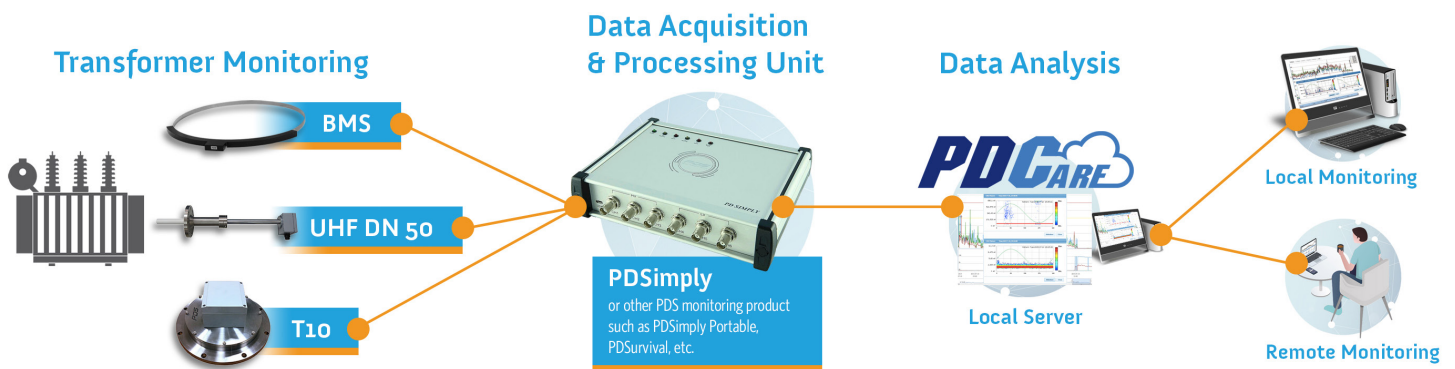


TMS-UHF System

Comprehensive Transformer Monitoring System



Power Diagnostic Service's TMS-UHF system offers a continuous, real-time, early warning partial discharge monitoring system for HV/MV power transformers. This system can transform time-based maintenance to condition-based maintenance. Advances in digital technology now make it possible to detect the presence of partial discharge (PD) in a transformer effectively.

PDS's on-line transformer monitoring system offers 24x7 partial discharge monitoring of high voltage transformers. The state of the art UHF sensors, along with a high performance data acquisition system, make it possible to detect partial discharge and enable users to take necessary action before it's too late. The PDS TMS-UHF system has been developed based on over 15 years of experience in monitoring transformers on-line for partial discharge.

Outstanding Features

- Easy installation
- Front-end processing for better performance and more detail
- 24 x 7 on-line monitoring of transformers with one-minute resolution
- UHF sensor for high signal to noise ratio
- Local/Remote indication of alerts

24 x 7 Continuous Monitoring

The CTM-UHF is an IEC TS 62478 compliant on-line partial discharge (PD) diagnosis and monitoring system designed for early warning of partial discharge. The system provides continuous on-line monitoring of the insulation condition of a transformer. Each monitoring channel is updated every minute enabling the user to review trending data. The system uses advanced noise and PD source separation techniques to ensure reliable PD detection. It is designed to sense the presence of partial discharge which can occur due to voids in the paper and oil insulation of a transformer.

Two Stage Threshold for Alarm Indications

The system provides early warning detection of PD events giving users the opportunity to take corrective action to prevent failure. The two stages of threshold coupled with PDS's Smart algorithm prevents false alerts of the early warning system. The relevant data from PDS Simply can be transmitted to the local computer as well as a remote computer running the PDCare software system.

Multiple Operation Modes

The TMS-UHF system can be configured to operate in stand-alone, local or network mode, providing maximum operational flexibility based on the user's choice. PDS Simply acquires, process and stores the data for analysis. In stand-alone mode, users can access PDS Simply from a computer to analyze the stored data following an alert.

In local mode, PDS Simply transfers the data to the local computer on a continuous basis via an ethernet connection. The local computer can be accessed locally or remotely via WAN for data transfer and analysis.

In network mode, the local computer communicates via WAN to remote devices. The alerts can be configured to be sent via email or SMS to smart devices. The PDCare software system enables users to remotely access the system for data analysis.

