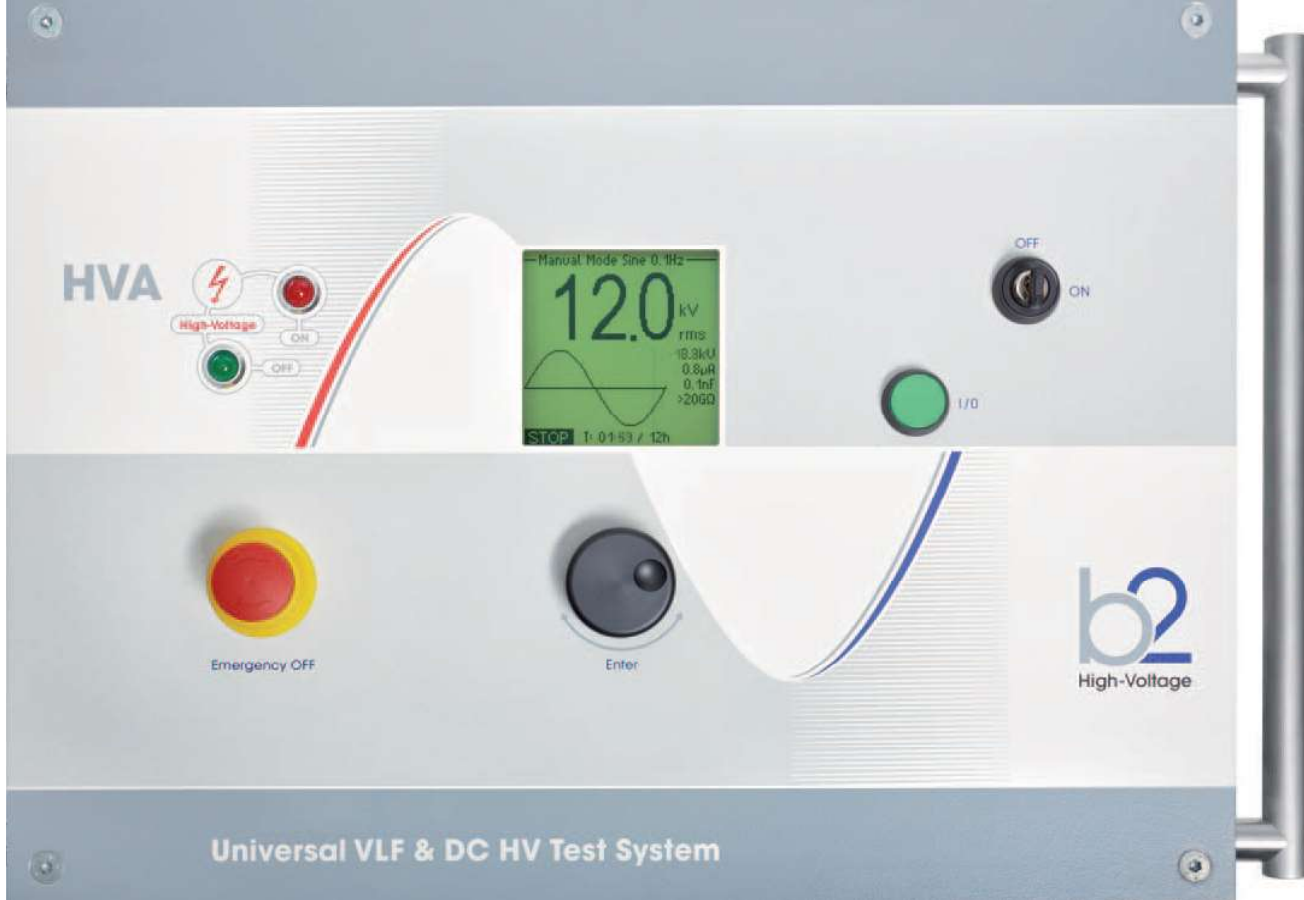




HVA SERIES VLF TEST SETS

Hipot Testers – HVA Series for VLF (0.1 Hz) testing
of MV and HV cables.



