

## UltraTEV Locator™

portable partial discharge (PD) investigation system

Locates, measures and records PD activity in all substation assets – including cables

## benefits

- Locating and measuring PD activity to identify faults BEFORE they lead to failures
- Recording and analysing PD activity to provide valuable information on the actual condition of assets
- More effective asset management, reliability, efficiency and safety, at lower cost

**fact:** 85% of disruptive substation failures are PD related

**fact:** The UltraTEV Locator™ is the most powerful multi-sensor PD investigation system on the market

## features

- Ability to pinpoint PD activity to within 60cm
- Ultrasonic and TEV sensors for surface and internal PD
- Measures environmental conditions: temperature, pressure and humidity
- Records the severity of PD for diagnostic analysis
- Works with cables and overhead assets
- Tough, weatherproof case with built-in 8 hour battery

The UltraTEV Locator™ takes the investigation of PD activity to a new level of accuracy and sophistication

## third generation technology

The UltraTEV Locator™ is the product of EA Technology's unique experience as a pioneer of measuring and interpreting Partial Discharge (PD) activity, gained over more than 35 years.

### first generation

#### TEV instruments

EA Technology's PD Locator™ was one of the first transportable instruments to record PD activity by measuring Transient Earth Voltage effects, using time of flight measurement to locate their source. Together with the PD Monitor™, it revolutionised the investigation of PD activity, with both instruments continuing to provide valuable service to this day.



### second generation

#### Ultrasonic + TEV instruments

Combining ultrasonic and TEV measurement in single instruments like the UltraTEV Plus+™ has transformed the ability to detect and measure PD activity.





## third generation multiple sensor systems

The UltraTEV Locator™ is one of the first of a new generation of asset management SYSTEMS, combining the functions of multiple PD instruments in a single package.

## UltraTEV Locator™

### PD investigation system including SIX sensors for improved accuracy

The UltraTEV Locator™ is a fully portable, multi-functional system for investigating and recording PD activity in unprecedented detail. It comprises a central unit with six sensors and dual probes, plus a range of accessory options to increase its versatility even further. This single package will measure the environmental variables which are known to affect PD activity, greatly increasing the value of the PD measurements.

## multiple features



### Ultrasonic

- An Ultrasonic sensor is built into one probe, to detect and measure surface PD activity in the form of decibel readings
- A Flexible Sensor extended microphone is provided to enable measurements to be taken in apertures and hard to reach corners
- An Ultrasonic contact probe is provided to measure surface PD in sealed chambers such as cable boxes. The contact probe is magnetic for ease of application
- The central unit converts ultrasonic signals to the audible range, so operators can listen to PD activity over headphones



### TEV

- Transient Earth Voltage (TEV) sensors are built into each probe, to detect and measure internal PD activity
- Time-of-flight measurement between the two probes enables the system to locate PD activity to within 60cm
- For ease of use, one probe can be attached magnetically to the asset under test



### RFCT

- PD activity in cables is measured using a Radio Frequency Current Transformer (RFCT) sensor which plugs into the central unit



### Temperature

- The central unit includes a sensor to measure ambient temperature
- An additional infrared probe can be plugged into the unit to measure spot temperatures



### Humidity/Pressure

- The central unit measures the relative humidity of the operating environment
- The central unit measures the atmospheric pressure of the operating environment

The UltraTEV Locator™ is excellent value because it does the job of several instruments, all in one package - and a lot more

## multiple functions

### 1 PD location

Both probes are switched to TEV mode to locate the source of PD activity, using time-of-flight measurement between the two probes.

The latest electronics enable the system to calculate the site of the discharge to an accuracy of 2ns (nanosecond), equivalent to 60cm. The maximum resolution of earlier instruments was 3 to 5ns.

### 2 PD one-shot survey

In one-shot survey mode, a single probe is used in the same way as our UltraTEV Detector™ and UltraTEV Plus+™ handheld instruments, to detect PD activity.

Both ultrasonic and TEV sensors are used. A simple traffic light display indicates when threshold levels of PD activity are detected: green shows no significant discharge, amber indicates some activity, and red warns that activity is at a level which warrants further investigation.

Operators can use the factory-set threshold levels, or programme in their own.



### 3 PD comparative measurement

In comparative measurement mode, operators have a range of options:

- Measure surface PD activity in the form of decibel readings in the ultrasonic range, and compare results with those taken from other assets
- Listen to changes in PD activity in the form of audible signals through headphones (the system heterodynes the ultrasonic measurements for this purpose)

- Take TEV readings of internal PD activity at various points on the asset in the form of numerical values
- Factor-in readings of ambient and localised temperatures
- Factor-in atmospheric pressure and relative humidity, both of which can influence PD activity
- Compare results with those taken from other assets and historical records



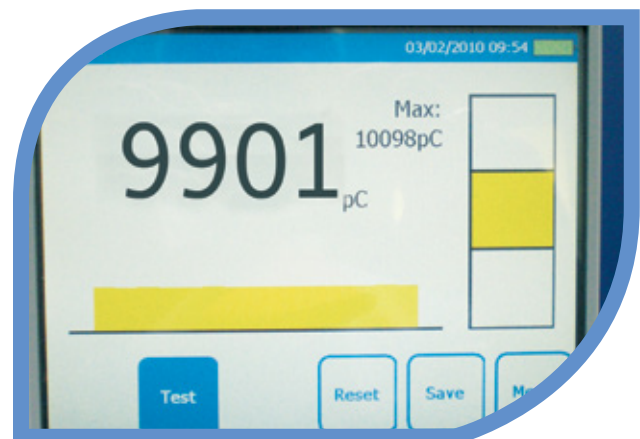
### 4 PD cable activity

PD activity in cables is measured by the UltraTEV Locator™ using a plug-in RFCT sensor.

