

# Auto-Ohm 200 S3

true DC micro-ohmmeter



**Vanguard Instruments**  
A DOBLE COMPANY





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## true DC micro-ohmmeter

The Auto-Ohm-200 S3 is Vanguard's fourth generation, microprocessor-based, true DC micro-ohmmeter. It is designed for testing EHV circuit-breaker contact resistances, bushing contact joints, welding joints, or for any low-resistance measuring application. This high current and very lightweight (16.8 lbs/ 7.6 Kg) micro-ohmmeter is designed to meet the IEEE C57.09-1999 (5.15) requirement for testing circuit breaker contact resistance.

The Auto-Ohm-200 S3 can accurately measure resistance values from 1 micro-ohm to 5 ohms. A 0.1 micro-ohm resolution is possible with current greater than 5A. The Auto-Ohm-200 S3 applies a selectable true DC test current from 1A to 200A to the resistance load to be tested.

### Product Overview

The Auto-Ohm-200 S3 controls the test current's rise and fall rates. The test current rise and fall rate can be selected from 5 seconds to 30 seconds. An "Auto Test" mode is also available and can be initiated simply by applying the sense cables' leads across the two points of interest in the current path. This feature is very convenient when measuring a sequence of several resistance values in a circuit breaker contact. The Auto-Ohm 200 S3 can also compare test results against preset limits and determine if a test passed or failed, and a "Pass" or "Fail" flag is displayed accordingly.

Since a true DC current (with controlled rise/fall time) is passed through the circuit breaker contact, no magnetic transient is induced into the breaker's current transformers. This feature greatly reduces the risk of inductively tripping a breaker control (bus differential relay).

### Dual Ground Option

With the Dual Ground option, the Auto-Ohm-200 S3 can also measure the circuit breaker contact resistance with both sides of the breaker bushing being grounded. When a test current is applied to a circuit breaker with both sides grounded, some of the test current flows through the safety ground cables. Using an external current sensor, the Auto-Ohm-200 S3 measures and eliminates this current from the total test current. The Auto-Ohm then calculates the actual resistance value of the circuit breaker.

### Test Record Storage

The Auto-Ohm 200 S3 can store 128 records of 64 readings internally, and up to 999 test records on an external USB Flash drive. Test header information (Company, Substation, circuit breaker ID's) can also be entered using the 44-key keypad and is stored with each test record.

### ordering information

| Part No. | Description                           |
|----------|---------------------------------------|
| 9051-UC  | Auto-Ohm 200 S3 unit with test cables |
| 9051-DG  | Auto-Ohm 200 S3 dual ground option    |
| 9051-SC  | Auto-Ohm 200 S3 shipping case         |

### Computer Interface

Windows®-based analysis software is provided with each unit and can be used to retrieve test records (from the unit's memory via the RS-232C port or from a USB Flash drive), analyze test results, and print test results on a desktop printer. Test records can also be exported to PDF, Excel, and XML formats for further analysis.

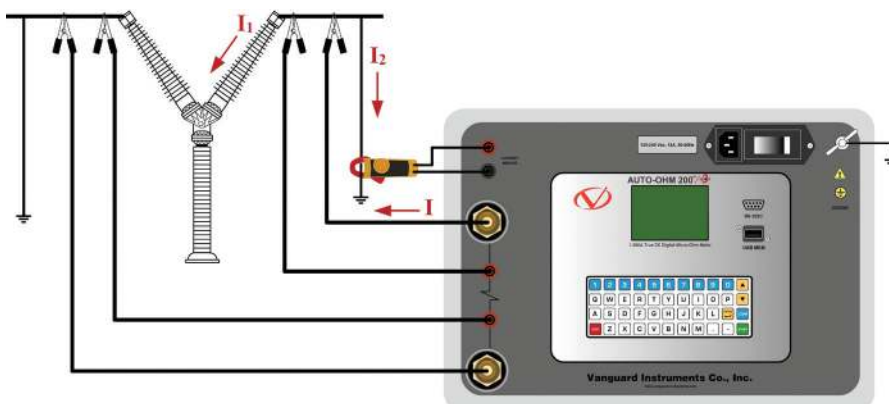
### Included Cables

The Auto-Ohm-200 S3 is furnished with a 30-ft test cable set. Test cables are terminated with heavy duty welding type clamps. The test current and voltage sense cables are isolated and fastened to the clamp jaws. This feature allows for a simple connection to the circuit breaker bushing. An optional voltage sense cable and probe can be used to measure resistance in small access locations. Optional heavy-duty, welding type C-clamps are also available for connecting the test leads to a wide variety of bushing sizes, bus-bars, or large conductors.

