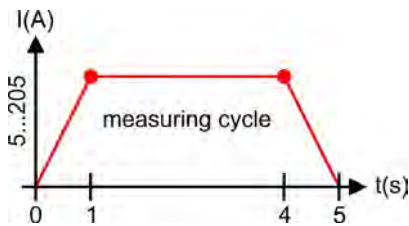


Portable Micro-Ohmmeter

VG-BAT-xxx-III

- ✓ Battery powered
- ✓ Lightweight and compact
- ✓ Real measuring current over whole measuring cycle
- ✓ Measures with both sides grounded
- ✓ Sunlight readable 5" IPS touch screen
- ✓ Excellent noise immunity suitable for 400kV substations
- ✓ USB PC-Interface and USB logger
- ✓ Optional mobile phone control



Technical description

The portable micro-ohmmeters VG-BAT-x00 are used for resistance measurements of high-power switches, bus bars, high power feedthroughs etc. The strengths of the instrument are its easy handling, battery power, rugged design and low weight.

The VG-BAT-x00 enables a real direct current measurement for highest precision. The current rises linear in a ramp over 1 second then holds the preset current for 3 seconds and then decreases linear in a ramp pattern over a 1 second.

An advanced build-in LiFePO4 battery offers maximum power with excellent safety and outstanding lifespan.

Equipped with a 5" IPS TFT touch display, the instrument can do measurements in darkness, coldness and full sunlight with an intuitive multilingual interface.

Measurement data is saved directly to a USB stick and to the internal memory. Through the USB PC-Interface the instrument can be controlled or the measurement results can be

read out automatically by computer. Use our Bluetooth dongle to read out the device history or start a measurement with an Android phone or tablet. After you can send the data directly to your office.

The VG-BAT-200, with a weight of 5.8kg only is very handy and easily transportable. With the case door closed the instrument achieves an IP67 rating.

Typical applications are ohmic tests of:

- Circuit breakers
- Disconnecting switches
- High current busbar joints
- Railway parts
- Wind turbines
- Electric vehicle applications
- Cable splices
- Welding joints
- Ground connections

Technical data

Type:	VG-BAT-150	VG-BAT-200	VG-BAT-300															
Measuring ranges:	0...20.00μΩ, 0...200.0mΩ, 0...2.000mΩ, 0...20.00mΩ, 0...200.0mΩ, 0...999.9mΩ																	
Display:	Sunlight readable 5" IPS touch screen with a resolution of 800x480 dots																	
Display resolution:	0.01μΩ ... 0.1mΩ																	
General Accuracy:	0 ... 1000μΩ @ 200A / 25°C = ±0.05% FS 1 ... 25mΩ @ 200A / 25°C = ±0.2% FS 25 ... 999mΩ @ 5 - 200A / 25°C = ±0.5% FS																	
Calculate measurement accuracy at a specific measuring point:	a) Calculate sense voltage: $\text{sense voltage[V]} = \text{EUT}[\Omega] * \text{measurement current[A]}$ Example 1: $500\mu\Omega * 200A = 100mV$ Example 2: $50 \mu\Omega * 100A = 5mV$ Example 3: $10 \mu\Omega * 100A = 1mV$ b) Determine the absolute amplifier error for the desired measurement <table border="1" data-bbox="568 669 1442 882"> <thead> <tr> <th>Sense Voltage a)</th> <th>Max. Error Sense Voltage</th> <th>Absolute Error in [V]</th> </tr> </thead> <tbody> <tr> <td>200.1mV – 5.000V</td> <td>+/- 0.1%</td> <td>+/- 5mV</td> </tr> <tr> <td>20.01 – 200.0mV</td> <td>+/- 0.05%</td> <td>+/- 100μV</td> </tr> <tr> <td>2.001 – 20.00mV</td> <td>+/- 0.1%</td> <td>+/- 20μV or +/- 0.1μΩ whichever is greater</td> </tr> <tr> <td>0.00 – 2.000mV</td> <td>+/- 0.2%</td> <td>+/- 4μV or +/- 0.1 μΩ whichever is greater</td> </tr> </tbody> </table> c) Divide the absolute error in [V] from the table b) by the measurement current Example 1: $100\mu V / 200A = +/- 0.5\mu\Omega$ absolute sense amplifier error Example 2: $20\mu V / 100A = +/- 0.2\mu\Omega$ absolute sense amplifier error Example 3: $4\mu V / 100A = +/- 0.04\mu\Omega$ absolute sense amplifier error d) Additional security margin due to the current amplifier Example 1: $+/- 0.5\mu\Omega * 2 = +/- 1\mu\Omega$ Example 2: $+/- 0.2\mu\Omega * 2 = +/- 0.4\mu\Omega$ Example 3: $+/- 0.04\mu\Omega * 2 = +/- 0.08\mu\Omega \rightarrow +/- 0.1\mu\Omega$			Sense Voltage a)	Max. Error Sense Voltage	Absolute Error in [V]	200.1mV – 5.000V	+/- 0.1%	+/- 5mV	20.01 – 200.0mV	+/- 0.05%	+/- 100μV	2.001 – 20.00mV	+/- 0.1%	+/- 20μV or +/- 0.1μΩ whichever is greater	0.00 – 2.000mV	+/- 0.2%	+/- 4μV or +/- 0.1 μΩ whichever is greater
Sense Voltage a)	Max. Error Sense Voltage	Absolute Error in [V]																
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2.001 – 20.00mV	+/- 0.1%	+/- 20μV or +/- 0.1μΩ whichever is greater																
0.00 – 2.000mV	+/- 0.2%	+/- 4μV or +/- 0.1 μΩ whichever is greater																
Reproducibility:	<0.1%																	
Measuring current:	5 - 155A, 5 adjustable preset currents	5 - 205A, 5 adjustable preset currents	5 - 305A, 5 adjustable preset currents															
Maximum test voltage:	5.5V																	
Current ramp:	The test current rises following a linear ramp, holds the preselected value and falls with a linear ramp.																	
Battery:	LiFePO4, 41Wh	LiFePO4, 82Wh	LiFePO4, 82Wh															
Charging:	CCCV, approx. 1.5hours	CCCV, approx. 2 hours	CCCV, approx. 2 hours															
Number of Measurements:		200A	100A	50A														
Typical for VG-BAT-200/300	27mΩ	60#	250#	1000#														
→ for VG-BAT-150 divide by 2	5mΩ	335#	1350#	>2000#														
	1mΩ	1690#	>2000#	>2000#														
Measuring interval:	No limitation of the number of current cycles																	
Result data logging:	The last 100 data sets are stored internally. Unlimited data sets on the external USB stick.																	
Data logger:	Accepts FAT32 formatted USB sticks																	
Weight:	5.6 kg	5.8 kg	5.9 kg															

