

1423-A Precision Decade Capacitor

- 100 pF to $> 1 \mu\text{F}$
- $\pm 0.05\%$ accuracy
- two- or three-terminal connection

This capacitor is a versatile tool for calibration laboratories and production-line testing. With it a bridge can be standardized to an accuracy exceeded only by that of the highest quality, individually certified laboratory standards such as the GR 1404 and 1408 Reference Standard Capacitors. Used with a limit bridge, such as the GR 1654 Impedance Comparator, the 1423 facilitates fast and accurate production-line measurements of arbitrary capacitance values with minimum setup time.

Any value of capacitance from 100 pF to $1.111 \mu\text{F}$, in steps of 100 pF, can be set on the four decades and will be known to an accuracy of 0.05%. The terminal capacitance values are set precisely to the nominal value and can be readjusted later at calibration intervals, if necessary, without disturbance of the main capacitors.

The 1423 consists of four decades of high-quality silvered-mica capacitors similar to those used in the GR 1409 Standard Capacitors. The capacitors and associated switches are mounted in an insulated metal compartment, which in turn is mounted in a complete metal cabinet. This double-shielded construction ensures that capacitance at the terminals is the same for either the three-terminal or the two-terminal method of connection (except for a constant difference of about one picofarad). This external capacitance can be included in the two-terminal calibration by the adjustment of a single trimmer.

SPECIFICATIONS

Nominal Values: 100 pF to $1.111 \mu\text{F}$ in steps of 100 pF.

Accuracy: $\pm(0.05\% + 0.05\text{pF})$ at 1 kHz, calibrated in the three-terminal connection. Two-terminal connection (capacitor inserted into Type 777-Q3 Adaptor) adds about 1.3 pF.

Stability: $\pm(0.01\% + 0.05\text{pF})$ per year.

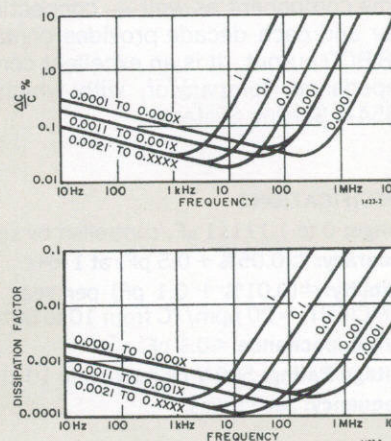
Certificate: A certificate is supplied certifying that each component capacitor was adjusted by comparison, to a precision better than $\pm 0.01\%$, with working standards whose absolute

National stock numbers are listed at the back of the catalog.

values are known to an accuracy typically $\pm 0.01\%$, determined and maintained in terms of reference standards periodically calibrated by the National Bureau of Standards.

Frequency: See curves for typical variation of capacitance and dissipation factor with frequency.

(Top) Change in capacitance as a function of frequency. These changes are referred to the values that the capacitors would have if there were neither interfacial polarization nor series inductance. The 1-kHz value on the plot should be used as a basis of reference in estimating frequency errors. (Bottom) Dissipation factor as a function of frequency.



Dissipation Factor: Not greater than 0.001, 0.0005, and 0.0003 for capacitances of 100 to 1000 pF, 1100 to 2000 pF, and 2100 pF to $1.111 \mu\text{F}$, respectively.

Temperature Coefficient of Capacitance: Approx $+20$ ppm per degree between 10° and 50°C .

Insulation Resistance: $> 5 \times 10^{10} \Omega$ to $0.1 \mu\text{F}$ and $> 5 \times 10^9 \Omega$ from $0.1 \mu\text{F}$ to $1.111 \mu\text{F}$.

Maximum Voltage: 500 V peak, up to 10 kHz.

Supplied: Two Type 777-Q3 Adaptors.

Mechanical: Rack-bench cabinet. DIMENSIONS (wxhxd): Bench, $19 \times 7.25 \times 10.5$ in. ($483 \times 184 \times 267$ mm); rack, $19 \times 7 \times 8.5$ in. ($483 \times 178 \times 216$ mm). WEIGHT: 26 lb (12 kg) net, 39 lb (18 kg) shipping.

Description

Catalog
Number

1423-A Precision Decade Capacitor
Bench Model
Rack Model

1423-9801
1423-9811