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4300B DIGITAL µ-OHMMETER



Features:

- **User Selectable Test Current Up to 10 Amps.**
- **Boosted Compliance Voltage Mode For Rapid Charging of Motors and Transformers.**
- **Safety Disconnect Status L.E.D.s.**
- **Test Current On/Off Switch.**
- **Selectable Voltage Sensitivity:1µV-10µV-100µV**
- **18 Combinations of Voltage Sense/Current provide optimum measurement conditions**

Performance That Conquers Any Resistance

The 4300B Digital µ-Ohmmeter quickly and accurately measures a wide variety of low resistance devices ranging in value from 100nΩ to 20kΩ. 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 4½ digit resistance readings are displayed on a high contrast LCD display and are optionally available via optional BCD, RS-232 or GPIB interface. Features of the 4300B include: four terminal compensation, a very low 2mΩ 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 ±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 400MW 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 Automatic Temperature Compensation mode (ATC), 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 unit's current source compliance voltage is exceeded. The 4300B "Boost Mode" then increases the compliance voltage to exceed 20V 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 LED'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 5V.

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.
Large Inductor Resistance Measurement: The 4300B's 10A 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 (10A) with High Compliance Drive circuitry and 18 combinations of Voltage / Current Range Selectivity, the 4300B Digital Micro-ohmmeter is second to none.

VALHALLA SCIENTIFIC

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Specification

Accuracy: ±.04% of reading ± 3 digits (add ± 3 digits on 20mV range; ± .02% of reading on 10A range)

Temperature Coefficient: (5°C – 21°C and 29°C – 50°C) ± .005% of reading per °C

Temperature Sensor: AL" and "CU" add ± .05% of reading to accuracy specification (Temperature compensators are accurate to ± 0.1% of the rated coefficient)

CMR Ratio: 60dB at DC, 50Hz, and 60Hz

Display: 4 ½ digit (19999) Liquid Crystal Display

Overload Indication: Display Flashes "-1"

Terminal Configuration: Four-Wire Kelvin

Conversion Rate: ~ 400msec

Maximum Kick-Back Protection: 500Amp Peak Induced Current

Compliance Voltage (Normal Mode): 7.5 VDC nominal at 10A resistive

Compliance Voltage (Charging Inductor Mode): > 20VDC when indicator is lit

Open Circuit Voltage (Test Current Off): <20mV between I_{HI} and I_{LO} terminals

Ranges and Resolution:

Resistance Ranges (Ω)	Resolution	Full Scale Voltage		
		20mV	200mV	2V
2m	.0001mΩ	10A	---	---
20m	.001mΩ	1A	10A	---
200m	.01mΩ	100mA	1A	10A
2/2000m	.0001Ω/.1mΩ	10mA	100mA	1A
20/20000m	.001Ω/1mΩ	1mA	10mA	100mA
200	.01Ω	100µA	1mA	10mA
2000	.1Ω	---	100µA	1mA
20000	1Ω	---	---	100µA
			-Test Current Ranges-	

Environmental Requirements:

Operation Temperature Range: 0°C to 50°C

Humidity: 70% RH at 40°C (non-condensing)

Storage Temperature Range: -30°C to 70°C

Power Requirements:

Power Supply Voltage: 105-125 VAC or 210-250 VAC

Power Supply Frequency: 50Hz – 60Hz

Power Supply Consumption: 200VA Maximum

Physical Specifications:

Dimensions: 17" (43cm) W
17" (43cm) D
4" (10cm) H

Weight: 9.1Kg (20lbs) NET
11.8Kg (26 lbs) Shipping

Options:

Option RX-3: Rack Adapter
TL-488: IEEE Interface
Option BCD: BCD Data Outputs
RS-232: Serial Interface
PAR: Printer Interface
Option JB-2: Rear Bendix Connectors

Accessories:

Model 1248: Dual Limit Comparator (needs BCD)
AL20, AL 25: Aluminum Temperature Compensator
CU20, CU25: Copper Temperature Compensator

Valhalla Scientific, Inc. manufactures many cable sets and probes that can be used with the model 4300B. For more information please contact Valhalla Scientific, Inc. or visit our web site.

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