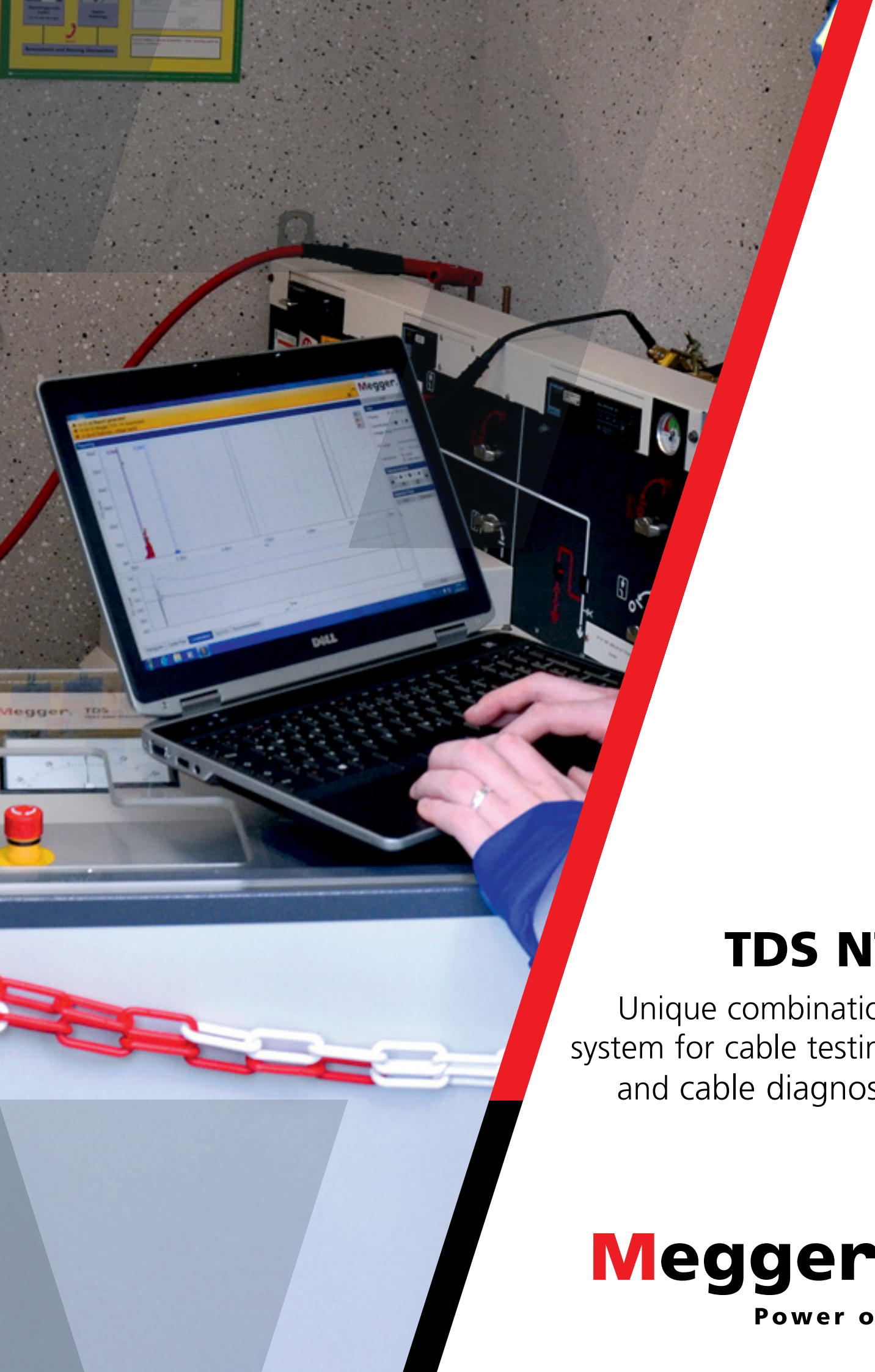


TDS NT

Unique combination system for cable testing and cable diagnosis

Megger

Power on

TDS NT

The unique combination system for cable testing and cable diagnosis

- Two proven voltage wave shapes in one device
- Standard compliant VLF cable testing with accompanying PD diagnosis
- Non-destructive PD diagnosis by means of proven DAC voltage
- 50 Hz Slope Technology for a direct comparison with the power frequency

Two proven methods in one device

SebaKMT is widely known for its powerful VLF test systems. The high testing capability is achieved through the patented energy recovery principle. Now, in addition to the VLF waveform, which is ideal for commissioning tests, there is also the option of generating a DAC voltage. The DAC voltage has proven to be the ideal voltage waveform for a non-destructive PD diagnosis.