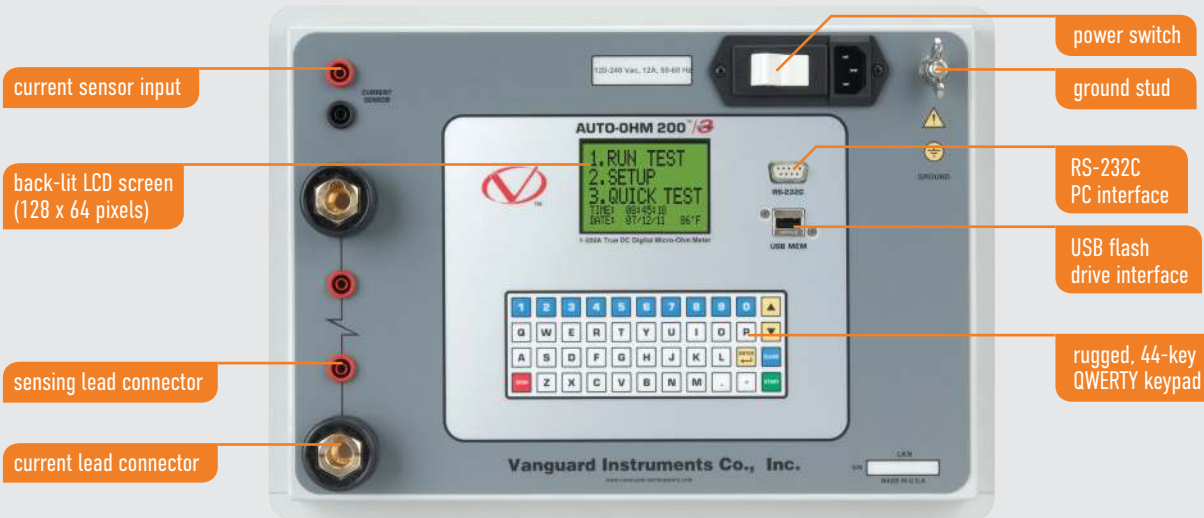
### User Interface

The Auto-Ohm-200 S3 features a back-lit (128 x 64 pixels) LCD screen that is viewable in both direct sunlight and low-light levels. The resistance readings are displayed on the LCD screen in micro-ohms or milliohms. The unit is operated via a convenient 44-key "QWERTY" keypad on the front panel.




















