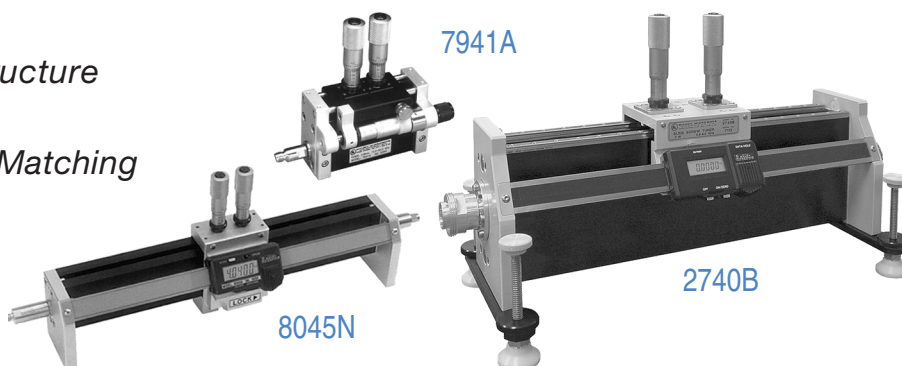


Coaxial Slide Screw Tuners – Wide Matching Range

Features

- ▶ Slab-line Transmission Structure
- ▶ Dual Probes for Improved Matching
- ▶ LCD Readout for Carriage Position



Description

Maury wide matching range slide screw tuners feature a slab-line transmission structure with dual micrometer-driven probes that provide precise control of the mismatch magnitude. Models operating up to 18 GHz are equipped with a digital LCD readout to indicate carriage position (phase). Higher frequency models are equipped with a micrometer driven carriage mechanism which is also employed in the standard matching range models (see page 144).

The positional repeatability and high matching range of these tuners make them ideally suited for use in device characterization

applications where there is a critical need to establish impedances near the outer edge of the Smith chart and to reproduce electrical characteristics as a function of mechanical position. They are designed to serve as a matching network for reducing reflections caused by mismatches present in a transmission line, or to introduce a controlled mismatch into an otherwise matched transmission line.

The models listed below are optimized for operation over wider matching ranges than the standard matching range models.

Available Models

MODEL	FREQUENCY RANGE (GHz)	CONNECTOR TYPE	VSWR MATCHING RANGE	MAXIMUM LOSS (PROBES RETRACTED)	PROBE CROSSOVER FREQUENCY	POWER ¹ HANDLING (AVE./PK. WATTS)	DIMENSION "A" (INCHES (CM))	DIMENSION "B" (INCHES (CM))
7941A	12.0 — 50.0	2.4mm ²	10:1	1.0 dB	21.5 GHz	15/150	0.417 (1.059)	4.62 (11.735)
8041C	12.0 — 34.0	3.5mm ³	10:1	0.7 dB	16.0 GHz	15/150	0.417 (1.059)	4.95 (12.573)
8045D1		3.5mm ³				25/250	3.4 (8.636)	8.94 (22.708)
2640D1	1.8 — 18.0	7mm ⁴	12:1	0.4 dB	5.5 GHz	50/500	3.4 (8.636)	8.88 (22.555)
1643D1		Type N ⁵				50/500	3.4 (8.636)	8.92 (22.657)
8045P		3.5mm ³				25/250	7.8 (19.812)	13.34 (33.884)
2640P	0.8 — 18.0	7mm ⁴	10:1	0.6 dB	4.6 GHz	50/500	7.8 (19.812)	13.28 (33.731)
1643P		Type N ⁵				50/500	7.8 (19.812)	13.32 (33.833)
1643N	0.8 — 2.5 2.5 — 8.0	Type N ⁵	25:1 18:1	0.5 dB	2.8 GHz	50/500	7.8 (19.812)	13.32 (33.833)
2640N	0.8 — 2.5 2.5 — 8.0	7mm ⁴	25:1 18:1	0.5 dB	2.8 GHz	50/500	7.8 (19.812)	13.28 (33.731)
8045N	0.8 — 2.5 2.5 — 8.0	3.5mm ³	25:1 18:1	0.5 dB	2.8 GHz	25/250	7.8 (19.812)	13.34 (33.884)
2740B	0.8 — 8.0	7-16 ⁶	35:1	0.1 dB	2.8 GHz	100/1000	7.88 (20.015)	14.48 (36.779)
2440B		14mm ⁷					7.88 (20.015)	13.07 (33.198)
2740C	0.4 — 4.0	7-16 ⁶	25:1	0.1 dB	1.4 GHz	100/1000	14.95 (37.973)	22.76 (57.810)
2440C		14mm ⁷					14.95 (37.973)	21.35 (54.229)

¹ Within rated matching range.

