LID-UPD

The **LID-UPD** is two-piece hand held non-destructive inspection system with Advance analysing software which utilizes AC/DC Current sensor and Online Portable Partial Discharge Detector for predictive maintenance. **It is a Complete Tool to do the primary Health Check of switchyard Critical Assets Transformer, CB, CT & PT.** A Successful Implementation of LIDOR-UPD testing and monitoring technique prevents an in-services failure of a substation & Switchyard Equipments and panels. By practising periodic on line testing to detect problematic component using this method we can achieve reliability based HV asset extension.

In this equipment the flexible smart CT sensor is specially designed to measure the line and leakage current in HVAC/HVDC Substation assets like Transformer, CT, PT, LA, Isolator etc. failure of insulation leading to leakage which will flow to ground either from earthing or structure. Abnormal leakage current indicates defect due to partial discharge. In case abnormal leakage current measured at any components this is to be diagnosed for further partial discharge.

Feature of Leakage Clamp meter:

- Flexible Hall effect Sensor
- AC(True RMS)/DC measurement
- 200mm Jaw size
- EMI and EMC compliance
- 1mA ~ 3000A current measurement

The Portable on-line handheld PD detection unit is for condition-based maintenance of substation Assets. To reduce the down time screen for partial discharge

Partial Discharge

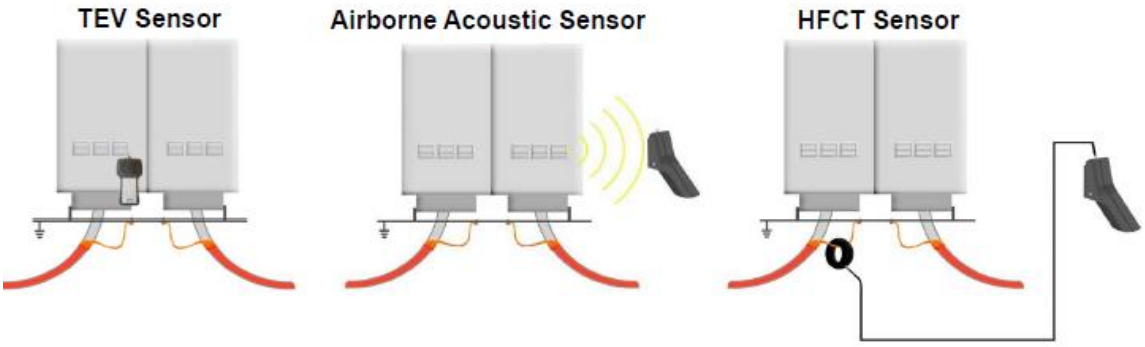
As per IEC 60270, Partial discharge is a localised electrical discharge that only partially bridges the insulation between conductors and which can/cannot occur adjacent to a conductor. PDs normally develop in air gaps or on insulation surfaces, due to defects in the insulation system. Because PDs are correlated to insulation ageing, they are the cause and effect of insulation degradation. Innovative Technology of insight to address detection of PD

The Portable PD utilizes 3 different type of sensors for identification of both Internal and external PD of the Substation assets.

In-built TEV sensor is a small-size; electromagnetic sensor which can detect the high frequency radiation that is coupled onto earthed metal surfaces from 'local' partial discharge (PD) within switchgear, bushings and other plant. The sensor has a wideband frequency response to detect 'local' PD pulses in the range of 1 MHz to 100 MHz

In-built Airborne Acoustic (AA) sensor : The AA sensors are used to detect ultrasonic radiation from discharges into air, such as surface discharges from within air-insulated MV switchgear and corona in outdoor HV switchyards. Measurements are made in *microvolt decibels* by the unit across the range of 0–70dBµV

High Frequency Current Transformer (HFCT) sensor detect the current impulses from partial discharge in cables and plant that is remotely connected at the end of the cable. The sensor can be attached either to the cable earth or around the cable core + cable earth return. Measurements are made in *pico Coulombs* (pC) and *nano Coulombs* (nC) with a measurement range of 100pC to 100nC.