### Auto-Ohm 200 S3 connections



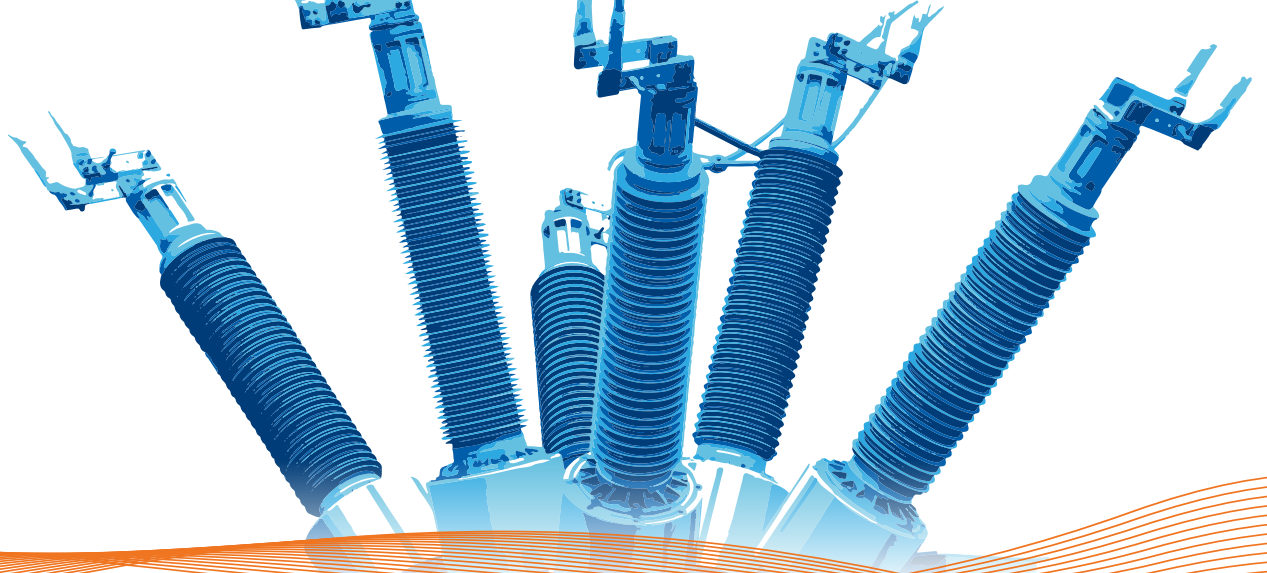
# Auto-Ohm 200 S3 Features



## Auto-Ohm 200 S3 technical specifications

|   |   |  |   |
|---|---|--|---|
|  <b>physical specifications</b>      | <b>Dimensions:</b> 17"W x 7"H x 13" D (43.2 cm x 17.8 cm x 33.0 cm)<br><b>Weight:</b> 16.8 lbs. (7.6 Kg)  |  <b>input power</b>  | 100 – 240 Vac, 50/60 Hz   |
|  <b>resistance reading range</b>     | 1 micro-ohm to 5 ohms<br>(max 10 milliohms @ 200A and 5 ohms @ 1A)  |  <b>test current range</b>   | 1A – 200A (selectable in 1A steps); thermally protected DC power supply |
|  <b>resolution</b>                   | <b>1.0 <math>\mu\Omega</math> – 999.9 <math>\mu\Omega</math>:</b> 0.1 $\mu\Omega$<br><b>10.00 m<math>\Omega</math> – 99.99 m<math>\Omega</math>:</b> 10 $\mu\Omega$ | <b>1.000 m<math>\Omega</math> – 9.999 m<math>\Omega</math>:</b> 1 $\mu\Omega$<br><b>100.0 m<math>\Omega</math> – 999.9 m<math>\Omega</math>:</b> 0.1m $\Omega$ | <b>1 <math>\Omega</math> – 5 <math>\Omega</math>:</b> 0.01 $\Omega$     |
|  <b>typical accuracy</b>             | $\pm(0.15\%$ of reading + 0.15% FS) at test current of 10-200A  |  |   |
|  <b>display</b>                      | back-lit LCD screen (128 x 64 pixels)<br>viewable in bright sunlight and low-light levels   |  |   |
|  <b>internal test record storage</b> | 128 test records. Each record can contain up to 64 readings   |  |   |
|  <b>pc software</b>                  | Windows <sup>®</sup> -based analysis software is included with purchase price   |  |   |
|  <b>temperature</b>                  | <b>Operating:</b> -10°C to +50°C (+15°F to +122°F)<br><b>Storage:</b> -30°C to +70°C (-22°F to +158°F)  |  |   |
|  <b>cables</b>                       | 30 ft (9.1 m), #1 AWG test cables, power cord, ground cable, RS-232C cable  |  |   |
|  <b>options</b>                      | shipping case, C-clamp set, hand spike set, dual ground option  |  |   |
|   |  <b>keypad</b>  | rugged, 44-key "QWERTY" membrane keypad  |   |
|   |  <b>external test record storage</b>  | up to 999 test records on external USB flash drive   |   |
|   |  <b>computer interfaces</b>   | one RS-232C PC interface, one USB flash drive interface  |   |
|   |  <b>safety</b>  | designed to meet IEC 61010 (1995), UL 61010-a, and CAS-C22.2 standards   |   |
|   |  <b>humidity</b>  | 90% RH @ 40°C (104°F)<br>non-condensing  |   |
|   |  <b>altitude</b>  | 2,000 m (6,562 ft)<br>to full safety specifications  |   |
|   |  <b>warranty</b>  | one year on parts and labor  |   |

**NOTE :** the above specifications are valid at nominal voltage and ambient temperature of +25°C (+77°F). Specifications are subject to change without notice.



## Instruments designed and developed by the hearts and minds of utility electricians around the world.

Founded in 1991 and located in Ontario, California, USA, Vanguard Instruments™ offers a wide range of diagnostic test equipment that accurately and efficiently measures the health of critical substation equipment, such as transformers, circuit breakers, and protective relays.

Our first product was a computerized, extra high voltage (EHV) circuit breaker analyzer, which became the forerunner of an entire line of EHV circuit breaker test equipment. Over the years, our portfolio has grown tremendously to include microcomputer-based precision micro-ohmmeters; single- and three-phase transformer winding turns-ratio testers; transformer winding-resistance meters; mega-ohm resistance meters; and a variety of other application-specific products.

Our instruments are rugged, reliable, accurate, and user friendly. They eliminate tedious and time-consuming operations, while providing fast, complex test-result calculations. Using our equipment helps reduce errors and eliminates the need to memorize long sequences of procedural steps.

In 2017, Vanguard Instruments became a part of Doble Engineering Company, an energy industry leader in hardware, software, and services that diagnose and monitor the health of critical assets.



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