INNOVATIVE, RELIABLE, ECONOMICAL – HIGH VOLTAGE TESTING FROM b2 HIGH VOLTAGE

VLF cable testing is a standardized and contemporary process for determining the condition of cables in medium-voltage networks, since the older DC testing of aged extruded cables in many cases led to damage to the cable insulation, causing premature and unwanted loss of the cable.

For more than 12 years, b2 electronic GmbH has developed and manufactured VLF high voltage systems for testing and diagnostics, for power utilities and their supporting industries worldwide.



VLF, DC, cable sheath testing and sheath fault location

- Sinusoidal VLF output voltage up to 200 kV
- Squarewave voltage
- DC (\pm) voltages up to 200 kV
- Cable sheath testing / sheath fault location



Unlimited operating time

Operating time of the HVA high voltage generators are not thermally limited and can be operated continuously.

HVA SERIES

VLF TEST SETS



HVA28 / HVA28TD



HVA34



HVA30-5 / HVA60

THE MOST INNOVATIVE, SAFEST, LIGHTEST AND SMALLEST – A CLASS OF THEIR OWN!

The compact design and the unmatched HV output power to weight ratio, are second to none in the market and make the b2 electronic high-voltage generators the lightest in all classes at all voltage levels. The most modern power electronics, numerous patents and innovative user interfaces help to secure this competitive edge.



Smallest and lightest VLF cable test sets

The VLF Hipot testers of the HVA series are the most advanced, smallest and lightest available (from 14kg).



Dry system – no oil-filled parts

The HVA test sets are dry type test systems (they have no oil filled components). This means less maintenance, compact and lightweight design and no limitation of operating time.



HVA54/80 / HVA90 / HVA94



HVA120 / HVA54-5

HVA – MORE BENEFITS

- Load independent, true symmetrical sinusoidal output over the entire power range
- Automatic load calculation and frequency selection (0.01 - 0.1 Hz)
- High output power
- RMS digital metering of voltage and current. Automatic measurement of R and C
- PC software "b2 Control Center" with various reporting functions included



HVA28 / HVA28TD – very bright and high-contrast colour display



DDD® – integrated electronic and mechanical discharge devices

Double safety! Additional mechanical discharge unit (in addition to the electronic discharge device) works as a back-up.



50 Hz – 12 kV Feedback Protection

Another safety feature for "Man and Machine" is a reverse voltage or transient protection up to 12 kV (except HVA30-5).



Upgradeable to Partial Discharge (PD) – and Tan Delta diagnostics (TD) systems

The HVA high voltage generators can be extended at any time to a cable diagnostics system. Generating a load independent, true symmetrical sinusoidal voltage allows an upgrade of an HVA test generator to a diagnostics system for Partial Discharge and or Tan Delta.

The HVA test generator serves as the HV source for these diagnostics systems from b2 electronic.



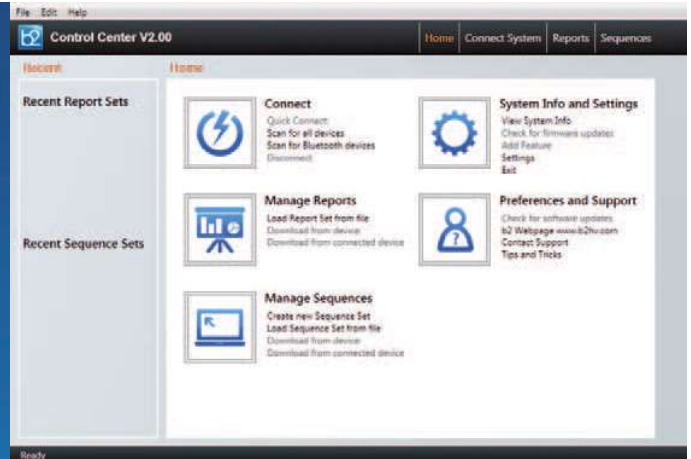
PD30-E

PDTD60-2



PC SOFTWARE “b2 CONTROL CENTER”

The PC software “b2 Control Center” provides various options for test results printing, data processing, data archiving or analysis, and custom test set program auto-sequences can be created and uploaded (“b2 Control Center” in scope of supply).