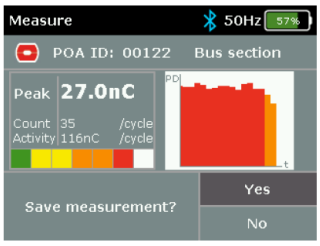
Features

- Supplied with a 10.1" Android™ tablet PC with the OLPD Manager™ asset management application.
- Detects electromagnetic radiation from PD in metal-clad plant (TEV), current impulses from PD in cables and accessories (HFCT), and ultrasonic radiation from PD into air from air-insulated switchgear (AIS) and outdoor HV plant (AA).
- Combines PD Level, PD Pulse Count and Cumulative PD Activity measurements across the 50/60Hz cycle.
- Phase resolved PD (PRPD) patterns allow for differentiation of PD defects.
- An in-built barcode scanner is used with sensor POA barcode labels for automatic repeat testing.
- The unit displays data on a 3.5" colour LCD screen.
- Supplied with 3M™ PELTOR™ HT™ Series Listen Only Headset as standard (to listen to airborne acoustic (AA) PD activity in noisy environments).

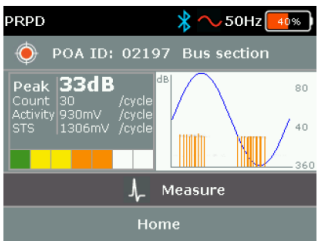
OLPD Manager™ for Windows& Androids
Measurement results from a test can be synchronised from the handheld or tablet to a Windows PC for analysis, benchmarking and trending.

- Real-time Data measurement for all three type of sensors
- PRPD function to eliminate the misleading background noises from the true partial discharge source, which will help to avoid in-service failures and costly unplanned outage.

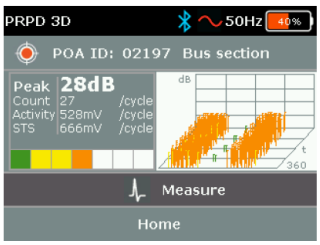
Real-time data measurements



5-second results



PRPD data measurements



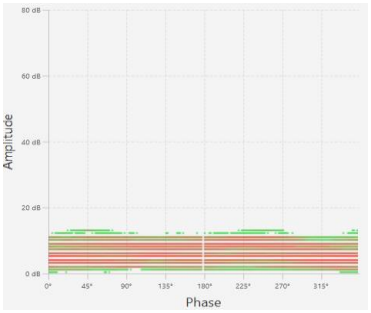
3D PRPD data measurements

Data captured at TSTRANSCO Karimnagar ZONE at Nirmal S/S

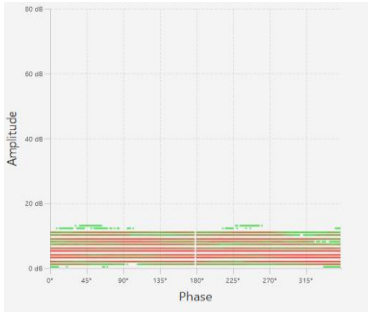
Transformer I- Make-EMCO Date of Comisssion 28.11.1999
100 MVA

	Leakage current in Ampare				
	Leg A	Leg B	Leg C	Leg D	Total
Body LC	5.4	3.23	1	2.166	11.79
Neutral LC	12.35				12.35

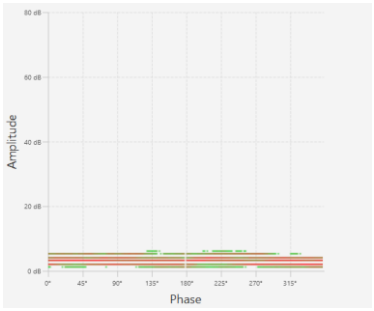
Acoustic Sensor
Primary Side



R-Phase



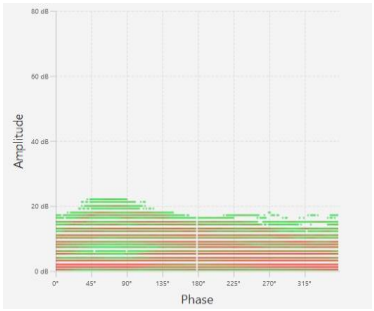
Y-Phase



B-Phase

Secondary Side

R-Phase



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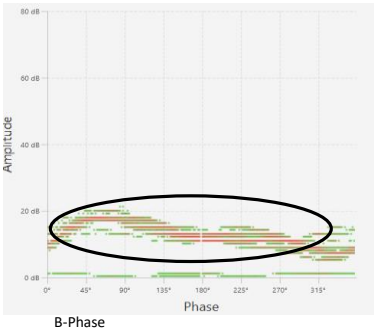
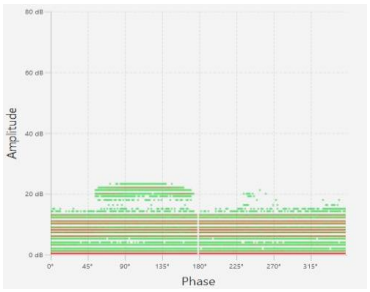


