiple PD sources
- Use the Radio Frequency Current Transformer (RFCT) to detect PD activity in cables
- Phase resolved and waveform displays allow more reliable and conclusive decisions to be made based on measured PD
- Wi-Fi connectivity allows survey results to be easily synchronised with asset management systems
- Use NFC tags attached to the assets to store and retrieve key results
- Menu-driven backlit colour touchscreen and buttons (can be used when wearing gloves) giving an intuitive user experience
- Multi language options
- Long-life rechargeable internal Lithium-Ion (Li-Ion) battery
- Temperature and Humidity sensor

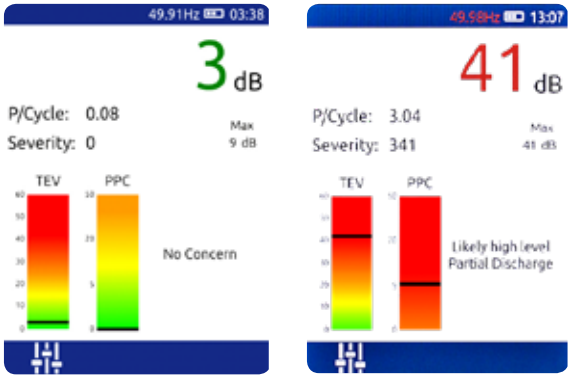
We have been using EA Technology's products successfully for detecting Partial Discharge and other condition monitoring solutions for many years".

Neil Dobbs HV Compliance Manager-British Steel

Capturing the results and transferring them easily

The UltraTEV Plus[2] has NFC capability to store Asset data on programmable tags. It also has the ability to transfer the results directly on to your PC via Wifi or USB / SD Card. The survey functionality allows details of substations and assets to be entered on the screen, guiding users through the simple survey process. Screen shots can also be captured and saved.

Interpreting the condition of your electrical assets



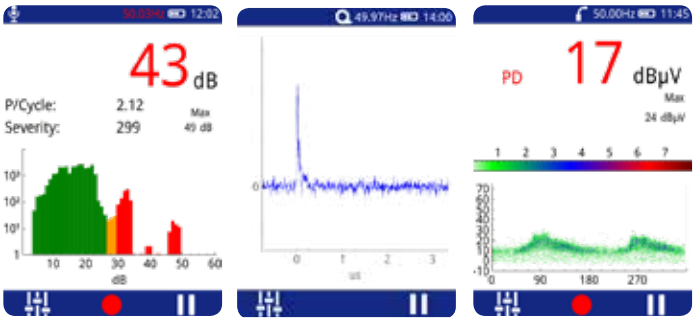
The UltraTEV Plus[2] has been designed to make asset inspections easy. The instrument helps the operator understand what the results mean by interpreting the data and displays clear information and instructions.

Partial Discharge Detection and Advanced Analytics

The UltraTEV Plus[2] has the ability to measure PD in cables and cable accessories using an RFCT as well as established techniques for surface PD (Ultrasonic) detection and internal PD (TEV) detection on switchgear.

The new advanced analytics allow PD measurements to be examined more precisely in real time or after the inspection:

- Phase plots: helps to differentiate between noise patterns and real PD
- Waveform capture: examines amplitude of individual pulses, for PD Characteristics
- Histograms: assists with identification of multiple sources of PD and noise discrimination



Histogram Waveform Phase Resolved

Range of Kits and Uses

The UltraTEV Plus[2] is a multifunctional instrument that can be used to rapidly survey the condition of whole substations and check that working environments are safe. Changes in PD activity levels can be compared between assets and analysed over time, providing a clear indication if further investigation is required. To meet your needs we offer the following instrument kits:

Kit 1	Metal clad Switchgear	Standard kit for Switchgear condition assessment includes headphones & battery chargers.
Kit 2	Metal clad Switchgear Cables	This kit has additional external sensors and includes an RFCT, allowing quick and easy condition assessment of your cables*
Kit 3	Metal clad Switchgear Cables Outdoor assets	With the UltraDish™ option included in Kit 3, PD activity can be measured in overhead assets, offering a comprehensive condition assessment package
Kit 4	Locator probe kit 4 can be added to any of the above kit types	Specifically designed carry case containing Locator probe, 2m lead and 6m lead

* Access to cable earth required.

