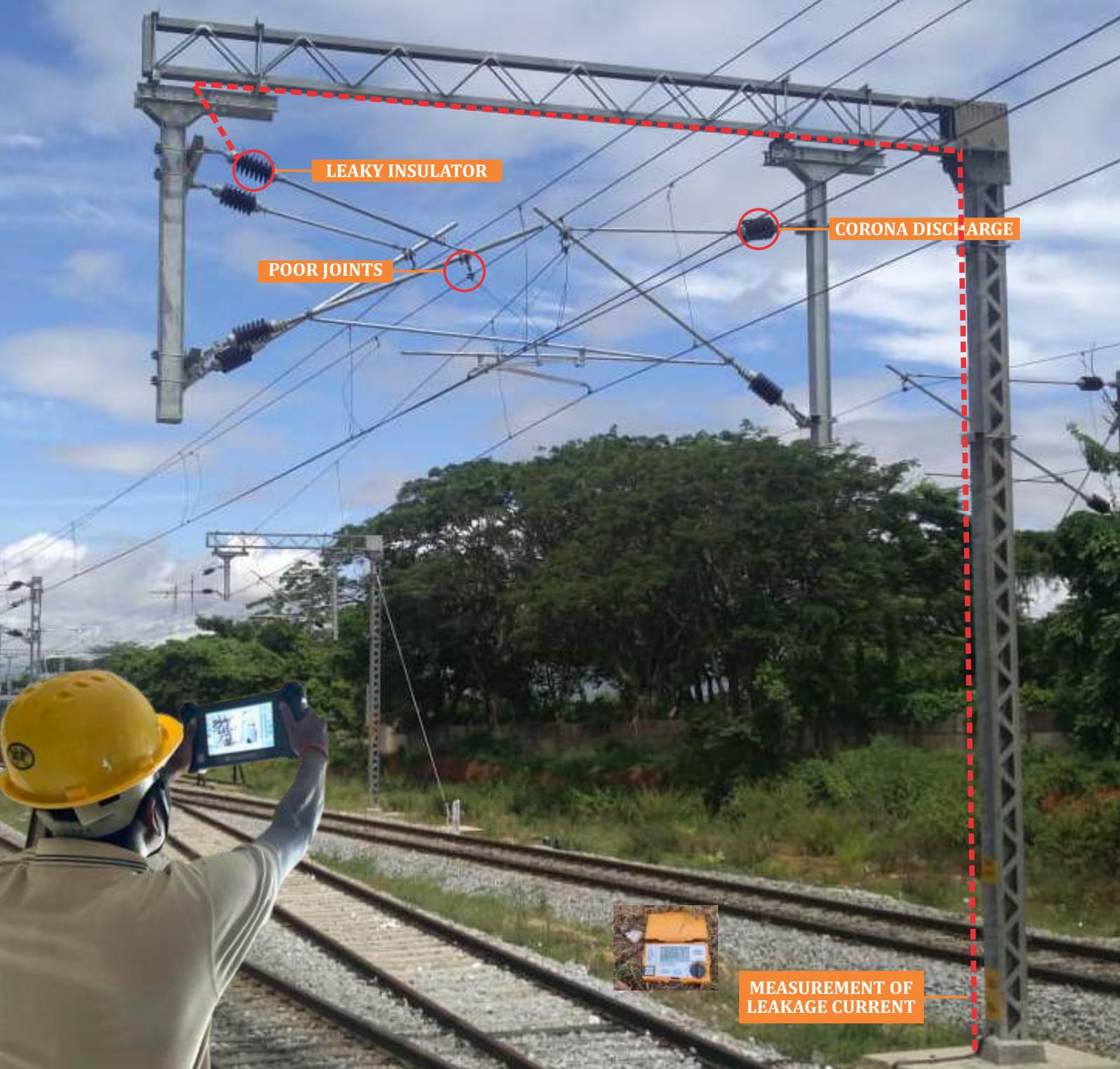


# LID<sub>RTS</sub>

## LEAKY INSULATOR DETECTOR WITH VIDEO PARTIAL DISCHARGE

### AVOID BAD THINGS HAPPENING TO YOUR RAILWAY TRACTION LINES



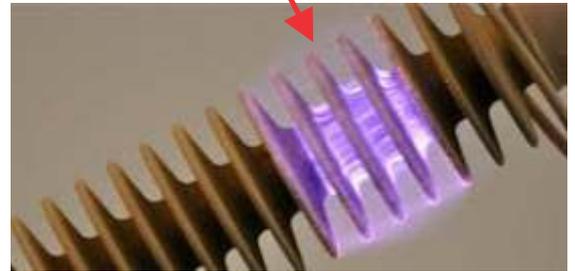
### YOUR SAVIOUR TO AVOID DISASTER



# PREDICTIVE

TECHNOLOGY | DATA | ANALYTICS

# TRACTION POLE INSULATOR HEALTH ANALYSER



The Leaky Insulator Detector with Video Partial Discharge (LID<sub>RTS</sub>) is hand-held non-destructive inspection system which utilises AC/DC Current sensor and Ultrasonic technology for predictive maintenance. The (LID<sub>RTS</sub>) has a Flexible clamp sensor and Ultrasound Imager.