B-Phase

TEV Sensor
Primary Side



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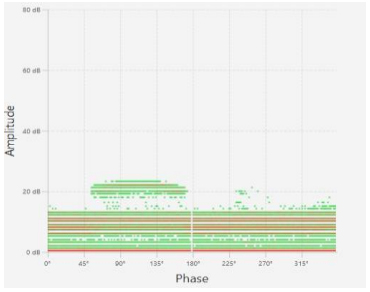

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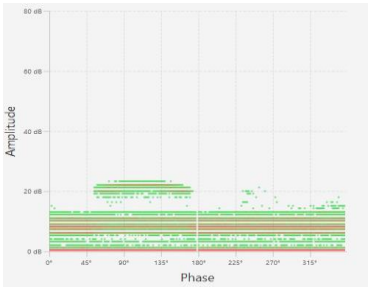
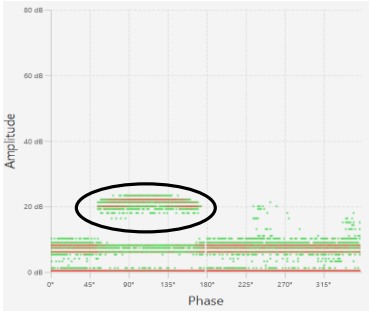


B-Phase

Secondary Side

R-Phase



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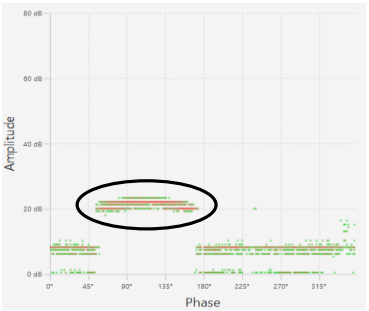


B-Phase

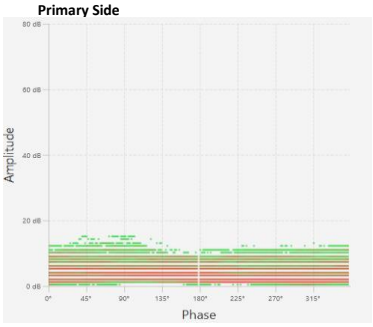
Transformer II- 100 MVA

Make-CGL

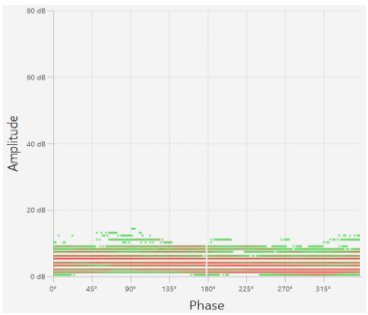
Leakage current in Ampare					
	Leg A	Leg B	Leg C	Leg D	Total
Body LC	1.65	0.012			1.66
Neutral LC	2.9				2.9

Acoustic Sensor

Primary Side



R-Phase



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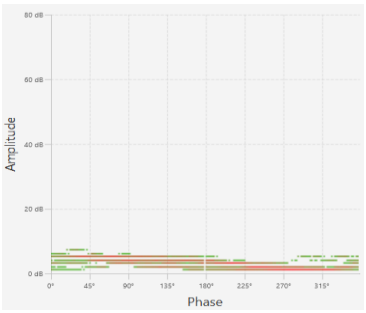
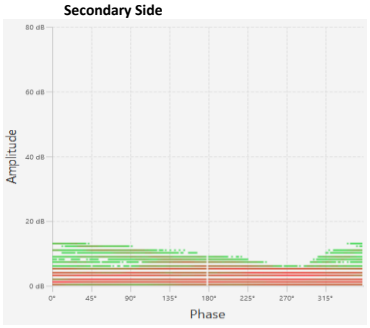