² Precision 2.4mm per Maury data sheet 5E-064.

³ Precision 3.5mm per Maury data sheet 5E-062.

⁴ Precision 7mm per Maury data sheet 5E-060.

⁵ Precision type N per Maury data sheet 5E-049.

⁶ Precision 7-16 per Maury data sheet 5E-066.

⁷ Precision 14mm (GR900) per Maury data sheet 5E-068.

Coaxial Slide Screw Tuners – Wide Matching Range

Functional Description

The dual probe structure in Maury coaxial slide screw tuners is designed so that one probe (the low frequency probe) covers the range from the lowest frequency to the crossover frequency listed in the **Available Models** table on page 142. The second probe (the high frequency probe) covers the range from the crossover frequency to the tuner's maximum rated frequency. The optimum crossover frequency varies from tuner to tuner.

As each micrometer-driven probe is introduced into the slab-line transmission structure it induces a mismatch in its frequency range. The magnitude of this impedance

mismatch is determined by the probe position (depth); the closer the probe approaches the center conductor, the greater the magnitude. The phase of the impedance mismatch is determined by the carriage position. The probes operate independently of each other with little or no interaction. Each probe will meet its specifications over its rated frequency range, and typically has considerably higher matching capability in the middle of its band. Figure 1 shows responses that are typical of those seen in a low frequency /high frequency pair of probes.

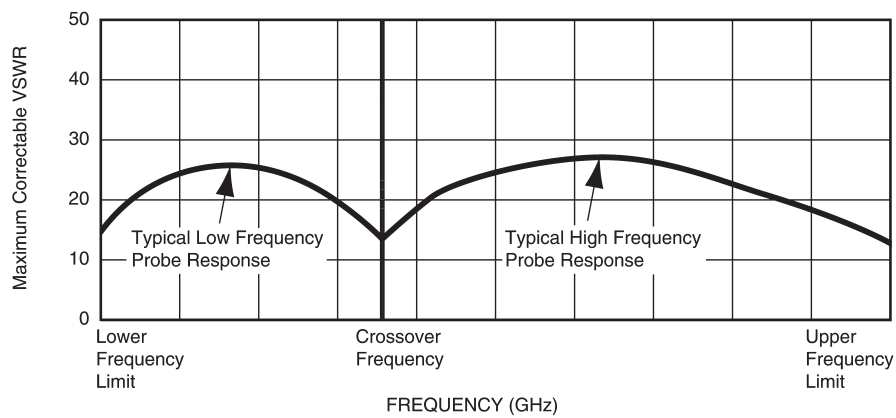
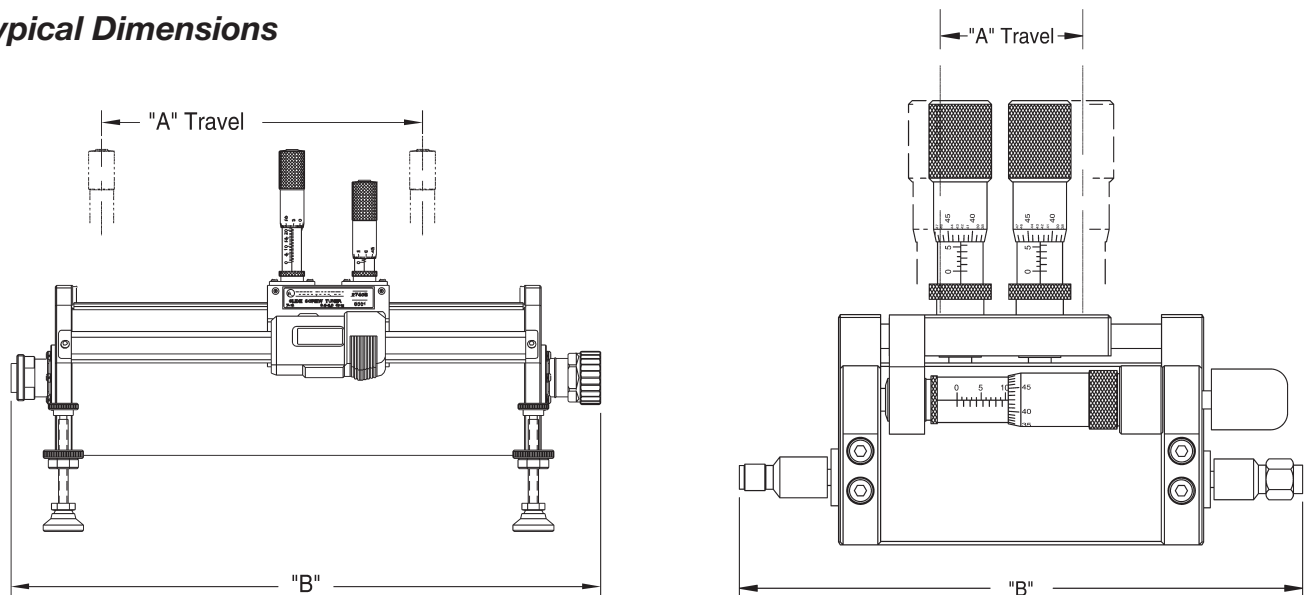


Figure 1. Typical responses seen in low frequency and high frequency probes as they are used in Maury coaxial slide screw tuners.

