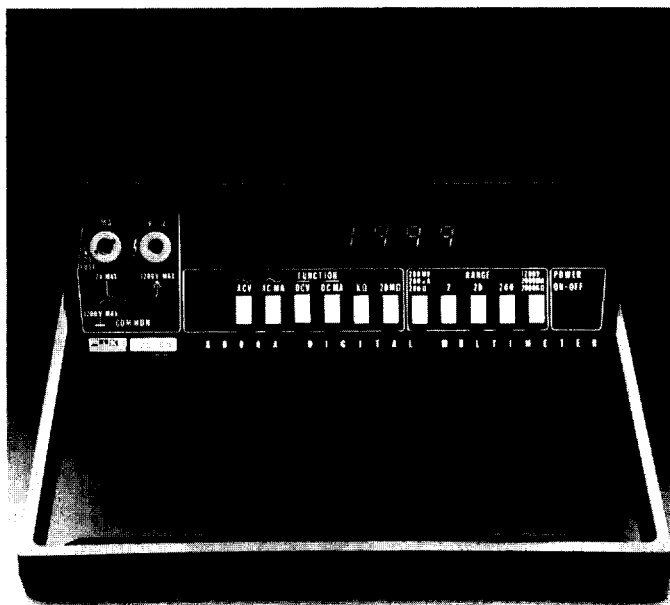


# DIGITAL VOLTMETERS

## Digital Multimeter 8000A



### 8000A

The 8000A 3½-digit multimeter features 5 measurement functions and a total of 26 ranges. Functions include ac volts, dc volts, ac current, dc current and resistance. There are five ranges of voltage, five of current and six ranges of resistance. Input overload protection, auto polarity, and auto zero are provided on all ranges.

Both the ac and dc voltage functions include ranges from 200 mV to 1200V. Sensitivity on the 200 mV range is 100  $\mu$ V per digit. Input protection up to 1200V rms is provided on all voltage ranges.

The ac and dc current functions measure ranges from 200  $\mu$ A full scale (100 nA sensitivity) to 2A full scale. Current input terminals are separated from voltage input terminals to prevent voltage inputs from being applied to the current shunts during function changes. Protection against input currents exceeding 2A is provided by a front-panel mounted fuse located in the input-high (MA) terminal

Resistance measurements are made using the two-terminal method. Six ranges are provided, from 200 $\Omega$  full scale (0.1 $\Omega$  sensitivity) to 20 M $\Omega$  full scale. Overload protection for the ohm's ranges is 130V rms on the 200 $\Omega$  and 2 k $\Omega$  ranges, and 250V rms on the higher ranges.

### Battery Pack Option (-01)

Model 8000A-01 is the equivalent of an 8000A with batteries and charging circuitry added. Rechargeable nickel-cadmium batteries provide a minimum of 8 hours operation on a full charge. Recharge is possible during normal operation, and requires less than 14 hours for a fully discharged set of batteries.

### Data Output Option (-02)

The 8000A-02 is equipped with a Digital Printer Output which provides measurement data in digital format to a rear connector. The data is intended to interface with a Fluke Model 2010A Printer. However, custom interfaces are possible. Batteries cannot be installed in the Model 8000A-02.

### High Current Option (-05)

Model 8000A-05 is functionally identical to the 8000A with the exception of an added 10A current range. This extra range employs separate input terminals and allows continuous measurement of up to 10 A ac/dc or periodic measurement of up to 20A ac/dc. The measurement duration for currents above 10A should not exceed 1 minute. The 8000A-05 can be supplied with rechargeable batteries (-015).

All of the specifications for the basic 8000A apply to the 8000A-05, -015 plus the following current specifications. The range for both ac and dc current measurement is 10A, with one-minute operation from 10A to 20A. DC accuracy in the 10A range is  $\pm(0.5\%$  of reading +1 digit). For ac in the 10A range, 45 Hz to 3 kHz, accuracy is  $\pm(1\%$  of reading +2 digits).

### Low-Ohms Option (-06)

Two low-ohms ranges of 2 $\Omega$  and 20 $\Omega$  full-scale replace the 20 M $\Omega$  range in the 8000A to create the 8000A-06. Because of the 1 m $\Omega$  sensitivity available on the 2 $\Omega$  range, a front panel zero control is used to eliminate the effect of lead resistance from the measurement. The 8000A-06 can be supplied with rechargeable batteries (-016).

