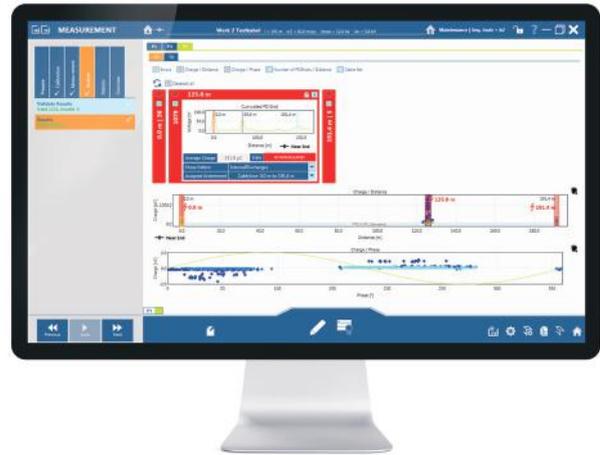# PDTD60-2

Partial Discharge Diagnostics System
incl. Tan Delta Diagnostics

VLF DIAGNOSTICS SYSTEM

The **HVDSA** high voltage Test System **PDTD60-2** offers both portable and built-in solutions for diagnostics of medium voltage cables, rotating machines and transformers.

Diagnostics of medium and high voltage cables provides the opportunity for early detection of vulnerabilities and preventative maintenance work to be carried out before the cable fails in service. Partial Discharge diagnostics (PD) allows a precise analysis of cables and their joints and terminations. Tan Delta diagnostics (TD) provides a clear statement about the overall dielectric condition of aged polymeric cables and especially any damage by so-called "water trees".

Features

- Simultaneous PD and TD measurement
- Small, light and portable units
- b2 Suite® - comprehensive diagnostics software and data base
- Easy and clear process of PD measurement
- Manual and automatic diagnostics modes
- Saves all data automatically
- PD-locating and phase-resolved presentation of PD
- PD magnitude

- High noise reduction
- Comprehensive but easy reporting
- Filter for suppressing noise signals
- Lightest solution
- Measurement setup according to IEC 60270 for Partial discharge measurement and calibration
- Leakage currents detection and correction for Tan Delta Measurement
- Monitored Withstand Test (MWT) according IEEE400.2-2013

PDTD60-2

Partial Discharge Diagnostics System
incl. Tan Delta Diagnostics

HVDSA Diagnostics System PDTD60-2 (combined with VLF generator[1]) provides a pure sinusoidal output voltage with stable frequencies. This is a pre-condition of direct comparison of PD and TD diagnostics results across cables of different lengths. The characteristics at ever-changing frequencies and varying output voltage waveforms provide no basis for reliable comparisons. Pure sinusoidal output voltage is recommended by standards (such as IEEE400.2-2013) and therefore clear guidelines and test procedures are provided.

With PDTD60-2 - VLF testing[1], PD diagnostics and TD diagnostics can be carried out simultaneously, saving time and avoiding preconditioning of the cable, which would lead to false results.

The comprehensive control and diagnostics software Suite® makes the process of diagnostics easy as never before, guiding the operator step by step through the entire process. The Suite® Data Base allows your data to be processed, stored and made available for future reference in just a few clicks.