The principle

For both voltage waveforms, these two fundamental conditions are present:

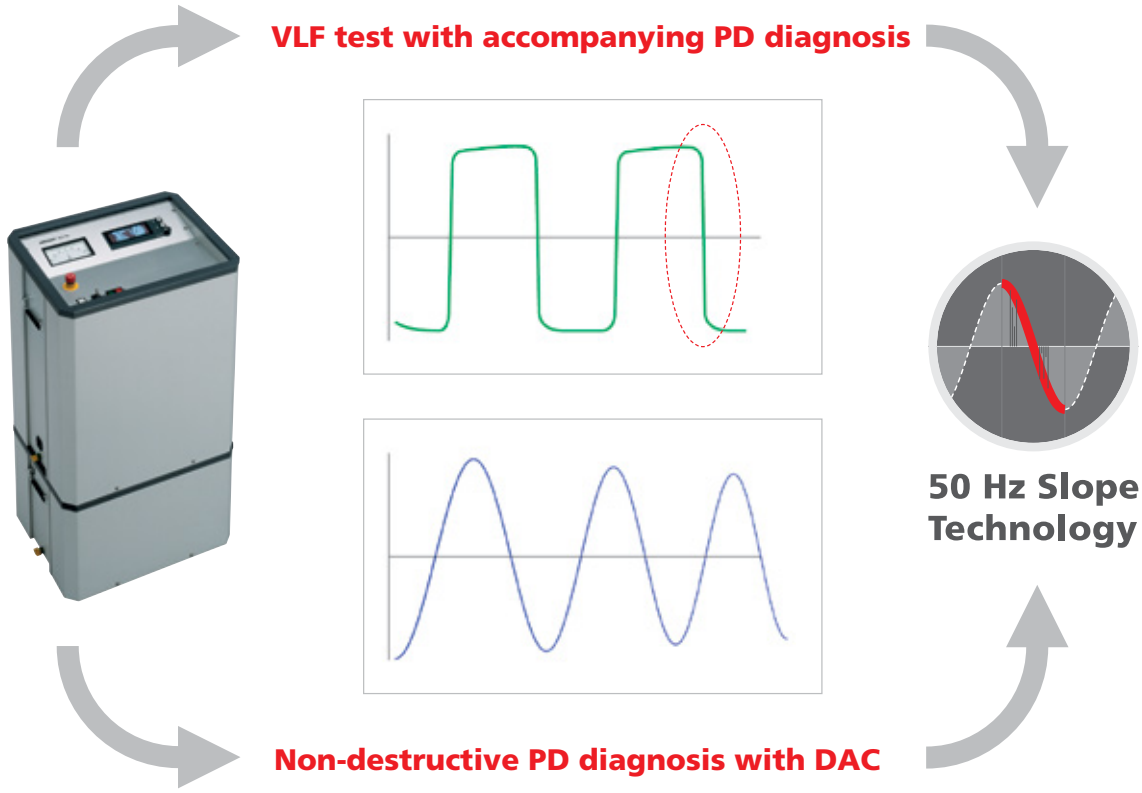
the **charging phase** and the **resonance phase**.

During the charging phase the test object is charged to the desired voltage, or the voltage losses of the cable during measurement are recharged. During the resonance phase the TDS and the cable form a resonant circuit whose natural resonance frequency is determined by the fixed inductance and the support capacitor of the power source, and the capacitance of the test object. The support capacitor has been designed in such a way that the resonance frequency will always fall in a specific frequency window comparable to that of the network frequency - thus a 50 Hz Slope - is attained for every test object.

The unique “all-in-one” solution

The new TDS NT series offers the highest degree of flexibility in the area of cable testing and diagnosis. The TDS NT consists of a multifunctional, compact voltage source and a modern PD detector. The TDS test voltage source can be used for both simple VLF tests or for meaningful commissioning tests with accompanying PD diagnosis in connection with the PD detector.

In addition to the proven **VLF and DAC test voltage** the TDS can also be used for **DC tests** and **sheath tests** in compliance with IEC 60229. Furthermore, in combination with the step voltage sensor ESG NT, it can also be used for precise pinpointing of sheath faults.



