frida and frida TD
BAUR VLF testers and diagnostics devices

MWT

truesinus

NEW!

Output voltage up to 26 kV_{rms}

- **VLF cable testing with 3 x U_0 for cables up to 15 kV**
- **Monitored Withstand Test with 3 x U_0 for cables up to 15 kV (frida TD)**

The new cable condition evaluation generation

- Cable testing and dissipation factor measurement in one device
- Easy and quick test setup
- Automatic testing and diagnostic sequences
- Compact dimensions and lightweight

The portable BAUR devices frida and frida TD are used for

- Cable testing
- Cable sheath testing
- Cable diagnostics (frida TD):
  - Dissipation factor measurement
  - Monitored Withstand Test with dissipation factor measurement
  - Partial discharge measurement*
  - Full Monitored Withstand Test with dissipation factor and partial discharge measurement*

The **VLF testing** makes it possible to locate insulation faults in plastic- and paper-insulated mass-impregnated cables in the shortest of testing times without impairing the quality of the surrounding insulating material.
The **dissipation factor measurement** with 0.1 Hz VLF truesinus® provides differentiated information on the ageing condition of paper-insulated mass-impregnated and PE/XLPE cables. In the case of PE/XLPE cables, the dissipation factor measurement is capable of differentiating between new, slightly or severely "water tree"-damaged cables. This makes it possible to prioritise the need to replace cables.
The **Monitored Withstand Test with dissipation factor measurement** combines the cable testing and dissipation factor measurement, allowing an accurate and comprehensive assessment of the cable condition. In addition, there is minimum load on the cable due to the optimised test duration.

Functions and features

frida and frida TD

- Suitable for continuous operation
- Max. test voltage 26 kV_{rms}
- Voltage shapes: VLF truesinus®, VLF square wave voltage and DC voltage
- Load-independent, reproducible sinusoidal high voltage by means of VLF truesinus® testing technology
- Cable testing on cables up to 15 kV according to
  - IEC 60502.2
  - CENELEC HD 620/621 (DIN VDE 0276-620/621)
- Acceptance and maintenance tests according to IEEE 400-2012, IEEE 400.2-2013
  NEW: Acceptance test with 26 kV_{rms} for 20 kV cables
- Cable testing according to IEC 60060-3
- Cable sheath testing according to IEC 60502/ IEC 60229
- Extendible in combination with the PD-TaD 62:
  - frida: to include the PD diagnostics function
  - frida TD: to include the PD and Full MWT diagnostics function

frida TD

- Dissipation factor measurement on medium-voltage cables up to 20 kV
- Monitored Withstand Test MWT according to IEEE 400.2
  - MWT with dissipation factor measurement
  - Full MWT with dissipation factor and PD measurement (with the PD-TaD 62)
- Highly precise dissipation factor measurement with precision of 1 x 10^{-4}
- Detection of leakage currents using VSE box (option)
- Fully automated and individually programmable diagnostic sequences incl. evaluation

* in combination with the BAUR PD-TaD 62 PD diagnostics system.

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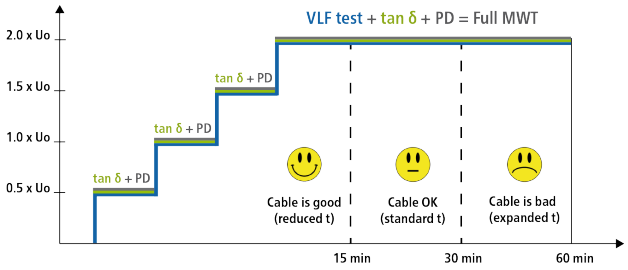
Full Monitored Withstand Test

Combination of methods for more significant information



With the BAUR frida TD VLF tester and diagnostics device and in combination with the PD-TaD 62 portable PD diagnostics system, you can measure dielectric losses and test the cable route for partial discharges during the VLF cable testing. This combination of methods is called Full MWT and delivers significantly more information than the cable test alone. While the cable test shows whether the cable system can withstand a load over a specified test duration, the dissipation factor measurement enables an evaluation of the condition of the cable insulation. Moreover, partial discharge testing shows and locates the PD faults precisely. The highlight of MWT is the condition-based test duration: Provided it is permitted, the test duration can be shortened, which in turn lowers costs. This way, the cable is only exposed to the increased test voltage for the required duration.

