

- Low and selectable test signal current: 1  $\mu$ A to 10 mA
- Wide measurement range: 10  $\mu\Omega$  to 100 k $\Omega$
- 10  $\mu\Omega$  resolution

- 1 kHz ac measurement
- High-speed measurement: 34 ms
- Built-in comparator
- Auto-measurement mode



HP 4338A



### HP 4338A Milliohmmeter

The HP 4338A milliohmmeter is a precise, reliable, high-speed test tool for measurements of low resistance.

#### Precise, Low-Resistance Measurement

Contact failure of electromechanical components in a low-current circuit is a key issue for component reliability. The HP 4338A offers selectable low ac test signals (1  $\mu$ A to 10 mA). Users can now characterize low resistances of electromechanical components under low-current conditions. A high resolution of 10  $\mu\Omega$  allows you to determine the slightest differences in contact resistance testing of relays, switches, connectors, PC board traces and cables. The 1 kHz test signal eliminates potential errors introduced by thermoelectric effects on the device-under-test (DUT) contacts. The 1 kHz ac test signal is the best solution to evaluate the internal resistance of batteries, because it avoids dc energy consumption.

#### High-Speed Measurements

The high-speed (34 ms), built-in comparator and HP-IB/handler interfaces make it possible to construct a measurement system using an automatic handler and external computer to minimize production test time.

#### Auto-Measurement Mode

When performing gross continuity testing where the test signal level is not a significant factor in the test, the auto-measurement function allows the instrument to select an appropriate test signal and measurement range setting.

#### Specifications (Refer to data sheet for complete specifications.)

##### Measurement Function

**Measurement parameters:** R (ac resistance), X (reactance), L (inductance), |Z| (impedance),  $\theta$  (phase [°])

**Combinations:** R, R-X, R-L, |Z| -  $\theta$  (series mode only)

**Mathematical Functions:** Deviation and percent deviation

**Ranging:** Auto and manual

**Trigger:** Internal, external, manual, and HP-IB

**Delay Time:** 0 to 9999 ms in 1 ms steps

**Measurement Time:** Short, medium, and long

**Averaging:** 1 to 256

##### Test Signal Characteristics

**Test frequency:** 1 kHz

**Frequency accuracy:**  $\pm 0.1\%$

**Test signal level:** 1  $\mu$ A, 10  $\mu$ A, 100  $\mu$ A, 1 mA, 10 mA rms

**Level accuracy:**  $\pm 10\% + 0.2 \mu$ A

**Maximum voltage across sample:** 20 mV peak in any case

##### Measurement Range

Parameter	Measurement range
R	10 $\mu\Omega$ to 100 k $\Omega$
X,  Z	10 $\mu\Omega$ to 100 k $\Omega$ (typical)
L	10 nH to 10 H (typical)
$\theta$	-180° to +180° C (typical)

**Measurement Accuracy:**  $\pm 0.4\%$  Basic for R

**Measurement Time:** Time interval from a trigger command to the end of measurement (EOM) signal output at the handler interface port.

Mode	Time (typical)
Short	34 ms
Medium	70 ms
Long	900 ms

**Display:** 24 digits LCD display. Capable of displaying: measured values, control settings, comparator limits and decisions, self-test messages, and annunciations.

##### Correction Function

**Zero SHORT:** Eliminates measurement errors due to parasitic impedances in the test fixture.

##### Comparator Function

HIGH/IN/LOW for each primary measurement parameter and the secondary measurement parameter.

##### Other Functions

**Superimposed dc:**  $\pm 42$  Vdc maximum may be present on measurement terminals.

**Save/recall:** Ten instrument setups can be saved/recalled from the internal nonvolatile memory.

**Continuous memory capability:** If the instrument is turned off, or if a power failure occurs, instrument settings are automatically memorized ( $\leq 72$  hours at  $23 \pm 5^\circ$  C).

**HP-IB interface:** All control settings, measured values, and comparator information

**Handler interface:** All output signals are negative-logic, optically isolated open collectors.

**Output signals include:** HIGH/IN/LOW, index, end of measurement, and alarm. Input signals are keylock and external trigger.

#### General Specifications

**Power Requirements:** 90 to 132 V or 198 to 264 V, 47 to 66 Hz, 45 VA max

**Operating Temperature:** 0° to 55° C

**Size:** 320 mm W  $\times$  100 mm H  $\times$  300 mm D (12.6 in  $\times$  3.94 in  $\times$  11.81 in)

**Weight:** 4.5 kg (9.9 lb)

#### Furnished Accessories

Operation manual, power cable (mating cable and test leads, or HP 16338A test lead set, must be ordered separately.)

#### Ordering Information

	Price
HP 16338A Test Lead Set	\$770
HP 16143B Mating Cable (0.6 m)	\$320
HP 16005B Kelvin Clip Lead (0.4 m, with large clip)	\$100
HP 16005C Kelvin IC Clip Lead (0.4 m, with IC clip)	\$140
HP 16006A Pin-Type Probe Lead (0.4 m)	\$53
HP 16007A Alligator Clip Leads (0.4 m, with 2 red clips)	\$25
HP 16007B Alligator Clip Leads (0.4 m, with 2 black clips)	\$25
HP 16064B LED Display/Trigger Box	\$330
HP 4338A Milliohmmeter	\$3,450
Opt 009 Delete Operation Manual	-\$54
Opt W30 Extended Repair Service (see page 636)	+\$80

☎ For off-the-shelf shipment, call 800-452-4844.