

- **b2 Suite®** - comprehensive **Diagnostics Software and Data Bank**
- **Automatic and manual diagnostics modes**
- **Saves data automatically**
- **Sets parameters and recommends settings**
- **Leads the operator through diagnostics step by step**
- **Extremely easy and quick reporting**
- **Complete cable length display with PD activities**
- **High noise reduction**
- **PD locating – PD mapping**
- **PD magnitude**

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DHV1316 Rev01  
ENGLISH

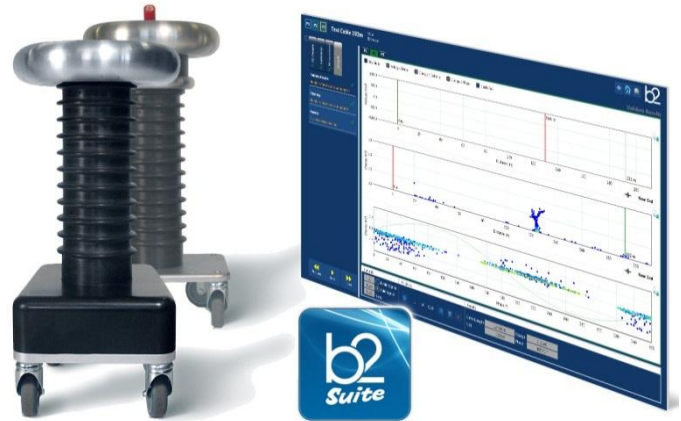
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Illustrations are not binding.

# PD90-2

## Partial Discharge Diagnostics System

The b2 electronic GmbH high voltage Test System **PD90-2** offers both portable and build-in solutions diagnostics of medium voltage cables, rotating machines and transformers.

The comprehensive control and diagnostics software **b2 Suite®** makes the process of diagnostics easy as never before, guiding the operator through the entire process. The Data Bank solutions of **b2 Suite®** makes data processing and availability for future references accessible in a few click's.



Representative images

### Partial Discharge Diagnostics

|                              |                           |                                    |
|------------------------------|---------------------------|------------------------------------|
| <b>Article Number</b>        | SH0236                    |                                    |
| <b>Operating Voltage</b>     | <b>Sinusoidal</b>         | 1 - 64 kV rms / 90 kV peak         |
|                              | <b>Frequency</b>          | 0,1 Hz                             |
| <b>HV Coupling Capacitor</b> | <b>Filter Capacitance</b> | 1 nF                               |
|                              | <b>Dimensions</b>         | L 300 x H 710 x W 250 mm - 19,5 kg |
| <b>HV Filter</b>             | <b>Dimensions</b>         | L 300 x H 770 x 250 mm– 16,5 kg    |
| <b>Measuring Range</b>       | 12.800 m at 80 m/μs       |                                    |
| <b>PD background level</b>   | 10 pC                     |                                    |
| <b>Sample rate</b>           | 10 ns                     |                                    |
| <b>Input Impedance</b>       | 10 kΩ / 50 pF             |                                    |
| <b>Bandwidth</b>             | 100 MHz                   |                                    |

### Control and Diagnostic Software b2 Suite®

|                            |   |
|----------------------------|---|
| <b>Features</b>            | <ul style="list-style-type: none"> <li>• 0,1 Hz PD Diagnostics</li> <li>• Automatic or manual modes for PD Diagnostics</li> <li>• Guided Diagnostics Process</li> <li>• Comprehensive Data Bank</li> <li>• Sets or recommends measuring parameters</li> <li>• Extremely easy reporting</li> </ul> |
| <b>Control</b>             | b2 VLF generator control, PD Diagnostics  |
| <b>Measurement</b>         | Cable length with PD activities, PD Location, PD Mapping, PD Magnitude, Sine Wave Imposed display, Background Noise, PDIV and PDEV, etc...  |
| <b>System requirements</b> | MS Windows 7  |

Please note: VLF (0,1 Hz) high voltage generator (required) is not in scope of delivery.

# PDTD90-2

## PARTIAL DISCHARGE AND TAN DELTA DIAGNOSTICS SYSTEM



simultaneous  
measurement  
of PD and TD



Software incl.  
Database



portable

The b2 electronic GmbH PDTD90-2 Partial Discharge (PD) and Tan Delta (TD) diagnostics system for diagnosis of medium voltage cables, rotating machinery and transformers.



### PARTIAL DISCHARGE DIAGNOSTICS (PD)

The Partial Discharge diagnostics on medium and high voltage cable offers the possibility of early detection of vulnerabilities through a precise localization of PD faults in cables and their connections (joints and terminations), often caused by mechanical damage or a faulty installation process.



### TAN DELTA DIAGNOSTICS (TD)

The Tan Delta diagnostics (TD) allows a statement about the overall dielectric condition of cables. A deterioration or damage by so-called water trees in XLPE/PE/XLPE cables can be easily detected. Water Trees cannot be identified or measured with a sole partial discharge measurement.



