liona

BAUR online PD spot tester

Figure: liona incl. VDS-C VDS PD coupler and the optionally available iPD transponder

Reliable, cost saving, easy to use

- Online PD testing of cable routes during normal cable network operation
- Automatic evaluation of the PD: no expert knowledge necessary
- Unique new technology based on artificial reflections for online PD mapping
- Detection of faraway PD by means of patented frequency response modification with VDS PD coupler

liona is a portable online PD spot tester for measuring and locating partial discharges in cables and switchgear during normal mains operation.

liona lets you test cable systems and switchgear online without switching off partial discharge activities, and then generate trend analyses. Even a PD spot test (duration: 2 – 3 minutes) is capable of reliably assessing the current status of your system. This keeps you constantly informed of when in it necessary to intervene and further maintenance is required, e.g. comprehensive offline diagnostic measurements.

Using the DeCIFer® algorithm, the core of the software, the unit is able to clearly differentiate between noise signals and partial discharges. liona therefore provides meaningful results even in environments with high noise levels.

With the iPD transponder – available as an optional extra – it is possible to precisely locate partial discharges and determine the cable length.

NEW:

PD testing via VDS ports without taking critical cable routes out of operation

Functions and features

liona

- Easy and fast performance of an online PD test for inspecting the cable route for partial discharges (in just 2-3 minutes)
- Automatic partial discharge detection with the DeCIFer® algorithm
- Online PD testing possible even with high noise levels
- Can be used on medium- and high-voltage cables
- Continuous monitoring of a cable route for PD activity for up to 30 days
- 24-hour commissioning testing acc. to IEC 60840
- Regular PD monitoring of critical cable routes (e.g. industrial assets) by permanently installed sensors
- Simultaneous evaluation of 4 measurement channels
- Compact and light equipment that is easy to transport
- Measurements also possible without mains supply in battery mode
- VDS PD coupler for connection to the switchgear VDS ports during operation acc. to IEC 61243-5 (LRM, MR, and HR systems) and IEC 62271-213:2021 (LRM systems)

liona and iPD

- Online cable length measurement for medium- and high-voltage cables
- Automatic, precise online PD mapping thanks to the DeCIFer® algorithm and a new technology based on artificial reflections
- Length measurement also possible on cables with cross-bonding joints
- Simple application thanks to the special, automatic AUTO SWEEP trigger mode
- Measurements also possible without mains supply in battery mode

„Required equipment for the available measurement methods“ on page 4

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Technical data

liona	
Measurement range for cable PD	5 pC – 1,000 nC
No. of signal inputs	4
Overvoltage protection	Up to 500 V
Sampling rate	100 MSamples/s
Resolution	14 bit
Analogue input voltage range	±1.0 V (Resolution 61 µV)
Data interface	USB 2.0, Ethernet
Power supply	
Mains voltage	100 – 240 V, 50/60 Hz
Rechargeable battery	Lithium-polymer battery, DC 12 V, 8 Ah, 96 Wh
Battery life	Min. 3 hours
Degree of protection	IP67 in closed state
Dimensions (W x H x D)	Approx. 550 x 350 x 225 mm
Weight	Approx. 13.5 kg
Ambient temperature (operational)	-10°C to +45°C
Storage temperature	-20°C to +60°C
Humidity	≤ 90%, non-condensing
Safety and EMC	CE-compliant in accordance with Low Voltage Directive (2014/35/EU) and EMC Directive (2014/30/EU)
liona software	
Software modules*	▪ Spot Tester: Is used for PD measurement ▪ Mapping: Is used for PD mapping ▪ Cable Length: Is used to measure the cable length
Operating modes of the Spot Tester software module	▪ PD TEST: used for routine and repetitive testing ▪ Scope: used for in-depth investigation
PD analysis	▪ PRPD (PD pattern analysis) ▪ Waveform (analysis of individual PD pulses)
Noise separation and PD classification**	DeCIFer® algorithm
Reporting	On screen, PDF
Software available in	English, German, Chinese, French, Portuguese, Russian, Spanish

"VDS PD coupler" set	
VDS-C VDS PD coupler	
No. of signal inputs	3
No. of signal outputs	▪ 3 x voltage signal ▪ 1 x synchronisation signal for liona
Frequency range	▪ Voltage signals: 100 kHz – 10 MHz ▪ Synchronisation signal: 47 – 63 Hz (depending on the test object)
Adapters for switchgear VDS ports	Adapter for: ▪ HR systems acc. to IEC 61243-5 ▪ MR systems acc. to IEC 61243-5 ▪ LRM systems acc. to IEC 61243-5 and IEC 62271-213:2021
Rechargeable battery	▪ 2 x lithium-ion battery, 3.7 V, 2,600 mAh, 19.2 Wh (total) ▪ Overtemperature protection (NTC), protection against deep discharge and overcharging
Battery life	Approx. 24 h
Charging time	Approx. 6 h
Charger socket	USB (type C plug)
Degree of protection	IP40
Dimensions (W x H x D)	Approx. 120 x 150 x 50 mm
Safety and EMC	CE-compliant in accordance with Low Voltage Directive (2014/35/EU), EMC Directive (2014/30/EU), and EN 60068-2-ff Environmental testing
Charger	
Power supply	100 – 240 V, 50/60 Hz
Charging voltage	5 V ± 5%
Charging current	2,200 mA
General	
Degree of protection (transport case)	IP67 in closed state
Transport case dimensions (W x H x D)	Approx. 470 x 176 x 357 mm
Weight (total)	Approx. 5.5 kg
Ambient temperature (operational)	-10°C to +45°C
Storage temperature	-20°C to +60°C
Humidity	≤ 90%, non-condensing

* „Required equipment for the available measurement methods“ on page 4

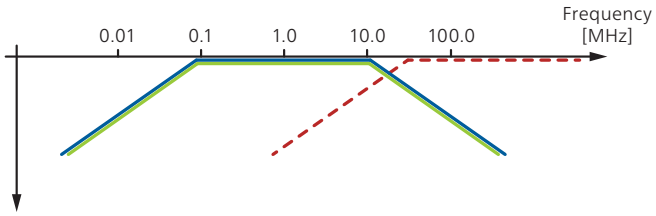
** In general, very high noise levels and interference in the PD frequency range can result in some limitations during PD testing.

