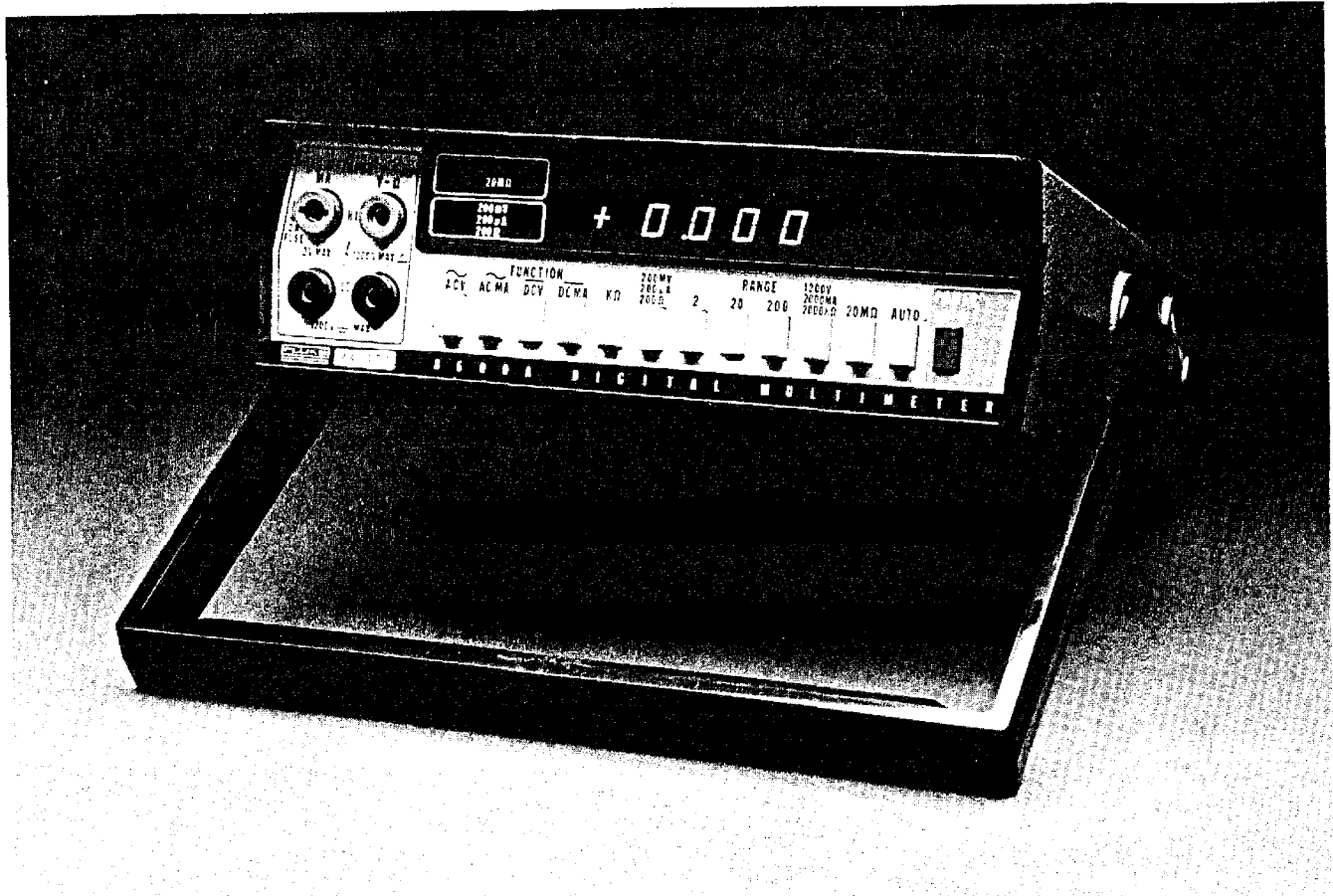


# DIGITAL VOLTMETERS

Digital Multimeter  
8600A

FLUKE®



8600A

The 8600A 4½-digit, five-function multimeter features high accuracy and full autoranging capability. Measurement functions include ac volts, dc volts, ac current, dc current and resistance. Five switch selectable ranges are provided for each of the voltage and current functions, and six ranges are provided for the resistance functions. Ranging is switch selectable or automatic for convenient operation when frequent range changes are required. Available options include a battery pack (-01) for portable operation and a printer output (-02) for data logging applications.

