

## Model 7100A Digital Voltmeter



### TECHNICAL SPECIFICATIONS

#### DC VOLTAGE MEASUREMENTS

**Ranges** —  $\pm 100.00$  mV,  $\pm 1.0000$  V,  $\pm 10.000$  V,  $\pm 100.00$  V,  $\pm 1000.0$  V Full Scale. A full 60% over-ranging with no loss in accuracy on 4 lowest ranges, 10% over-ranging with no loss in accuracy on 1000.0 V range.

**Accuracy** —  $\pm 0.01\%$  of Reading,  $\pm 1$  digit; 100 mV range  $\pm 0.01\%$  of Reading,  $\pm 2$  digits.

**Stability** — Internal Reference  $\pm 0.01\%$  for 3 months.

**Input Resistance** —  $> 1000$  megohms; 100 V and 1000 V ranges 10 Megohms.

**Autorangeing** — Operates on both DC volts and resistance. Up-ranges at 16000 and downranges at 01399.

**Input Circuit** — Floated and guarded, may be operated up to  $\pm 500$  V from chassis ground. Special 2-pin insulated BNC connector maintains guard shield at front panel. Separate banana jack for chassis ground.

**Maximum Input** — 1100 V can be safely applied to all ranges.

**Measurement Time** — 250 ms, rear panel switch provides a fast setting of 50 ms on four high ranges.

**Integration Time** — 83-1/3 ms; 16-2/3 ms on fast setting. Controlled by a crystal oscillator.

**Common Mode Rejection** — 140 db at dc, 120 db at 60Hz with up to 1000 ohms connected between either side of the source and the voltmeter input for short integration time. 140 db at dc, 120 db at all frequencies to 1 kHz with up to 1000 ohms connected from either side of the source and the voltmeter input for long integration time.

**Normal Mode Rejection** — Greater than 20 db at 55 Hz with 83-1/3 ms integration time, increases 20 db/decade increase in frequency. Virtually infinite rejection at 60 Hz and its harmonics. The combined DC signal and normal mode noise shouldn't exceed full scale. The polarity indication is determined by the integrated input and is stable even in the presence of severe noise.

#### VOLTAGE RATIO MEASUREMENT

**Range** —  $\pm 1.0000:1$  Full Scale. A full 60% over-ranging with no loss in accuracy.

**Unknown Input** —  $\pm 1$  mV to  $\pm 16$  V, input resistance  $> 1000$  Megohms.

**Reference Input** —  $+5$  V to  $+16$  V, input resistance 3 kilohms, 30 V maximum input.

**Accuracy** —  $+9$  V to  $+16$  V;  $\pm 0.02\%$  of Reading,  $\pm 1$  digit.

**Measurement Time** — Same as DC volts.

#### RESISTANCE MEASUREMENT

**Ranges** — 10.000 K, 100.00 K, 1.0000 M, 10.000 M ohms Full Scale. A full 60% over-ranging on all ranges with no loss in accuracy.

**Accuracy** —  $\pm 0.01\%$  of Reading,  $\pm 1$  digit;  $\pm 0.02\%$  of Reading,  $\pm 1$  digit on 10.000 megohm range.

**Measurement Current** — 1 mA, 100  $\mu$ A, 10  $\mu$ A, and 1  $\mu$ A on the 10 K $\Omega$  through 10 M $\Omega$  ranges respectively.

**Measurement Time** — Same as DC volts.

### GENERAL

#### READOUT

**Visual** — Amperex ZM-1030 numeric tubes; four full decades plus fifth digit gives full range readout of 16000 with display storage. Polarity, decimal point, and measurement units are indicated.

**Electrical** — See options.

**Operating Temperature Range** — 10 to 50°C.

**Temperature Coefficient** —  $\pm 0.0008\%$  of full scale,  $\pm 0.002\%$  of reading per degree centigrade.

#### POWER

**Standard** — 105-125 V or 210-250 V selected by rear panel switch, 50-60 Hz, approximately 50 watts. (See option 02 for special 50 Hz version.)

## Model 7100A (continued)

### MECHANICAL DIMENSIONS

**Weight** — 27 lbs. (12 kg); shipping approximately 36 lbs. (16 kg).

### ACCESSORIES FURNISHED

**5911-18** — Power Cable, 7½ feet long.

**5911-26** — Input cable, two furnished with each 7100A.

**DM-01B** — Provides function control for the 7100A.

**Price** — 7100A. F.O.B. Factory. \$2075.00

### OPTIONS

**02 50 Hz Operation** — Crystal time base changes to give 1/50 and 1/10 second integration time for maximum normal mode rejection at 50 Hz.

