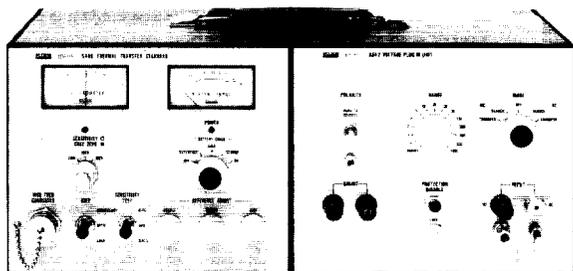


CALIBRATORS & STANDARDS

540B/A55



540B

540B Thermal Transfer Standard

5

Fluke Model 540B is a thermal transfer instrument for precise measurement and calibration of ac voltage and current, incorporating design features for rapid, simple operation and positive protection from severe overloads. Voltage capability of the 540B is 0.25V to 1000V rms ac in 14 ranges, with a frequency range from 5 Hz to 1 MHz. Basic ac to dc transfer accuracy is $\pm 0.01\%$ without the use of calibration curves or correction tables.

The thermally responsive element of the 540B is a specifically constructed vacuum thermocouple which is protected from over-voltage burnout by a unique solid-state trigger-relay circuit. Up to 1500V dc or rms ac may be applied on any range without damage to the thermocouple or other components.

Model 540B includes a solid-state search circuit with meter, for visual indication at all times of percent of rated range of input voltage. The search meter indicates when the overload circuit has operated by deflecting up scale into a red "overload" area. After an overload condition, the instrument is returned to normal operation simply by setting the "mode" switch to the off position.

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

Dc reversal of the thermocouple is less than 0.01% of input voltage. For convenience, a "push-to-reverse" switch reverses polarity of dc input.

Specifications

Voltage Ranges: 0.5, 1, 2, 3, 5, 10, 20, 30, 50, 100, 200, 300, 500, and 1000V, with each range useful from $\frac{1}{2}$ to 1 times rating

Accuracy

Voltage Range	Frequency Range	AC/DC Difference
All except 1000V	5 Hz to 50 kHz	$\pm 0.01\%$
1000V	5 Hz to 20 kHz	$\pm 0.02\%$
1000V	20 kHz to 50 kHz	$\pm 0.04\%$
0.5 through 50V	50 kHz to 100 kHz	$\pm 0.05\%$
20 through 50V	100 kHz to 500 kHz	$\pm 0.10\%$
0.5 through 10V	100 kHz to 1 MHz	$\pm 0.1\%$
100 through 500V	50 kHz to 100 kHz	$\pm 0.20\%$

Calibration: Each range is adjusted to be within the above deviations from zero error as defined by reference standards maintained by the John Fluke Standards Laboratory and periodically calibrated by the National Bureau of Standards. These ac/dc difference figures do not include the National Bureau of Standards random and systematic error uncertainties. John Fluke or NBS test reports to the nearest

0.01% are available at extra cost. Fluke test fee schedule is available on request

Search Circuit: Solid-state circuit provides visual indication of input voltage as a percentage of range selected

Input Impedance: 180 Ω /V of input

Polarity: Reversible via front panel pushbutton switch

Galvanometer: Fluke all-solid-state electronic type

Galvanometer Resolution: 0.0012% of input/scale division at rated input; 0.006% of input/scale division at $\frac{1}{2}$ rated input

Thermocouple Reversal Error: $\leq 0.01\%$ of input at 100% of rated current or voltage; $\leq 0.03\%$ at 50% of rated current or voltage

Overload Protection: Up to 1500V dc or rms ac may be applied to the instrument on any range without damage to any component

Power: 115 or 230V ac $\pm 10\%$, 50 to 440 Hz, approximately 7W; (Self-contained rechargeable nickel-cadmium cells for complete isolation from power system. 200 hours of operation on full charge; 16 hours charging 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: Manual, power cord, coaxial input cable

Model

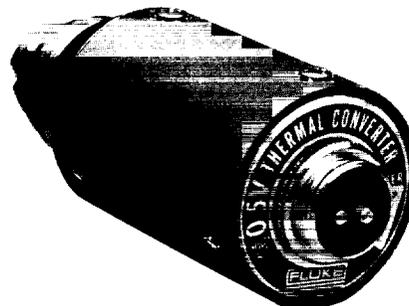
February 1982 prices

540B Thermal Transfer Standard \$4000

Accessories

540B-103 7" Rack Adapter 95

540B-110 Rechargeable Battery Pack 350



A55

A55 High Frequency Thermal Converters

Nine Model A55 High Frequency Thermal Converters are available for use with the Model 540B, extending the frequency response to 50 MHz. One is provided to match each voltage range of the 540B from 0.5 volts to 50 volts. Each may be used from $\frac{1}{2}$ to 1 times the rated voltage. The design of the A55 series is comparable to that of standards maintained by the National Bureau of Standards.

By connecting the output of an A55 converter to the jack provided, the internal transfer circuit of the 540B is bypassed so that only the null detector and reference supply are used. Each of the nine A55 models is identified by its nominal voltage rating.