Solid HV connectors

Robust HV-connectors allow the use of different HV test lead lengths, the quick exchange for a replacement cable, or the simpler upgrade path for connection of diagnostic systems.





HVA28 / HVA28TD



HVA34



HVA30-5 / HVA60

HVA SERIES

b2 electronic GmbH offers a wide range of different VLF test generators. From portable and very robust generators, such as the HVA28, which weighs only 14kg, to very powerful systems for mobile test van applications, models are available with up to 200 kV test voltage. The designs of all b2 electronic VLF generators are based on the same scalable power electronics that have already been well proven in over 120 countries under varied environmental conditions.

	HVA28/TD	HVA34	HVA30-5	HVA54/80
Output Voltage				
- VLF Sinusoidal	28 kV, 20 kV _{rms}	34 kV, 24 kV _{rms}	33 kV, 23 kV _{rms}	54 kV, 38 kV _{rms}
- DC	± 28 kV	± 34 kV	± 30 kV	± 80 kV
- VLF Squarewave	28 kV	34 kV	30 kV	54 kV
Output Current _{max}	20 mA	15 mA	85 mA	65 mA
Output Load	0,5 µF @ 0,1 Hz @ 20 kV _{rms}	0,5 µF @ 0,1 Hz @ 24 kV _{rms}	3,4 µF @ 0,1 Hz @ 23 kV _{rms}	2,0 µF @ 0,1 Hz @ 38 kV _{rms}
max. Capacitance *	10,0 µF	12,0 µF	15,0 µF	10,0 µF
Output Modes	AC (VLF) Symmetrical and load independent across full range, DC (plus or negative polarity), Burn / Fault Condition or Fault Trip Mode, Jacket / Sheath Testing			
DDD® – Dual Discharge Device	●	●	●	●
50 Hz – 12 kV Feedback Protection	●	●	○	●
USB / Bluetooth	●/●	●/○	●/○	●/○
Dimensions L x W x H (mm)	430 x 240 x 340 **	430 x 250 x 360	450 x 340 x 520	540 x 445 x 615
Weight	14 kg	19,5 kg	45 kg	127 kg

* at lower voltage and frequency

** Peli Case 1430



HVA54/80 / HVA90 / HVA94



HVA120 / HVA54-5

Redundant safety features such as dual discharge devices and integrated reverse voltage protection ensure optimal safety. The HVA high voltage generators are designed for continuous operation, are very easy to operate via rotary knob control interface and are extremely sturdy in design so as to meet all the requirements of field operation.

HVA54-5	HVA60	HVA90	HVA94	HVA120	HVA200
54 kV, 38 kV _{rms} ± 54 kV 54 kV	62 kV, 44 kV _{rms} ± 60 kV 60 kV	90 kV, 64 kV _{rms} ± 90 kV 90 kV	94 kV, 66 kV _{rms} ± 90 kV 90 kV	120 kV, 85 kV _{rms} ± 100 kV 100 kV	200 kV, 138 kV _{rms} ± 200 kV 200 kV
160 mA	40 mA	65 mA	65 mA	60 mA	65 mA
5 μF @ 0,1 Hz @ 38 kV _{rms}	1 μF @ 0,1 Hz @ 44 kV _{rms}	1 μF @ 0,1 Hz @ 61 kV _{rms}	0,75 μF @ 0,1 Hz @ 66 kV _{rms}	0,5 μF @ 0,1 Hz @ 85 kV _{rms}	0,5 μF @ 0,1 Hz @ 138 kV _{rms}
15,0 μF	10,0 μF	10,0 μF	10,0 μF	10,0 μF	5,0 μF
AC (VLF) Symmetrical and load independent across full range, DC (plus or negative polarity), Burn / Fault Condition or Fault Trip Mode, Jacket / Sheath Testing					
●	●	●	●	●	○
●	●	●	●	●	○
● / ○	● / ○	● / ○	● / ○	● / ○	● / ○
863 x 445 x 611	450 x 340 x 520	540 x 445 x 615	540 x 445 x 615	790 x 445 x 740	Flex set-up
175 kg	57 kg	127 kg	127 kg	181 kg	850 kg



VLF DIAGNOSTICS SYSTEMS

Partial Discharge and Tan Delta diagnostics systems
for condition evaluation of MV and HV cables.



