

# When 3½ digits just aren't enough, it's time to move up to Fluke.



Here's the most powerful handheld DMM we've ever built: our 4½-digit 8060A. Measures frequencies from 12 Hz to 200 kHz, fully autoranging, with 1-second response time and 0.01 Hz resolution in the 200 Hz line-power frequency range.

AC or dc voltage readings can be displayed in dBm referenced to 600Ω or in relative dB.

Selectable visual (↔) and audible ())) indicators for continuity checking with 50 μs response time; continuity threshold of <10% of ohms range (i.e., 20 Ω on 200 Ω range) for indicating shorts.

Relative reference feature (offset) works with all DMM functions—including frequency and dB—to display subsequent readings as ± deviations from stored inputs.

Investing in one of our 4½-digit DMM's buys you much more than ten times greater resolution. These versatile, general-purpose multimeters are designed to lower the cost of problem solving in design, manufacturing and field service by making important measurements more meaningful and accurate.

Consider this: our 4½-digit handheld and bench/portable DMM's are truly "full range" instruments. Each has 200 mV, 200 μA and 200 Ω ranges with 10 μV, 10 nA and 10 mΩ sensitivity—with superb stability down to the least significant digit.

There's more. In Fluke's 4½-digit

family you can choose from models with wideband True RMS capability, dB conversion, relative reference (offset), autoranging frequency measurements to 200 kHz, and visual and

audible continuity indication. You'll also find units with conductance, direct autoranging megohms to 300 MΩ, constant current diode test and extensive self-diagnostics. All made possible by innovative CMOS and LSI technologies.

Whether you select our top-of-the line handheld 8060A, the less expensive 8062A or the 8050A bench/portable, you'll be getting Fluke's traditional quality, precision, ruggedness and value. And you'll own one of the world's finest 4½-digit DMM's.

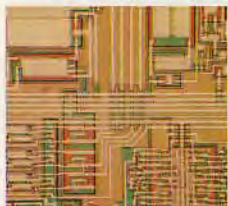


Combined frequency and dB capabilities of the 8060A make it ideal for audio applications...from testing multistage amplifier gain to checking filters, tone controls, equalizers and attenuator pads.



# You'll find surprising new capabilities in the 8060A and 8062A.

At the heart of these 4½-digit DMM's is a custom CMOS integrated circuit designed and manufactured by Fluke. This state-of-the-art technology means you no longer have to sacrifice performance for portability—or give up accuracy and



Fluke's custom CMOS integrated circuit is more than an A/D converter. It makes special features such as frequency, autoranging megohms and conductance measurements possible.

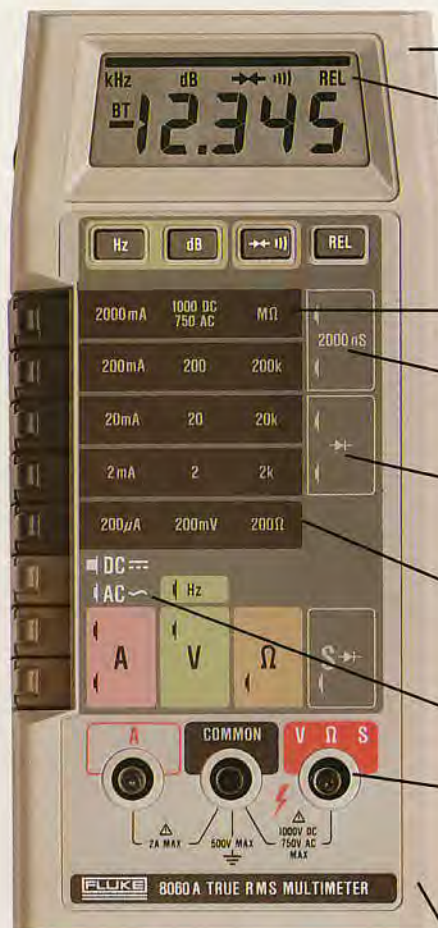
resolution for the convenience of handheld DMM design.

In fact, with all its special functions, the 8060A lets you reach beyond traditional applications into test and service situations that normally require a precision wideband True RMS multimeter, an audio frequency counter, a continuity tester, a power supply... and even a calculator.

