



**Accuracy Specifications ± (% of reading + % of range)<sup>[1]</sup>**

Function	Range <sup>[3]</sup>	Frequency, etc.	24 Hour <sup>[2]</sup> 23°C ± 1°C	90 Day 23°C ± 5°C	1 Year 23°C ± 5°C	Temperature Coefficient 0°C – 18°C 28°C – 55°C	
dc Voltage	100.0000 mV		0.0030 + 0.0030	0.0040 + 0.0035	0.0050 + 0.0035	0.0005 + 0.0005	
	1.000000 V		0.0020 + 0.0006	0.0030 + 0.0007	0.0040 + 0.0007	0.0005 + 0.0001	
	<b>10.00000 V</b>		<b>0.0015 + 0.0004</b>	<b>0.0020 + 0.0005</b>	<b>0.0035 + 0.0005</b>	<b>0.0005 + 0.0001</b>	
	100.0000 V		0.0020 + 0.0006	0.0035 + 0.0006	0.0045 + 0.0006	0.0005 + 0.0001	
	1000.000 V		0.0020 + 0.0006	0.0035 + 0.0010	0.0045 + 0.0010	0.0005 + 0.0001	
True rms ac Voltage <sup>[4]</sup>	100.0000 mV	3 Hz - 5 Hz	1.00 + 0.03	1.00 + 0.04	1.00 + 0.04	0.100 + 0.004	
		5 Hz - 10 Hz	0.35 + 0.03	0.35 + 0.04	0.35 + 0.04	0.035 + 0.004	
		10 Hz - 20 kHz	0.04 + 0.03	0.05 + 0.04	0.06 + 0.04	0.005 + 0.004	
		20 kHz - 50 kHz	0.10 + 0.05	0.11 + 0.05	0.12 + 0.04	0.011 + 0.005	
		50 kHz - 100 kHz	0.55 + 0.08	0.60 + 0.08	0.60 + 0.08	0.060 + 0.008	
		100 kHz - 300 kHz <sup>[6]</sup>	4.00 + 0.50	4.00 + 0.50	4.00 + 0.50	0.20 + 0.02	
	1.000000 V to 750.000 V	3 Hz - 5 Hz	1.00 + 0.02	1.00 + 0.03	1.00 + 0.03	1.00 + 0.03	0.100 + 0.003
		5 Hz - 10 Hz	0.35 + 0.02	0.35 + 0.03	0.35 + 0.03	0.35 + 0.03	0.035 + 0.003
		<b>10 Hz - 20 kHz</b>	<b>0.04 + 0.02</b>	<b>0.05 + 0.03</b>	<b>0.06 + 0.03</b>	<b>0.06 + 0.03</b>	<b>0.005 + 0.003</b>
		20 kHz - 50 kHz	0.10 + 0.04	0.11 + 0.05	0.12 + 0.05	0.12 + 0.05	0.011 + 0.005
50 kHz - 100 kHz <sup>[5]</sup>		0.55 + 0.08	0.60 + 0.08	0.60 + 0.08	0.60 + 0.08	0.060 + 0.008	
	100 kHz - 300 kHz <sup>[6]</sup>	4.00 + 0.50	4.00 + 0.50	4.00 + 0.50	0.20 + 0.02		
Resistance <sup>[7]</sup>	100.0000 Ω	1 mA Current Source	0.0030 + 0.0030	0.008 + 0.004	0.010 + 0.004	0.0006 + 0.0005	
	1.000000 kΩ	1 mA	0.0020 + 0.0005	0.008 + 0.001	0.010 + 0.001	0.0006 + 0.0001	
	<b>10.00000 kΩ</b>	100 μA	<b>0.0020 + 0.0005</b>	<b>0.008 + 0.001</b>	<b>0.010 + 0.001</b>	<b>0.0006 + 0.0001</b>	
	100.0000 kΩ	10 μA	0.0020 + 0.0005	0.008 + 0.001	0.010 + 0.001	0.0006 + 0.0001	
	1.000000 MΩ	5.0 μA	0.002 + 0.001	0.008 + 0.001	0.010 + 0.001	0.0010 + 0.0002	
	10.00000 MΩ	500 nA	0.015 + 0.001	0.020 + 0.001	0.040 + 0.001	0.0030 + 0.0004	
	100.0000 MΩ	500 nA    10MΩ	0.300 + 0.010	0.800 + 0.010	0.800 + 0.010	0.1500 + 0.0002	
dc Current	10.00000 mA	<0.1 V Burden Voltage	0.005 + 0.010	0.030 + 0.020	0.050 + 0.020	0.002 + 0.0020	
	<b>100.0000 mA</b>	<0.6 V	<b>0.010 + 0.004</b>	<b>0.030 + 0.005</b>	<b>0.050 + 0.005</b>	<b>0.002 + 0.0005</b>	
	1.000000 A	<1 V	0.050 + 0.006	0.080 + 0.010	0.100 + 0.010	0.005 + 0.0010	
	3.00000 A	<2 V	0.100 + 0.020	0.120 + 0.020	0.120 + 0.020	0.005 + 0.0020	
True rms ac Current <sup>[4]</sup>	<b>1.000000 A</b>	3 Hz - 5 Hz	1.00 + 0.04	1.00 + 0.04	1.00 + 0.04	0.100 + 0.006	
		5 Hz - 10 Hz	0.30 + 0.04	0.30 + 0.04	0.30 + 0.04	0.035 + 0.006	
		<b>10 Hz - 5 kHz</b>	<b>0.10 + 0.04</b>	<b>0.10 + 0.04</b>	<b>0.10 + 0.04</b>	<b>0.015 + 0.006</b>	
	3.00000 A	3 Hz - 5 Hz	1.10 + 0.06	1.10 + 0.06	1.10 + 0.06	0.100 + 0.006	
		5 Hz - 10 Hz	0.35 + 0.06	0.35 + 0.06	0.35 + 0.06	0.035 + 0.006	
		10 Hz - 5 kHz	0.15 + 0.06	0.15 + 0.06	0.15 + 0.06	0.015 + 0.006	
Frequency or Period <sup>[8]</sup>	100 mV to 750 V	3 Hz - 5 Hz	0.10	0.10	0.10	0.005	
		5 Hz - 10 Hz	0.05	0.05	0.05	0.005	
	10 Hz - 40 Hz	0.03	0.03	0.03	0.001		
		<b>40 Hz - 300 kHz</b>	<b>0.006</b>	<b>0.01</b>	<b>0.01</b>	<b>0.001</b>	
Continuity	1000.0 Ω	1 mA Test Current	0.002 + 0.010	0.008 + 0.020	0.010 + 0.020	0.001 + 0.002	
Diode Test	1.0000 V	1 mA Test Current	0.002 + 0.010	0.008 + 0.020	0.010 + 0.020	0.001 + 0.002	

