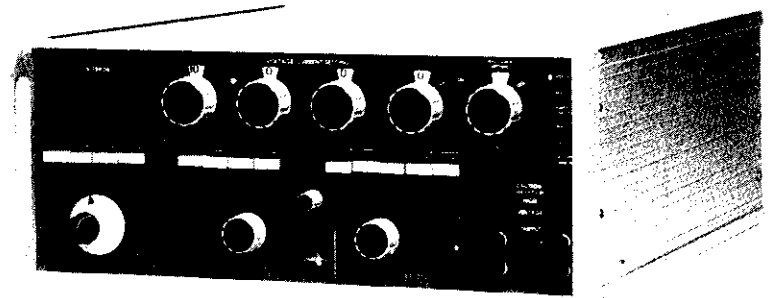


### MULTIFUNCTION CALIBRATOR

#### Featuring:

- AC and DC Voltage
- AC and DC Current
- Resistance
- Voltages to 1100 Volts
- Currents to 100 Amperes
- Frequencies to 5kHz
- Accuracy: 0.005% DCV and 0.05% ACV
- Burdens: 70mA at 300 VAC



Model 3970A

#### Cost Effective, Multifunction Calibrators

The Series 3900A Calibrators are cost effective, versatile multifunction voltage, current and resistance calibrators with accuracy suitable for digital multimeters and burdens suitable for moving coil analog meters. Each of the calibrators in the series offers unique capabilities and performance to meet most calibration requirements.

#### 3 Models to Choose From

- Model 3950A, 4 Digit Setting Resolution.
- Model 3960A, 5 Digit Setting Resolution.
- Model 3970A, 4 Digit Setting Resolution with fractional divider function.

#### Convenient Rotary Selection of Settings

The rotary switch is the most rapid manual means for changing settings, particularly where a rapid scan of a particular digit is desired or where the least significant decade is used in a high resolution measurement. The five decade resolution of the Model 3960A makes it suitable for 4 ½ and some 5 ½ digit multimeters. Even at settings of 1/10 of ranges the least significant increment is 0.01% of setting.

#### Fractional Scale Divider

An automatic fractional scale divider is available in the Model 3970A to divide any voltage or current setting into equal subdivisions of 5ths, 4ths, and 3rds for rapid testing of non-decade ranges. When the Fractional Scale Divider is in use, the % Deviation Indicator reads directly in percent of the full scale selected. This simplifies calibration procedures considerably, since most meters for which the

fractional scale division feature is suitable have errors specified in terms of percent of full scale.

#### Error Measurement with Deviation Control

A 2 ½ digit display is used, in conjunction with the Deviation control to indicate meter error directly in percent. The deviation controls consists of three decade range selectors and an infinite resolution potentiometer. On the lowest range, one least significant display digit corresponds to 10 ppm of output.

#### Currents Available to 100A

The Model 350A High Current Amplifier is a valuable accessory to the 3900A Series. It extends the current range to 10 Amperes DC and 50 Amperes AC. Compliance of 2 Volts is obtained to 10 Amperes and 350 millivolt to 50 Amperes.

If higher currents are required, the Model 380A Transconductance Amplifier may be used to achieve currents to 100A, AC and DC. Compliance of 2 Volts is obtained to 100 Amperes. See specifications contained in bulletin 380A/2.

#### Wattmeter Calibration Extender

When the Model 360A Wattmeter Extender is used in conjunction with the Model 350A and a Series 3900A Calibrator, the resulting system provides an excellent means for the calibration of wattmeters by the phantom load method. The Model 360A features five fixed voltages and five fixed power factor settings. See specifications contained in Bulletin 360/6.

All accuracy specifications obtained within 60 minutes after turn-on, at a temperature of  $25 \pm 5^{\circ}\text{C}$ , a line frequency of 50 to 60Hz, at a nominal line voltage  $+5\%$ ,  $-10\%$ , including loading or compliance except as otherwise specified, and are maintained for a period of not less than six months. All specifications describe maximum limits unless stated otherwise, from 10% to 100% of range.