Take a look at the 8060A's remarkable capabilities and those of its companion model, the 8062A. You'll see why.



High-speed audible continuity beeper is standard on the 8060A and 8062A, for "eyes off" troubleshooting of multi-wire cables.



Basic dc accuracy 0.04%; 10  $\mu$ V, 10 nA and 10 m $\Omega$  sensitivity.

Display annunciators for low battery (BT) and special functions: frequency (kHz), dB, continuity ( $\rightarrow$ ),  $\rightarrow$ ) and relative reference (REL).

Autoranging M  $\Omega$  measurements from 2 M  $\Omega$  to 300 M  $\Omega$ .

Conductance functions for resistance measurements to 10,000 M  $\Omega$ .

Separate constant-current source diode-test function for checking semiconductor junctions.

Full range capability for voltage, current, resistance (200  $\mu$ A, 200 mV and 200  $\Omega$  ranges).

Wideband True RMS AC measurements to 100 kHz.

Overload protection to 750 VAC or 1000 VDC on voltage inputs and 500 V on resistance. Protection on current inputs provided by a 2A/250V fuse in line with a heavy-duty 3A/600V fuse.

Sophisticated self-diagnostics provided for all range and function selections plus LCD display, battery and CMOS circuitry.

Fluke's 8062A makes many of the same measurements as the 8060A, at a lower price.

Continuity and relative reference functions identical to 8060A.

True RMS measurements to 30 kHz.

Basic dc accuracy 0.05%; 10  $\mu$ V, 10 nA and 10 m $\Omega$  sensitivity.



# In bench/portables, the 8050A is the high-performance value.



Expanded 4 1/2-digit LCD includes indicators for overloads and operator errors. 8050A will withstand 750 VAC or 1000 VDC continuous, 500 VDC when measuring resistance, and short transients to 6 kV.

Extensive internal protection provided for overloads and operator errors. 8050A will withstand 750 VAC or 1000 VDC continuous, 500 VDC when measuring resistance, and short transients to 6 kV.

39 measurement ranges and nine functions make the 8050A a versatile value in bench/portable DMM's. Two conductance ranges extend resistance measurement capabilities to 100,000 MΩ.

Relative reference (offset) function simplifies dB gain and loss measurements; also useful for component checking and to null out test lead resistance for more accurate ohms tests.

"REF Z" button activates scrolling memory—allows rapid setting of reference impedances from 8 to 1200 Ω.

Like the 8060A and 8062A, handheld models, this 4 1/2-digit bench/portable is designed to outperform DMM's offered at considerably higher prices. Microcomputer technology is the key to its special capabilities, which include relative reference, direct readings in dB and a specified basic dc accuracy of 0.03%.

The 8050A is designed around Fluke's hybrid True RMS converter, to give you honest ac measurements to 50 kHz without missing any significant distortion components.

	4 1/2-Digit Resolution	Wideband True RMS AC	Continuity (Audible & Visual)	Frequency	Relative dB	Relative Reference (Offset)	Autorangeing Megohms	Conductance	Diode Test	Self Diagnostics	Basic DC Accuracy
8060A Handheld	• 100 kHz	•	• 200 kHz	•	•	•	•	•	•	•	0.04%
8062A Handheld	• 30 kHz	•	•	•	•	•	•	•	•	•	0.05%
8050A Bench/Portable	• 50 kHz	•	•	•	•	•	•	•	•	•	0.03%

The 8050A delivers direct readouts over a 108 dB range, referenced to any one of 16 selectable reference impedances from 8 to 1200 ohms. Using the "Ref Z" button you can call up any impedance desired from the DMM's scrolling memory, set it and get right to work. Measuring gains and losses in amplifiers and system components is faster than ever before.



Use the 8060A's frequency mode to measure the horizontal scan frequency or the stepper motor frequency of the disc drive in a home computer.

Another very useful capability of the 8050A is made possible by a new accessory—the Fluke 80T-H Touch-Hold Probe.

By simply touching a button on the body of the probe, you can hold the reading on the DMM's display until you have time to turn your attention back to the meter. This probe is invaluable when measuring voltage, resistance or conductance in hard-to-reach, hazardous or delicate places.



Analog and digital servicing go hand-in-hand with the 8060A DMM and the 9010A Micro-System Troubleshooter. The Fluke 9010A uses automatic tests to check a micro-system's RAM, ROM and I/O. It's the first tester designed specifically for troubleshooting digital systems.



