



## VLF DIAGNOSTICS SYSTEMS

Partial Discharge and Tan Delta diagnostics systems  
for condition evaluation of MV and HV cables.



Corona Bells

Diagnostics of medium and high voltage cables provides the opportunity for early detection of vulnerabilities and thus prevention of potential breakdowns. The Partial Discharge diagnostics (PD) allows a precise analysis of cables and their joints and terminations. The exact localization of Partial Discharges (PD) can lead to a massive improvement in the quality of the network.

Tan Delta measurement – also called dissipation factor – is a proven, simple and reliable test method for confirming the overall dielectric condition of cables or other electrical plant and infrastructure.



### Simultaneous measurement of PD and TD

The parallel measurement of PD and TD gives a significant advantage in time and prevents pre-conditioning of the cable, which can influence the results of a second test of two (due to the prior application of HV test voltages during the first).



### 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.



PD30-E



(Filter)

(CC)



PD60-2  
PDTD60-2



(Filter)

(CC)



PD90-2  
PDTD90-2

## PARTIAL DISCHARGE DIAGNOSTICS (PD)

The Partial Discharge measurement (PD) allows the precise localization of PD faults in cables and their connections (joints and terminations), often caused by mechanical damage due to a faulty installation process.



### b2 Suite® software

b2 Suite® provides a comprehensive “all-in-one” software solution for testing, diagnosis and management with a comprehensive database.



### True modularity

All b2 high voltage generators can be easily extended to a diagnostic system. Thus, the basic classic cable test set can be easily up-graded later to a diagnostics system, keeping initial investment low.



**HVA28TD**  
with integrated Tan Delta  
diagnostics system



**PDTD60-2**  
Partial Discharge system with  
integrated Tan Delta unit



**TD30 / TD60 / TD90-MC**  
external Tan Delta  
diagnostics systems

## TAN DELTA DIAGNOSTICS (TD)

Tan Delta diagnostics (TD) allows a clear statement about the overall dielectric condition of aged polymeric cables (XLPE/PE/VPE), and especially any damage by so-called "water trees". The TD diagnostics can be carried out simultaneously with the PD diagnostics. This saves time and prevents pre-conditioning of the cable by the first measurement of two separate but sequential ones.



### Automatic Mode

Besides the manual, incremental, and self-explanatory menu, the system also allows a fully automatic measurement mode.



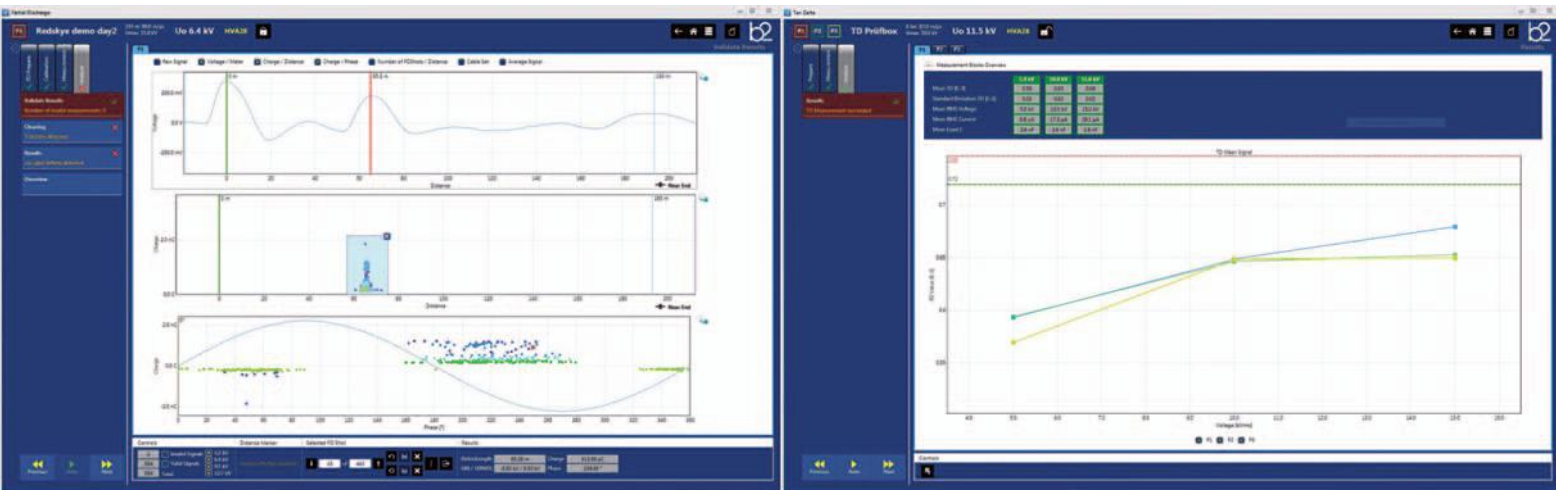
### Algorithms for detection of PD activities

