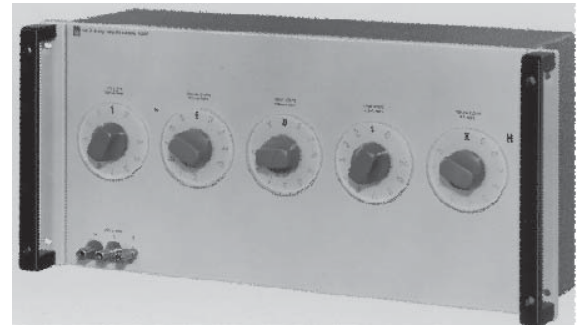


The 1491 Decade Inductor is an assembly of several Decade-Inductor Units in a single metal cabinet. The units have no electrical connection to the panel, but a separate ground terminal is provided, which can be connected to the adjacent low terminal, leading to the smallest decade.



Model 1491 Precision Inductor

- Shielded toroidal cores for small mutual inductance and minimal effect from external fields
- Sealed against moisture for long-term stability
- Excellent as a moderately precise standard of inductance
- High-Q, 200 and above

These inductance decades are convenient elements for use in wave filters, equalizers, and tuned circuits throughout the range of audio and low radio frequencies. As components in oscillators, analyzers, and similar equipment, they are especially useful during the preliminary design period, when you need to vary circuit elements

over relatively wide ranges to determine optimum operating values. As moderately precise standards of inductance they have values of low-frequency storage factor, Q, that are much larger than those of air-core coils.

Figure 1: Percentage change in normal and incremental inductance with ac and bias current. Incremental curve is limited to and ac excitation less than  $I_1$ .

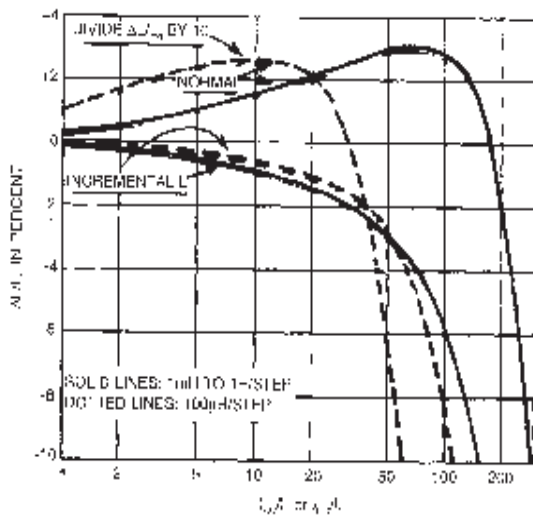


Figure 2: Variation of inductance with frequency for the 1491 Decade Inductors.

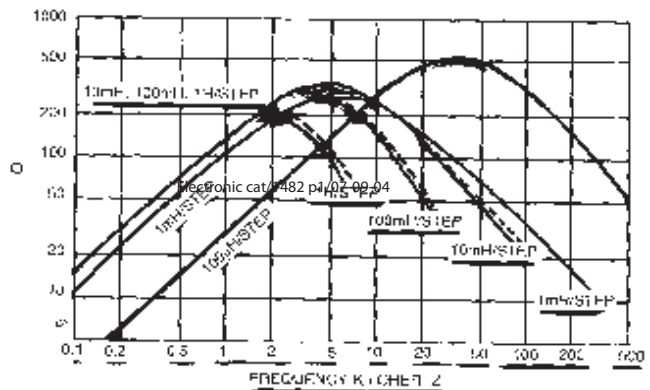
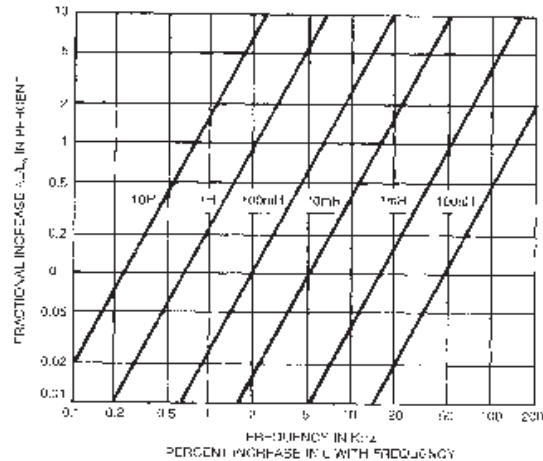


Figure 3: Variation to Q for the maximum inductance at low excitation levels. Dashed curves correspond to use with chassis floating.



## 1491 Series

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### SPECIFICATIONS

Frequency Characteristics: Percentage increase in effective series inductance (above the zero-frequency value,  $L_0$ ) may be obtained by interpolation in accompanying graph (see Figure 2) for any setting to the highest-value decade used, when LOW terminal is grounded to cabinet.

Zero Inductance: Approximately 1  $\mu$ H

Maximum Voltage: 500V rms. Switch will break circuit at 500V if turned rapidly, but voltages above 150V may cause destructive arcing with switch between detent positions.

Accuracy (Low Frequency, Low Signal Level):

Model	Inductance Per Step				
	100 $\mu$ H	1 mH	10 mH	100 mH	1 H
1491-9704	N/A	$\pm 2\%$	$\pm 1.6\%$	$\pm 0.8\%$	$\pm 0.8\%$
1491-9707	$\pm 2\%$	$\pm 2\%$	$\pm 1.6\%$	$\pm 0.8\%$	$\pm 0.8\%$

Change in Inductance with Current: Fractional change in initial inductance with AC current for each type of toroid is shown in the normal curves, Figure 1, in terms of the ratio of the operating current,  $I$ , to  $I_1$  the current for 0.25% change, solid line (0.1%, broken line). For ratios below unity, inductance change is directly proportional to current. Values of  $I_1$ , listed below, are approximate and are based on the largest inductor in the circuit for each setting.

Storage Factor Q: See Figure 3.

dc Resistance: Approximately 45  $\Omega$  per Henry.

Switch Setting		RMS $I_1$ (mA)			
		0.1% Increase	0.25% Increase		
			100 $\mu$ H	10 mH	100 mH
1	141	17	5.4	1.7	.54
2,3,4	100	12	3.8	1.2	.38
5,6,7,8,9,10	63	8	2.4	0.8	.24
Maximum I	4 A	1.5 A	500 mA	150 mA	50 mA

Storage Factor Q: See Figure 3.

DC Resistance: Approximately 45  $\Omega$  per Henry.

Temperature Coefficient: Approximately -25 ppm/ $^{\circ}$ C between 16 $^{\circ}$  and 32 $^{\circ}$  C.

Terminals: Binding posts on  $\frac{3}{4}$ -in centers; separate ground terminal provided.

Mechanical: Lab-bench cabinet.

Dimensions: 22.3 cm H x 43.2 cm W x 16.6 cm D (8.75" x 17" x 6.5").

### ORDERING INFORMATION

1491-9704      1491-D, Decade Inductor, 11.11 H, 1 mH/Step

1491-9707      1491-G, Decade Inductor, 11.111 H, 100  $\mu$ H/Step