Durable and reliable operation is a built-in characteristic of the 8600A. A high impact plastic case provides more than adequate protection for both bench-top and field-service environments. Superior reliability is assured through LSI construction, dual-slope measurement techniques and extensive input overload protection on all ranges. All dc voltage ranges will withstand  $\pm 1200\text{V}$  dc or  $1700\text{V}$  peak ac without damage. Similarly, all ac voltage ranges will endure  $1200\text{V}$  rms without damage. The resistance ranges can handle continuous  $250\text{V}$  rms or dc input without damage. All current ranges are protected by a 2A fuse which is replaceable from the front panel.

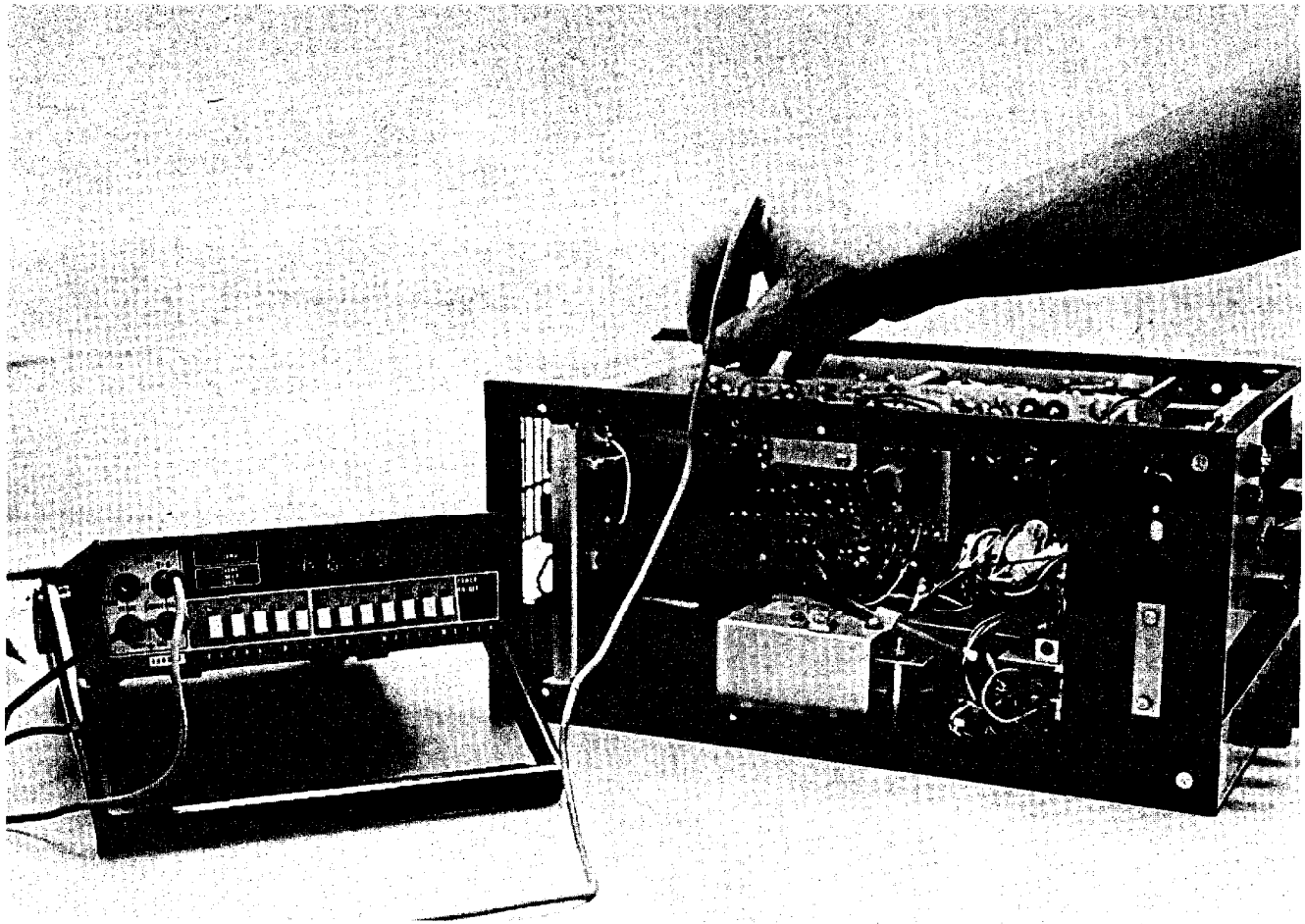
Accessories available to further enhance the operation of the 8600A include a series of probes to allow measurement of rf voltage, high voltage, high current and temperature. Carrying cases and test leads are also available.