DC Voltage:	Accuracy:	
	1 - 1100V	$\pm 0.005\%$ stg. $\pm 0.001\%$ mg.
	0 - 1000mV	$\pm 0.005\%$ stg. $\pm 0.002\%$ mg. $\pm 2\mu\text{V}$
	Noise:	0.03% RMS of output
	Loading:	
	15 - 1000v	10mA, 150 m $\Omega$ output impedance
	10 - 15V	7mA, 150 m $\Omega$ output impedance
	0.1 - 10V	100mA, 150 m $\Omega$ output impedance
	0 - 100mV	10 $\Omega$ output impedance
	Temperature Coefficient:	
	15 - $20^{\circ}\text{C}$ , 30 - $35^{\circ}\text{C}$	10ppm/ $^{\circ}\text{C}$ or $4\mu\text{V}/^{\circ}\text{C}$ , whichever is greater
AC Voltage	Accuracy:	
	50 - 1000Hz	$\pm 0.05\%$ stg. $\pm 0.005\%$ mg. $\pm 10\mu\text{V}$
	40Hz, 2 - 5kHz	$\pm 0.1\%$ stg. $\pm 0.01\%$ mg. $\pm 10\mu\text{V}$
	Loading:	
	300 - 1000V	220pf and 20mA, 150m $\Omega$ and 3mH output impedance.
	150 - 299V	1500pf and 70mA, 150 m $\Omega$ and 1mH output impedance.
	100 - 150V	1500pf and 50mA linearly increasing to 70mA at 150V, 150 m $\Omega$ and 1mH output impedance.
	1 - 100V	10000pf and 100mA, 150 m $\Omega$ and 1mH output impedance.
	100 - 1000mV	10000pf and 100mA, 150 m $\Omega$ and 1mH output impedance.
	100mV	10 $\Omega$ output impedance.
	Distortion and Noise:	
	40 - 1000Hz	0.05% $\pm 150\mu\text{V}$ RMS of output
	2 - 5kHz	0.1% $\pm 150\mu\text{V}$ RMS of output
	Temperature Coefficient:	
	40 - 1000Hz	25ppm/ $^{\circ}\text{C}$ , 15 - $20^{\circ}\text{C}$ , 30 - $35^{\circ}\text{C}$
	2 - 5kHz	100ppm/ $^{\circ}\text{C}$ , 15 - $20^{\circ}\text{C}$ , 30 - $35^{\circ}\text{C}$
DC Current	Accuracy	
	0 - 100mA	$\pm 0.05\%$ stg. $\pm 0.005\%$ mg. $\pm 50\text{nA}$
	100mA - 1.1A	$\pm 0.02\%$ stg. $\pm 50\mu\text{A}$
	1 - 10A(Model 350A)	$\pm 0.1\%$ stg. $\pm 3\text{mA}$
	Noise:	
	0 - 1.1A	0.05% $\pm 50\mu\text{A}$
	1 - 10A(Model 350A)	0.2%
	Compliance:	2V (0.3V, 1 $\mu\text{A}$ - 1000 $\mu\text{A}$ )
	Temperature Coefficient:	10ppm/ $^{\circ}\text{C}$ or 25nA/ $^{\circ}\text{C}$ , whichever is greater
AC Current	Accuracy:	
	0.01 - 1100mA	
	40 - 400Hz	$\pm 0.05\%$ stg. $\pm 0.005\%$ mg $\pm 100\text{nA}$
	500 - 1000Hz	$\pm 0.1\%$ stg. $\pm 0.01\%$ mg $\pm 200\text{nA}$
	1 - 10A(Model 350A)	
	40 - 400Hz	$\pm 0.1\%$ stg. $\pm 3\text{mA}$
	500 - 1000Hz	$\pm 0.3\%$ stg. $\pm 4\text{mA}$
	10 - 50A(Model 350A)	
	40 - 400Hz	0.5% stg.
	Compliance:	
	0-10A	2V (0.3V, 1 $\mu\text{A}$ to 1000 $\mu\text{A}$ : 1V, 500Hz to 1000Hz)
	10 - 50A	0.25V
	Noise and Distortion:	
	0 - 1100mA	0.05% + 50nA
	1 - 10A	0.2%
	10 - 50A	0.5%
	Temperature Coefficient:	25ppm/ $^{\circ}\text{C}$ , Max.
Resistance	Accuracy:	
	1 $\Omega$	0.1%
	10 $\Omega$	0.05%
	100 $\Omega$	0.02%
	1k $\Omega$ - 1M $\Omega$	0.01%
	10M $\Omega$	0.1%
Physical	Series 3900A	178mm H $\times$ 422mm W $\times$ 537mm D (7"H $\times$ 17 3/8"W $\times$ 21 1/8"D) 20.4 kg(45lbs); 100Watts; 100/120/220/240 Volts (+5%, -10%), 50/60-Hz
	Model 350A	134mm H $\times$ 442mm W $\times$ 537mm D (5 1/4" H $\times$ 17 3/8" W $\times$ 21 1/8" D) 20.4kg (45lbs), 25 Watts, 100/120/220/240 Volts (+5%, -10%), 50/60-Hz