Test and diagnosis system in one

Network operators can now get faster and significantly more reliable information about the quality and the condition of their cables. This is made possible thanks to the brand-new 50 Hz Slope Technology. For the first time, it has become possible to immediately locate faults in underground cables during the actual PD measurement.

With the 50 Hz Slope Technology for the first time worldwide a withstand test with VLF cosine-rectangular voltage (VLF CR) and PD diagnosis with damped alternating voltage (DAC) is combined in one unit. This allows an efficient and integrated solution for precise inventory of the network infrastructure. The important fact here is that the PD measurement data, gained with the VLF CR or with the DAC test voltage, can be compared directly with the 50 / 60 Hz networkvoltage. This facilitates reliable decision making.

TDS NT consists of a multifunctional, compact voltage source and a PD detector. It can be used to test cables according to the international standards (e.g. IEC 60502-2 and IEEE 400.2) with VLF-CR. In addition, a PD diagnosis using the new 50 Hz Slope Technology, can be performed simultaneously with the help of the PD detector. Alternatively, the TDS NT can also be used for PD diagnosis with the proven damped AC voltage (DAC).

In practice, the PD diagnosis has been established nationally and internationally as an effective method of measurement. It is especially useful for commissioning testing, as it is the only way to check reliably the quality of workmanship of the accessories.

TDS 40 together with the PD detector PDS 60 in operation to test the quality of workmanship on a newly installed cable.

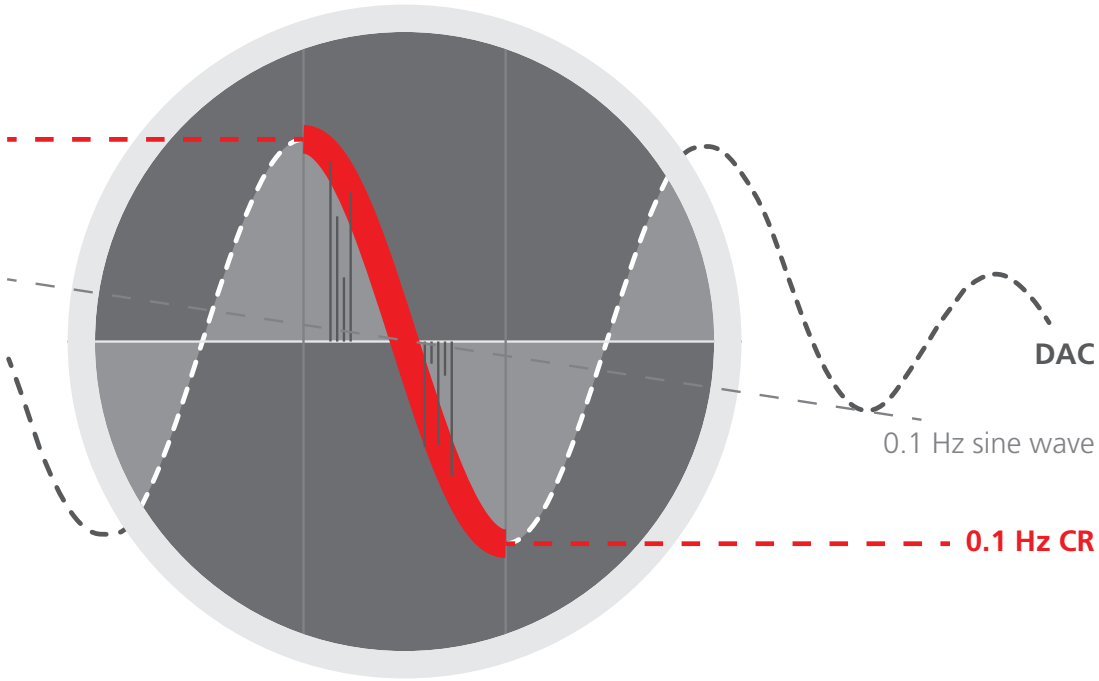
By users for users

Your partner with long-lasting experience in PD diagnosis

The new PD detector PDS 60 combines many years of field experience, customer demands and innovations in one device. That makes it possible to carry out a VLF test along with a PD diagnosis. This not only increases the reliability of the withstand-test, since partial discharges are simultaneously recorded, but is also cost-effective. If a PD-free cable is detected during the withstand-test, a PD diagnosis for quality control is no longer required.