# Product specifications.

NOTE: Accuracy specifications are  $\pm$  (% of reading + number of digits)

DC VOLTAGE		8060A	8062A	8050A
Ranges		200 mV, 2V, 20V, 200V, 1000V	200 mV, 2V, 20V, 200V, 1000V	200 mV, 2V, 20V, 200V, 1000V
Resolution		10 $\mu$ V on 200 mV range	10 $\mu$ V on 200 mV range	10 $\mu$ V on 200 mV range
Accuracy				
200 mV, 2V ranges:		0.04% + 2	0.05% + 2	0.03% + 2
20V, 200V, 1000V ranges:		0.05% + 2	0.07% + 2	on all ranges
Response Time		1 sec. max. to accuracy in range	1 sec. max. to accuracy in range	1 sec. max. to accuracy in range
AC VOLTAGE		8060A	8062A	8050A
Ranges		200 mV, 2V, 20V, 200V, 750V	200 mV, 2V, 20V, 200V, 750V	200 mV, 2V, 20V, 200V, 750V
Conversion Type		True RMS, ac coupled	True RMS, ac coupled	True RMS, ac coupled
Accuracy		5% to 100% of range:	5% to 100% of range:	5% to 100% of range:
200 mV range		20 Hz-45 Hz: 1% + 10 45 Hz-1 kHz: 0.2% + 10 1 kHz-10 kHz: 0.2% + 20 10 kHz-30 kHz: 0.5% + 40 30 kHz-50 kHz: 1% + 100 50 kHz-100 kHz: 3% + 200	20 Hz-45 Hz: 1% + 10 45 Hz-500 Hz: 0.5% + 10 500 Hz-10 kHz: 0.5% + 20 10 kHz-30 kHz: 1% + 40	20 Hz-45 Hz: 1% + 10 45 Hz-10 kHz: 0.5% + 10 10 kHz-20 kHz: 1% + 10 20 kHz-50 kHz: 5% + 30
2V range		20 Hz-45 Hz: 1% + 10 45 Hz-1 kHz: 0.5% + 10 1 kHz-10 kHz: 0.5% + 20 10 kHz-30 kHz: 1% + 40 30 kHz-50 kHz: 2% + 100 50 kHz-100 kHz: 3% + 200	20 Hz-45 Hz: 1% + 10 45 Hz-500 Hz: 0.5% + 10 500 Hz-10 kHz: 0.5% + 20 10 kHz-30 kHz: 1% + 40	20 Hz-45 Hz: 1% + 10 45 Hz-10 kHz: 0.5% + 10 10 kHz-20 kHz: 1% + 10 20 kHz-50 kHz: 5% + 30
20V-200V ranges		20 Hz-45 Hz: 1% + 10 45 Hz-1 kHz: 0.5% + 10 1 kHz-10 kHz: 0.5% + 20 10 kHz-30 kHz: 1% + 40 30 kHz-50 kHz: 2% + 100 50 kHz-100 kHz: 3% + 200	20 Hz-45 Hz: 1% + 10 45 Hz-500 Hz: 0.5% + 10 500 Hz-10 kHz: 5% + 20 10 kHz-30 kHz: 5% + 40	20 Hz-45 Hz: 1% + 10 45 Hz-10 kHz: 0.5% + 10 10 kHz-20 kHz: 1% + 10 20 kHz-50 kHz: 5% + 30
750V range		45 Hz-1 kHz: 1% + 10	45 Hz-1 kHz: 2% + 10	20 Hz-45 Hz: 1% + 10 45 Hz-1 kHz: 0.5% + 10
Extended Frequency Response		-3 dB at 420 kHz typ. (100% range) -3 dB at 220 kHz typ. (5% range)	-3 dB at 420 kHz typ. (100% range) -3 dB at 220 kHz typ. (5% range)	-3 dB at 200 kHz typical
Crest Factor Range		1:1 to 3:1	1:1 to 3:1	1:1 to 3:1
Response Time		3 sec. max. to accuracy in range	3 sec. max. to accuracy in range	2 sec. max. to accuracy in range
DC CURRENT		8060A	8062A	8050A
Ranges		200 $\mu$ A, 2 mA, 20 mA, 200 mA, 2000 mA	200 $\mu$ A, 2 mA, 20 mA, 200 mA, 2000 mA	200 $\mu$ A, 2 mA, 20 mA, 200 mA, 2000 mA
Resolution		0.01 $\mu$ A on 200 $\mu$ A range	0.01 $\mu$ A on 200 $\mu$ A range	0.01 $\mu$ A on 200 $\mu$ A range: 0.3% + 2
Accuracy		200 $\mu$ A, 2 mA ranges: 0.2% + 2 20 mA, 200 mA, 2000 mA ranges: 0.3% + 2	200 $\mu$ A, 2 mA, 20 mA ranges: 0.3% + 2 200 mA, 2000 mA ranges: 0.7% + 2	on all ranges
AC CURRENT		8060A	8062A	8050A