CALIBRATORS & STANDARDS

A55/A40/A40A

Accessory Kit

Model A55-110 Accessory Kit is recommended for use with A55's in virtually any calibration or measurement setup. The kit includes a coaxial tee for A55 input (GR Type 874-TL), three coaxial adapters for A55 input (GR 874-to UHF), BNC jack, type N jack, and an interconnecting coaxial cable (ac source to coaxial tee). The C55 Storage Case will hold a complete set of nine A55's plus the accessories in A55-10.

Specifications

Voltage Ratings: 0.5, 1, 2, 3, 5, 10, 20, 30, and 50V

Note: Each converter may be used from 1/2 to 1 times its voltage rating

Accuracy of Calibration: (% of input) $\pm 0.05\%$ at 1 MHz, $\pm 0.10\%$ at 10 MHz, $\pm 0.15\%$ at 20 MHz, $\pm 0.20\%$ at 30 MHz, $\pm 0.50\%$ at 50 MHz

Certification: Each converter is furnished (at no charge) with a Fluke production test record listing the ac/dc difference characteristic at the above frequencies to the nearest $\pm 0.01\%$, except at 50 MHz for the 20, 30, and 50V converters. The ac/dc difference is established by comparison to Fluke standards that are periodically intercompared to NBS.

Typical ac/dc differences are less than $\pm 0.01\%$ below 1 MHz, $\pm 0.01\%$ at 1 MHz, $\pm 0.02\%$ at 20 MHz, $\pm 0.1\%$ at 30 MHz and $\pm 0.3\%$ at 50 MHz (All calibration is referenced to center of GR 874-TL coaxial tee attached to converter input connector)

Fluke test reports to the nearest $\pm 0.01\%$ at varying frequencies and voltages are available at extra cost. A test fee schedule will immediately be forwarded upon request. NBS test reports, price, delivery and other information should be requested directly from NBS.

Input Impedance: Approximately $200\Omega/V$

Output Voltage: 7 mV nominal at "rated" input

Output Resistance: 8Ω nominal

Reversal Error: Less than 0.025%

Input Connector: GR type 874-TL

Output Connector: Amphenol 80-PC2M 2-pin, microphone

Size: 3.5 cm (1.37 in) diameter, all models. Length is 8.41 cm to 19.37 cm depending on model

Weight: 8 kg to 0.45 kg (10 oz. to 16 oz.) depending on model

Included: Instruction Manual

Model

February 1982 prices

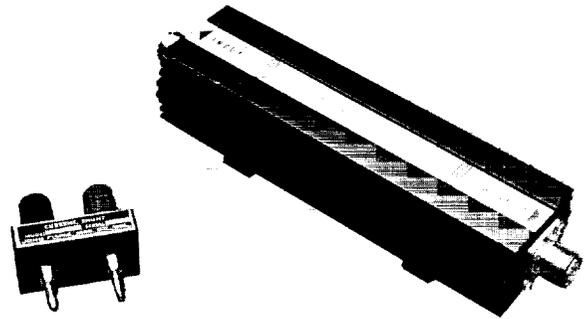
A55 High Frequency Thermal Converters \$425 ea*

**Identify each model ordered by voltage rating. See specifications*

Accessories

A55-110 Accessory Kit 425

C55 Case 350



A40

A40A

A40 & A40A Current Shunts

Fourteen A40-Series Current Shunts are available for use with the Model 540B, for current transfer measurements from 2.5 mA to 20A, from 5 Hz to 100 MHz. The A40 shunts cover the range of 10 mA to 5A, and plug into panel connectors on the 540B. They electrically shunt the 5 mA heater of the 540B thermal converter. Current from 2.5 mA to 5 mA may be read directly.

The A40A shunts (10A and 20A) are connected to the panel connectors of the 540B by a special cable, (A45-4004 not furnished with shunt). In the same manner as the 540B voltage ranges, each shunt is useful from 1/2 to 1 times its nominal rating.

Specifications

Current Ratings: 10, 20, 30, 50, 100, 200, 300, and 500 mA, 1, 2, 3, 5, 10, and 20A

Note: Each shunt may be used from 1/2 to 1 times nominal rating

Accuracy: (% of input)

A40 Shunts	Frequency	AC/DC Difference
10 mA to 5A	5 Hz to 20 kHz	$\pm 0.02\%$
	20 kHz to 50 kHz	$\pm 0.03\%$
	50 kHz to 100 kHz	$\pm 0.05\%$
A40A Shunts 10A and 20A	5 Hz to 20 kHz	$\pm 0.03\%$
	20 kHz to 50 kHz	$\pm 0.005\%$

Calibration: Each shunt, when used in conjunction with a 540B, is within the above deviations from zero error. The ac/dc difference figures do not include the National Bureau of Standards random and systematic error uncertainties. Fluke or NBS test reports to the nearest 0.01% are available at extra cost

Cables: A45-4004 required to connect A40A (10 and 20A) shunt to front panel connector. A45-4003 for input to A40A

Case: Model C41 case manufactured of ABS plastic with polyurethane foam cushion is available for transporting and storing a complete set of A40 and A40A shunts

Test Leads: Not supplied. Y8133 recommended for A40's

Model

February 1982 prices

A40, A40A Current Shunts \$350 ea*

**Identify each model ordered by current rating. See specifications*

Accessories

A45-4003 Input Cable to A40A's 55

A45-4004 24" Output Cable for A40A's 85

C41 Case 350

Y8133 Test Lead Kit for A40's 20

Also see Section 17 for more accessory information.

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