The 50 Hz Slope Technology

Both the VLF voltage and the DAC voltage work according to the principle of 50 Hz Slope Technology. This is particularly important for PD diagnosis, since reliable evaluation of the measured results requires a direct comparability with the power frequency. It is widely known that PD characteristics change in case of large frequency differences, making reliable evaluation impossible. Our 50 Hz Slope Technology ensures comparability for both voltage wave shapes.



The above diagram shows a typical example of how PD measurement is carried out during the slope of the applied voltage. The steepness of the VLF CR and DAC slopes in comparison to the 0.1 Hz sine wave can be clearly seen.

It is precisely this rise in voltage which is so important for the PD inception voltage. Therefore, the 0.1 Hz sine wave test voltage cannot be directly compared to the 50 / 60 Hz power frequency and critical partial discharge defects are therefore not always reliably detected.

User-friendly software

The focus of the new technology is on the user

- **The operating software is designed so that any user will come to grips with it immediately.**
- **Integrated database, simplified searching, browsing and administration of measurement and cable data.**
- **Improved fully automatic calibration with display of signal to noise ratio.**
- **“Live” PD mapping: The PD evaluation algorithm enables a reliable automatic detection and precise location of partial discharges (PD mapping) whilst the measurement is taking place. Time-consuming post-processing of the measurement data is no longer needed, maintenance resources can be directly scheduled. (See figure 1)**
- **Reporting by mouse click: immediately after the measurement has been completed, the operator can create a report with a clearly structured summary of the most important measurement data with a simple mouse click. (See figure 2)**

