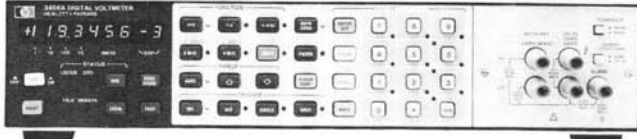


DIGITAL MULTIMETERS

6½ to 3½ Digit HP-IB DMM with High Stability

HP 3456A

- Up to 330 readings per second
- 100 nanovolt resolution



Description

This fully guarded, integrating Digital Multimeter is designed for bench or systems. The HP Model 3456A measures dc, true RMS ac voltage and resistance.

Measurement speed and accuracy can be enhanced for a specific application, using the HP 3456A's selectable integration time (up to 100 power line cycles). An operator can select up to 330 readings/second for high speed bursts or one reading every fifteen minutes for periodic measurements. Resolution of 100 nanovolts at 48 readings/second (6½ digits) to 10 microvolt resolution at 330 readings per second (3½ or 4½ digits) can be selected.

With good repeatability and 100 nanovolt sensitivity, accuracy on the ten volt range is ±0.0008% +2 counts over a 24-hour period at 23°C ±1 °C.

Four full-scale, true rms ac voltage ranges are provided, with reading speeds up to 12 readings per second over a 10 Hz to 250 kHz frequency range. Best accuracy is 0.05%. Crest factor is greater than seven at full scale.

With the HP 3456A's program memory and reading storage capability, the HP 3456A can take measurements and store them while a computer performs some other task.

Another system feature of the HP 3456A is its hardware scanner advance capability for scanned or multiplexed system applications. As soon as the HP 3456A's measurement cycle is complete, a TTL signal is available to trigger a variety of switching instruments.

Specifications

DC Voltage

Range	Maximum Reading (5½ digit)	6½ digit	Resolution 5½ digit	4½ digit	Input Resistance	Maximum Input Voltage
0.1 V	1.19999 V	100 nV	1 µV	10 µV	>10 ¹⁰ Ω	±1000 V peak
1.0 V	1.19999 V	1 µV	10 µV	100 µV	>10 ¹⁰ Ω	
10.0 V	11.9999 V	10 µV	100 µV	1 mV	>10 ¹⁰ Ω	
100.0 V	119.999 V	100 µV	1 mV	10 mV	10 MΩ ±5%	
1000.0 V	1000.00 V	1 mV	10 mV	100 mV	10 MΩ ±5%	

Measurement accuracy: ± (% of reading + number of counts).

RANGE	24 hour: 23°C ±1°C		90 days: 23°C ±5°C		1 year: 23°C ±5°C	
	6½ digit (≥10 PLC)	6½ digit (1 PLC)	6½ digit (≥10 PLC)	6½ digit (1 PLC)	6½ digit (≥10 PLC)	6½ digit (1 PLC)
0.1 V	.0022 + 24	0.0024 + 32	0.0026 + 24	0.0027 + 32	0.0034 + 24	0.0035 + 32
1.0 V	0.0009 + 4	0.0012 + 5	0.0016 + 4	0.0017 + 5	0.0024 + 4	0.0025 + 5
10.0 V	0.0008 + 2	0.0011 + 3	0.0015 + 2	0.0016 + 3	0.0023 + 2	0.0024 + 3
100.0 V	0.0011 + 3	0.0014 + 4	0.0018 + 3	0.0019 + 4	0.0026 + 3	0.0027 + 4
1000.0 V ¹	0.0011 + 2	0.0013 + 3	0.0016 + 2	0.0017 + 3	0.0024 + 2	0.0025 + 3

¹Add .02 $\left(\frac{\text{Input Voltage}}{1000}\right)^2$ % to % of reading.

AC RMS Voltage (AC, AC + DC)

Range	Maximum Reading (5½ digit)	6½ digit	Resolution 5½ digit	4½ digit	Input Impedance	Maximum Input Voltage
1.0 V	1.19999 V	1 µV	10 µV	100 µV	1 MΩ ±5% peak	±1000 V
10.0 V	11.9999 V	10 µV	100 µV	1 mV	shunted by <90 pF	(700 V rms)
100.0 V	119.999 V	100 µV	1 mV	10 mV		10 ⁸ VHZ
1000.0 V	700.00 V	1 mV	10 mV	100 mV		

- 100 micro-ohm to 1.0 gigaohm

Measurement accuracy: ± (% of reading + number of counts).
90 days: 23°C ±5°C

Integration Time	Frequency In Hz					
	In Power Line Cycles	10 to 20	Filter Off→ 20 to 30	400-20k 30-20k	20k to 50k 20k to 50k	50k to 100k 50k to 100k
>1~ (6 Digit) ²	.47 + 450	.35 + 500	.07 + 730	.17 + 1700	.55 ± 2900	5.0 + 6500
.1~ (5 Digit)	.48 + 90	.36 + 53	.08 + 73	.18 + 173	.56 + 293	5.0 + 653
.01~ (4 Digit)	.56 + 10	.41 + 7	.13 + 9	.23 + 19	.61 + 31	5.1 + 67

¹Frequencies > 100 kHz are specified for 1.0 V and 10 V ranges only.