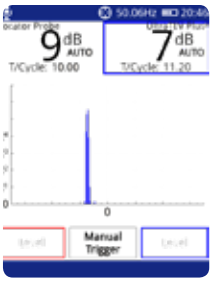
Multiple Functions

UltraTEV Plus² Locator probe

The UltraTEV Plus² Locator probe accessory has been designed to attach to the UltraTEV Plus², ensuring that all your PD needs can be catered for in one instrument.

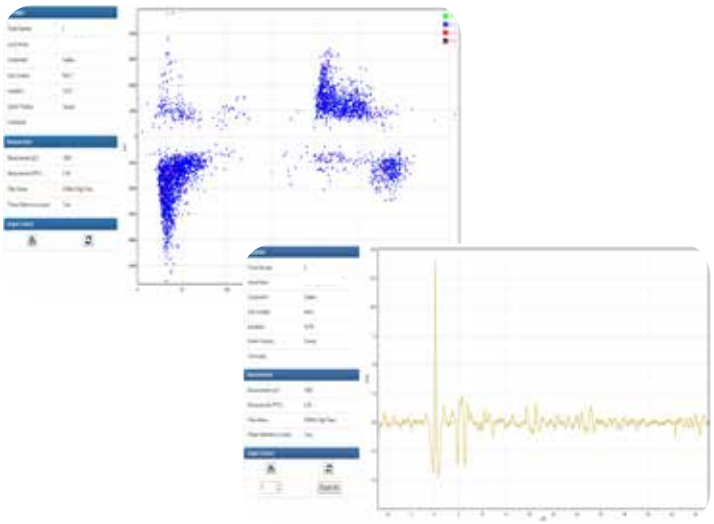
The Locator probe is used in conjuction with the UltraTEV Plus² TEV sensor to locate the source of PD activity, using time-of-flight measurements.

Advanced software enables the instrument to easily locate PD at multiple discharge sites.



UltraTEV Plus² Cable PD

PD activity in cables is measured by attaching the split-core RFCT accessory around the cable earth. The results are displayed on the instrument in pico Coulombs (pC) as numerical values.



Other Accessories

Flexi Sensor

The Flexi Sensor accessory is used to detect ultrasonic PD activity in hard to reach places where access is limited.

UltraDish

The UltraDish accessory is used to detect ultrasonic PD activity in overhead assets or at a distance.

Contact Probe

The Contact Probe is used to detect ultrasonic PD in sealed chambers.

Environmental Sensor

The Environmental Sensor is used to measure local temperature and humidity.

NFC Tags

NFC tags can be used to hold key asset information and results locally on the assets.

Headphones

The low-profile Headphones are comfortable to wear and are compatible with other PPE

The UltraTEV Plus² Survey Process

1. Enter Substation Data

Details of substations and assets can be uploaded from NFC tags or manually entered on screen.

2. Survey and Capture Data

The instrument guides users through the simple PD survey process, quickly capturing high quality diagnostic data. The new advanced analytics allow measurements to be examined more precisely in real-time or after the PD survey has been completed. Asset data, results and ultrasonic activity, as well as screen shots can all be recorded for subsequent review and analysis.

3. Transfer Asset Information

The UltraTEV Plus² has the ability to transfer data directly to your PC or corporate system via Wifi or USB / SD Card.

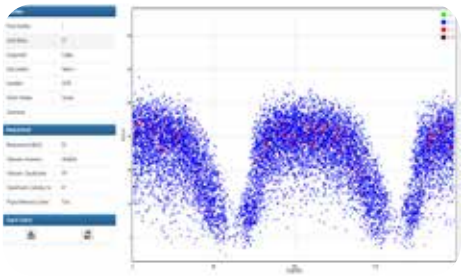
The UltraTEV Plus² - Kit 3 stored in the specifically designed carry case.