**03 122'4 BCD/Programing** — See below. Price \$175.00

**04 1248 BCD/Programing** — See below. Price \$175.00

### BCD/Programming Options Provide:

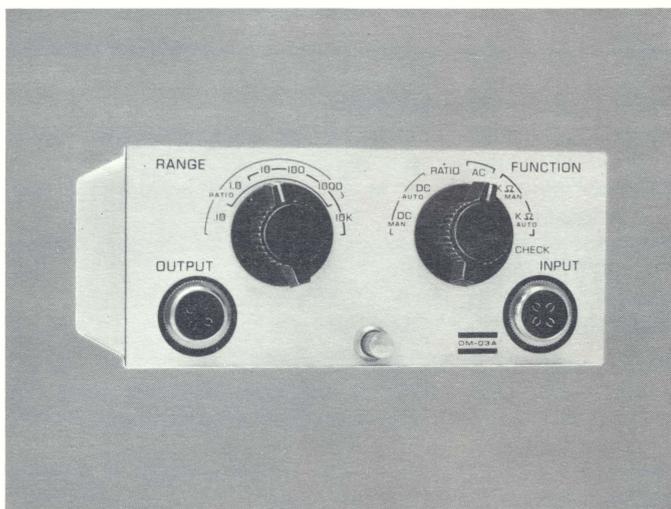
**BCD** — Positive True Logic. Numerals, decimal point, negative polarity, and function (dc volts, resistance, ratio, ac volts) indicated by a "0" state of +0.5 V and a "1" state of +30 V, 20 k $\Omega$  source impedance.

**Print Command** — +30 V pulse, 3.6 k $\Omega$  source impedance, 3  $\mu$ sec maximum rise time, 1.5 msec ( $\pm 0.5$ ) width.

**Programming** — Range and mode controlled by external NPN transistor gate or contact closure to ground corresponding to selected switch position. A rear panel remote/local switch selects the control point. Remote trigger providing up to 20 measurement samples per second initiated by +10 V pulse into 20 k $\Omega$ , width 10  $\mu$ sec minimum and 10 msec maximum.

**Connector** — A mating connector, Winchester MRAC-50P-JTP-H8, is provided.

## Model DM-03A AC/DC Converter



### DESCRIPTION

The Fairchild DM-03A AC/DC Converter adds AC voltage measurement to the basic capabilities of the 7100A. The AC conversion produces readings which are proportional to the average value of the applied AC voltage; the readings are calibrated in rms based on the assumption of a sine wave input. Four manually selected AC ranges provide full scale readings of 1.0000, 10.000, 100.00 and 1000.0 volts. In addition, the 1, 10, and 100 volt ranges provide 50% over-range with full accuracy.

The input of the DM-03A is floating and guarded to permit accurate differential measurements and to provide high common mode rejection. A 5-foot input cable maintains the guard circuit as it enters the instrument and also protects the operator from exposure to the high common mode voltages frequently associated with differential AC measurements.

THE DM-03A range switch controls the AC voltage ranges and also the DC volts, ratio, and ohm functions built into the Series 7100A instrument.

### TECHNICAL SPECIFICATIONS

**AC Voltage Ranges** — Four manually selected full scale ranges of 1.0000, 10.000, 100.00, and 1000.0 volts rms.

**Over-Ranging** — 50% on all ranges except 1000.0 volts.

**Frequency Response** — 30Hz-10kHz plus extended response to 30kHz (see table).

**Accuracy** — (Reference condition 23°C  $\pm 1^\circ$ C)  $\pm 0.05\%$  of reading  $\pm 0.02\%$  of full scale.

Below 10% full scale:  $\pm 0.03\%$  of full scale.

**Voltage Coefficient** —  $\pm 0.0005\%$ /volt for input signals above 500 volts rms.

**Temperature Coefficient** —

30Hz-8kHz  $\pm 0.005\%$  of reading  $\pm 0.002\%$  of full scale/ $^\circ$ C.

8kHz-15kHz  $\pm 0.01\%$  of reading  $\pm 0.004\%$  of full scale/ $^\circ$ C.

15kHz-30kHz  $\pm 0.02\%$  of reading  $\pm 0.01\%$  of full scale/ $^\circ$ C.

**Input Impedance** — 5 megohms  $\pm 1\%$  shunted by  $< 50$ pf.

**Weight** — Net 3 lbs. (1.4kg). Shipping, 6 lbs. (3kg).

### ACCESSORIES FURNISHED

**Input Cable** — 5 ft. (170cm) long,  $< 100$ pf.

**Output Cable** — 13" (33cm) long, 100pf.

### EXTENDED RESPONSE

Range	Frequency	
1 and 10V	10kHz-15kHz	15kHz-20kHz
	$\pm 0.06\%$ of Reading $\pm 0.04\%$ of Full Scale	$\pm 0.10\%$ of Reading $\pm 0.05\%$ of Full Scale
1 and 10V	20kHz-25kHz	25kHz-30kHz
	$\pm 0.15\%$ of Reading $\pm 0.05\%$ of Full Scale	$\pm 0.20\%$ of Reading $\pm 0.05\%$ of Full Scale
100 and 1000V	$\pm 0.20\%$ of Reading $\pm 0.04\%$ of Full Scale	

**Notes** — 1. Reference, rated, and extreme operating conditions per American Standard C39.6 except maximum humidity not to exceed 75% at rated accuracy.

**Price** — DM-03A. F.O.B. Factory. \$500.00