

Valhalla 4300B Digital Micro-Ohmmeter



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Specifications

Options-Accessories

Feature-Packed Capabilities/Ultra Low Ohm Ranges

Performance That Conquers Any Resistance

Valhalla Scientific's new 4300B Digital Micro-Ohmmeter quickly and accurately measures a wide variety of low resistance devices ranging in value from 100 nano-ohms to 20 kilo-ohms. The flexible measurement format of the 4300B provides six ranges of user selectable test current (from .1mA to 10A) and three voltage sensitivity settings (20mV, 200mV and 2V). The unit's 4^{1/2} digit resistance readings are displayed on a razor sharp, high contrast LCD display and are optionally available via BCD or GPIB interface. Features of the 4300B include: four terminal compensation, a very low 2 milliohm range, selectable test current levels (up to 10 amps), a fast settling charge inductor mode, safety disconnect status indicators, automatic temperature compensation, a basic accuracy of $\pm 0.03\%$ and a push button or GPIB controlled current on/off selector.

Transformers, Motors, Cables and More

The 4300B is the perfect instrument for tackling ultra-low resistance testing requirements associated with motors, transformers, fuses, connectors, breakers, bonding/weld resistance and many other applications. For rapid testing of inductive loads the 4300B's charge inductor mode provides in excess of 20V compliance. This model reduces settling time by a factor of 5:1 on inductive loads. The result is valid readings in minutes instead of hours when testing 400 megawatt utility transformers. A solid-state "Crowbar" design provides front end protection for up to 500 amps of induced current.

Automatic Temperature Compensation "Why Do You Need It?"

Materials such as copper and aluminum will exhibit approximately a 0.4% change in resistance for a 1°C change in ambient temperature. When in ATC mode, the Valhalla 4300B temperature sensor automatically senses the ambient temperature and references the resistance value of the test item equivalent to being in a 20° C controlled environment. A 10° C change in ambient (i.e. open air, shop floor) provides a 4% change in the resistance of a copper item.

Without this "ATC" feature, a micro-ohmmeter which may be 0.02% accurate, may be making a 5-10% resistance measurement error when measuring copper or aluminum (i.e., transformer wire) material. Virtually all competitive micro-ohmmeters lack copper or aluminum (ATC) ambient temperature coefficient of resistivity compensation.

Ambient temperature can have drastic effect on the resistivity of a conductor. Without temperature compensation, materials can easily be erroneously classified during the resistance testing process. Correcting the resistance measurement on copper conductors while ambient temperature varies makes "ATC" a very useful feature.

Charging Inductor Mode Indicator

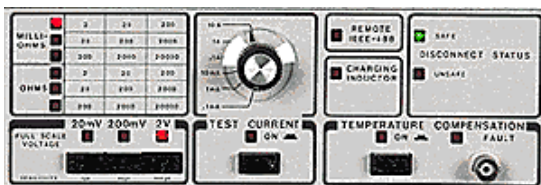
The Valhalla 4300B charging inductor mode LED indicates when the units current source compliance voltage is exceeded. The 4300B "Boost Mode" then increases the compliance voltage to exceed 20 volts output to reduce the settling time (charges the inductance) when inductive loads (i.e. large transformers) are being measured.

Cable Disconnect Status Indicator

The Valhalla 4300B safe and unsafe L.E.D.'s indicate when it is safe to disconnect the test leads from the load. When a highly inductive load is being measured, a potentially lethal back-EMF (collapsing field) is induced when the test current is removed. The Valhalla 4300B internally automatically provides a discharge path for this back-EMF and monitors voltage. The safe to disconnect LED is illuminated when the back-EMF is less than five volts.

The 4300B test current can be turned off and on via the test current switch or GPIB command. In addition, the LED above the test current switch indicates the current source status.

The 4300B's variable test current levels are selected via a six position rotary switch of GPIB command. The test current and full scale voltage sensitivity switch positions determine the resistance range as indicated by the front panel matrix.



