



DOBLE IN-SERVICE TESTING & ASSESSMENT

PD-Smart

Partial Discharge Analyzer

**IN-DEPTH PARTIAL
DISCHARGE TESTING
IN THE FIELD**

The Doble PD-Smart is a versatile, partial discharge analyzer used to detect PD in all types of in-service equipment including transformers, rotating machines, cables and switchgear. The PD-Smart works with Doble couplers or your existing, pre-installed couplers.

FEATURES

- High measurement accuracy and sample rate
- Complies with IEC 60270 and various VDE, ANSI and IEEE standards
- Advanced noise suppression tools include windowing, gating, frequency band shifting and an adjustable internal digital filter
- Uses well-known and advanced Lemke Noise Gating Technology where the elimination of external noises happens via an external antenna
- Measures both the PD and the actual applied voltage under test
- User interface features a customizable dashboard layout to make PD testing easier and more intuitive
- UHF mode for detection of radiated and conducted high frequency activity from partial discharge

BENEFITS

- Use for in-house and on-site applications of all types of HV apparatus
- Combines state-of-the-art technology with 40 years of Lemke's Partial Discharge knowledge within one smart solution
- Noise suppression techniques make it possible to perform tests in rough and noisy environments
- A simple way to add partial discharge analysis to your condition-based maintenance testing program
- Versatile test instrument for both directly coupled sensors and indirectly coupled sensors, such as UHF antennae and high frequency current transformers



PD-SMART TECHNICAL SPECIFICATIONS

| MEASUREMENT PARAMETERS | |
|---|---|
| INPUT FREQUENCY RANGE | |
| Test voltage | 20 Hz - 1.2 kHz |
| PD signal | 35 kHz - 20 MHz |
| INPUT VOLTAGE | |
| Test voltage | 50V rms (max) |
| PD signal | 70V rms (max) |
| INTEGRATION IN TIME AND FREQUENCY RANGE | |
| Time range | 140 ns...8µs |
| Frequency range | 0 Hz...20 MHz |
| Filter bandwidths | Freely adjustable |
| DYNAMIC RANGE | |
| Test voltage | 16 bit, 80 dB |
| PD signal | 16 bit, 100 dB |
| ADDITIONAL MEASUREMENT PARAMETERS | |
| Selectable input attenuation | 64 dB / 8 dB - 16 dB |
| Single pulse resolution capability | > 100 kHz repetition rate (deviation < 10 %) |
| Single pulse detection | < 3 ns |
| Max. double pulse resolution | < 200 ns (time range, super position error < 1%) |
| Max. pulse frequency | > 2 MHz |
| Synchronization between units | < 800 ps |
| Minimum detectable apparent charge | 0.2 pC |
| Maximum input pulse amplitude | 100 V, max. 100 nC |
| I/O | |
| Outputs | 1 x FOL-output with E/O converter as Ethernet 1 x FOL-output Downlink 1 x FOL-output Uplink 1 x TNC Trigger output 1 x FOL Trigger output |
| Inputs | 1 x TNC HF PD-signal 1 x TNC LF voltage signal 1 x TNC HF gating signal |
| PD input coupling | DC, AC |
| PD input protection | Input protection against over-voltage and short-circuit |
| INPUT IMPEDANCE | |
| Test voltage | 1 MΩ |
| PD signal | 50 Ω |
| UHF MODULE | |
| UHF Spectrum analyzer | Integrated zero span function |
| UHF Sensor pre-amplifier | Optional 38 dB amplification for frequencies 110 - 850 MHz over-voltage protection |
| UHF Processing unit | TNC type signal input attenuation unit: 62 dB software controlled in 2-dB steps Band stop filter 7 MHz Software controlled adjustment 110-850 MHz |
| IF Mixer Unit | Internal IF signal (peak detected) as output signal for the digital input unit, with bandwidth 110-850 MHz at 7 MHz (IF) |

| SYSTEM PARAMETERS | |
|---|--|
| Power Supply | 14.4 V DC with battery |
| External power supply | 100-240 V, 50-60 Hz |
| Warming-up period | 15 Minutes (only required with UHF unit when in calibration mode) |
| Power consumption | 50 VA |
| TEMPERATURE RANGE | |
| Operation | 0°C to 45°C, 32°F to 113°F |
| Storage | -10°C to 60°C, 14°F to 114°F |
| Humidity | 5% ... 95%, non-condensing |
| OPTIONAL ACCESSORIES | |
| Calibrators | Calibrators for external calibration of the PD measuring circuit |
| LDC-7/UHF | Function tester, UHF pulse signal injector |
| ROTATING MACHINES | |
| Couplers and connections | Range of Doble PD Couplers with integrated measuring impedance According to IEC EN 60270 Including splitting box and connection box |
| BC Matching Unit | To adapt conventional PD measuring methods to maximum 4 low-capacitance line couplers |
| MV/HV CABLES | |
| HFCT-300 Sensor | For highly sensitive PD measurements with superposed line currents or high reactive currents (50/60 Hz) which can reach up to 300 A. Also available in potted version. |
| LDWS-T | Cable sealing end UHF sensor |
| HV TRANSFORMERS AND SWITCHGEAR | |
| TEV Sensor | Detection PD signals behind metal surfaces, i.e. metalclad switchgear and transformers |
| HFCT-300 Sensor | (as above) |
| HV TRANSFORMERS | |
| DN-50/80 | Drain Valve UHF PD-probe |
| UHF PD Plate Sensor | Integrated UHF sensor |
| HFCT-Mini | For use with bushing PD detection |
| MEASURING IMPEDANCE AT MV/HV CABLES & HV TRANSFORMERS | |
| LDM-5/U5 | Measuring impedance for signal and test voltage decoupling |
| Coupling Capacitor | Range of coupling capacitors to be used with LDM-5/U5 |
| LDF-6/FU - Filter Unit | Filter for suppression of radio interferences to be used with LDM-5/U5 |

Specifications are subject to change without notice.

Doble is ISO certified.

Doble is an ESCO Technologies Company.

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