Typical Dimensions



Models with LCD readouts for carriage position

Models with micrometer-driven carriage blocks

Figure 2. Typical dimensions for Maury coaxial slide screw tuners. See the **Available Models** table on page 138 for model-specific dimensions at the “A” and “B” references.

Coaxial Slide Screw Tuners – Standard Matching Range

Description

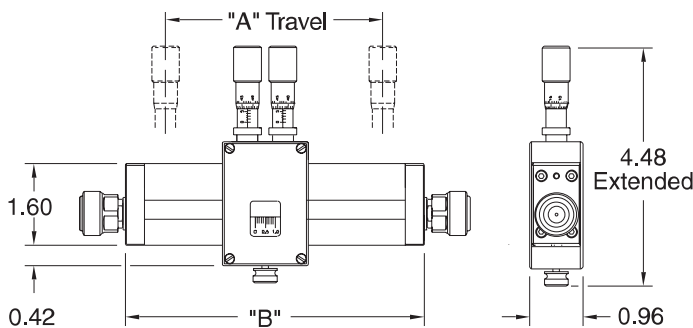
Maury slide screw tuners are particularly well suited for use in establishing impedances for device characterization, or for any other application requiring a precisely repeatable mismatch condition. The calibrated position indicators on these tuners make it possible to repeat a specific matching condition with a high degree of accuracy. These tuners are also designed to allow the reflection magnitude and phase to be set independently. Slide screw tuners are also easy to use due to the almost independent electrical results of the mechanical motions.

Maury produces two categories of coaxial slide screw tuners; standard matching range (minimum 6:1 equivalent VSWR) and wide matching range (up to 25:1 nominal VSWR). Both types employ a slab-line transmission structure which defines their frequency range, with probes designed to be very close to $1/4\lambda$ in the linear dimension at the mid-band of each range. Each tuner has two probes for enhanced matching characteristics. Units with sexed connectors have a female connector on one end and a male on the other.

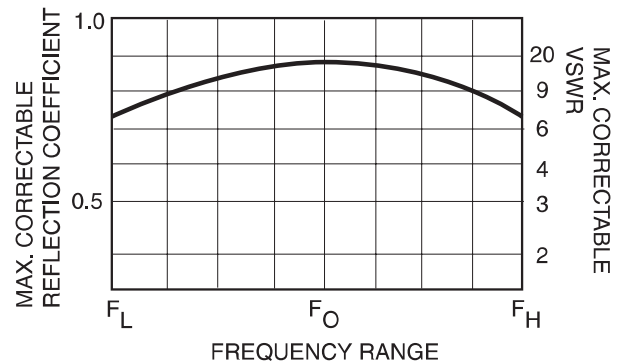


Maury standard matching range tuners are provided with micrometer driven probes and vernier readout of carriage position (except for the 3.5mm units which have micrometer driven carriages). Position locks are provided on both the probe micrometers and the carriage mechanism.

Typical Dimensions



Typical Performance



Available Models

MODEL	FREQUENCY RANGE (GHz)	CONNECTOR TYPE	VSWR MATCHING RANGE	MAXIMUM LOSS (PROBES RETRACTED)	PROBE CROSSOVER FREQUENCY	POWER 1 HANDLING (AVE./PK. WATTS)	DIMENSION "A" INCHES (CM)	DIMENSION "B" INCHES (CM)
8041B	12.0 — 26.5	3.5mm ²	≥ 10:1	0.7 dB	16.0 GHz	25/250	0.52 (1.321)	2.90 (7.400)
8045D		3.5mm ²				25/250		
2640D	1.8 — 18.0	7mm ³	≥ 6:1	0.4 dB	5.5 GHz	50/500	3.40 (8.636)	7.50 (19.100)
1643D		Type N ⁴				50/500		
8045C		3.5mm ²				25/250		
2640C	0.9 — 12.4	7mm ³	≥ 6:1	0.6 dB	4.6 GHz	50/500	7.80 (19.812)	10.50 (26.700)
1643C		Type N ⁴				50/500		

¹ Within rated matching range.

³ Precision 7mm per Maury data sheet 5E-060.

² Precision 3.5mm per Maury data sheet 5E-062.

⁴ Precision type N per Maury data sheet 5E-049.