VLF truesinus® – A voltage shape for all methods and method combinations

VLF truesinus® is the only voltage shape that enables both the reliable voltage tests as well as precise dissipation factor measurements and partial discharge testing. Unlike other voltage shapes, the VLF truesinus® voltage is load-independent, symmetrical and continuous. This is a prerequisite for high precision as well as reproducibility and comparability of measurement results.

Available methods and combinations of methods

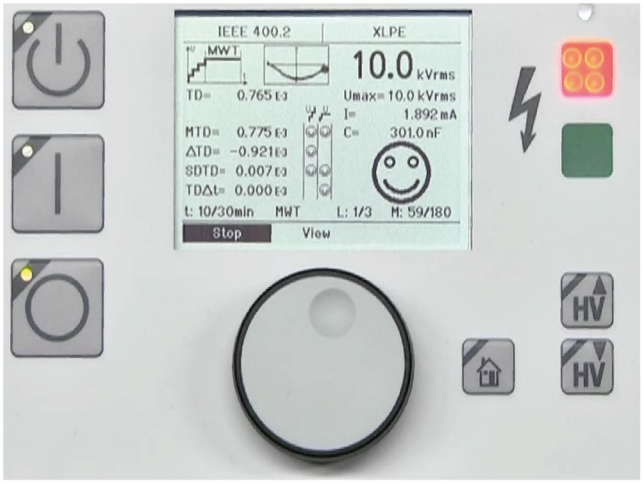
Method	Significance and benefits	BAUR equipment
VLF testing	▪ Easy voltage test (Verdict: Pass / Fail)	frida
Dissipation factor measurement	▪ Evaluation of the dielectric condition of the insulation, indication of PD	frida TD
PD testing	▪ Diagnostics of local weak points and their location	frida & PD-TaD 62
Simultaneous dissipation factor and PD measurement	▪ Combination of statements of a dissipation factor measurement and PD testing ▪ Shorter test duration with simultaneous dissipation factor measurement and PD testing ▪ Better detection of hidden faults (e.g. moist joints) through conditioning of weak points and simultaneous monitoring of TD values and PD activities	frida TD & PD-TaD 62
MWT with dissipation factor measurement	▪ Evaluation of the dielectric condition of the insulation, indication of PD ▪ Intelligent withstand voltage test ▪ Shorter test duration for cables in good condition	frida TD & PD-TaD 62
VLF cable testing with parallel PD testing	▪ Localisation of faults in the cable insulation ▪ Intelligent withstand voltage test	frida & PD-TaD 62
Full MWT (VLF cable testing with parallel dissipation factor and partial discharge measurement)	▪ Evaluation of the dielectric condition of the insulation, indication of PD ▪ Localisation of faults in the cable insulation ▪ Intelligent withstand voltage test with shorter test duration for cables in good condition ▪ Shorter test duration with simultaneous dissipation factor measurement and PD testing ▪ Better detection of hidden faults (e.g. moist joints) through conditioning of weak points and simultaneous monitoring of TD values and PD activities	frida TD & PD-TaD 62

Data sheet: BAUR GmbH · 826-095-7 · 07.2020 · Subject to modifications

Technical data

Output voltage	
Frequency range	0.01 – 0.1 Hz
VLF truesinus®	1 – 26 kV_{rms} (36 kV_{peak})
VLF square wave voltage	1 – 34 kV
DC voltage	±1 – 34 kV
Resolution	0.1 kV
Accuracy	1%
Load range (VLF testing)	1 nF – 8 µF
Output current	
Measurement range	0 – 14 mA
Resolution	1 µA
Accuracy	1%
Max. capacitive load	0.5 µF at 0.1 Hz / 24 kV_{rms} / 34 kV_{peak} 1 µF at 0.05 Hz / 24 kV_{rms} / 34 kV_{peak} 8 µF at 0.01 Hz / 18 kV_{rms} / 25 kV_{peak}
Dissipation factor measurement (frida TD)	
VLF truesinus®	1 – 26 kV_{rms}
Load range	10 nF - 8 µF
Resolution	1 x 10^{-6}
Accuracy	1 x 10^{-4}
Measurement range	1 x 10^{-4} – 21,000 x 10^{-3}
tan δ measuring frequency	0.1 Hz
Automatic detection and compensation of leakage currents	With VSE box (optional)