[1] Specifications are for 1hr warm-up and 6½ digits, Slow ac filter.  
 [2] Relative to calibration standards.  
 [3] 20% over range on all ranges except 1000 Vdc and 750 Vac ranges.  
 [4] For sinewave input > 5% of range. For inputs from 1% to 5% of range and < 50 kHz, add 0.1% of range additional error.

[5] 750 V range limited to 100 kHz or 8 x 10<sup>7</sup> Volt-Hz.  
 [6] Typically 30% of reading error at 1 MHz.  
 [7] Specifications are for 4-wire ohms function or 2-wire ohms using Math Null. Without Math Null, add 0.2 Ω additional error in 2-wire ohms function.  
 [8] Input > 100 mV. For 10 mV inputs multiply % of reading error x10.



## Measurement Characteristics

<b>dc Voltage</b>	
Measurement Method	Continuously Integrating Multi-slope III A-D Converter
A-D Linearity	0.0002% of reading + 0.0001 % of range
Input Resistance	
0.1V, 1V, 10 V ranges	Selectable 10 M $\Omega$ or >10,000 M $\Omega$
100 V, 1000 V ranges	10 M $\Omega$ $\pm$ 1%
Input Bias Current	< 30pA at 25° C
Input Protection	1000 V all ranges
dcV:dcV Ratio Accuracy	$V_{input}$ Accuracy + $V_{reference}$ Accuracy
<b>True rms ac Voltage</b>	
Measurement Method	ac coupled True rms – measures the ac component of the input with up to 400 Vdc of bias on any range.
Crest Factor	Maximum of 5:1 at Full Scale
Additional Crest Factor Errors (non-sinewave)	
Crest Factor 1–2	0.05 % of reading
Crest Factor 2–3	0.15 % of reading
Crest Factor 3–4	0.30 % of reading
Crest Factor 4–5	0.40 % of reading
Input Impedance	1 M $\Omega$ $\pm$ 2% in parallel with 100 pF
Input Protection	750Vrms all ranges
<b>Resistance</b>	
Measurement Method	Selectable 4-wire or 2-wire Ohms. Current source referenced to LO input.
Maximum Lead Resistance (4-wire)	10% of range per lead for 100 $\Omega$ and 1k $\Omega$ ranges. 1k $\Omega$ per lead on all other ranges.
Input Protection	1000 V all ranges
<b>dc Current</b>	
Shunt Resistance	5 $\Omega$ for 10 mA, 100 mA; 0.1 $\Omega$ for 1 A, 3 A.
Input Protection	Externally accessible 3 A 250 V Fuse Internal 7 A 250 V Fuse
<b>True rms ac Current</b>	
Measurement Method	Direct coupled to the fuse and shunt. ac coupled True rms measurement (measures the ac component only).
Shunt Resistance	0.1 $\Omega$ for 1 A and 3 A ranges
Input Protection	Externally accessible 3 A 250 V Fuse Internal 7 A 250 V Fuse
<b>Frequency and Period</b>	
Measurement Method	Reciprocal counting technique
Voltage Ranges	Same as ac Voltage Function
Gate Time	1 s, 100 ms, or 10 ms.
<b>Continuity / Diode</b>	
Response Time	300 samples/s with audible tone
Continuity Threshold	Selectable from 1 $\Omega$ to 1000 $\Omega$
<b>Measurement Noise Rejection 60 (50) Hz<sup>[1]</sup></b>	
dc CMRR	140 dB
ac CMRR	70 dB
<b>Integration Time</b>	
100 plc / 1.67 s (2 s)	60 dB <sup>[3]</sup>
10 plc / 167 ms (200 ms)	60 dB <sup>[3]</sup>
1 plc / 16.7 ms (20 ms)	60 dB
<1 plc / 3 ms or 800 $\mu$ s	0 dB