The Flexible AC/DC Clamp meter is specially designed sensor to measure the AC/DC leakage current in HVAC/ HVDC Towers leg (caused due to the leaky insulator).

Ultrasound Imager is based on Ultrasound Technology which picks Partial Discharge Ultrasound from a distance upto 100 meters and converts Ultrasound into visual video digital image. After leakage current measurement, Ultrasound Imager is used to scan the insulator strings of leaky tower and pinpoint the phase and position of the leaky insulator.

## PROCEDURE

The Leakage current is measured in pole leg to get the total Leakage Current. If the total Leakage Current is more than prescribed limit, the tower & insulator is declared to be leaky. Then the Ultrasound Imager discharge detector is used to scan every insulator string and pinpoint the leaky insulator string by identifying the Partial Discharge arcing in the insulator causing the leak. The graphical evidence of arcing is then recorded for future reference.

In the final stage of partial discharge, the breakdown of the insulator causes a reduction in internal resistance, leading to an increase in heat.

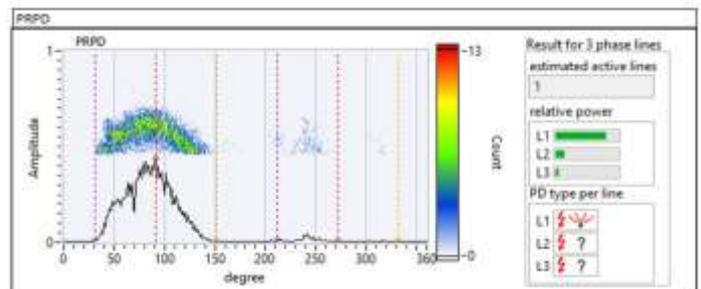
Increase of temperature is the sign of failure. LID<sub>RTS</sub> can be used to capture thermal images of the assets simultaneously. This inbuilt feature of the equipment helps the maintenance team to make quick decisions. High resolution photos and video combined with PD IR impressions, will help to spot the exact problematic area.

## Electrical Arching, Tracking, Partial Discharge, IR & Current Leakage

Overhead insulators provides mechanical support to high voltage cables and electrically isolate them from ground structure. In contaminated condition, uneven resistance exist.

The surface of contaminated insulator leads to formation of conductive layer causing leakage current to flow.

As quoted from IEC 60270 PD does not cause immediate breakdown of the insulation, the appearance of PD indicates the presence of fault which causes energy dissipation and further leads to insulation degradation.





**ADVANTAGES OF LEAKY INSULATOR DETECTOR TEST**

Improved safety when testing with ultrasound: (LID<sub>RTS</sub>) is designed to test railway traction poles, insulators and transformers for external arcing and corona type partial discharge and leakage current safely. (LID<sub>RTS</sub>) can also be used to test critical equipment from a safe area. You can improve your safety practices as well as to locate potential points quickly.

**Find arcing, corona type partial discharge, IR and leakage current:** You can indicate and locate the ultrasound produced Leakage Current by arcing and corona discharge easily using the Leaky Insulator Detector (LID<sub>RTS</sub>). In many cases, ultrasound is produced before heat. Therefore, you can implement an early cost effective routine monitoring program. Leakage Current is the most efficient technique to monitor and investigate the condition of insulator surface.

**Performs better:** The Leaky Insulator Detector (LID<sub>RTS</sub>) have been tested on numerous occasions alongside competitive Technologies. The Leaky Insulator Detector (LID<sub>RTS</sub>) detects with ultrasound technology and flexible clamp sensor with better accuracy than other devices.

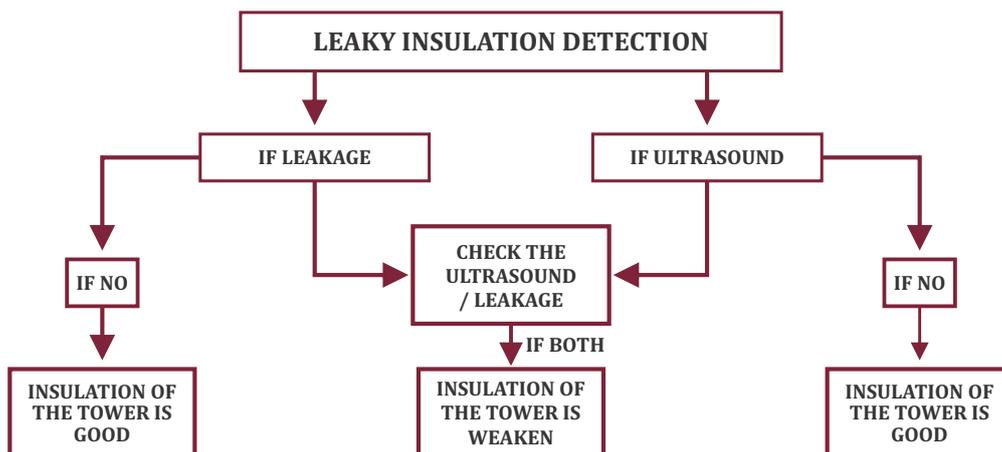
**Improves power line testing:** You can increase the amount of electricity that reaches railway engine and decreases power grid failure by using the Leaky Insulator Detector to routinely monitor power line, railway substation & transformers.