All of the specifications for the basic 8000A apply to the 8000A-06 plus the following. The instrument measures ranges of 1.999 $\Omega$  and 19.99 $\Omega$ . For 1 year at 15°C to 35°C, accuracy in the 1.999 $\Omega$  range is  $\pm(1\%$  of reading +2 digits); in the 19.99 $\Omega$  range it's  $\pm(0.5\%$  of reading +2 digits). Current through an unknown is 10 mA and the maximum input voltage is 130V rms.

Please note that (-06) does not include the 19.99 M $\Omega$  resistance range, nor is it field-installable. (-05) and (-06) both may not be installed in the same unit.

### Analog Meter Version (8000A/MTR)

The 8000A/MTR is the equivalent of an 8000A with the exception of an added analog meter movement. Subtle input changes and trends that are not readily discernable on the digital display can be observed on the direct indicating meter. For example, nulling and peaking adjustments can be easily performed by observing the analog meter, while the digital display is used for absolute level indications. The 8000A/MTR can be supplied with rechargeable batteries (-01).

### Milliampere-Second Version (8000A/mAS)

Model 8000A/mAS features a milliamp-second function designed to provide indications of energy with pulsed current. This function is switch selectable and shares the five standard current ranges to provide indications from 200  $\mu$ A-seconds full scale to 2000 mA-seconds full scale. (Milliamp-second measurements are especially useful in testing and qualifying X-ray equipment.) The input circuit includes a threshold detector to reject residual input currents and overload protection from catastrophic failures in X-ray tubes, e.g., anode-cathode flashover. Rechargeable batteries are standard with the 8000A/mAS.

With the 8000A/mAS reading directly in milliamp-seconds, the ranges are 2000 mA seconds, 200 mA seconds, 20 mA seconds, 2 mA seconds, and 200  $\mu$ A seconds. Accuracy for 1 year at 25°C  $\pm 5^\circ$ C is  $\pm(1\%$  of input +1 digit). The temperature coefficient is  $\pm(0.05\%/^\circ$ C of input +0.1 digit/ $^\circ$ C) -10°C to 20°C and 30°C to 55°C. The integrator is automatically zeroed when the switch is in the erase position.

# DIGITAL VOLTMETERS

Digital Multimeter

8000A

## Basic Instrument Specifications

### DC Voltage

**Ranges:**  $\pm 199.9$  mV,  $\pm 1.999$ V,  $\pm 19.99$ V,  $\pm 199.9$ V

**Accuracy:** 1 year, 15°C to 35°C,  $\pm(0.1\%$  of reading +1 digit)

**Temperature Coefficient:** -10°C to 15°C and 35°C to 55°C,  $\pm(0.01\%$  of reading +0.005% F.S.)/°C

**Input Impedance:** 10 M $\Omega$ , all ranges

**Normal Mode Rejection:** > 60 dB at 50 Hz, 60 Hz

**Common Mode Rejection:** 1 k $\Omega$  unbalance, > 120 dB at dc and 50 Hz, 60 Hz

**Response Time:** 0.5s

**Maximum Input Voltage:** 1200V rms, all ranges

### AC Voltage

**Ranges:** 199.9 mV, 1.999V, 19.99V, 199.9V, 1199V

**Accuracy:** 1 year, 15°C to 35°C, 45 Hz to 10 kHz,  $\pm(0.5\%$  of reading +2 digits); 10 kHz to 20 kHz  $\pm(1\%$  of reading +2 digits)

**Temperature Coefficient:** -10°C to 15°C and 35°C to 55°C,  $\pm(0.01\%$  reading +0.005% F.S.)/°C

**Input Impedance:** 10 M $\Omega$  in parallel with 100 pF

**Common Mode Rejection:** 1 k $\Omega$  unbalance, > 60 dB at 50 Hz, 60 Hz

**Response Time:** 3s, max

**Maximum Input Voltage:** 1200V rms, not to exceed 10<sup>7</sup>V-Hz product on 20, 200, 1200V ranges, 500V rms on 200 mV and 2V ranges