Ranges		200 $\mu$ A, 2 mA, 20 mA, 200 mA, 2000 mA	200 $\mu$ A, 2 mA, 20 mA, 200 mA, 2000 mA	200 $\mu$ A, 2 mA, 20 mA, 200 mA, 2000 mA
Conversion Type		True RMS, ac coupled	True RMS, ac coupled	True RMS, ac coupled
Accuracy		5% to 100% of range:	5% to 100% of range:	5% to 100% of range:
200 $\mu$ A-20 mA ranges		20 Hz-45 Hz: 1% + 10 45 Hz-3 kHz: 0.75% + 20 3 kHz-10 kHz: 2% + 10 10 kHz-30 kHz: 2% + 40	20 Hz-45 Hz: 2% + 10 45 Hz-3 kHz: 1.5% + 20 3 kHz-10 kHz: 2% + 20	45 Hz-3 kHz: 1% + 10 3 kHz-10 kHz: 1% + 10 10 kHz-20 kHz: 2% + 10
200 mA range		20 Hz-45 Hz: 1% + 10 45 Hz-3 kHz: 0.75% + 20 3 kHz-10 kHz: 2% + 20	20 Hz-45 Hz: 2% + 10 45 Hz-3 kHz: 1.5% + 20 3 kHz-10 kHz: 2% + 20	45 Hz-3 kHz: 1% + 10 3 kHz-10 kHz: 1% + 10 10 kHz-20 kHz: 2% + 10
2000 mA		20 Hz-45 Hz: 1% + 10 45 Hz-3 kHz: 0.75% + 20	20 Hz-45 Hz: 2% + 10 45 Hz-3 kHz: 1.5% + 20	45 Hz-2 kHz: 1% + 10
Crest Factor		1:1 to 3:1	1:1 to 3:1	1:1 to 3:1
RESISTANCE		8060A	8062A	8050A
Ranges		200 $\Omega$ , 2 k $\Omega$ , 20 k $\Omega$ , M $\Omega$	200 $\Omega$ , 2 k $\Omega$ , 20 k $\Omega$ , M $\Omega$	200 $\Omega$ , 2 k $\Omega$ , 20 k $\Omega$ , 200 k $\Omega$ , 20M $\Omega$
Resolution		0.01 $\Omega$ on 200 $\Omega$ range	0.01 $\Omega$ on 200 $\Omega$ range	0.1 $\Omega$ on 200 $\Omega$ range
Accuracy				
200 $\Omega$		0.07% + 2 + 0.02 $\Omega$	0.1% + 2 + 0.02 $\Omega$	0.1% + 2 + 0.02 $\Omega$
2 k $\Omega$		0.07% + 2	0.1% + 2	0.1% + 2*
20 k $\Omega$		0.07% + 2	0.1% + 2	0.5% + 2
200 k $\Omega$		0.07% + 2	0.1% + 2	0.05% + 2
2000 k $\Omega$		NA	NA	0.25% + 3
20 M $\Omega$		NA	NA	0.25% + 3
A 0-1.9999 M $\Omega$		0.15% + 2*	0.20% + 2*	NA
U 2 M $\Omega$ -19.99 M $\Omega$		0.2% + 3*	0.25% + 3*	NA
T 20 M $\Omega$ -99.9 M $\Omega$		1% + 3*	1% + 3*	NA
O 100 M $\Omega$ -300 M $\Omega$		2% + 3*	2% + 3*	NA
Open Circuit Voltage		<2.5V except 200 $\Omega$ range, <4.8V	<2.5 V except 200 $\Omega$ range, <4.8V	<3.5V on all ranges
*These ranges provide enough voltage to turn on silicon junctions. Diode test on 8050A.				
AC VOLTAGE, dB MODE		8060A	8050A	
AC voltage specifications above apply except:				
Accuracy			Accuracy	
2.45 mV-10.23 mV:		20 Hz-45 Hz: 0.5 dB 45 Hz-10 kHz: 1.0 dB 10 kHz-30 kHz: 3.0 dB	0.77 mV-2 mV:	20 Hz-20 kHz: 0.5 dBm
10.24 mV-19.99 mV:		20 Hz-10 kHz: 0.20 dB 10 kHz-30 kHz: 0.50 dB 30 kHz-50 kHz: 1.00 dB 50 kHz-100 kHz: 2.20 dB		
20 mV-200V:		20 Hz-45 Hz: 0.15 dB 45 Hz-10 kHz: 0.15 dB 10 kHz-30 kHz: 0.30 dB 30 kHz-50 kHz: 0.65 dB 50 kHz-100 kHz: 1.2 dB	2 mV-200 V:	20 Hz-45 Hz: 0.25 dB 45 Hz-10 kHz: 0.15 dB 10 kHz-20 kHz: 0.25 dB 20 kHz-50 kHz: 0.75 dB
200V-750V:		20 Hz-1 kHz: 0.50 dB	200V-750V:	20 Hz-45 Hz: 0.25 dB 45 Hz-1 kHz: 0.15 dB
0 dBm Reference Impedance		600 $\Omega$		50 $\Omega$ , 75 $\Omega$ , 93 $\Omega$ , 110 $\Omega$ , 125 $\Omega$ , 135 $\Omega$ , 150 $\Omega$ , 250 $\Omega$ , 300 $\Omega$ , 500 $\Omega$ , 600 $\Omega$ , 800 $\Omega$ , 900 $\Omega$ , 1000 $\Omega$ (dBV), 1200 $\Omega$ , 8 $\Omega$ (dBW)