SYSTEM FOR 60 kV - HVA60[1] & PDTD60-2
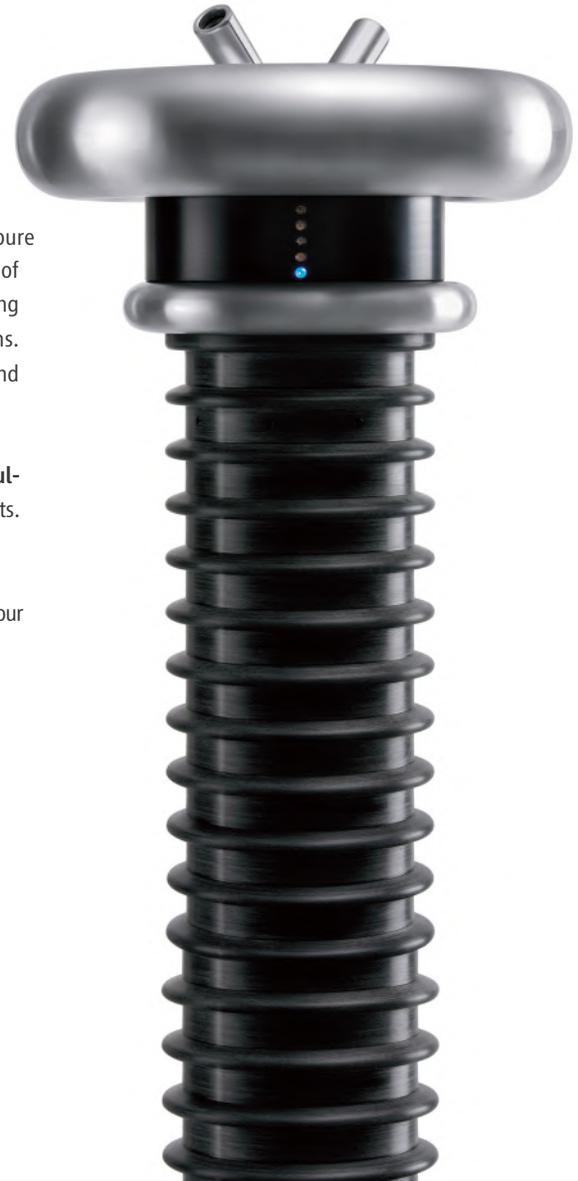
[1] *VLF (0.1 Hz) high voltage generator (required) is not in scope of delivery.*

Simultaneous measurement of VLF Testing, PD and TD

The parallel testing and measurement of PD and TD saves a significant amount of time, and prevents preconditioning of the cable.

Compact, lightweight and portable solutions

From small portable units for on-site use (e.g. off-shore) to built-in solutions for „test van" versions.

Automatic Mode

In addition to the manual, incremental, and self-explanatory menu, the system also offers an automatic measurement mode.

Diagnostics and Data Base Software

- Automatic or manual modes for testing, PD and TD diagnostics

- Guided Diagnostics Process - **leads the operator through diagnostics step by step**

- Automatic & manual gain and trigger setting

- Comprehensive Data Base

- Sets or recommends measuring parameters

- Reporting by a mouse-click

- Recommended by Standards (CENELEC & IEEE), with guidance for interpretation in literature

- Simultaneous VLF testing, Partial Discharge and Tan Delta Diagnostics

- Precise location of PD events on cable insulation, terminations and joints

- Algorithms for PD detection

- Analog and digital frequency filters
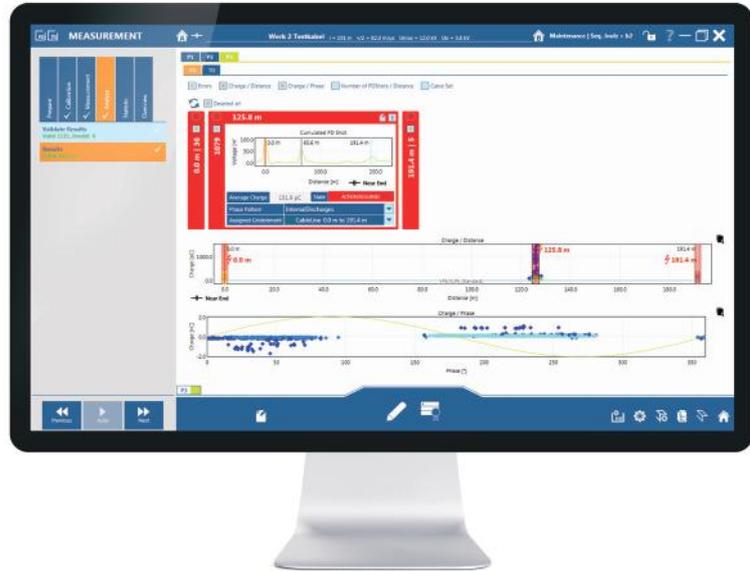
- Measurement in as little as 15 min incl. reporting