Corona Bells

b2 ELECTRONIC DIAGNOSTICS SYSTEMS

Diagnostics of medium and high voltage cables provides the opportunity for early detection of vulnerabilities and thus prevention of potential breakdowns. The Partial Discharge diagnostics (PD) allows a precise analysis of cables and their joints and terminations. The exact localization of Partial Discharges (PD) can lead to a massive improvement in the quality of the network.

Tan Delta measurement – also called dissipation factor – is a proven, simple and reliable test method for confirming the overall dielectric condition of cables or other electrical plant and infrastructure.



Simultaneous measurement of PD and TD

The parallel measurement of PD and TD gives a significant advantage in time and prevents pre-conditioning of the cable, which can influence the results of a second test of two (due to the prior application of HV test voltages during the first).



Compact, lightweight and portable solutions

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



PD30-E



(Filter)

(CC)



PD60-2
PDTD60-2



(Filter)

(CC)



PD90-2
PDTD90-2

PARTIAL DISCHARGE DIAGNOSTICS (PD)

The Partial Discharge measurement (PD) allows the precise localization of PD faults in cables and their connections (joints and terminations), often caused by mechanical damage due to a faulty installation process.

b2 electronic offers various solutions for small modular and portable PD instruments, through to full vehicle installed systems. The high-voltage generators of the HVA family serve as the HV power sources for all the b2 diagnostics systems.



b2 Suite® software

b2 Suite® provides a comprehensive “all-in-one” software solution for testing, diagnosis and management with a comprehensive database.



True modularity

All b2 high voltage generators can be easily extended to a diagnostic system. Thus, the basic classic cable test set can be easily up-graded later to a diagnostics system, keeping initial investment low.



HVA28TD
with integrated Tan Delta
diagnostics system



PDTD60-2
Partial Discharge system with
integrated Tan Delta unit



TD30 / TD60 / TD90-MC
external Tan Delta
diagnostics systems

TAN DELTA DIAGNOSTICS (TD)

Tan Delta diagnostics (TD) allows a clear statement about the overall dielectric condition of aged polymeric cables (XLPE/PE/VPE), and especially any damage by so-called "water trees". The TD diagnostics can be carried out simultaneously with the PD diagnostics. This saves time and prevents pre-conditioning of the cable by the first measurement of two separate but sequential ones.

b2 electronic offers TD-solutions either integrated into the high-voltage source (HVA models) or within the Partial Discharge Diagnostics System (PD models) or externally via hardware for the upgrade of existing HVA Hipot systems (TD models).



Automatic Mode

Besides the manual, incremental, and self-explanatory menu, the system also allows a fully automatic measurement mode.