Close up of the 4300B Front Panel

- User Selectable Test Current Up to 10 Amperes
- Boosted Compliance Voltage Mode For Rapid Charging of Motors and Transformers
- GPIB (IEEE-488) Remote Talk/Listen Interface
- Safety Disconnect Status L.E.D.s For Use With Large Inductors
- Automatic Temperature Compensation
- Test Current On/Off Switch
- Selectable Voltage Sensitivity: 1µV-10µV-100µV
- 18 Combinations of Voltage Sense/Current provide optimum measurement conditions

Large Inductor Resistance Measurement

The 4300B's 10 Ampere current source is ideal for low resistance inductors such as utility transformers. Combining the current output with boosted compliance voltage (>20 VDC) enables rapid stable resistance readings in seconds, not hours. Having unique features like Automatic Temperature Compensation, High Level Current Sourcing (10 amps) with High Compliance Drive circuitry and 18 combinations of Voltage / Current Range Selectivity, the 4300B Digital Micro-ohmmeter is second to none.

Range, Resolution, Sensitivity Table

Resistance		Test Current / Full Scale Voltage Drop		
Ranges	Resolution	F.S. Volts: 20mV	200mV	2V
2 mΩ	0.1 µΩ	10 A	-----	-----
20 mΩ	1.0 µΩ	1 A	10 A	-----
200mΩ	10 µΩ	100 mA	1 A	10 A
2Ω	100 µΩ	10 mA	100 mA	1 A
20Ω	1 mΩ	1 mA	10 mA	100 mA
200Ω	10 mΩ	100 µA	1 mA	10 mA
2KΩ	100 mΩ	-----	100 µA	1 mA
20KΩ	1 Ω	-----	-----	100 µA

Locking Rear Terminals - Option "JB-2"

For GPIB based systems, rugged field use, or applications where disconnecting the leads while outputting current into a large inductor is to be avoided, the 4300B is available with positive mating, rear panel mounted "Bendix" connectors. The rear terminal option is designated "JB-2" and is compatible with the heavy duty, four wire "KC" lead set terminated with "JAWS" (opens to 2 inches).

Specifications



- Accuracy: (180 days 24°C ± 2°C) ±.03% of reading ± 2 counts (add 2 counts on 20mV range; ±.01% of reading on 10 amp range)
- CMR Ratio: 60db at DC, 50Hz & 60Hz
- Display: 4 1/2 digit (19999) LCD -20,000 counts Overload Indication: Display Flashes
- Terminal Configuration: Four-wire Kelvin. Front terminals standard, rear Bendix terminals optional
- Maximum Input: 500 amps peak induced current

- Temperature Range: 5°C to 50°C
- Temperature Coefficient: (5°C to 24°C and 26°C to 50°C) $\pm 0.005\%$ of reading per °C
- Conversion Rate: ~ 3 per second (12 readings per sec. available)
- Compliance Voltage: 7.5 VDC nominal at 10A resistive, 20 VDC nominal while charging inductor
- Size: 432mm/17" L x 432mm/17" W x 89mm/3½" H
- Weight: 9.1KG/20 lbs NET, 11.8KG/26 lbs Shipping

Ordering Information

Model "4300B"	Digital Micro-Ohmmeter
Option " AL "	Aluminum Temp. Compensator
Option " CU "	Copper Temp. Compensator
Option " AG "	Silver Temp. Compensator
Option " CK "	Compensator Extension Cable
Option "RS-232"	RS-232C Remote PC Interface
Option "TL-488"	IEEE-488 Talk/Listen Interface
Option "BCD-1"	Data Output for Limit Comparator " 1248 "
Option " JB-2 "	Rear Panel Bendix Locking Terminals
Option " KCS "	Medium Weight Gold-Plated Kelvin Clip Set
Option " K "	Kelvin Clips set w/ " KCS "
Option " JAWS "	Heavy Duty Kelvin Clip set (no cabling)
Option " KK "	Kelvin Clips set w/ " JAWS "
Option " KC "	10Amp Kelvin Clips set w/ " JAWS " (" JB-2 " compatible)
Option "KL"	10Amp Kelvin Clips set Bananas to " JAWS "
Option " MP-1 "	Kelvin Micro Probes (.05")
Option " MP-2 "	Kelvin Micro Probes (.18")
Option " MP-3 "	Kelvin Micro Probes (.08")
Option " MP-4 "	Kelvin Surface Probe set (1" diameter)
Option " MP-5 "	Kelvin Surface Probe set (1/2" diameter)
Option " RX-3 "	19" Rack Mount Adaptor
Option "M4300B"	Additional User/Maintenance Manual