#### (Option -01) Battery Pack

A battery pack (-01) can be ordered with the 8600A for portable operation. The batteries are rechargeable nickel-cadmium cells, and provide up to 8 hours of continuous operation on a single charge. A built-in charger is included with the option.

#### (Option -02) Data Output

The Isolated Printer Output (-02) is designed to transmit measurement data from the 8600A to an external printer. Data is transmitted in parallel BCD format, and is DTL/TTL compatible. Transmitted data characters consist of polarity, magnitude and range. Busy, not busy and overload indications are also available. Print commands can be internally or externally generated. This option will interface directly with the Fluke Model 2010A Printer. However, (-02) is not compatible with (-01).



## Specifications

### DC Voltage

**Ranges:**  $\pm 200$  mV,  $\pm 2$ V,  $\pm 20$ V,  $\pm 200$ V,  $\pm 1200$ V

**Ranging:** Full autoranging or manual ranging

**Polarity:** Automatic + and - display

**Resolution:**  $10 \mu\text{V}$  on 200 mV range

**Accuracy:** (6 months  $15^\circ\text{C}$  to  $35^\circ\text{C}$ )  $\pm(0.02\%$  of input +  $0.005\%$  of range) for 2, 20, 200V ranges;  $\pm(0.02\%$  of input +  $0.008\%$  of range) for 1200V range;  $\pm(0.04\%$  of input +  $0.01\%$  of range) for 200 mV range