Algorithms for detection of PD activities

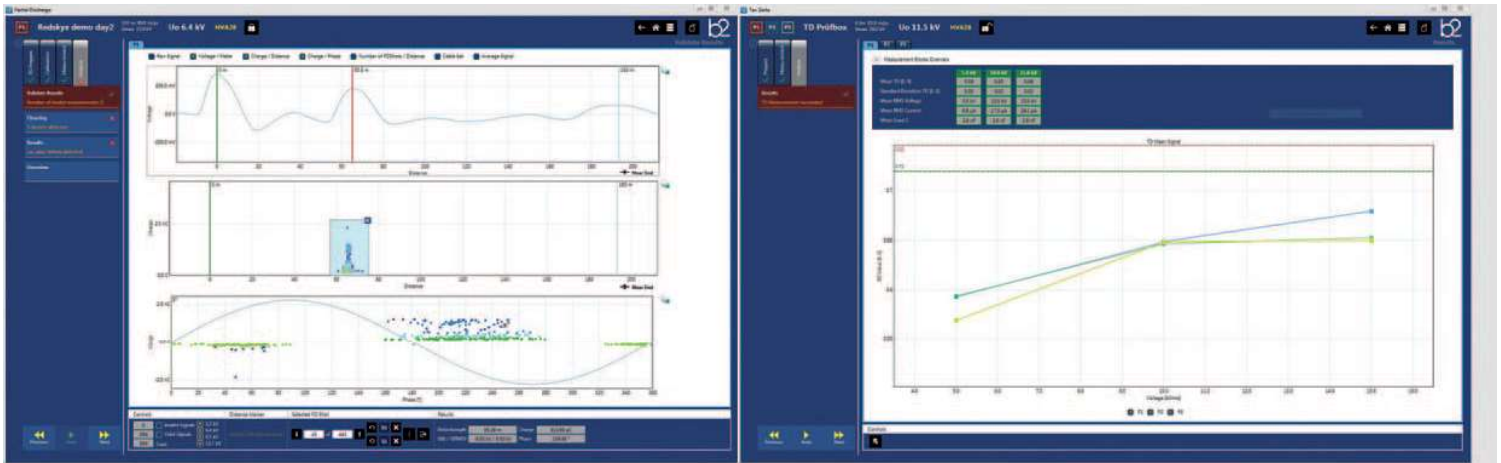
The b2 Suite® distinguishes between valid and invalid TE signals, and then separates them. This facilitates the analysis and results process, providing a rapid learning curve for the user.



b2 Suite® – Testing, diagnostics, data management and control of hardware

VLF-, DC- and insulation testing as well as PD and TD diagnostics with common and integrated data management within a single software solution.

- Very simple and clear measurement process
- Control of the b2 test generators
- Automatic measurement mode and detection of parameters
- Automatic storage of all measured data
- Simultaneous Tan Delta and PD diagnostics
- PD localization and phase-resolved representation
- PD level and PD-rate
- High noise suppression by filtering
- Comprehensive but very simple reporting



Partial Discharge diagnostics – b2 Suite®

Tan Delta diagnostics – b2 Suite®



Database

Comprehensive b2 Suite® database enables easy analysis and evaluation of the PD measurement. Fast search function for archived measurements and easy reproducibility of a measurement are among key features.



Reporting

Reporting by a mouse click – simple or comprehensive. Individual design for reporting and easy integration of data and files.



CABLE TEST AND DIAGNOSTICS VANS

b2 electronic offers the smallest, most flexible and modular solutions for on-site use, up to complete solutions for individually equipped test and diagnostics vehicles. Combined solutions via the integration of portable units into test vans or the upgrade of existing vehicles to diagnostics systems are all possible.

EXAMPLE: SYSTEM FOR 60 kV



HVA60
VLF Hipot Tester

PDTD60-2
Partial Discharge system with
integrated Tan Delta unit

b2 Suite® – Software for testing,
diagnostics, data management
and control of hardware

VLF DIAGNOSTICS SYSTEMS

The VLF diagnostics systems from b2 electronic GmbH are extremely compact, portable and modular. They provide users with a clear statement about the quality and condition of a medium or high voltage network. The VLF high voltage generators (HVA) together with Partial Discharge - and Tan Delta diagnostics systems provide a fully comprehensive testing and diagnostics system.

	PDTD30-E	PDTD60-2	PDTD90-2
Operating voltage	1 - 24 kV _{rms} / 34 kV _{peak}	1 - 44 kV _{rms} / 62 kV _{peak}	1 - 66 kV _{rms} / 94 kV _{peak}
Rated current / Frequency	1 A / 0,1 Hz	1 A / 0,1 Hz	1 A / 0,1 Hz
Capacitance Coupling capacitor / Filter	1 nF / 4nF	1 nF / 1nF	1 nF / 1nF
Filter analog, digital, frequency filter	●	●	●
Dimensions L x H x W (mm) / Weight	300 x 486 x 250 / 29 kg	300 x 740 x 250 / 18,5 kg	300 x 880 x 250 / 24,5 kg
Filter		300 x 720 x 250 / 15 kg	300 x 770 x 250 / 32 kg
Metering	Cable length with PD activities, PD location, PD mapping, PD magnitude, PD rate, Sine Wave Imposed display, Background Noise, PDIV and PDEV		