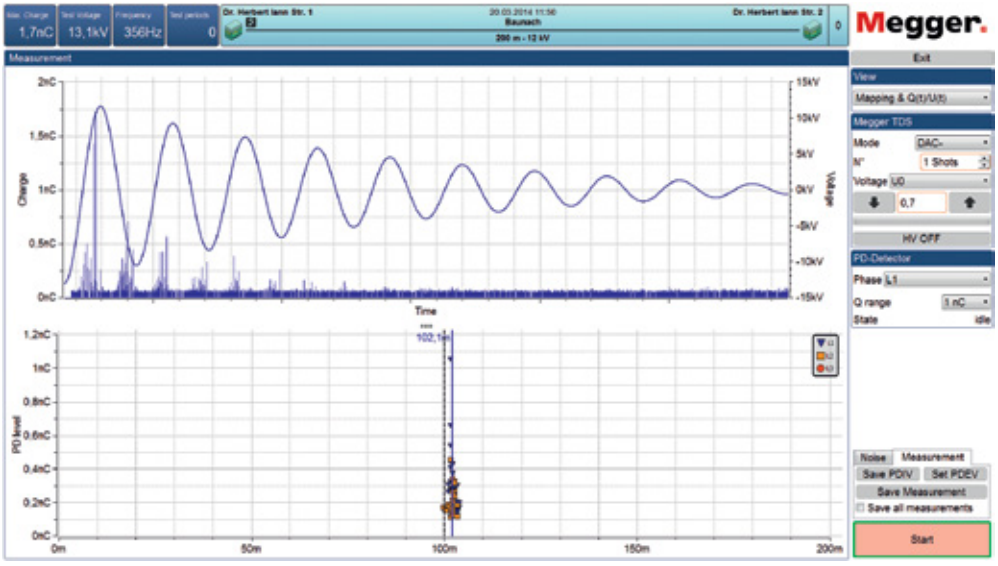


Fig. 1

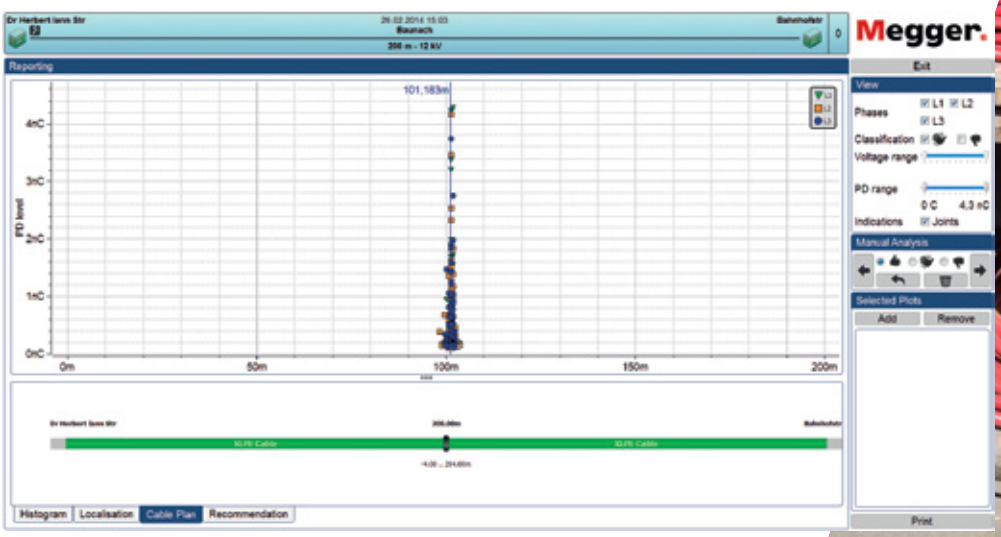
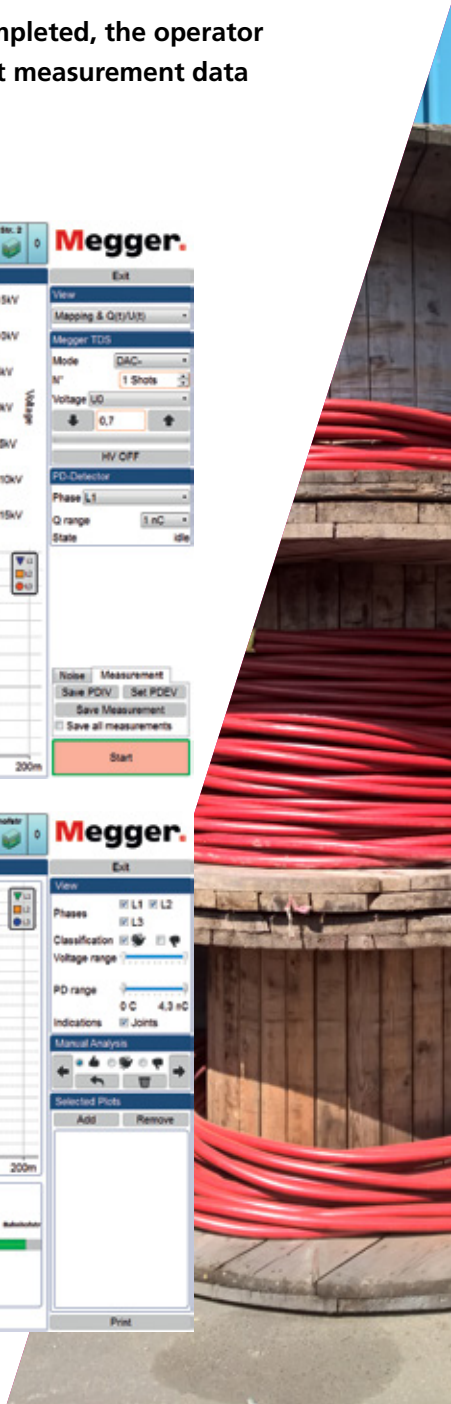


Fig. 2



Technical data

TDS 40 / 60

Special features:

- **Thanks to the high test capacitance, standard compliant 0.1 Hz VLF tests on long cables or multiple phases in parallel are guaranteed. This allows considerable time savings.**
- **Portable and easy to transport thanks to two-piece design.**
- **The integrated leakage measurement gives a first indication about the condition of the cable.**
- **Highest safety through integrated discharge unit, earth-loop-monitoring and breakdown detection.**