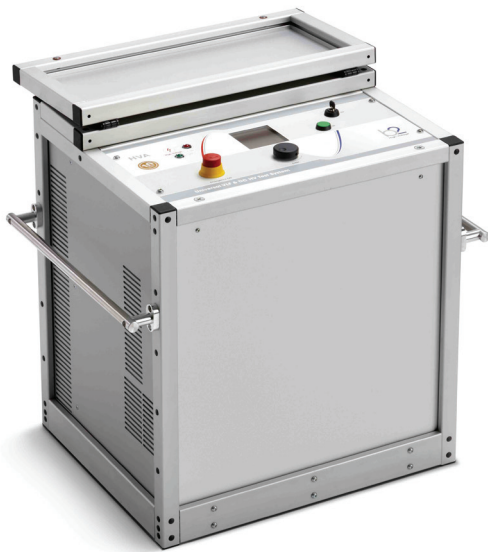
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## Features

- Compact, light and portable devices
- Simultaneous Partial Discharge and Tan Delta measurement
- b2 Suite® - comprehensive diagnostic software and database
- Display of cable route on OpenStreetMap®
- Very simple and clear measurement process
- Manual and automatic diagnostic mode
- Exact PD localization (PD mapping)
- Phase-resolved PD display (PD Pattern)
- PD Magnitude
- PD inception and extinction voltage
- PD rate
- High noise suppression by filtering
- Very high accuracy for Tan Delta measurement
- Extensive reporting
- Test setup according to IEC 60270 and calibration
- Monitored Withstand Test (MWT) according IEEE400.2-2013
- PD and TD measurement unit in one device
- PD and TD measurement unit in battery operation

## PDTD90-2

### PARTIAL DISCHARGE & TAN DELTA DIAGNOSTICS SYSTEM



HVA90<sup>1</sup>



PDTD90-2



PDC

## PDTD90-2 DIAGNOSTICS WITH VLF

The diagnostic system PDTD90-2 (in combination with a VLF generator<sup>1</sup>) enables comprehensive diagnosis with sinusoidal output voltage with constant frequency, which is a prerequisite for the comparison of PD and TD measurement results of cables with different lengths. Load-dependent and therefore constantly changing measurement frequencies offer no basis for this. The sine wave output voltage is the only described VLF voltage form in IEEE400.2-2013 for partial discharge and tan delta measurements and provides clear procedures and quality control procedures.

The comprehensive monitoring and diagnostics software b2 Suite<sup>®</sup> makes the process easier and leads you through the diagnostics process. The database solution of b2 Suite<sup>®</sup> allows to process the data quickly and can be retrieved at any time.



### Compact, lightweight and portable solutions

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

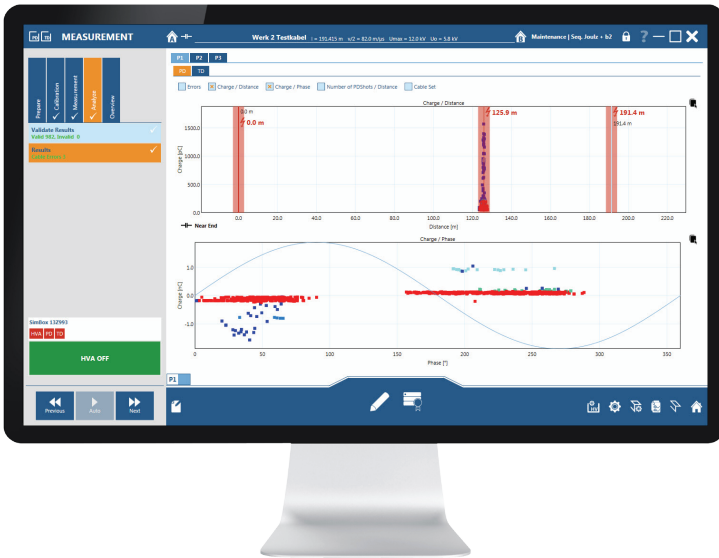


### Algorithms for detection of PD activities

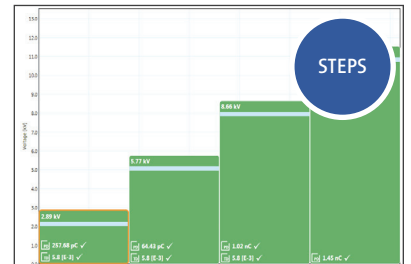
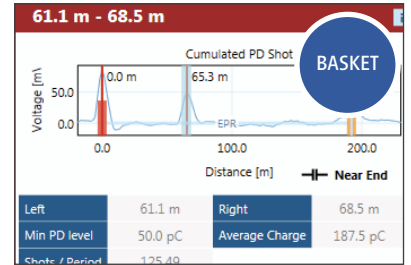
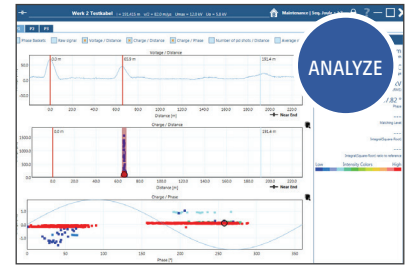
The b2 Suite<sup>®</sup> distinguishes between valid and invalid PD signals, and then separates them. This facilitates the easy interpretation of results for the user.