	TD30	TD60	TD90-MC
Operating voltage sinus	1 - 24 kV _{rms} / 34 kV _{peak}	1 - 44 kV _{rms} / 62 kV _{peak}	1 - 66 kV _{rms} / 94 kV _{peak}
Frequency	0,1 Hz / 0,01 - 0,09 Hz	0,1 Hz / 0,01 - 0,09 Hz	0,1 Hz / 0,01 - 0,09 Hz
TD measurement (Resolution / Accuracy)	1 x 10 ⁻⁵ / ± 1 x 10 ⁻⁴	1 x 10 ⁻⁵ / ± 1 x 10 ⁻⁴	1 x 10 ⁻⁵ / ± 1 x 10 ⁻⁴
Load range	500 pF bis 10 µF	500 pF bis 10 µF	500 pF bis 10 µF
Dimensions (mm) / Weight	L 240 x Ø 80 / 3 kg	L 450 x Ø 120 / 5 kg	LHW 300x790x276 / 16 kg

* **PD30-E / PD60-2 / PD90-2** – technical specification at www.b2hv.com



Insulating oil testing

THE ULTRA-LIGHT INSULATING OIL TESTER OF THE BA - BREAKDOWN ANALYZER SERIES FOR DIELECTRIC TESTING OF MODERN INSULATION LIQUIDS.



BA Family

The test result enables plant operators to evaluate the condition of the insulating oil, allowing them to assess on the need for substitution of the oil. Various predefined and fully automatic test sequences meet all relevant international standards, thus the models of the BA series fulfill all legal requirements of the mandatory transformer oil test.

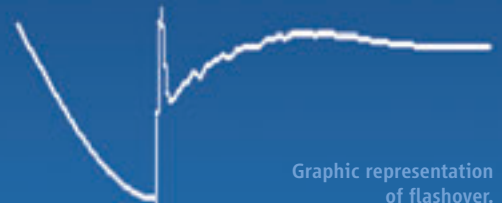
	BA60	BA75	BA80	BA100
Output Voltage (rms sym.)	up to 60 kV	up to 75 kV	up to 80 kV	up to 100 kV
Voltage rise rate	0,5 ... 10 kV/s			
Power supply	85 V ... 264 V (47 Hz ... 63 Hz) and 12 V external supply			
Internal rechargeable battery	○	●	●	●
Switch-off time on flashover	< 5 μs			
Measurement of oil temperature	0 ... 100 °C			
Display	2.8" colour (ultra bright)			
Selectable programs (extract)	IEC 60156/95, ASTM1816-04-1, ASTM1816-04-2, ASTM877-02A, ASTM877-02B, AS1767.2.1, BS EN60156, NEN 10 156, VDE370-5/96, ÖVE EN 60156, UNE EN60156, single measurement, other standards possible			
Customer-specific programs	unlimited			
PC Software "BA Control Center"	included			
Printer / Bluetooth / USB Memory Stick	○ / ● / ●	● / ● / ●	● / ● / ●	● / ● / ●
Dimensions L / H / B (mm)	430 / 280 / 250	430 / 280 / 250	430 / 280 / 250	521 / 343 / 300
Weight (kg)	19	22 incl. battery	22 incl. battery	32 incl. battery



Ultra fast switch-off time and clear detection of breakdown

15.3 kV

The use of modern mineral or silicon oils, as well as new ester-fluids generates new challenges for oil testing. An ultra fast switch-off time ($<5\mu\text{s}$) is essential, for reliable, trustworthy and repeatability of any series of tests performed. Moreover, the direct measurement of the output voltage and the oscillographic display of the arc event present a precise and reliable analysis of the breakdown.



Graphic representation of flashover.



Lockable electrode spacing

The adjustment of electrode spacing can be locked quickly, easily and safely to eliminate the possibility of electrodes moving while handling or testing.