**Reason to consider Leaky Insulator Detector (LID<sub>RTS</sub>)**

- **Detect ultrasound from 100 meters:** The Ultrasound imager improves the distance of detection to 100 meters.
- **Pinpoints leaks at heights:** Many organizations have instituted routine leak detection programs for energy saving. Installations that are more than 40 feet height, you could use

the Ultrasound imager to locate the leak within a few inches without climbing ladders or using lifts.

- **Best way to locate fault:** Visual way to locate Partial Discharge & high thermal effect.
- **Optional Instant:** Ultrasound Image to capture and Analyse.
- **Leakage Current:** Measures both AC/DC leakage current
- Testing of Substation equipment & Power of the Railways.
- Indication and location of arcing or Corona Discharge. measures body leakage current and Geo magnetic DC current created due to unperiodic rotation of earth.
- Pinpoint faults at lightning Arrester, Bushings & Contaminated Insulator / Transformer.
- Indicate Broken Strands, Loose Hardware, Improper Installations, & Damaged / Punctured Insulator; Failure of Earthing.
- Other Applications in Railway sector: Testing of equipment in railway engine, panel boards, loco shed (with Optional Accessories).



## SPECIFICATIONS OF LID RTS

**Functional Requirement** : Leaky Insulator Detector with Video Partial Discharge measures Pole Leakage Current & Visually detects Ultrasound Partial Discharge & Infrared to identify the leaky insulators.

### Hall Effect CT (AC/DC)

**Type of CT sensor** : Flexible Split-Core Type  
**Inside Diameter** :  $\varnothing 200$  mm or  $\varnothing 400$ mm (User Selectable)  
**Measuring Function** : AC/DC Leakage/Line Current  
**Measuring Method** : Dual Integration Mode  
**Measuring Range** : AC/DC 3A/30A/300A (AC50/60 Hz & DC)  
**Accuracy** :  $\pm 3\%$  of reading  
**Display** : LCD max. 3200 reading with Annunciators  
**Low Battery Indication** : B" mark on LCD  
**Data Hold Function** : "DH" Switch  
**Zero Adjustment** : DC current range, by "0 SET" switch  
**Power Supply** : 1.5V (AA size, UM-3)  $\times 6$

### Display

**Size** : 7 inch / 15 cm  $\times$  9.4 cm  
**Resolution** : 1280 px  $\times$  800 px  
**Touch** : 10-point multi-touch capacitive

### Sensors

**Microphones** : 176 digital MEMS microphones  
**Frequency Range** : 1 Hz – 100 kHz  
**Sample Rate** : 200 kHz  
**Acoustic Image Resolution** : 100 fps  
**Sound Pressure** : 120 dB max.  
**Resolution** : 24 bit  
**Detection Range** : Up to 150 m (492 feet)

### Optical Camera

**Type** : Digital  
**Resolution** : 640  $\times$  480 px with 56 fps  
**Lighting** : 4 LEDs  
**Aperture Angle** : 70°  $\times$  55° (FoV horizontal  $\times$  vertical)  
**Shutter** : Global Shutter

### Thermal Imager (IR-Module)

**Spectral range** : Longwave infrared, 8 ... 14  $\mu$ m  
**Resolution** : 160  $\times$  120 Pixel  
**Effective Frame Rate** : 8.7 Hz  
**Thermal Sensitivity** : <50 mK  
**Measuring Range** : High gain mode: -10°C to 140°C  
 Low gain mode -10°C to 400°C

### Software Features

**Operational System** : Linux (camera), Windows (laptop/PC)  
**HMI** : Touchscreen, headphones, buttons  
**Protection** : Password (unauthorized access protection)  
**Features Camera** : Acoustic images, optical images, FFT and spectrogram  
 Listen to local sound (broadband or frequency filtered)  
 Place marker while measuring  
 Buffer recording, trigger recording (SPL or frequency-triggered)  
 Long term measurements (average and peak-hold)  
 Time evaluation: fast, slow, impulsive  
**Features PC-Software** : Display acoustic results frame by frame  
 Save and reload  
 Replay in real-time or slow motion  
 Listen to local sound  
**Export** : Photo, video, audio, measured data  
**Intuitive Usability** : Distance settings  
 Frequency filters (narrow band, 1/3-octave and octave)  
 Dynamic filter and low cut-off frequency  
 3 scaling modes: off, auto, smart (CREST factor)  
**Transmitter** : Supplied with Dual frequency selectable transmitter for lab test condition  
**Tested Standard** : As per the IEC



**POWERTRONICS PVT. LTD.**  
 An ISO 9001 : 2015 Company

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