Easy System Configuration and Installation

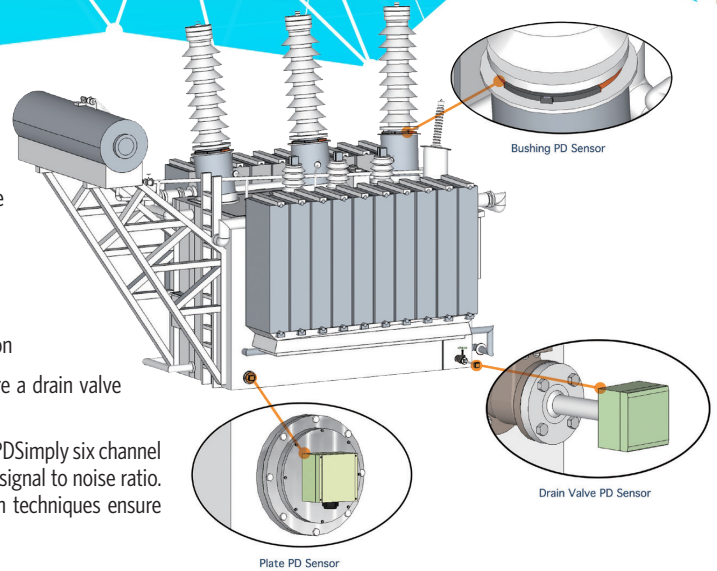
Installation of the system is very simple. It comprises of UHF sensors connected to a data acquisition system such as PDS Simply which provides 6 monitoring channels. More PDS Simply units can be added if more monitoring channels are required. PDS Simply has a built in self-monitoring function and 5 output contacts which can be configured for status indications for local/SCADA communications. Also, in cases where a permanent installation of PDS Simply is not required, sensors can be installed and PDS Simply Portable can be used to check for the presence of PD.

UHF Sensors for High Signal to Noise Ratio

For comprehensive transformer monitoring, the following sensors can be installed on the transformer:

- BMS sensor for monitoring PD in the entire transformer
- UHF DN 50 drain valve sensor for monitoring PD inside the transformer tank
- TM sensor type for monitoring PD in the transformer, as well as the cable termination
- TN hatch sensor for monitoring PD inside the transformer tank for situations where a drain valve sensor cannot be installed

The complete monitoring system has two main components - appropriate sensors and the PDSimply six channel data acquisition system. All PDS sensors work in UHF frequency range as it provides high signal to noise ratio. PDSimply's advanced noise suppression and multiple partial discharge source separation techniques ensure that only relevant PD data is evaluated so that faults are detected quicker.



UHF B800 Sensor

Features

- UHF oil immersed transformer partial discharge sensor
- Can be applied on in-service transformers
- High sensitivity
- Custom size according to the bushing diameter for best fitting and signal result
- Consisting of passive elements - low failure rate

Specifications

Type	B800
Frequency Range	30 Mhz to 900 Mhz
UHF enclosure material	POM
Surrounding strip material	Stainless
Connector	N-type
Input resistance	50 Ω
Test lead	5D coaxial cable



PDSimply Specifications

Measurement Specs

No. of Channels	6
PD Measuring Frequency	50 MHz - 900 MHz
PD Measuring Range	0.1 mV - 5 Vp-p
Resolution	10 bits bi-polar
Input Resistance	50 Ω
Filter	Built-in 50 MHz high-pass filter
Amplifier	90 dB Dynamic Amp, 6 dB/step



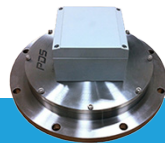
UHF T10 PD Sensor

Features

The UHF T10 PD sensor is designed for installation in oil immersed transformers for on-line partial discharge measurement. Typically, this is incorporated at the design and manufacturing stage of the transformer and in places where drain valve sensor installation is not possible due to the drain valve's design constraints.