Results are displayed as pC (pico-Coulomb) numerical values or in graphical form.

### 5 PD activity recording

All of the measurements taken by the UltraTEV Locator™, including heterodyne sound recordings, can be saved to the system's internal memory and recalled on the touch-screen display. Data can be downloaded via the USB port.



## operator friendly

Intuitive software accessed through easy-to-use touch screen menus.



**1**

- Weatherproof carry case



**2**

- Can be carried halter-style or over-the shoulder



**3**

- High resolution touch-screen - can be operated through the carry case cover



**4**

- Simple touch-screen navigation between functions, including browser for stored data file



**5**

- Port for a 50Hz sensor, which automatically synchronises the system with the local power frequency, referenced from any nearby lighting source



**6**

- USB port for easy transfer of stored PD activity data to PCs. Also makes it simple to download and install the latest software and firmware updates



**7**

- Integral Function Checker confirms that probes are operating correctly

## plug-in accessory

The range of UltraTEV Locator™ functions can be greatly extended with this fully compatible accessory:



### UltraDish™ waveform concentrator

Ultrasonic directional microphone which enables operators to listen to PD activity on overhead assets.

# specification UltraTEV Locator™

TEV	
Sensor	Capacitive
Measurement Range	0 – 60dBmV
Resolution	1dB
Accuracy	±1dB
Max Number of Pulses/ Cycle	655
Min Pulse Rate	10Hz

ULTRASONIC	
Measurement Range	-7dBµV to 68 dBµV
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 MEASUREMENTS	
Sensor	RFCT
Measurement Range	0 – 25,000pC
Resolution	98pC
Accuracy	±98pC
Min Pulse Rate	10Hz

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

ENVIRONMENTAL	
Operating Temperature	0 – 55 degrees C
Humidity	0 – 90% RH non-condensing
IP Rating	30

DIMENSIONS	
Size	240mm x 140mm x 140mm
Weight	1.7kg

POWER SUPPLIES	
Internal Batteries	3.7V 13.6Ah Lithium-Ion
Typical Operating Time	approx. 8 hours
Battery Conservation	Automatic 'switch off' when low battery voltage detected
BATTERY CHARGER	
Rated Voltage	90 – 264V AC
Frequency	47 - 63Hz
Charging Voltage	18V DC
Charging Current	2500 mA
Time for Full Charge	7 hours
Dimensions	74mm x 44mm x 34mm
Weight	0.12 kg
Operating Temperature	0 - 40 degrees C
Humidity	20 – 85% RH non-condensing

The UltraTEV Locator™ kit consists of:





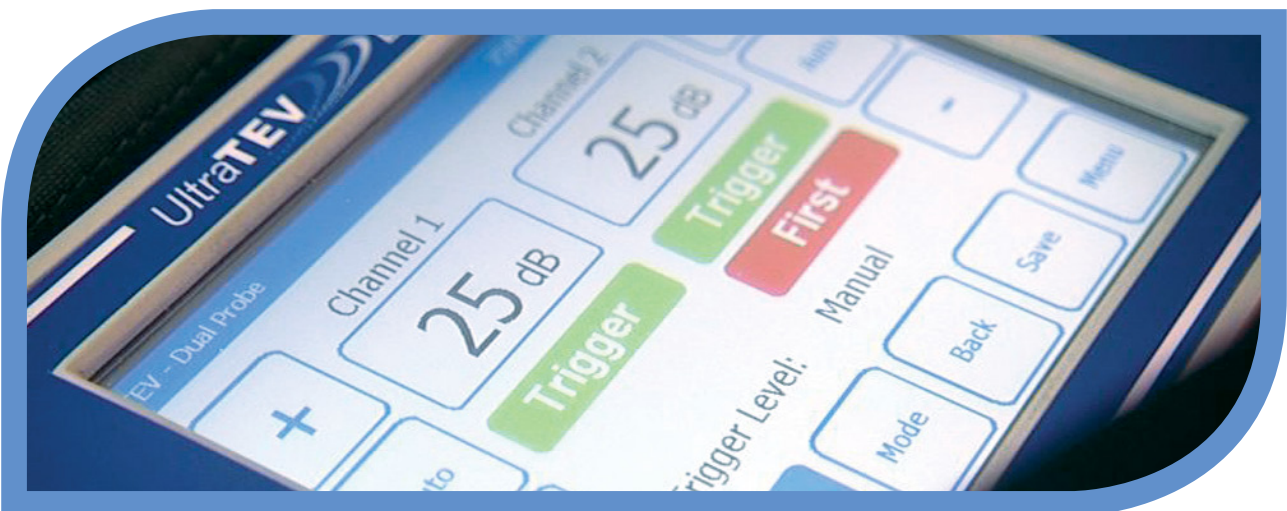
## valuable condition data

The UltraTEV Locator™ when used in conjunction with the UltraTEV Monitor™ provides operators with all the information they need to move towards full condition-based asset management techniques.

The ability to gather data on the condition of assets is a key part of the process of upgrading to Condition Based Risk Management™ (CBRM). This is EA Technology's market-leading methodology, based on applying a Health Index to each asset and factoring in both the probability and consequences of their failure: an approach which is proven to improve asset reliability, availability and safety, while reducing the overall costs of asset maintenance and replacement.

## driven by customer need

The addition of the UltraTEV Locator™ and UltraTEV Monitor™ to our portfolio is the direct result of listening carefully to what customers require from their new asset management systems.



# global support

The UltraTEV Locator™ 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



To find out more, why not see the Podcasts at: [www.eapodcasts.com](http://www.eapodcasts.com)

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Improving Network Performance



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Communicating the Message

