

UHF PD Transformer Monitoring



Pioneering the future of power testing and monitoring

UHF PD Monitoring



Reliable and powerful

Analog devices sensors in combination with the most advanced software for diagnostics and monitoring .



Early fault detection and notification

Measures on-load vibrations, detects winding deformations at the earliest stages

Partial discharge (PD) monitoring in power transformers is a critical aspect of their maintenance and reliability. UHF (Ultra-High Frequency) PD monitoring and traditional electrical PD monitoring are two common techniques used to detect and assess PD activity in power transformers.



1. Detection Method:

- UHF PD Monitoring: UHF PD monitoring relies on detecting the electromagnetic emissions generated by PD events in the ultra-high frequency range (typically several hundreds of MHz to several GHz). Antennas or sensors are placed on the transformer to capture these signals.

- Electrical PD Monitoring: Electrical PD monitoring involves measuring the electrical impulses produced by PD events. This method typically uses capacitive or resistive couplers to capture the signals.

2. Sensitivity:

- UHF PD Monitoring: UHF monitoring is highly sensitive and can detect PD events at their early stages. It can identify PD sources in various transformer components, such as winding, oil, or insulation.

- Electrical PD Monitoring: Electrical PD monitoring may have limited sensitivity compared to UHF monitoring, as it primarily focuses on electrical signals.

3. Location of PD Sources:

- UHF PD Monitoring: UHF can pinpoint the location of PD sources more accurately. It can distinguish between different types of PD sources within the transformer.

- Electrical PD Monitoring: Electrical PD monitoring may provide less precise localization information about PD sources.



4. Interference and Noise:

- UHF PD Monitoring: In substation UHF signals can be affected by external interference, but as the transformer tank is closed box it is relatively immune to external interferences .

- Electrical PD Monitoring: Electrical PD monitoring is less susceptible to external interference from the surrounding but is far more affected by system noise and careful and experienced gating is required to eliminate the system noise.

5. Frequency Range:

- UHF PD Monitoring: UHF monitoring covers a higher frequency range, making it capable of detecting a wider range of PD events.
- Electrical PD Monitoring: Electrical monitoring typically operates at lower frequencies, limiting its ability to detect certain types of PD events.

6. Complementary Use:

Both UHF and electrical PD monitoring can be used together to provide a more comprehensive understanding of the transformer's condition. They complement each other, as UHF can detect certain types of PD events that electrical monitoring might miss. The choice between UHF and electrical PD monitoring depends on factors like the specific transformer, its design, budget constraints, and the desired level of sensitivity and accuracy. Some utilities and industries may opt for a combination of both methods to ensure thorough monitoring and early detection of potential issues in power transformers.



<p>CIGRE Working Group WG A2-27 recommends to install DN50 valves or dielectric windows for later fitting of UHF probes. (Recommendations for condition monitoring and condition assessment facilities for transformers, TB 343). The dielectric window sensor is designed according to CIGRE Working Group WG D1-37 (Guidelines for partial discharge detection using conventional and unconventional methods, TB 662).</p>	
<ul style="list-style-type: none"> • Retrofit possible at DN50 and DN80 valves • For oil-filled transformers • Bandwidth: 100 MHz ... 3000 MHz • Integrated LF grounding 	
Technical Data Bandwidth	100 MHz - 3000 MHz
Oil pressure	5 bar (max.)
Oil temperature	120°C (max.) Connection
Type N connector	female
Dimensions (H x D)	630 mm x 180 mm
Antenna diameter	44 mm
Weight	2.6 kg
IP protection	Class IP65
Operation temperature	-40°C ... +100°C
Insertion depth of UHF antenna	50 mm ... 450 mm (laser scaled)
Type Tests CE conformity	EMC, RoHS EMC EN IEC 61326-1
Emission	CISPR 11 / EN IEC 55011
Immunity	EN IEC 61000-4-2 / EN IEC 61000-4-3 / EN IEC 61000-4-4 / EN IEC 61000-4-5 / EN IEC 61000-4-6 / EN IEC 61000-4-8 / EN IEC 61000-4-11
Environmental EN	IEC 60068 EN IEC 60068-2-1 / EN IEC 60068-2-2

Controller specification

HV Cable channels	Configurable from 1 to 12 channels
Number of sensors needed for a power transformer	The system typically requires 1-3 UHF sensors depending on the transformer size.
HF bandwidth	100MHz to 3.0GHz
HF dynamic range	40 dB
Power Supply	24 VDC
Operating temperature	-30°C to 50°C (-22°F to 122°F)
Alarm Threshold	Units comes with Preset alarm levels . However, these are User-adjustable for each channel in terms of level and Rate of change
Alarm Reporting	SCADA, Substation Digital alarming, sms, e-mail
Noise mitigation	High-frequency noise mitigation based on amplitude and repetition rate
Software	Substation Digital (International Organization for Substations Digital Development)
Connectivity	Wireless Long range, Modbus RT
IP rating	IP68 with dust boots installed
Weight	0.9 kg (1.98 lbs)
Dimensions	150 x 177 x 95 mm

The POWER VIEW UHF PD monitoring signal processing

The system utilizes sophisticated signal processing algorithms to analyze captured data in real-time. These algorithms help distinguish PD signals from background noise, enabling reliable detection and localization of potential insulation faults.

Remote Monitoring and Analysis:

POWER VIEW's HFCT PD monitoring system features remote monitoring capabilities, allowing operators to access real-time data and analysis remotely via web interfaces on the Substation Digital dedicated software platform. This facilitates proactive maintenance planning and decision-making, optimizing asset management strategies.

Scalability and Adaptability

POWER VIEW's HFCT PD monitoring systems is a cost-effective PD monitoring solution scalable and adaptable to various HV cable configurations and deployment scenarios. Whether monitoring a single cable or an entire network, these systems can be tailored to meet specific requirements and accommodate future expansion.



Office: 2416 Main street
Vancouver
BC V5T 3E2
Canada

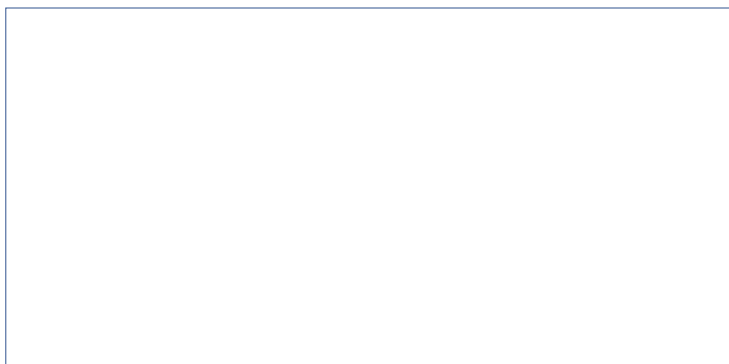
Tel: + [1 \(778\) 8194363](tel:17788194363)

Fax+ [1 \(778\) 8194363](tel:17788194363)

Email: info@powerview-energy.com

Web: www.powerview-energy.com

Distributor



pioneering the future of power testing and monitoring