Specifications

Type	T10
Frequency Range	150 Mhz to 1.2 Ghz
UHF enclosure material	stainless steel
Dielectric window material	PA 66 chopped fiber-glass reinforced nylon
Connector	N-type
Connection box	Waterproof box (IP 67) within surge absorber
Test lead	5D coaxial cable



UHF Drain Valve DN 50 PD Sensor

Features

The UHF DN 50 PD sensor is designed for installation through a transformer drain valve. Two models, T50V and T80V, are available depending on the size of the drain valve.

Specifications

Type	UHF DN 50
Frequency	150 Mhz to 1.2 Ghz
Input Impedance	50 Ω
Leak-tightness	Tested for oil temperature 120°C at 5 bars pressure



Hardware

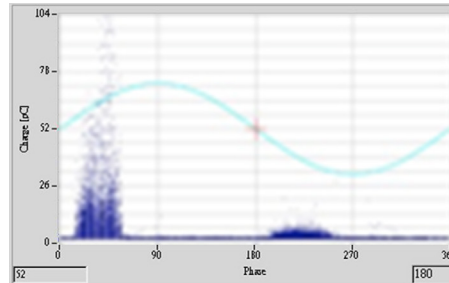
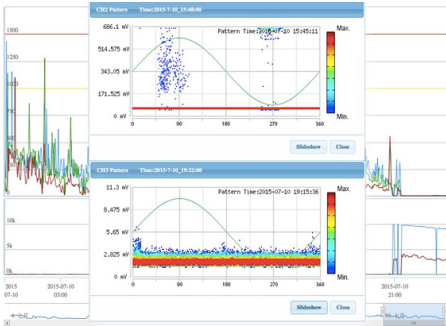
Storage	512 MB
Communication	micro USB, USB, RJ45
Output	5 x Dry Contacts
Power	AC 85 V - 264 V, 50/60 Hz, 15 W
Dimensions (mm)	250 x 164 x 53

Function

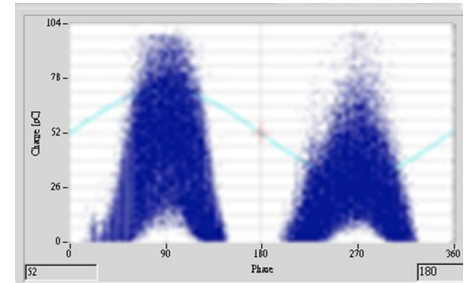
PD Magnitude	Yes
PD Trend	Yes
Pulse-Per-Second (pps)	Yes
PRPD Pattern	Yes
Two-stage Adjustable Threshold	Yes, PDS Smart Algorithm
System Overview	Yes

PDCare Software System

The PDCare software system from PDS enables users to review data over time for fault diagnosis. The system allows users to configure the system for two levels of alarm thresholds and view real-time data and trends locally or remotely. The PDCare system can send instant alerts to remote smart devices via multiple methods such as SMS, email, or web server notification. The system can be accessed over WAN to download the data for timely action.



PD Pattern with Sharp Edges



PD Pattern with Moisture in Paper

Applications



Drain Valve UHF Dn 50 Sensor



UHF Bushing Sensor Type B800



Cable Termination UHF Sensor Type TM



Transformer UHF Hatch Sensor Type T10

US

5010 E. Shea Blvd., Suite 240
Scottsdale, AZ 85254
Phone: +1-602-732-1099
E-Mail: sales.us@pdservice.com

Switzerland

Letzigraben 165
8047 Zürich
Phone: +41-78-6907218
E-Mail: sales@pdss.ch

Taiwan

No. 10, Ln. 482, Sec 4, Zhonghua Rd.
Hsinchu City 30094
Phone: +886-3-5305588
E-Mail: sales.tw@pdservice.com

Singapore

3 Pemimpin Drive, #04-01
Lip Hing Industrial Building, Singapore 576147
Phone: +65-62556308
E-Mail: singapore@pdservice.com

Korea

Room 611-1 Woorim W-City, #9-22, 255
Iod Panyo-ro, Seongnam-City, Gyeonggi-Do, 463-400
Phone: +82-010-86827714
E-Mail: sales.kr@pdservice.com

China

Building No. 58, Lane 118, Yonghe Rd.
JingAn District, Shanghai
Phone: +86-21-36355895
E-Mail: sales.cn@pdservice.com



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Power Diagnostic Service

www.pdservice.com