### DC Current

**Ranges:**  $\pm 199.9$   $\mu$ A,  $\pm 1.999$  mA,  $\pm 19.99$  mA,  $\pm 199.9$  mA,  $\pm 1999$  mA

**Accuracy:** 1 year, 15°C to 35°C,  $\pm(0.3\%$  of reading +1 digit)

**Temperature Coefficient:** -10°C to 15°C and 35°C to 55°C  $\pm(0.015\%$  reading +0.005% F.S.)/°C

**Voltage Burden:** 0.3V max up to 200 mA, 0.6V at 2A

**Response Time:** 0.5s

**Maximum Input:** 2A rms (fuse protected)

### AC Current

**Ranges:** 199.9  $\mu$ A, 1.999 mA, 19.99 mA, 199.9 mA, 1999 mA

**Accuracy:** 1 year, 15°C to 35°C, 45 Hz to 10 kHz,  $\pm(1\%$  of reading +2 digits) all ranges, except 45 Hz to 3 kHz  $\pm(1\%$  of reading +2 digits) on 2000 mA range

**Temperature Coefficient:** -10°C to 15°C and 35°C to 55°C,  $\pm(0.015\%$  reading +0.005% F.S.)/°C

**Voltage Burden:** 0.22V max up to 200 mA; 0.6V at 2A

**Response Time:** 3s, max

**Maximum Input:** 2A rms (fuse protected)

### Resistance

**Ranges:** 199.9 $\Omega$ , 1.999 k $\Omega$ , 19.99 k $\Omega$ , 199.9 k $\Omega$ , 1999 k $\Omega$ , 19.99 M $\Omega$

**Accuracy:** 1 year, 15°C to 35°C,  $\pm(0.2\%$  of reading +1 digit) all ranges, except  $\pm(0.5\%$  of reading +1 digit) on 20 M $\Omega$  range

**Temperature Coefficient:** -10°C to 15°C and 35°C to 55°C, k $\Omega$ :  $\pm(0.015\%$  reading +0.005% F.S.)/°C

10 M $\Omega$ :  $\pm(0.02\%$  reading +0.005% F.S.)/°C

**Response Time:** 0.5s all ranges, except 4s on 20 M $\Omega$  range

**Current Through Unknown:** 200 $\Omega$  range, 1 mA; 2 k $\Omega$  range, 1 mA; 20 k $\Omega$  range, 100  $\mu$ A; 200 k $\Omega$  range, 1  $\mu$ A; 2000 k $\Omega$  range, 1  $\mu$ A; 20 M $\Omega$  range, 0.1  $\mu$ A

**Maximum Input Voltage:** 200 $\Omega$  and 2 k $\Omega$  ranges, 130V rms. 20 k $\Omega$  through 20 M $\Omega$  ranges, 250V rms

### General

**Maximum Common Mode Voltage:** 1200V peak

**Operating Temperature Range:** -10°C to +55°C

**Storage Temperature Range:** -40°C to +75°C (-40°C to +60°C with batteries)

**Relative Humidity:** 0 to 80%

**Display:** 7-segment LED 7.62 mm (0.30 in) character height

**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:** 1.2 kg (2.75 lbs without batteries) 1.8 kg (4 lbs) with batteries

**Power:** 100/115/230V ac, 50 to 400 Hz, 2W. Battery option (-01), 8 hour minimum operation on internal rechargeable batteries

### Price

#### Models

8000A Digital Multimeter .....	\$325
8000A-01 DMM with Rechargeable Battery Pack .....	375
8000A-02 DMM with Data Output .....	425
8000A-015 DMM with 10A Range and Rechargeable Battery Pack .....	399
8000A-05 DMM with 10A Range .....	349
8000A-06 DMM with 2 and 20 Ohm Ranges .....	375
8000A-016 DMM with 2 and 20 Ohm Ranges and Rechargeable Battery Pack .....	425
8000A/mAS DMM with Milliamp-Second Meter and Batteries .....	550
8000A/MTR DMM with Meter .....	375
8000A/MTR-01 DMM with Meter and Rechargeable Battery Pack .....	425

#### Accessories

A80 Deluxe Test Lead Kit .....	\$ 6
80K-40 High Voltage Probe .....	65
81RF RF Probe .....	40
82RF RF Probe .....	75
80I-600 Clamp-on AC Current Probe .....	70
80J-10 Current Shunt .....	25
80T-150 Temperature Probe .....	99
C80 Carrying Case, soft vinyl .....	15
C86 Carrying Case, rugged .....	15
M00-100-714 Front Panel Dust Cover .....	10
M00-200-611 Right or Left Outset Rack Mounting Kit .....	30
M00-200-612 Center Mount Rack Mounting Kit .....	30
M00-200-613 Dual Unit Mounting Kit .....	40
2010A Printer, 10 column .....	1095

Also see Accessory page 3 and 39