<b>CONDUCTANCE</b>		<b>8060A</b>	<b>8050A</b>
Ranges		200 nS	2 mS, 200 nS
Equivalent Resistance		500 kΩ to 10,000 MΩ (2000 nS)	500Ω to 10 MΩ (200 nS) 5 MΩ to 100,000 MΩ (200 nS)
Accuracy		NA	0.1% + 5
2 mS		NA	0.5% + 20
200 nS		0.5% + 20	NA
2000 nS			
<b>CONTINUITY</b>		<b>8060A</b>	<b>8062A</b>
Ranges		All resistance ranges	All resistance ranges
Threshold		<10% of range (eg: <20Ω in 200Ω range), except MΩ <20 kΩ	<50% of range (eg: <100Ω in the 200Ω range), except MΩ <100 kΩ
Indication		Bar on LCD and selectable tone	Bar on LCD and selectable tone
Response Time		50 μs min. duration of continuity	50 μs min. duration of continuity
<b>AUTORANGING FREQUENCY (8060A ONLY)</b>		<b>RELATIVE REFERENCE (8060A, 8062A, 8050A)</b>	
Ranges		200 Hz, 2000 Hz, 20 kHz, 200 kHz	Function
Resolution		0.01 Hz on 200 Hz range	Input added when "REL" is depressed is held as "0" ref. Subsequent readings are deviations (±) from this point.
Accuracy		0.05% + 1	Error < sum of errors of measurements.
Input Characteristics		AC coupled, 10 MΩ, <100 pF	
Maximum Sensitivity		20 mV to 20 kHz 50 mV, 20 kHz to 100 kHz 150 mV, 100 kHz to 200 kHz	
<b>GENERAL</b>		<b>8060A</b>	<b>8062A</b>
Max. Common Mode Voltage		500V RMS ac or dc	500V RMS ac or dc
Normal Mode Rejection		>60 dB at 50 Hz and 60 Hz	>60 dB at 50 Hz and 60 Hz
Common Mode Rejection		>120 dB at dc, >90 dB at 50 Hz, 60 Hz	>120 dB at dc, >90 dB at 50 Hz, 60 Hz
(1 kΩ unbalance)		(>60 dB in ac volts)	(>60 dB in ac volts)
Input Impedance (Volts)		10 MΩ, <100 pF, all ranges	10 MΩ, <100 pF, all ranges
		>1000 MΩ, 200 mV/2V dc, selectable	>1000 MΩ, 200 mV/2V dc, selectable
Burden Voltage (Current)		0.3V max on all ranges except 0.9V max on 200 mA range	0.3V max on all ranges except 0.9V max on 200 mA range
Overload Protection			
Voltage/dB/Frequency:		750V rms or 1000V dc cont., not to exceed 10' volt-hertz (except 20 sec. max. on 200 mV/2V range) Series fuses: 2A/250V & 3A/600V	750V rms or 1000V dc cont., not to exceed 10' volt-hertz (except 20 sec. max. on 200 mV/2V range) Series fuses: 2A/250V & 3A/600V
Current:			
Resistance/Conductance			
Continuity/Diode Test:		500V dc or rms on all ranges	500V dc or rms on all ranges
Display		4½-digit LCD, 19999 count	4½-digit LCD, 19999 count
Temperature		Operating 0°C to 50°C; -35°C to +60°C storage	Operating 0°C to 50°C; -35°C to +60°C storage
Relative Humidity		0% to 80% from 0°C to 35°C, 0% to 70% from 35°C to 50°C, except 0% to 70% above 20 MΩ.	0% to 80% from 0°C to 35°C, 0% to 70% from 35°C to 50°C, except 0% to 70% above 20 MΩ.
Temperature Coefficient		(0°C to 18°C or 28°C to 50°C) <0.1 x the applicable accuracy specification per °C.	(0°C to 18°C or 28°C to 50°C) <0.1 x the applicable accuracy specification per °C.
Shock and Vibration		Per MIL-T-28800B	Per MIL-T-28800B
Power		Single 9V battery, NEDA 1604	Single 9V battery, NEDA 1604
Battery Life		170 hours (typical for alkaline)	170 hours (typical for alkaline)
Size		45 mm H x 86 mm W x 180 mm L (1.8 in. H x 3.4 in. W x 7.1 in. L)	45 mm H x 86 mm W x 180 mm L (1.8 in. H x 3.4 in. W x 7.1 in. L)
Weight		0.41 kg (14.5 oz.)	0.41 kg (14.5 oz.)
Calibration Interval		1 year for specified accuracy	1 year for specified accuracy
Warranty		1 year parts and labor	1 year parts and labor