**DC Input Resistance:**  $>1000 \text{ M}\Omega$ , 200 mV, 2V;  $10 \text{ M}\Omega$ , 20V, 200V, 1200V

**Zero Stability:** Auto zeroed on all ranges

**Overload Protection:**  $\pm 1200$ V dc or  $\pm 1700$ V peak ac applied continuously to any range

**Normal Mode Noise Rejection:** 60 dB minimum at 50 Hz and 60 Hz

**Common Mode Noise Rejection:** 120 dB minimum (with  $1 \text{ k}\Omega$  in either lead) at dc, 50 Hz and 60 Hz

**Response Time To Rated Accuracy Within Range:** 1 s max to displayed input

### AC Voltage

**Ranges:** 200 mV, 2V, 20V, 200V, 1200V

**Ranging:** Full autoranging or manual ranging

**Resolution:**  $10 \mu\text{V}$  on 200 mV range

**Accuracy:** (6 months  $15^\circ\text{C}$  to  $35^\circ\text{C}$ )

**200 mV Range:** (100% to 1% of range)  $\pm(0.2\%$  of input +  $0.08\%$  of range) 50 Hz - 10 kHz

$\pm(0.5\%$  of input +  $0.10\%$  of range) 30 Hz - 50 Hz and 10 kHz - 50 kHz

$\pm(0.5\%$  of input +  $0.5\%$  of range) 50 kHz - 100 kHz

**2V Range-200V Range:** (100% to 1% of range)  $\pm(0.2\%$  of input +  $0.015\%$  of range) 50 Hz - 10 kHz

$\pm(0.5\%$  of input +  $0.025\%$  of range) 30 Hz - 50 Hz and 10 kHz - 50 kHz

$\pm(1.0\%$  of input +  $0.05\%$  of range) 50 kHz - 100 kHz

**1200V Range:** (100% to 1% of range)  $\pm(0.2\%$  of input +  $0.03\%$  of range) 50 Hz - 10 kHz

500V to 1200V

$\pm(0.37\%$  of input +  $0.03\%$  of range) 50 Hz - 10 kHz

10V to 1200V

$\pm(0.5\%$  of input +  $0.08\%$  of range) 30 Hz - 50 Hz and 10 kHz - 20 kHz

**AC Input Impedance:**  $2 \text{ M}\Omega$  shunted by  $<100 \text{ pF}$

**Overload Protection:** 1200V rms maximum, not to exceed  $2(10^7)\text{V}\cdot\text{Hz}$  product

**Response Time to Rated Accuracy Within Range:** 1.5 s max to displayed input

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## DC Current

**Ranges:** 200  $\mu$ A, 2 mA, 20mA, 200mA, 2000mA  
**Ranging:** Manual ranging  
**Resolution:** 10nA on 200  $\mu$ A range  
**Accuracy:** (6 months 15°C to 35°C)  $\pm$ (0.1% of input +0.01% of range) on all ranges  
**Voltage Burden:** 0.5V max at 2A, 0.25V to 200 mA  
**Overload:** Protected to 2A on any range; fused above 2A  
**Response Time To Rated Accuracy Within Range:** 1 s max to displayed input

## AC Current

**Ranges:** 200  $\mu$ A, 2 mA, 20 mA, 200 mA, 2000 mA  
**Ranging:** Manual Ranging  
**Resolution:** 10 nA on 200  $\mu$ A range  
**Accuracy:** (6 months 15°C to 35°C)  $\pm$ (0.3% of input +0.08% of range) 50 Hz - 10 kHz  
 All ranges (except 2000 mA range 50 Hz - 5 kHz) (15°C to 35°C)  $\pm$ (0.6% of input +0.1% of range) 30 Hz - 50 Hz  
**Voltage Burden:** 0.5V max at 2A, 0.25V to 200 mA  
**Overload:** Protected to 2A on any range; fused above 2A  
**Response Time To Rated Accuracy Within Range:** 1 s max to displayed input

## Ohms

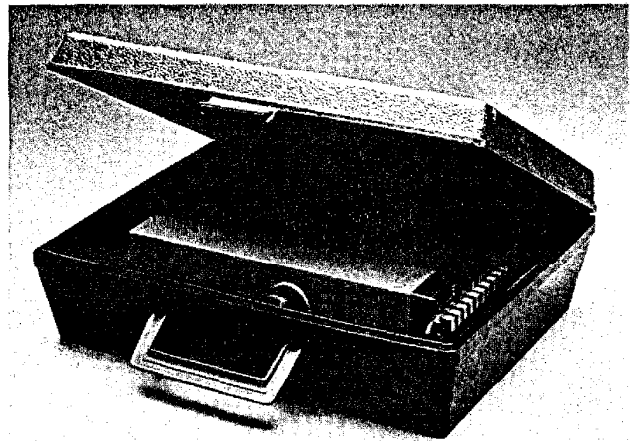
**Ranges:** 200 $\Omega$ , 2 k $\Omega$ , 20k $\Omega$ , 200 k $\Omega$ , 2000 k $\Omega$ , 20 M $\Omega$   
**Ranging:** Full autoranging or manual ranging  
**Resolution:** 10 m $\Omega$  on 200 $\Omega$  range  
**Configuration:** 2 wire  
**Accuracy:** (6 months 15°C to 35°C)  
 $\pm$ (0.1% of input +0.015% of range) 200 $\Omega$  range  
 $\pm$ (0.1% of input +0.005% of range) 2 k $\Omega$  range  
 $\pm$ (0.05% of input +0.005% of range) 20 k $\Omega$  to 2000 k $\Omega$  range  
 $\pm$ (0.2% of input +0.005% of range) 20 M $\Omega$  range  
**Maximum Open Circuit Voltage:** 5V  
**Overvoltage Protection:** 250V rms or dc, applied continuously  
**Response Time To Rated Accuracy Within Range:** 1.0 s max to displayed input (200 $\Omega$  range to 2000 k $\Omega$  range), 4 s max to displayed input (20M $\Omega$  range)

