

MERKPD

Focus Partial Discharge

EC4000P

Portable PD solution for GIS/TR/CABLES/MCSG



EC4000P ULTRASCAN

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The Ultrascan EC4000P, Multiple partial discharge (PD) detection unit to incorporate several types of partial discharge sensor technology. These include a TEV (Transient Earth Voltage) sensor, an external UHF Sensor, split-core HFCT, an acoustics sensor and a range of airborne acoustic probes. The Ultrascan Unit has been designed to provide the 'first Line of defense' for the early detection of PD activity in MV cables, switchgear, transformers and rotating machines, Gas insulated Switchgear(GIS) in the voltage range from 3.3kV to 1000kV. This easy-to use Handheld detection device is suitable for Rapid pre-qualification PD testing by all operational staff in the substation.

Multiple functions

- UHF detection of internal PD activity as numerical value and graph.
- Ultrasonic (AE) detection of surface PD activity as numeral decibel values and as audible signals.
- Measurement of internal PD activity in the form of TEV (Transient Earth Voltage) signals which you can view on screen as numerical value and graph.
- PD activity is measured using an external, split-core, High Frequency CT (HFCT) Sensor which is clipped around the earth strap of the cable.
- Ultrasonic Dish (AA) and Ultrasonic probe (AA) option for overhead assets.



Ultrascan Benefits

Efficient Uses

The modern high-tech design of the Ultrascan EC4000P Multiple PD detection system enables the highest level of detection capability in terms of power and duty cycle, with an ease of use so far unknown in this type of equipment.

Weight and Size

Amazing portability compared to other existing equipment, due to its light weight and small size that allows one person to carry it. It is easier and cheaper to transport and handle. Each unit Reduces the length of cables required as sets can be much closer to the device tested. Facilitates portability into installations with limited space and/or with difficult access, such as stairs, soft soils, underground substations, etc.

Multi-Functionality

The Ultrascan system concentrates many applications and testing assets, offering a time-saving and cost effective solution.

Low-cost and high efficiency

Electrical system are among the most valuable assets in your plant and can have the biggest impact on your bottom line. Today's asset managers are facing the increased challenge of maximizing their aging electrical infrastructure with fewer qualified technical in-house resources and shrinking maintenance budgets. Our multiple technology of a low-cost and high efficiency are giving asset managers new approaches to achieve improved reliability and performance of critical electrical assets.

UltraScan Measurement Unit

Product	Item	Specification	
	Enclosure	ABS Plastic Case	
	Display	5.7 inch TFT-LCD	
	Connectors	BNC for UHF/TEV/AE/HFCT	
	Connector	Quick socket for AA external	
	Communication	RJ45 cable to PC software	
	Charger	220VAC,5V/2A,USB	
	Storage	SD Card	
	Operating temperature	-20~+60°C	
	Humidity	0~95%RH	
	IP Rating	IP54	
	Dimension	Size	240*140*50mm
		Weight	1Kg
	Power Supply	Internal batteries	3.7A, 14400mA
		Typical operating time	5~6 hours Continuously

ULTRASCAN-Specifications with different sensors

	Product	Item	Specification
UHF		Full detection bandwidth	100~2000MHz
		Dynamic Range	-80dBm~+0dBm
		sensitivity	<5PC
		Channel Precision	<1dBm
		Band filter	3 band selectable
		Frequency Range of Sensor	100~2000 MHz
		Effective height	>10mm
		Display	PRPS/PRPD, Peak, Pulse data
TEV		Full detection bandwidth	1~100MHz
		Measurement Range	0~60dBmv
		Accuracy	± 1dB
		Resolution	1dB
		Display	dBmV, PRPS/PRPD,
AE		Full detection bandwidth	10~500KHz
		Measurement Range	20-100dB
		Transducer Amplifier	40dB
HFCT		Full detection bandwidth	1-100MHz
		Minimum Detection	1~2PC
		Sensor Diameter	Internal Diameter>48mm,100mm(Opt)
		Display	PRPS/PRPD, Peak / Pulse data
		PC calibration	yes
AA		range	75dBuV
		Gain	Changeable,60 or100
		Transducer Sensitivity	-65dB(0db=1volt/ubar rms SPL)
		center Frequency	40KHz
		Accuracy	± 1dB
		Display	dBuV, PRPS/PRPD, Peak data

AA Airborne Acoustic with inbuilt (built in/Standard)

AA Airborne Acoustic with Flexible probe
(Optional Kit)



AA Airborne Acoustic with parabolic Sensor
(Optional Kit)



ULTRASCAN Multiple uses – ALL in one hand-held PD machine

The ULTRASCAN EC4000P has Multiple PD Sensors for detection of different sources of PD activity in facilities.

Ultra High Frequency (UHF)

The UHF sensors popular used in PD detection and location in substation are partial discharge UHF sensor are usually ultra wideband antenna in the frequency range of 200 MHz to 1.5GHz, which contains interference from communication signals. Accordingly, in order to improve the detection sensitivity and the signal-to-noise ratio, a kind of multi-band UHF narrowband sensors is proposed and designed in accordance with the principles of the loop antenna for PD detection. Corona discharge, surface discharge and metallic particles discharge generated by PD mode. Results show that the selection of band for the UHF sensor is reasonable, and the sensor is with high sensitivity.

Ultrasonic (AE/AA)

All electrical equipment produces a broad range of sound. The basic electrical problems that produce distinct ultrasound waves that can be detected by Ultrasonic Testing include partial discharge, corona and tracking. Ultrasonic measurement is most powerful on a comparative basis and will significantly increase the reliability of correct detection of partial discharge when used with other Focus PD online partial discharge detecting technologies.

Transient Earth Voltage (TEV)

PD measurements of air insulated and solid insulated switchgear has been around for over 30 years using TEV (Transient Earth Voltage) sensors. These are small Radio Frequency (RF) Aerials which detect the high frequency PD pulses emanating from the discharge site in the switchgear. These pulses tend to have pulse widths of a few tens of nanoseconds, and act as a good medium for nonintrusive PD detection in switchgear. Detection of these pulses can also be used for localization of the PD site. The Transient Earth Voltage (TEV) Sensor is recommended for this application. The sensor is magnetically latched to the earthed, metal-casing of the switchgear panel.

High Frequency Current Transformer (HFCT)

HFCT sensors are used to measure partial discharge in power cables and in remotely connected HV plant such as rotating HV machines and transformers. The sensors are attached around the cable's earth connections in the switchgear, rotating machine or transformer's HV cable terminal box. Partial discharge activity in solid high voltage insulation induces small high frequency currents in the earth conductor of the electrical system. These impulses travel along the equipment earth to the substation earth. Using a high frequency current transformer they can be detected as they pass through the CT. This transducer is ideal for all earth and neutral PD monitoring applications.



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