B-Phase

Secondary Side



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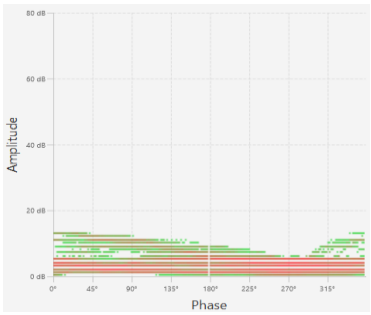
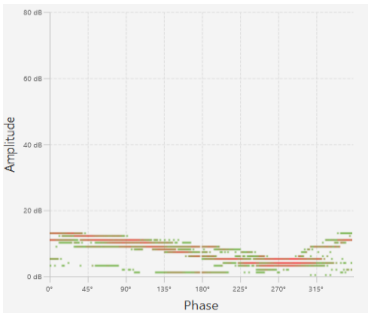


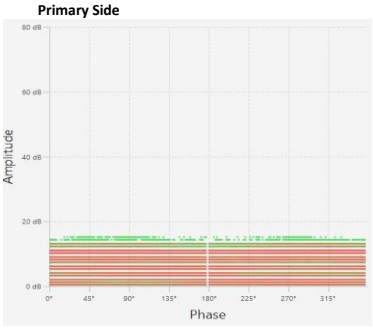
Y-Phase



B-Phase

TEV SENSOR

Primary Side



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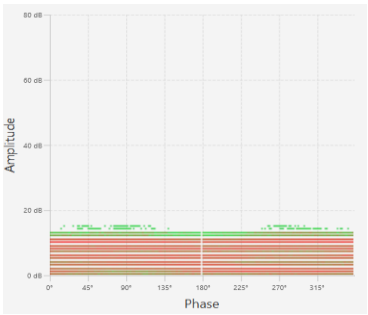

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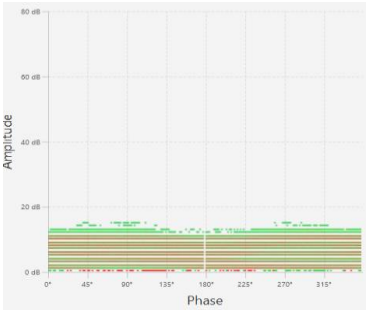
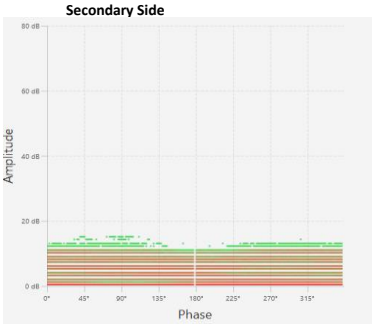


B-Phase

Secondary Side



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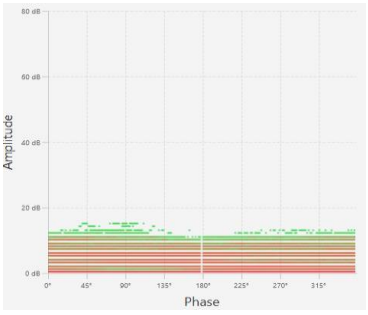

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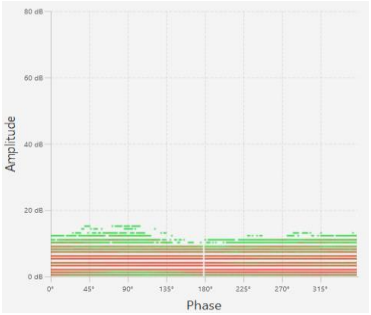

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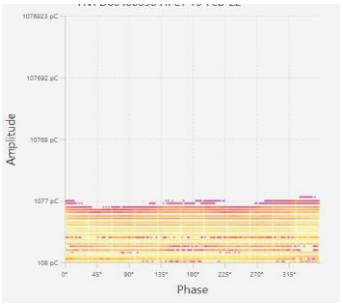
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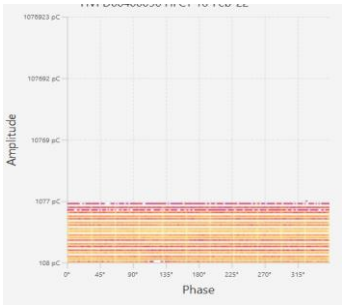
107692 pC
10769 pC
1077 pC
108 pC
Amplitude
0°
45°
90°
135°
180°
225°
270°
315°
Phase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