## Current Through Unknown:

200 $\Omega$	2 k $\Omega$	20 k $\Omega$	200 k $\Omega$	2000 k $\Omega$	20 M $\Omega$
1 mA	1 mA	100 $\mu$ A	10 $\mu$ A	1 $\mu$ A	0.1 $\mu$ A

## General

**Function:** Selected via front panel controls  
**Range:** Automatic or manual selected via front panel controls  
**Autorange Rate:** 600 ms max per range change  
**Display:** 7 segments 0.3" LED display, automatic decimal location  
**Reading Rate:** 2½ samples/second within range  
**Overload Indication:** Flashing display of +18888 (built-in segment test of LED display) for out of range indication  
**Operating Temperature:** 0°C to +50°C  
**Temperature Coefficients:** (0°C to 15°C and 35°C to 50°C)  
 DC Volts Except 200 mV:  $\pm$ (0.001% input +0.0005% range)/°C  
 DC Current and 200 mV:  $\pm$ (0.003% input +0.001% range)/°C  
 AC Volts Except 200 mV:  $\pm$ (0.01% input +0.002% range)/°C  
 AC Current and 200 mV:  $\pm$ 0.015% input + 0.005% range)/°C  
 k $\Omega$  Except 200 $\Omega$  and 20 M $\Omega$ :  $\pm$ (0.003% input +0.0005% range)/°C  
 200 $\Omega$  and 20 M $\Omega$ :  $\pm$ (0.005% input + 0.001% range)/°C  
**Storage Temperature:** -40°C to +75°C (-40°C to +60°C with batteries)



**Humidity Range:** 80% RH, +5°C to +35°C  
 70% RH, +35°C to +50°C  
**Shock and Vibration:** Meets pertinent requirements of MIL-T-21200L and MIL-E-16400F  
**MTBF:** 10,000 hours calculated, minimum  
**Maximum Common Mode Voltage:** 1000V dc or peak ac  
**Power:** 115/230V ac = 10%, 50 or 60 Hz, 7 watts line, 10 watts battery  
**Size (excluding handle):** 6.4 cm H x 19.05 cm W x 25.15 cm D, (2.52 in H x 7.5 in W x 9.9 in D)  
**Weight:** 1.6 kg (3.5 lbs) line; 2.1 kg (4.5 lbs) w/batteries

## Options

**-01, Battery Pack:** Rechargeable battery pack, capable of 8 hours typical (6 hours minimum) operation, rechargeable in 16 hours max  
**-02, DOU:** Isolated BCD output, TTL/DTL compatible levels (not compatible with option -01)  
**Available Data:** Digits, polarity (both logic senses) and range  
**Data Coding:** 8-4-2-1 BCD positive true parallel (negative true easily obtained by changing output buffers)  
**Logic Levels:** "1" = +5V, "0" = 0V  
**Drive Capability:** All outputs can drive a minimum of two TTL loads (i.e., sink 3.2 mA)  
**Flags:** Busy, not busy, and overload  
**Controls:** External trigger (negative-going edge triggers); External trigger enable (Logic "1" enables external trigger. Logic "0" causes data update at the internal sample rate of approximately 2.5/second); +5V reference

## Accessories (See Page 31)

- High Voltage Probe: (80K-40)
- RF Probe: (81 RF and 82 RF)
- Temperature Probe: (80T-150)
- Clamp-on AC Current Transformer: (801-600)
- Deluxe Test Lead Kits: (A80)
- Carrying Case: (C-80)
- Front Panel Dust Cover: M00-100-714
- Rack Mount Kits: M00-200-611 (Offset); M00-200-612 (Center); M00-200-613 (Dual)