Type:	VG-BAT-150	VG-BAT-200	VG-BAT-300
Automatic power switch-off:	Default 3 minutes		
Sense input:	Independent polarity with banana jacks on front panel		
Input voltage:	Max. ±5V		
Input impedance:	>200kΩ		
Current Clamp input:	Independent polarity with banana jacks on front panel		
Input voltage:	Max. ±1V		
Input sensitivity:	Adjustable 0.1 – 20mV/A		
Input impedance:	>1MΩ		
Shunt output:	100µV/A +/-1%, banana jacks on front panel		
Data interface:	USB comport or RS232 Remote, various measuring protocols may be set (Modbus RTU, VG-CS Win, data output, data control) for full access software license is needed: Order No: VG-CS-WIN		
Pass/Fail:	Display signalization, 5 preset limits. Optional alarm contacts		
Date/time:	The instrument has a battery buffered real time clock		
Buzzer:	An acoustic beep for an ongoing test		
Other features:	<ul style="list-style-type: none"> -device labeling, 16 characters on display -settings can be copied from device to device via USB stick -firmware update via USB stick -the device settings can be protected with a 4-digit access code -write all results on USB stick -each current preset can be switched on and off 		
Ambient temperature:	-20.0°C ... +50.0°C		
IP Code:	IP67 (closed case cover) IP30 (open case cover)		
Humidity:	Max. 95% non-condensing		
LVD:	RL2014-35-EU, EN 61010-1:2020		
EMC:	RL2014-30-EU, EN 61326:2018, EN61000-6-1/2/3/4:2019		
Printer:	Optional, 24-characters standard thermal paper (58x32mm diameter)		
Unit manipulations:	Touch screen, keyboard, external PC or Android phone/tablet		
Manipulations:	Menu operated, multilingual (en, de, fr, es, sv, cs), easy to use, fast and responsive		
Power supply (battery charger):	100...240V, 1.3A, 50-60Hz		
CE-conformity:	Fulfilled		
Dimensions:	L x W x D: 318 x 249 x 203 mm		
Warranty:	2 Years		
Software license (optional):	PC-software (VG-Win) to transfer and log stored data sets, Order No: VG-CS WIN. Also needed for full remote access with various protocols (Modbus-RTU, DataOutput, DataControl) ideal for integration in custom process.		
Special accessories:	<ul style="list-style-type: none"> -Customer specific changes -Current clamp (for example 20mV/A) to measure dual grounded systems 		

Ordering example

- 1 x VG-BAT-200-III (measuring unit including USB stick, power supply without power cable ¹)
- 2 x VG-CS-STR35/5TR (current cable)
- 1 x VG-CS-EK2.5/6 (PE grounding cable)
- 2 x VG-CS-SNE2.5/6R (sense cable)
- 1 x Cable bag type VG-CS-TRT (cable bag)

