



### 540B Thermal Transfer Standard

- 100 ppm aV/dV transfer uncertainty
- Less than 100 ppm dc reversal error
- Frequency range 5 Hz-1 MHz (to 50 MHz with A55)
- Overvoltage protection
- Polarity reversal switch

The Fluke 540B is a thermal transfer instrument for precise measurement and calibration of alternating voltage and current. The 540B is designed for simple operation with positive protection from overloads. Voltage transfers may be made from 0.25V to 1000V rms in 14 ranges, with a frequency range from 5 Hz to 1 MHz. Each range maintains specified accuracy down to half of range. Resolution of input per scale division varies from 12 ppm at full range to 60 ppm at half of range. Basic aV to dV transfer uncertainty is 100 ppm ( $\pm 0.01\%$ ) without the use of calibration curves or correction tables.

The thermal element in the 540B is a specially constructed vacuum thermocouple protected from overvoltage. Up to 1500V dc or rms ac may be applied on any range without damage. A pushbutton protection disable switch allows confirmation that diode aging in protection circuitry is not contributing to error.

Three galvanometer sensitivity settings are provided. A sensitivity test function provides momentary galvanometer deflection for 0.1% and 0.01% of input voltage, at any galvanometer sensitivity setting.

The 540B includes a meter-display search function, for continuous visual indication of input percent of range. The search function indicates when the overload circuit has activated, by deflecting upscale into a red "overload" area. After an overload condition, the 540B is returned to normal operation simply by setting the mode switch to "off."

The basis of transfer comparison in the 540B is always 1:1; ac and dc voltages are placed across the same transfer circuit. In this way, accuracy is independent of range division ratios.

DC reversal error in the thermocouple is less than 100 ppm (0.01% of input voltage). A convenient "push-to-reverse" switch is provided to reverse dc input polarity.

A high frequency thermal converter input jack is provided so that the galvanometer and Lindeck reference supply may be used with Fluke Model A55 High Frequency Thermal Converters.

The 540B operates from rechargeable nickel-cadmium battery cells for complete isolation from line power. Fully charged, the 540B may be operated for up to 200 hours without an interruption for charging.

#### Calibration

Each range is adjusted to be within the specified deviations from zero error as defined by reference standards maintained by the Fluke Standards Laboratory and periodically calibrated by the U.S. National Institute of Standards and Technology. These ac/dc difference figures do not include U.S. National Institute of Standards and Technology's random and systematic errors. Fluke test reports to the nearest 100 ppm are available at extra cost upon request.

#### Characterization

Model 540B-900 is a 72-point characterization of a 540B Thermal Transfer Standard. Model 540B-901 is the same characterization service for a customer-owned 540B, available through Fluke Technical Service Centers. All characterizations are actually performed by the Fluke Standards Laboratory in Everett, Washington. This 72-point characterization is intended to support customers who wish to characterize 5200A-800 Enhancement Software.

Special characterizations to meet specific calibration requirements are also available. Consult your local Fluke Service Center for further information.

#### Specifications

**Voltage Ranges:** 0.5, 1, 2, 3, 5, 10, 20, 30, 50, 100, 200, 300, 400, and 1000V, with each range usable from  $1/2$  to 1 times rating

#### aV to dV Transfer Uncertainty

Frequency Hz	Voltage Ranges			
	0.5-10V	10-50V	100-500V	1000V
5k-20k	$\pm 0.01\%$	$\pm 0.01\%$	$\pm 0.01\%$	$\pm 0.02\%$
20k-50k	$\pm 0.01\%$	$\pm 0.01\%$	$\pm 0.01\%$	$\pm 0.04\%$
50k-100k	$\pm 0.5\%$	$\pm 0.05\%$	$\pm 0.20\%$	X
100k-500k	$\pm 0.10\%$	$\pm 0.10\%$	X	X
500k-1M	$\pm 0.10\%$	X	X	X

**Search Function:** Meter display of input as percentage of range

**Input Impedance:** 180 $\Omega$ /V

**Polarity:** Reversible, front panel push-button

**Galvanometer:** Fluke electronic type

**Galvanometer Resolution:** 12 ppm of input/scale division at full range; 60 ppm of input/scale division at half range

**Thermocouple Reversal Error:**  $\leq 100$  ppm of input at full range;  $\leq 300$  ppm at half range

**Overload Protection:** Withstands up to 1500V dc or rms ac, any range

**Power:** 115V or 230V ac  $\pm 10\%$ , 50 to 440 Hz, 7W; self-contained rechargeable batteries; 200 hours operation, 16 hours recharge time

**Size:** 17.2 cm H x 41.7 cm W x 19 cm D (7 in H x 17 in W x 7.75 in D)

**Included with Instrument:** Instruction manual, A55 connecting cable

#### Ordering Information

**Model** January 1990 prices  
**540B** Thermal Transfer Standard ..... \$6290

#### Accessories (Also see Section 17)

**540B-103** 7" Rack Mount Kit ..... \$ 130  
**540B-110** Rechargeable Battery Pack .. 475  
**A40** Current Shunts ..... 630  
**A40A** Current Shunts ..... 700  
**A55** High Frequency Thermal Converters 735