#### ORDERING INFORMATION

##### Digital Multimeters

8050A 4½-digit Bench Multimeter (ac powered)  
8050A-01 4½-digit Bench Multimeter (with Ni-Cads)  
8060A 4½-digit True RMS Handheld Multimeter  
8062A 4½-digit True RMS Handheld Multimeter

##### Accessories

80I-600 AC Current Transformer  
80J-10 Current Shunt  
80K-6 High Voltage Probe  
80K-40 High Voltage Probe  
80T-150C Temperature Probe (C)  
80T-150F Temperature Probe (F)  
80T-H Touch-Hold Probe (for 8050A)  
83RF RF Probe  
85RF RF Probe  
A81 Battery Eliminator (for Handhelds)  
C-86 Ruggedized Carrying Case (for 8050A)  
C-90 Carrying Case (for Handhelds)

M00-200-611 Rack Mount Kit for 8050A (single, offset)  
M00-200-612 Rack Mount Kit for 8050A (single, center)  
M00-200-613 Rack Mount Kit for 8050A (dual)  
Y8100 DC/AC Current Probe  
Y8101 AC Current Transformer  
Y8105 Ruggedized Carrying Case (for Handhelds)  
Y8133 Deluxe Test Lead Kit  
Y8134 Deluxe Test Lead Kit (safety designed)  
Y8140 Slim-Flex Test Leads  
Y8205 Soft Carrying Case (for 8050A)  
Y9118 Phone Jack to Banana Plugs  
Y9119 Phono Jack to Banana Plugs

##### NOTE:

Handheld DMM's include battery, test leads, instruction manual, pocket-size operator's card and certificate of calibration. 8050A includes line cord, test leads, instruction manual and certificate of calibration.



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