Accessories



Transport carrying case type VG-BAT-TRK

VG-BAT-TRK: Order No: VG-BAT-TRK



Cable bag type VG-CS-TRT

44cm x 32cm x 15cm

Order No: VG-CS-TRT



Sense cable 2.5mm² type VG-CS-SNE2.5/6

L=6m with test probe & clips

Red: Order No: VG-CS-SNE2.5/6R

Black: Order No: VG-CS-SNE2.5/6B



Sense cable extension 2.5mm² type VG-CS-SNEV2.5/10

L=10m with one 4mm connector and one 4mm plug

Red: Order No: VG-CS-SNEV2.5/10R

Black: Order No: VG-CS-SNEV2.5/10B



Sense cable 2.5mm² type VG-CS-SNE-ABGRxx

Sense cable with test needles with a defined distance
sense distance=50mm, L=1.5m:

Order No: VG-CS-SNE-ABGR50/1.5



Current cable 35/50mm² type VG-CS-STRxx/xTR²

single cable with one connector and one clamp

L=0.6m: Order No: VG-CS-STR35/0.6TR

L=5.0m: Order No: VG-CS-STR35/5TR

L=10.0m: Order No: VG-CS-STR50/10TR



Current cable extension 50mm² type VG-CS-STRV50/xTR²

single cable with one connector and one cable plug

L=5.0m: Order No: VG-CS-STRV50/5TR

L=10.0m: Order No: VG-CS-STRV50/10TR

¹ Ask us if you need a C13 power cable

² Battery micro-ohmmeter cables longer than 5m and extensions have 50mm² cross sections to conserve the battery of the instrument.



PE grounding cable 2.5mm² type VG-CS-EK2.5
 single cable with one cable socket and one clamp
 L=1.5m: Order No: VG-CS-EK2.5/1.5
 L=6.0m: Order No: VG-CS-EK2.5/6
 L=15.0m: Order No: VG-CS-EK2.5/15



Temperature sensor type VG-CS-Pt100/5
 L= 5m cable with Velcro fastner
 Order No: VG-CS-Pt100/5



Current cable 4mm² with fuse type VG-CS-STR4 ***
 Current cable with one connector and one banana plug for current in
 Red: Order No: VG-CS-STR4/**R
 Black: Order No: VG-CS-STR4/**B



Railway current cable 35mm² type VG-CS-STRS35 ** / ***
 Special single current cable and one quick clamp suitable for railway wheels
 with profile width of 130mm
 L=0.6m: Order No: VG-CS-STRS35/0.6
 L=5.0m: Order No: VG-CS-STRS35/5



External power supply type VG-BAT-LG
 Replacement power supply for VG-BAT-xxx
 Order No: VG-BAT-LG



Power cable type VG-CS-NK-C13
 Cable for battery charger, L=3m
 Order No: VG-CS-NK-C13
Choose from plugs: CH (Type J/T12), EU (Typ F/Schuko), US (Type B),
 UK (Type G), China (PRC/3)



Remote control type VG-CS-Fern
 with display, keyboard and sense plugs incl. 5m cable
 Order No: VG-CS-Fern



Remote control type VG-CS-Fern-DK
 Simple one button remote control incl. 6m cable
 Order No: VG-CS-Fern-DK



Remote control foot pedal type VG-CS-Fern-FP
 To trigger the measurement with connector and foot pedal
 incl. 6m cable
 Order No: VG-CS-Fern-FP



Wireless remote control type VG-CS-Fern-BT

Remote control dongle for an Android device from Android 5.0 and up

Order No: VG-CS-Fern-BT

For dongle with full feature set including software license

Order No: VG-CS-WIN+



Software license type VG-CS-WIN

Software license for full remote access with various protocols (Modbus-RTU, DataOut-put, DataControl) ideal for integration in custom process. The license also unlocks the Windows software (VG-Win) which makes it easy to manage and save all test results.

Order No: VG-CS-WIN

Wireless remote control feature list

	VG-CS-Fern-BT Without license	VG-CS-WIN+ With license
Start measurement	✓	✓
Change measuring current	✓	✓
Set three preset current values for fast measuring sequence	✓	✓
Show result ³	✓	✓
Send result ³ by email or other messenger Apps (CSV files ⁴ are generated for easy data handling)	✓	✓
Clear result ³ history of the App	✓	✓
Show detailed results ⁵	x	✓
Send detailed results ⁵ by email or other messengers (CSV files ⁴ are generated for easy data handling)	x	✓
Readout device history	x	✓
Change device settings (Current Clamp, Temperature Compensation, Buzzer)	x	✓

³ Results includes: date, time, measuring current, resistance value

⁴ CSV files are coded in Unicode (UTF-8) character encoding

⁵ detailed result included: date, time, measuring current, resistance value, current clamp value, temperature compensation value