VARIENT	TDS 40	TDS 60
Output voltage VLF DAC DC	3 ... 40 kV_{RMS} 3 ... 40 kV_{peak} 3 ... ±60 kV	3 ... 60 kV_{RMS} 3 ... 60 kV_{peak} 3 ... ±60 kV
Output current	7 mA	5 mA
Leakage current measurement	0 ... 7 mA, resolution 10 µA	0 ... 5 mA, resolution 10 µA
Frequency VLF DAC	0.1 Hz 50 to 500 Hz	
Testable cable capacitance VLF		
Basic version	2.4 µF / 40 kVRMS @ 0.1 Hz	1 µF / 60 kVRMS @ 0.1 Hz
Plus version	4.8 µF / 40 kVRMS @ 0.1 Hz	2 µF / 60 kVRMS @ 0.1 Hz
Testable cable capacitance DAC	5 µF / 40 kVpeak 10 µF max.	2 µF / 60 kVpeak 10 µF max.
Sheath test / fault pinpointing	Testing: 3 ... 10 kV Pinpointing: 3 ... 10 kV, pulse 1:3 / 1:5 / 1:9	
Safety devices	Breakdown detection, integrated discharge unit, earth loop monitoring	
Power supply	230 V, 50/60 Hz, 500 VA 120 V, 60 Hz, 500 VA	
Logging	Yes	
Temperature Operation Storage	-25 °C ... +55 °C -40 °C ... +70 °C	
Relative humidity	93% / 30 °C (non-condensing)	93% / 30 °C to 50 kV (non-condensing) 70% / 30 °C from 50 kV to 60 kV (non-condensing)
Protection class	IP 20	
Weight (depends on options fitted)	Approx. 55 kg + 48 kg	Approx. 85 kg + 48 kg
Dimensions W x H x D, divided in two devices	550 x 1100 x 420 mm	550 x 1100 x 420 mm

Technical data

PD Detector PDS 60

Special features of the evaluation software:

- **Powerful database. Simplified searching, browsing and administration of measurement and cable data.**
- **Fully automatic calibration with the option of calibrating according to cable length or propagation velocity.**
- **Clear display of measurement results and live PD localization. A time-consuming post-processing of the measured data is no longer necessary.**
- **Report generation by mouse click.**

PD DETECTOR PDS 60	
Voltage Operation Type	 max. 60 kVRMS VLF CR or DAC
Capacity of HV coupling capacitor	25 nF
Sensitivity range	2 pC … 100 nC
Resolution	± 0.1 pC
PD self-noise level	< 2 pC
PD impulse repetition rate	100 kHz
PD localization Measuring range Propogation velocity v/2 Sampling rate Bandwidth Precision Resolution	 0 … 16.000 m / v/2= 80 m/µs 5 … 120 m/µs 125 MHz (8 ns) 3 / 25 MHz (switchable) 1% of the cable length ±0.1 pC / ±0.1 m
Filter	Analog and digital
Power supply	24 V via TDS test system
Temperature Operation Storage	 -20 °C … +55 °C -40 °C … +70 °C
Relative humidity	93 % / 30 °C (non-condensing)
Weight HV filter/ couple PD detector	 25 kg 6 kg
Dimensions (W x D x H)	
PD calibrator (IEC 60270-compliant) Measuring range Power supply	 200 pC … 20 nC 9 V block battery
Software	EasyGo principle, integrated cable database, fully automatic evaluation

Order information

PRODUCT	ORDER NO.
TDS NT 40-B Set Consists of TDS 40 Basic, PDS 60, PD calibrator, laptop and SW licence with 3 dongles	1004526
TDS NT 40-P Set Consists of TDS 40 Plus, PDS 60, PD calibrator, laptop and SW licence with 3 dongles	1004527
TDS NT 60-B Set Consists of TDS 60 Basic, PDS 60, PD calibrator, laptop and SW licence with 3 dongles	1004528
TDS NT 60-P Set Consists of TDS 60 Plus, PDS 60, PD calibrator, laptop and SW licence with 3 dongles	1004529
TDS 40 Basic	138315765
TDS 40 Plus	138315795
TDS 60 Basic	138315405
TDS 60 Plus	138315410
PDS 60	1003380
PD calibrator	90007366
SW licence with 3 dongles	90011937

OPTIONAL ACCESSORIES	ORDER NO.
Additional SW licence (1 dongle)	90011938
Mounting bracket PDS 60	2003886
Diagnostic connection set	890017909
PD-free test adapter PD PA-MC-12	820016301
PD-free test adapter PD PA-MC-16	820016302
External safety device	128309600
Laptop platform	2005346
PDS 60 HV connection cable 1.5 m	138315410
PDS 60 HV connection cable 3 m	2005655
PDS 60 HV connection cable 5 m	890010915
PDS 60 HV connection cable 10 m	890023555
TDS 40/60 HV connection cable 10 m	2005656
Upgrade VLF CR-40B/P to TDS 40-B/P	1005138
Upgrade VLF CR-60B/P to TDS 40-B/P	1005140

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