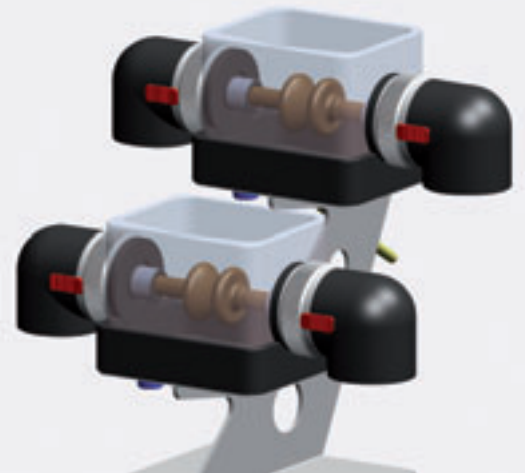
Very bright and high-contrast colour display

An extra bright and high contrast display allows easy readability even under tricky ambient light conditions or in outdoor situations.



Comprehensive accessories (partly optional)

- Test vessels with incorporated oil drain and hose terminal for easy draining of test liquid (oil)
- Test vessel bracket for easy drain of test liquid
- Various options of test vessel material (glass, plastic), form and size
- Calibrator accessories available
- Carrying bag, transport box, dust covers, etc...



Test vessel bracket with hose terminal for oil drain



Highest level of RFI/EMC shielding and rugged design

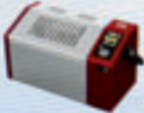
A metal case ensures best possible shielding of interfering electromagnetic fields and constitutes a verified protection for your IT assets. This rugged housing also permits tough in field usage.



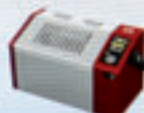
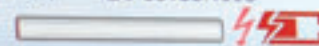
Low weight and very compact design

The BA Breakdown Analyzer models are the lightest and smallest oil testers of their ratings available.



BA75 11A001
 Sample: Transformer A 15
 Test: Single Test






BA75 11A001
 Sample: Transformer B 15
 Test: IEC 60156:1995

BA75 11B041
 Status: Ready!

BA80 11A125
 Status: Ready!

BA Control Center V1.15
 Tuesday, 19 04 2011 22:44:41

Sample Number	Test Sequence	Date/Time start	Device
Station 0323	Single Test	2011-04-19 22:49	BA75 11B041
Station 0424	Single Test	2011-04-19 22:49	BA80 11A125
Transformer A 15	Single Test	2011-04-19 22:49	BA75 11A001
Transformer B 15	IEC 60156:1995	2011-04-19 22:45	BA75 11B041
Station 0323	Single Test	2011-04-19 22:49	BA75 11B041
Station 0424	Single Test	2011-04-19 22:49	BA80 11A125
Transformer A 15	Single Test	2011-04-19 22:44	BA75 11A001
Transformer B 15	IEC 60156:1995	2011-04-19 22:45	BA75 11B041
Transformer A 15	Single Test	2011-04-19 22:44	BA75 11A001
Transformer B 15	IEC 60156:1995	2011-04-19 22:45	BA75 11B041



Bluetooth and USB-connection



Print-out of test results



PC Software "BA Control Center"

- Manage up to 4 BA's from your PC simultaneously
- Start the test sequence remotely from your PC
- Create user defined test sequences and implement them via Bluetooth or USB
- Test reports can be loaded to the PC also via Bluetooth or USB (PDF, XML or Text files)
- Printout also from external printer (via PC)



Comprehensive test reports

- Print-out (BA75, BA80 and BA100)
- PDF-file
- Text and XML-file
- Measurement of oil temperature

b2 electronic GmbH with its business division b2 High-Voltage is an internationally operating company, which develops, manufactures and distributes practically oriented high voltage equipment for simple cable testing, cable diagnostics and onsite oil testing.

Several decades of development experience in the field of test engineering, a profound understanding of the needs of energy suppliers and the will for improvement, equip the company with the skills required for lasting success.

Systems by b2 are benchmark worldwide for innovation, low weight, compact dimensions and usability and prove themselves with energy suppliers all over the world.

b2 is in a constant dialog with its customers, collects their suggestions and needs, matches them to b2 visions and develops new product ideas out of that.

By an active, certified quality management along the entire business process, b2 ensures in the implementation of its ideas the maximum customer satisfaction possible.



www.b2hv.com

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