## Operating Characteristics<sup>[4]</sup>

Function	Digits	Readings/s
dcV, dcI, and Resistance	6 1/2	0.6 (0.5)
	6 1/2	6 (5)
	5 1/2	60 (50)
	5 1/2	300
	4 1/2	1000
acV, acI	6 1/2	0.15
	6 1/2	1
	6 1/2	10
	6 1/2	50 <sup>[5]</sup>
Frequency or Period	6 1/2	1
	5 1/2	9.8
	4 1/2	80
<b>System Speeds<sup>[6]</sup></b>		
Configuration Rates		26/s to 50/s
Autorange Rate (dc Volts)		> 30/s
ASCII readings to RS-232		55/s
ASCII readings to HP-IB		1000/s
Maximum Internal Trig. Rate		1000/s
Max. Ext. Trig. Rate to Memory		1000/s
<b>Triggering and Memory</b>		
Reading HOLD Sensitivity		10%, 1%, 0.1%, or 0.01% of range
Samples/ trigger		1 to 50,000
Trigger Delay		0 to 3600 s: 10 $\mu$ s step size
External Trigger Delay		< 1 ms
External Trigger Jitter		< 500 $\mu$ s
Memory		512 readings
<b>Math Functions</b>		
NULL, Min/Max/Average, dBm, dB, Limit Test (with TTL output)		
<b>Standard Programming Languages</b>		
SCPI (IEEE-488.2), HP 3478A, Fluke 8840A/42A		
<b>Accessories Included</b>		
Test Lead Kit with probe, alligator, and grabber attachments.		
Operating Manual, Service Manual, test report, and power cord.		
<b>General Specifications</b>		
Power Supply		100 V/120 V/220 V/240 V $\pm$ 10%
Power Line Frequency		45 Hz to 66 Hz and 360 Hz to 440 Hz Automatically sensed at power-on.
Power Consumption		25 VA peak (10W average)
Operating Environment		Full accuracy for 0° C to 55° C Full accuracy to 80% R.H. at 30° C
Storage Environment		- 40° C to 75° C
Weight		3 kg (6.5 lbs)
Safety		Designed to CSA, UL-1244, IEC-348
RFI and ESD		MIL-461C, FTZ 1046, FCC
Vibration and Shock		MIL-T-28800E, Type III, Class 5 (Sine Only)
Warranty		3 years

[1] For 1 k $\Omega$  unbalance in LO lead.

[2] For power line frequency  $\pm$  0.1%.

[3] For power line frequency  $\pm$  1% use 40 dB or  $\pm$  3% use 30 dB.

[4] Reading speeds for 60 Hz and (50 Hz) operation.

[5] Maximum useful limit with default settling delays defeated.

[6] Speeds are for 4 1/2 digits, Delay 0, Auto-zero and Display OFF.

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## Ordering Information

HP 34401A Multimeter

### Accessories included

Test Lead Kit with probe, alligator, and grabber attachments, operating manual, service manual, calibration certificate, test report, and power cord.

### Options

- Opt. 908 Rack Mount Kit\* (P/N 5062-3972)
- Opt. 910 Extra manual set (English)
- Opt. OBO DMM without manuals
- Opt. W50 Additional 2-year warranty (5-year total)
- Opt. 1BP MIL-STD-45662A calibration with data

### Manual options (please specify one)

- ABA US English
- ABD German
- ABE Spanish
- ABF French
- ABJ Japanese
- ABZ Italian
- ABO Taiwan Chinese
- AB1 Korean

### Accessories

- HP 11059A Kelvin Probe set
- HP 11060A Surface Mount Device (SMD) test probes
- HP 11062A Kelvin clip set
- HP 34130 Deluxe test lead set
- HP 34161A accessory pouch
- HP 34300A 40 kV ac/dc high voltage probe
- HP 34301A 700 MHz RF probe
- HP 34302A Clamp-on ac/dc current probe (100 A)
- HP 34330A 30 A current shunt
- HP 34812A BenchLink Meter software
- HP E2308A 5K thermistor probe

\* For racking two side-by-side, order both items below  
Lock link kit (P/N 5061-9694)  
Flange kit (P/N 5062-3974)

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