Stable Polystyrene Decade Capacitor

1412 Series

Model 1412-BC: The wide capacitance range and high resolution of this decade capacitance box make it exceptionally useful in both laboratory and test shop. Owing to its fine adjustment of capacitance, it is a convenient variable capacitor to use with an impedance comparator. The polystyrene dielectric used in the decade steps is necessary for applications requiring low dielectric absorption and constancy of both capacitance and dissipation factor with frequency.

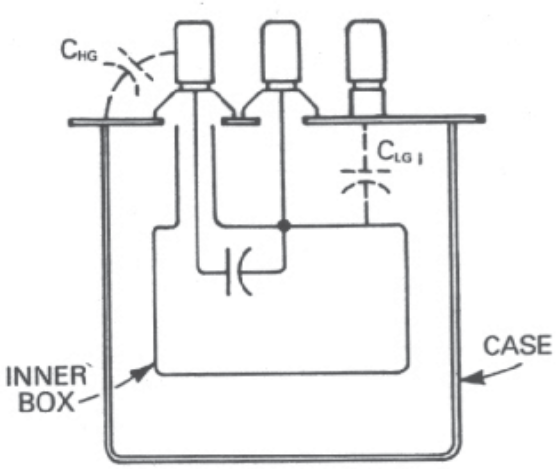
Model 1412-BC Decade Capacitor

- Verification of calibration of LCR meters
- Capacitance measurement functions
- Verification of calibration of multimeters
- For calibrating instrumentation
- 50 pF to > 1 µF
- Better than 1 pF resolution
- Accuracy of ± (0.5% + 5 pF)
- Low loss, leakage, dielectric absorption

For decades of polystyrene capacitors and a variable air capacitors are used, mounted in a double-shield box. The double shielding provides 2-terminal and 3-terminal capacitance's that are the same except for the capacitance between the terminals. The variable air capacitor with a linear ΔC of 100 pF and a resolution of better than 1 pF provides continuous adjustment between the 100 pF steps of the smallest decade.

Figure 1

The double shielding used in the 1412-BC Decade Capacitor keeps C_{HG} very small. This capacitance is the difference between the 3-terminal and 2-terminal capacitance of the box; C_{LG} is approx. 125 pF.



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SPECIFICATIONS

Capacitance: 50 pF to 1.11115 µF in steps of 100 pF with a 0 to 100 pF variable air capacitor providing continuous adjustment with divisions of 1 pF. Capacitance for 2- and 3-terminal connections differ by about 1 pF (C_{HG} in Figure 1) C_{LC} is approximately 125 pF.

Minimum Capacitance: 50 pF with all controls set at zero.

Dielectric: Polystyrene for decade steps.

Accuracy: ±(0.5% + 5 pF) at 1 kHz for total capacitance including 50 pF minimum for the 3-terminal connection.

Temperature Coefficient of Capacitance: -140 ppm/°C (nominal).

Frequency Characteristics: DC Cap/ 1 kHz Cap < 1.001. At higher frequencies the increase is approximately $\Delta C/C = (f/f_r)^2$. The resonant frequency, f_r, varies from over 400 kHz for a capacitance of 1 µF to 27 MHz for a capacitance of 150 pF when connections are made to the front terminals. f_r is about 300 kHz and 70 MHz for rear connections and the same capacitance.

Max Operating Temperature: 65°C.

Dielectric Absorption: (Voltage Recovery): 0.1% max.

Dissipation Factor: 150 to 1000 pF, 0.001 max, at 1 kHz; over 1000 pF, 0.0002 max, at 1 kHz.

Insulation Resistance: 10^{12} Ω min.

Max Voltage: 500V peak, up to 35 kHz.

Terminals: Four bindings posts with grounding link are provided on the front panel. Two of the binding posts are connected to the case and located for convenient use with patch cords in 3-terminal applications. Access is also provided to rear terminals for relay-rack application.

Mechanical: Lab-bench cabinet; brackets provided for rack mount.

Dimensions: 0.89 cm H x 43.9 cm W x 15.3 cm D
(3.5" x 17.25" x 3.5")

Weight: 3.9 kg (8.5 lb.) net, 4.6 kg (10 lb.) shipping.

ORDERING INFORMATION

1412-9410	1412-BC	Decade Capacitor