The b2 Suite® distinguishes between valid and invalid TE signals, and then separates them. This facilitates the analysis and results process, providing a rapid learning curve for the user.

## b2 Suite® – Testing, diagnostics, data management and control of hardware

VLF-, DC- and insulation testing as well as PD and TD diagnostics with common and integrated data management within a single software solution.

- Very simple and clear measurement process
- Control of the b2 test generators
- Automatic measurement mode and detection of parameters
- Automatic storage of all measured data
- Simultaneous Tan Delta and PD diagnostics
- PD localization and phase-resolved representation
- PD level and PD-rate
- High noise suppression by filtering
- Comprehensive but very simple reporting



Partial Discharge diagnostics – b2 Suite®

Tan Delta diagnostics – b2 Suite®



### Database

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



### Reporting

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



## EXAMPLE: SYSTEM FOR 60 kV



**HVA60**  
VLF Hipot Tester



**PDTD60-2**  
Partial Discharge system with  
integrated Tan Delta unit



**b2 Suite®** – Software for testing,  
diagnostics, data management  
and control of hardware

## VLF DIAGNOSTICS SYSTEMS

The VLF diagnostics systems from b2 electronic GmbH are extremely compact, portable and modular. They provide users with a clear statement about the quality and condition of a medium or high voltage network. The VLF high voltage generators (HVA) together with Partial Discharge - and Tan Delta diagnostics systems provide a fully comprehensive testing and diagnostics system.

	<b>PDTD30-E</b>	<b>PDTD60-2</b>	<b>PDTD90-2</b>
Operating voltage	1 - 24 kV <sub>rms</sub> / 34 kV <sub>peak</sub>	1 - 44 kV <sub>rms</sub> / 62 kV <sub>peak</sub>	1 - 66 kV <sub>rms</sub> / 94 kV <sub>peak</sub>
Rated current / Frequency	1 A / 0,1 Hz	1 A / 0,1 Hz	1 A / 0,1 Hz
Capacitance Coupling capacitor / Filter	1 nF / 4nF	1 nF / 1nF	1 nF / 1nF
Filter analog, digital, frequency filter	●	●	●
Dimensions L x H x W (mm) / Weight	300 x 486 x 250 / 29 kg	300 x 740 x 250 / 18,5 kg	300 x 880 x 250 / 24,5 kg
Filter		300 x 720 x 250 / 15 kg	300 x 770 x 250 / 32 kg
Metering	Cable length with PD activities, PD location, PD mapping, PD magnitude, PD rate, Sine Wave Imposed display, Background Noise, PDIV and PDEV		

	<b>TD30</b>	<b>TD60</b>	<b>TD90-MC</b>
Operating voltage sinus	1 - 24 kV <sub>rms</sub> / 34 kV <sub>peak</sub>	1 - 44 kV <sub>rms</sub> / 62 kV <sub>peak</sub>	1 - 66 kV <sub>rms</sub> / 94 kV <sub>peak</sub>
Frequency	0,1 Hz / 0,01 - 0,09 Hz	0,1 Hz / 0,01 - 0,09 Hz	0,1 Hz / 0,01 - 0,09 Hz
TD measurement (Resolution / Accuracy)	1 x 10 <sup>-5</sup> / ± 1 x 10 <sup>-4</sup>	1 x 10 <sup>-5</sup> / ± 1 x 10 <sup>-4</sup>	1 x 10 <sup>-5</sup> / ± 1 x 10 <sup>-4</sup>
Load range	500 pF bis 10 µF	500 pF bis 10 µF	500 pF bis 10 µF
Dimensions (mm) / Weight	L 240 x Ø 80 / 3 kg	L 450 x Ø 120 / 5 kg	LHW 300x790x276 / 16 kg