<sup>1</sup> VLF (0.1 Hz) high voltage generator (required) is not included in the scope of delivery.

# b2 SUITE® SOFTWARE



b2 Suite® - Software



## FEATURES

- Automatic or manual modes for testing and PD diagnostics
- Precise location of PD events on cable insulation, terminations and joints
- Presentation of PD events over total cable length
- Phase-resolved presentation (pattern) of PD
- PD inception- and extinction voltage
- Guided Diagnostics Process - leads the operator through diagnostics step by step
- Automatic & manual gain and trigger setting
- Sets or recommends measuring parameters
- Recommended by Standards (CENELEC & IEEE), with guidance for interpretation in literature
- Analog and digital frequency filters
- Direct Mapping of cable trace in OpenStreetMap®
- PD mapping
- Display of parasitic frequencies (bandpass and bandstop for parasitic frequencies)



### Database

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



### Reporting

Reporting - be it simple or comprehensive - takes one click. Individual design for reporting and easy integration of data and files. Measurement in as little as 15 min incl. reporting.

# PDTD90-2

## TECHNICAL DATA

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### PARTIAL DISCHARGE DIAGNOSTICS SYSTEM (PD)

|                       |  |   |
|-----------------------|--|---|
| Article number        | SH5033   |   |
| Input supply voltage  | 110/240 VAC, 50/60 Hz  |   |
| Operating voltage     | sinusoidal   | 64 kV rms, 90 kV peak   |
|                       | frequency  | 0.01-0.1 Hz in steps of 0.01 Hz<br>default: 0.1 Hz (auto frequency) |
| HV coupling capacitor | capacitance  | ~ 1 nF  |
|                       | dimensions, weight   | L 330 x W 280 x H 70730 mm, 24.7 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           | 200 MS/s   |   |
| Bandwidth             | 100 MHz, analog filter   |   |
| Signal amplification  | 0-52 dB (1 channel) , 0-72 dB (2 channel)                      |   |
| Environment           | temperature: storage -20°C to + 65°C, operating -5°C to + 45°C |   |

### TAN DELTA DIAGNOSTICS SYSTEM (TD)

|                       |  |                                     |
|-----------------------|--|-------------------------------------|
| Output Voltage        | sinusoidal                                     | 64 kV rms, 44 kV peak               |
|                       | frequency                                      | 0.1 Hz, 0.01 to 0.1 Hz <sup>1</sup> |
| Measuring range       | 0.1 x 10 <sup>-3</sup> -999 x 10 <sup>-3</sup> |                                     |
| Voltage measurement   | resolution                                     | 0.1 kV rms                          |
|                       | accuracy                                       | 0.5 % of reading                    |
| Current measurement   | resolution                                     | 1 μA rms                            |
|                       | accuracy                                       | 0.5 % of reading                    |
| Tan Delta measurement | resolution                                     | 1 x 10 <sup>-5</sup>                |
|                       | accuracy                                       | ± 1 x 10 <sup>-4</sup>              |
| Load range            | standard                                       | 500 pF to 10 μF                     |
| Weight and dimensions | incorporated in the PD coupling capacitor      |                                     |

### CONTROL AND DIAGNOSTICS SOFTWARE b2 SUITE®

|                     |   |
|---------------------|---|
| Features            | <ul style="list-style-type: none"> <li>• 0.1 Hz PD and TD diagnostics at the same time!</li> <li>• Automatic or manual modes for PD diagnostics</li> <li>• Guided diagnostics process</li> <li>• Comprehensive data base</li> </ul> |
| Control             | b2 VLF generator control <sup>3</sup> , and b2 Suite® Software  |
| Measurement         | Cable length with PD activities, PD location, PD mapping, background noise, PD magnitude, sine wave imposed display, PDIV and PDEV, etc   |
| System requirements | Windows 8 and 10, 64 Bit operating system   |

### ACCESSORIES

|                          |   |
|--------------------------|---|
| Scope of delivery        | Unit (two parts), PDC calibrator incl. accessories, HV cable, PD connection cable (2), power and earthing cable, corona shields, transport boxes (2), b2 Suite® V1.8 software <sup>2</sup> (2 licences), database, operating manual |
| NOT in Scope of delivery | Computer/PC, VLF (0.1 Hz) generator <sup>3</sup> (voltage source), b2 Suite V2 (optional)   |

<sup>1</sup> Calibration Certificate for variable frequencies optional, <sup>2</sup> b2 Suite V2 optional,

<sup>3</sup> Please note: A VLF (0.1 high voltage generator (required) is not included in the scope of delivery.