The UltraTEV Plus² Locator probe stored in the specifically designed carry case.

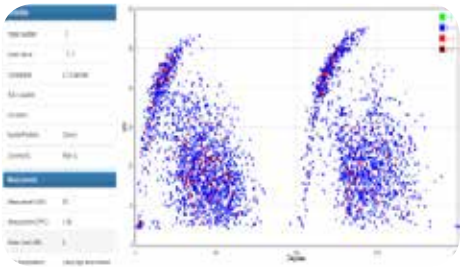
4. Analysis of Data

Asset data, results and ultrasonic activity, as well as screen shots can all be recorded for subsequent review and analysis.

Example of classification of readings asset information that can be transferred and sent to EA Technology or your in house PD experts for review.



Example of ultrasonic surface PD asset information that can be transferred and sent to EA Technology or your in house PD experts for review.



Example of internal void PD measured using the TEV sensor. Asset information can be transferred and sent to EA Technology or your in house PD experts for review.

Specification: UltraTEV Plus²

TEV	
Sensor	Capacitive
Measurement Range	0 – 60dBmV
Resolution	1dB
Min Pulse Rate	10Hz (rolling displays only)
Locator probe precedence	0.3ns equivalent to 10cm
Discharge Pattern Phase Reference	Optical, E-Field and Manual

ULTRASONIC	
Measurement Range	-7dBµV to 68dBµV
Resolution	1dB
Accuracy	±1dB
Transducer Sensitivity	-65dB (0dB = 1volt/µbar RMS SPL)
Transducer Center Frequency	40 kHz
Transducer Diameter	16mm
Heterodyning Frequency	38.4 kHz

CABLE PD	
Sensor	RFCT
Measurement Range	0 – 25,000pC
Resolution	98pC
Accuracy	±98pC
Min Pulse Rate	10Hz

HARDWARE	
Enclosure	Self-colour injection moulded plastic case
Indicators	Colour back-lit LCD Charging indicator LED
Controls	Touch screen
Connectors	TEV/Ultrasonic Lemo mixed socket TEV Lemo mixed socket Cable PD BNC External Ultrasonic sensor Lemo multipole socket Non-contact temperature sensor Lemo multipole socket 3.5mm stereo headphone socket USB 1.1 port type-A receptacle 2.1mm 18V DC charger input
Headphones	Min. 8 ohms

ENVIRONMENTAL	
Operating Temperature	0 – 55 degrees C
Humidity	0 – 90% non-condensing
IP Rating	42

POWER SUPPLIES	
Internal Batteries	3.7V 27.2Ah Lithium-Ion
Typical Operating Time	approx. 13 hours
Battery Conservation	Automatic low battery voltage ‘switch off’

Specification: UltraTEV Plus² Locator probe

TEV	
Sensor	Capacitive
Measurement Range	0 – 60dBmV
Resolution	1dB
Measurement Bandwidth	3 - 80 MHz
Accuracy	±1dB

HARDWARE	
Enclosure	Self-colour injection moulded plastic case
Indicators	Power indicator LED
Controls	3 x push-buttons
Connectors	Cable to UltraTEV Plus²

DIMENSIONS	
Size	201mm x 76mm x 34mm with 2m long cable
Weight	00.36kg

ENVIRONMENTAL	
Operating Temperature	-20 – 50 degrees C
Humidity	0 – 90% non-condensing
IP Rating	54

Global support

The UltraTEV Plus[2] can be supplied and supported anywhere in the world, through our network of international sales offices and distribution partners. We provide excellent lifetime support for this system, including:

- Installation and commissioning
- Training
- Lifetime technical support
- Online data analysis and reports

Our expertise

We provide world-leading asset management solutions for power plant and networks.

Our customers include electricity generation, transmission and distribution companies, together with major power plant operators in the private and public sectors.

Our products, services, management systems and knowledge enable customers to:

- Prevent outages
- Assess the condition of assets
- Understand why assets fail
- Optimise network operations
- Make smarter investment decisions
- Build smarter grids
- Achieve the latest standards
- Develop their power skills

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