Technical data – continued

HFCT set	
HFCT sensor 100/50	
Frequency range	60 kHz – 70 MHz
Diameter	Internal: 48 mm, external: 107 mm
HFCT sensor 140/100	
Frequency range	50 kHz – 80 MHz
Diameter	Internal: 96 mm, external: 150 mm
TEV sensor	
Frequency range	5 – 80 MHz
Dimensions (Diameter x H x D)	Approx. 68 x 78 x 27 mm
Sync transmitter	
Batteries	2 x alkaline batteries 1.5 V IEC LR6
Dimensions (W x H x D)	Approx. 75 x 200 x 45 mm
General	
Degree of protection (transport case)	IP67 in closed state
Transport case dimensions (W x H x D)	Approx. 295 x 146 x 347 mm
Weight (total)	Approx. 6.5 kg

iPD transponder (optional for PD mapping, cable length measurement)	
Pulse voltage	Max. 500 V
Trigger modes	▪ AUTO SWEEP ▪ LEVEL TRIGGER
Delay of the artificial reflection	▪ 10 µs ▪ 100 µs (for cable <800 m)
Power supply	
Mains voltage	100 – 240 V, 50/60 Hz
Rechargeable battery	Lithium-polymer battery, DC 12 V, 4 Ah, 48 Wh
Battery life	Approx. 15 h
Charging time	Approx. 4 h
Degree of protection	IP67 in closed state
Dimensions (W x H x D)	Approx. 295 x 146 x 347 mm
Weight (total)	Approx. 6 kg
Ambient temperature (operational)	-10°C to +45°C
Storage temperature	-20°C to +60°C
Humidity	≤ 90%, non-condensing
Safety and EMC	CE-compliant in accordance with Low Voltage Directive (2014/35/EU) and EMC Directive (2014/30/EU)

Frequency response modification with VDS-C



Frequency response of liona connected directly to the VDS ports of the switching station

Frequency response of liona with VDS-C connected to the VDS ports of the switching station

Frequency response of liona with HFCT sensors

The further away the partial discharges are from the liona online PD spot tester, the more strongly the PD pulse is damped. This causes the PD pulse to lose the high frequency components.

When liona is connected directly to the switchgear VDS ports (red line), the high-pass characteristic of the PD measurement setup prevents the detection of partial discharges that are far away.

However, when liona is connected to the VDS ports with the VDS-C VDS PD coupler, the signals of partial discharges that are a kilometre away can also be evaluated by modifying the frequency response.

The graphic serves as an example and is used to illustrate the principle of frequency response modification.

Required equipment for the available measurement methods

Measurement method	Required equipment			
	liona	"VDS PD coupler" set	HFCT set	iPD transponder (option)
PD measurement				
Connection to the switchgear VDS ports	✓	✓	–	–
Direct connection to the test object	✓	–	✓	–
PD mapping	✓	–	✓	✓
Measurement of cable length	✓	–	✓	✓

Standard delivery

- liona online PD spot tester, incl.:
  - Laptop acc. to quotation with installed liona software
  - User manual
  - Pocket guide (PDF)
- Connection set as selected, see below

Accessories and options

- iPD transponder, incl.
  - BNC cable, 4 m
  - Inductive HFCT sensor 100/50 mm
  - Earth cable, 2 m, with earth terminal
  - Mains supply cord, 2.5 m
  - User manual
- "VDS PD coupler" set in transport case
- HFCT set in transport case
- Inductive HFCT sensor 100/50 mm
- Inductive HFCT sensor 140/100 mm
- Capacitive TEV sensor
- Adapter for HR systems acc. to IEC 61243-5
- Adapter for MR systems acc. to IEC 61243-5
- Adapter for LRM systems acc. to IEC 61243-5 and IEC 62271-213:2021

Selectable connection sets

"VDS PD coupler" set in transport case, incl.:

- VDS-C VDS PD coupler
- USB charger incl. country-specific adapter
- USB charging cable, 1 m
- BNC cable, 0.5 m, 3 pcs, colours: red, yellow, blue
- BNC cable, 3 m, 4 pcs, colours: red, yellow, blue, black
- Connection cable for LRM systems acc. to IEC 62271-213:2021, 20 cm, 3 pcs
- Adapter for HR or MR systems acc. to IEC 61243-5 or for LRM systems acc. to IEC 61243-5 and IEC 62271-213:2021, 3 pcs (freely selectable)
- Earth cable, 5 m, with earth terminal
- Mains supply cord, 2.5 m

HFCT set in transport case, incl.:

- Inductive HFCT sensor 100/50 mm, 3 pcs
- Inductive HFCT sensor 140/100 mm
- Capacitive TEV sensor, 2 pcs
- BNC cable, 1.5 m, 3 pcs
- BNC cable, 4 m, 3 pcs
- BNC connector, 10 pcs
- Sync transmitter incl. batteries
- Earth cable, 2 m, with earth terminal
- Mains supply cord, 2.5 m

Would you like to discover more about this product?
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Data sheet: BAUR GmbH · 826-102-5 · 09.2023 · Subject to modifications