PD Alarm
IPEC Ltd is a highly specialised engineering company based in the heart of Manchester who are at the very forefront of technological innovations within the field of electrical engineering. Formed in 1995, the company has grown from strength to strength and IPEC are now world leaders in On-line Partial Discharge (PD) detection and location, for MV, HV and EHV cables, switchgear and accessories. IPEC currently have a live network of over 125 Permanent PD monitoring Systems - monitoring over 3,500 electricity assets worldwide.

PD is an electrical discharge that does not completely bridge the space between two conducting electrodes. The discharge may be in a gas filled void in a solid insulating material, in a gas bubble in a liquid insulator, or around an electrode in a gas. PD is generally accepted as the predominant cause of long term degradation and eventual failure of electrical insulation.

“Bringing expertise and market leading products and services to the power industry by listening to customer needs and creating innovative, quality, technical solutions that are sustainable, reliable and long-term.”

The PD Alarm

A significant proportion of disruptive HV failure in cables and substation assets can be prevented through PD testing. Periodic testing of electrical assets means that a potential fault can be detected and repaired before it becomes a risk to engineers or the surrounding environment.

The PD Alarm

The PD Alarm is a brand new Partial Discharge monitor from IPEC. It is an asset mounted device for indicating the presence of Partial Discharge in high voltage switchgear, ring main units and transformers. The PD Alarm is specifically designed for use in small substations.

Key features

The PD Alarm is easy to set up. It includes TEV detection, AE detection, noise rejection, alarms and central data server.

Product Specification

What’s in the box and detailed product specification outlining physical and technical capabilities.
PD Alarm
Permanent On-line PD Monitoring System for Switchgear

The PD Alarm is the latest in IPEC’s range of products for substation monitoring and testing. This smart device is cost-effective, reliable and gives total peace of mind.

Designed for On-line Monitoring of Secondary and Distribution Substations, Ring Main Units or Transformers, the PD Alarm can to be installed across a large asset base to enable remote monitoring of Partial Discharge levels of assets. This gives Asset Managers condition information of their network and helps identify assets in need of repair, or defer asset replacement if the condition of the equipment is acceptable.

The Benefits:

- **Avoid Power Outages** – Early warning about defects that can lead to failure
- **Cost Effective** – Designed for larger scale roll out across distributed assets
- **Failure Prevention** – Implement as part of Condition Based Maintenance programme

Set up

Magnetically coupled to the switchgear, the PD Alarm can be installed and set up in less than an hour without any high voltage outage required. Commissioning is quick and simple using a laptop or mobile phone.
The monitor detects TEV signals generated by internal discharge as well as acoustic discharge generated by surface tracking or corona.

**TEV PD Detection**

Partial discharge activity inside metal clad high voltage plant induces small voltage impulses called Transient Earth Voltages on the surface of metal panels. TEV pulses travel around the surface to the outside of the plant, where they can be picked up externally using capacitive TEV sensors.

**AE PD Detection**

Defects on the surface of high voltage insulators are prone to a phenomenon known as surface tracking. Tracking causes carbon deposits that build up over time, ultimately leading to flashover and insulation failure. The PD Alarm can be used with up to 3 AE sensors and is highly sensitive to the ultrasonic emissions produced by tracking enabling detection before insulation degradation leads to failure.

**Noise Rejection**

Signals captured by the PD Alarm are synchronized with the power cycle allowing the instrument’s sophisticated algorithms to accurately distinguish between PD and noise interference. The monitor measures only the PD magnitude even where there are noise pulses that maybe greater in magnitude.
Central Data Server

All measured data is recorded and saved locally on the monitor, with historical trends and PRPD information being accessible through the unit’s display screen. However, the system can be configured to automatically send monitoring data to a remote central data server to allow subsequent trend and data analysis by engineers.

Alarms

The instrument can be configured to activate local and remote alarms including SCADA, SMS and email when activity levels exceed pre-set thresholds.

- **SCADA** – Compatible with SCADA alarm systems
- **SMS** – Optional GSM module for alerts via SMS
- **Email** – SMS module can communicate with mail server to generate smart email alarms
- **Volt free relay contacts** – for local alarm systems
- **API** – for intergration with client Asset Management systems (SAP, Oracle etc)

The Key Features:

- **Display** – Ultrasonic and TEV level displayed in dB
- **Alarms** – Current ‘live’ alarms and historical alarms
- **TEV** – Measurement of electrical transients generated by internal PD
- **Ultrasonic Detection** – 3 independent ultrasonic channels detecting surface PD
- **Integrated Noise Detection** – Algorithm helps avoid ‘False Alarms’
- **Simple to Install** – No wiring required between PD detector and central hub

What’s in the Box?

The PD Alarm kit contains:

- PD Alarm Unit
- 3x AA Ultrasonic PD Sensors
- 1x TEV Capacitive PD Sensor
- Power supply
- Cable
- Arial
Detailed Specification
PD Alarm

1. TEV Measurements
   - Number of Channels: 1
   - Sensor: Capacitive
   - Measurement Range: 0 to 80 dBmV
   - Resolution: 1 dB

2. Ultrasonic Measurements
   - No. of Channels: 3
   - Measurement Range: -6dBuV to +70dBµV
   - Resolution: 1 dB
   - Transducer Sensitivity: -65dB (0dB = 1volt/µbar RMS SPL)
   - Transducer Frequency: 40 kHz

3. Alarms
   - Remote Alarms: SMS & Email
   - Local Alarms: SCADA interface
   - Local Indication: Colour coded LEDs & OLED display

4. Ultrasonic Measurements
   - Noise Discrimination: Noise Rejection Algorithm
   - Secure Remote Interface: Alarm settings, configuration, reports
   - Integration: Asset Management Systems (SAP, Oracle etc)
   - PD Reports: Via Website, Email, SMS
   - PD Data: PD trend & PDRP

5. Hardware
   - Enclosure: Robust ABS case
   - Screen: OLED
   - Control: Membrane keypad
   - Connectors: Power, SCADA, External Acoustic Sensor

6. Environmental
   - Operating Temp.: -5°C to 55°C
   - Humidity: 0 to 90% RH non-condensing
   - IP rating: 30

7. Dimensions
   - Size: 230 x 195 x 65mm
   - Weight: 660g

8. Power
   - Rated Voltage: 90 to 264 V AC
   - Frequency: 47 to 63Hz