²Integration time in power line cycles (PLC). For 5½ digits, multiply counts by 0.1. For 4½ digits, multiply counts by 0.01.

Resistance (2 WΩ, 4 WΩ, 2 WOCΩ, 4 WOCΩ)

Range	Maximum Reading (5½ digit)	6½ digit	Resolution 5½ digit	4½ digit	Current Through Unknown
100 Ω	119.999 Ω	100 µΩ	1 mΩ	10 mΩ	1 mA
1 kΩ	1199.99 Ω	1 mΩ	10 mΩ	100 mΩ	1 mA
10 kΩ	11.9999 kΩ	10 mΩ	100 mΩ	1 Ω	100 µA
100 kΩ	119.999 kΩ	100 mΩ	1 Ω	10 Ω	50 µA
1 MΩ	1199.99 kΩ	1 Ω	10 Ω	100 Ω	5 µA
10 MΩ	11.9999 MΩ	10 Ω	100 Ω	1 kΩ	500 nA
100 MΩ	119.999 MΩ	100 Ω	1 kΩ	10 kΩ	<500 nA ¹
1 GΩ	1000.00 MΩ	1 kΩ	10 kΩ	100 kΩ	<500 nA ¹

¹Ohms source is a 500 nA current source in parallel with a 10 MΩ resistance.

Measurement accuracy: ± (% of reading + number of counts).

RANGE	24 hour: 23°C ±1°C		90 days: 23°C ±5°C	
	6½ digit (≥10 PLC)	6½ digit (1 PLC)	6½ digit (≥10 PLC)	6½ digit (1 PLC)
100 Ω	0.003 + 24	0.003 + 32	0.004 + 24	0.004 + 32
1 kΩ	0.002 + 4	0.003 + 5	0.003 + 4	0.004 + 5
10 kΩ	0.002 + 4	0.003 + 5	0.003 + 4	0.004 + 5
100 kΩ	0.002 + 2	0.003 + 3	0.003 + 2	0.004 + 3
1 MΩ	0.006 + 2	0.006 + 3	0.007 + 2	0.007 + 3
10 MΩ	0.041 + 2	0.041 + 3	0.042 + 2	0.042 + 3
100 MΩ	1.3 + 1	1.3 + 1	1.8 + 1	1.8 + 1
1 GΩ	11 + 1	11 + 1	16 + 1	16 + 1

Ratio

Type: dc/dc, ac/dc, or (ac + dc)/dc

Method: 4-wire with Volts Lo input common

$$\text{Ratio} = \frac{\text{Signal Voltage}}{\text{Ref. Hi Voltage} - \text{Ref. Lo Voltage}}$$

Reading Rate

Integration Time In Power Line Cycles (PLC)	Rates (rdgs/second)			
	Auto Zero Off 60 Hz	50 Hz	Auto Zero On 60 Hz	50 Hz
0.01 (4½ digit)	330	290	210	180
0.10 (5½ digit)	210	180	120	100
1.00 (6½ digit)	48	40	25	20
10.00 (6½ digit)	5.8	4.8	2.9	2.4
100.00 (6½ digit)	.57	.47	.29	.24

Memory

Reading store: Store up to 350 readings.

Program memory: can execute an internal program which controls instrument configuration and measurement sequence.

General

Operating temperature: 0 to 50°C

Humidity Range: 95% R.H., 0 to 40°C

Power: 100/120/220/240 V +5%, -10%, 48 Hz to 400 Hz line operation, 45 VA max.

Size: 88.9 H x 425.5 W x 527.1 D (3½" x 16¾" x 20¾")

Weight: net, 10.49 kg (23.13 lb.); shipping, 13.35 kg (29.38 lb.)

Ordering Information

HP 3456A digital voltmeter

Opt 050: Noise rejection for 50 Hz

Opt 060: Noise rejection for 60 Hz

Opt W30: 3 year hardware support. See page 723.

Price

\$5695

\$0

\$0

+\$120