- Presentation of PD events over total cable length

- Direct Mapping of cable trace in Google Maps

- PD mapping

- Display of parasitic frequencies (bandpass and bandstop for parasitic frequencies)

- Phase-resolved presentation (pattern) of PD

Algorithms for detection of PD activities

The Suite distinguishes between valid and invalid PD signals, and then separates them.
This facilitates easy interpretation of results for the user.

Database

Comprehensive b2 Suite® database enables easy analysis and evaluation of the PD measurement. A fast search function for archived measurements and easy reproducibility of a measurement are among the key features.

Reporting

Reporting by a mouse click — simple or comprehensive. Individual design for reporting and easy integration of data and files.

PDTD60-2

Partial Discharge Diagnostics (PD)		
Article number		SH0233
Input Voltage		110 - 240V AC, 50/60Hz
Operating Voltage	Sinusoidal	1 - 44 kV rms / 62 kV peak
	Frequency	0.01 … 0.1 Hz in steps of 0.01 Hz (default 0.1 Hz) - auto frequency
HV Coupling Capacitor	Capacitance	~ 1 nF
	Dimensions / Weight	L 330 x W 280 x H 730 mm / 20.7 kg
HV Filter	Capacitance	~ 1 nF
	Dimensions / Weight	L 300 x W 280 x H 720 mm / 19.9 kg
Filter		Analog & Digital
Velocity Range (v/2)		10 - 150 m/µs
Measuring Range		100 km
PD background level		< 10 pC
PD localization	Accuracy	1%
PD resolution		0.1 pC | 0.1 m
Sample rate		125 MHz (Version 2 - 200 MHz)
Input Impedance		10 kΩ / 50 pF
Bandwidth		100 MHz | Analog Filter
Signal Amplification		0 - 52 dB (1 channel) | 0 - 72 dB (2 channel)
Environmental conditions	Storage	- 20°C to + 65°C
	Operating	- 5°C to + 45°C

Tan Delta Diagnostics (TD)		
Operating voltage	Sinusoidal	1 – 44 kV rms / 62kV peak
	Frequency	0.1 Hz - 0.01 to 0.1 Hz[1]
Measuring Range		0.1×10^{-3} - 999×10^{-3}
Tan Delta Measurement	Resolution	1×10^{-5}
	Accuracy	$\pm 1 \times 10^{-4}$
Voltage Measurement	Resolution	$0.1\ kV_{rms}$
	Accuracy	0.5%
Current Measurement	Resolution	$1\mu A_{rms}$
	Accuracy	0.5%
Load Range	standard	500 pF to 10 µF
Weight and dimensions		Incorporated in PD Coupling Capacitor

Control and Diagnostics Software b2 Suite®	
Features	• 0,1 Hz PD and TD Diagnostics at the same time! • Automatic or manual modes for PD Diagnostics • Guided Diagnostics Process • Comprehensive Data Base
Control	b2 VLF generator control, PD and TD Diagnostics
Measurement	Cable length with PD activities, PD Location, PD Mapping, Background Noise, PD Magnitude, Sine Wave Imposed display, PDIV and PDEV, etc…
System requirements	MS Windows 7 / 8, 64 Bit Operating System
Scope of delivery	Unit (two parts), Calibrator, HV Cable, Power and earthing cable, Corona Shields, Transport Boxes (2), b2 Suite Software (1 licence), Operating Manual, Data Base
NOT in Scope of delivery	Computer / PC, VLF (0.1 Hz) Generator (Voltage Source)

[1] Calibration Certificate for variable frequencies optional.| Please note: VLF (0.1 Hz) high voltage generator (required) is not in scope of delivery.