Diagnostic Reporter	
Used to process and evaluate test and measurement logs, based upon MS Excel, version from MS Excel 2007	
General	
Input voltage	100 – 260 V, 50/60 Hz
Power consumption	max. 300 VA
Reverse voltage protected	up to 13 kV
Degree of protection	IP54 (in closed state)
Data interface	USB 2.0
Dimensions (W x H x D)	438 x 456 x 220 mm
Weight (incl. HV connection cable)	Approx. 22 kg
Ambient temperature (operational)	-10°C to +50°C
Storage temperature	-20°C to +60°C
Safety and EMC	CE-compliant in accordance with Low Voltage Directive (2014/35/EU), EMC Directive (2014/30/EU), EN 60068-2-ff Environmental testing
User interface available in 13 languages	Czech, Chinese (CN), Chinese (TW), Dutch, English, French, German, Italian, Korean, Polish, Portuguese, Russian, Spanish



Standard delivery

BAUR frida VLF tester with truesinus®

- frida incl. HV connection cable, 5 m
- GDR 40-136 discharge and earth rod
- Earth cable, 5 m, with earth terminal
- Mains supply cord, 2.5 m
- Jumper plug for external emergency off unit
- Diagnostic reporter on USB drive

  (Used to process and evaluate test and measurement logs, based upon MS Excel)
- User manual
- Pocket guide

Accessories

- Remote control of VLF generators via BAUR Software 4 incl. laptop
- GDR 40-136 discharge and earth rod
- External emergency off unit with signal lamps, 25 m or 50 m cable length

Standard delivery

BAUR frida TD VLF tester and diagnostics device with truesinus®

- frida TD incl. HV connection cable, 5 m
- BAUR tan delta kit
- GDR 40-136 discharge and earth rod
- Earth cable, 5 m, with earth terminal
- Mains supply cord, 2.5 m
- Jumper plug for external emergency off unit
- Diagnostic reporter on USB drive

  (Used to process and evaluate test and measurement logs, based upon MS Excel)
- User manual
- Pocket guide

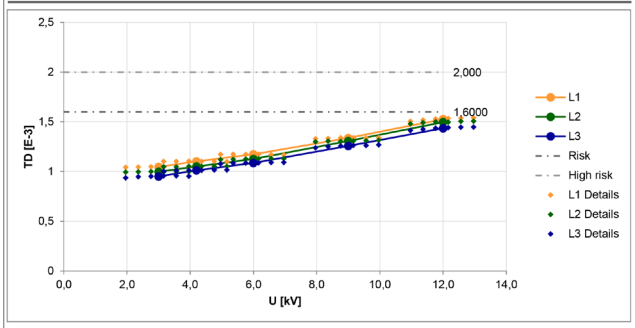
Accessories

- Remote control of VLF generators via BAUR Software 4 incl. laptop
- VSE connection kit (for the detection and compensation of leakage currents)
- GDR 40-136 discharge and earth rod
- External emergency off unit with signal lamps, 25 m or 50 m cable length

Diagnostic Reporter – Sample log (extract)

Ramp-up

Ramp-up curve



Ramp-up measurement results

Voltage	0,5 * U0 3,0 kV			0,7 * U0 4,2 kV			1,0 * U0 6,0 kV			1,5 * U0 9,0 kV			2,0 * U0 12,0 kV		
	MTD [E-3]	ΔTD [E-3]	SDTD [E-3]	MTD [E-3]	ΔTD [E-3]	SDTD [E-3]	MTD [E-3]	ΔTD [E-3]	SDTD [E-3]	MTD [E-3]	ΔTD [E-3]	SDTD [E-3]	MTD [E-3]	ΔTD [E-3]	SDTD [E-3]
L1	1,046		0,002	1,102	0,279	0,002	1,173	0,235	0,002	1,337	0,329	0,004	1,527	0,381	0,013
L2	0,998		0,002	1,050	0,265	0,002	1,126	0,252	0,005	1,307	0,362	0,005	1,496	0,379	0,010
L3	0,950		0,008	1,012	0,308	0,005	1,086	0,247	0,006	1,257	0,342	0,011	1,435	0,355	0,014

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