



# Wayne Kerr CORPORATION

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Innovations in Instrumentation ■ Measurement ■ Analysis ■ Synthesis ■ Control

## Conductivity & Permittivity Measurements

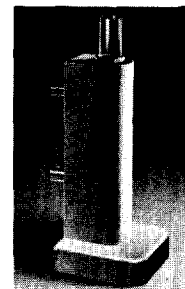


A Range of Chemical Cells Designed  
Primarily for Use with Wayne Kerr  
Bridges Type B221A, B641B or B331B

The three-terminal connection available from these Wayne Kerr cells permits accurate results to be obtained, even when extended lengths of connecting leads must be employed. Because the bridges can measure very small values of capacitance and conductance, it has been possible to design certain of these cells to use non-contacting electrodes. This technique eliminates problems of fouling, polarization, absorption and catalysis. With the recent introduction of Autobalance bridges it is now a simple matter to obtain a continuous record of changing conductivity or permittivity values.

The characteristics of many organic liquids can be difficult to evaluate in terms of conductivity when extremely low values are encountered. In such circumstances, permittivity is a more convenient parameter, with the valuable advantage that measured values are much less dependent on temperature.

**Liquid Conductivity Sampling Cell C121** This employs standard 6" x 5/8" soda-glass test-tubes (three are supplied), a vinyl collar ensuring consistency of location. The lower part of the moulding houses the voltage electrodes which are connected to the source side of the bridge. The upper part of the moulding contains the current electrodes, surrounded by a neutral shield to prevent hum pick-up on the detector side of the bridge. The column of liquid under investigation is capacitively coupled between the two sets of non-contacting electrodes. Full bridge accuracy can be realized over the range  $10^{-9}$  to  $10^{-4}$  mho-cm.



### Liquid Conductivity Flow Cell

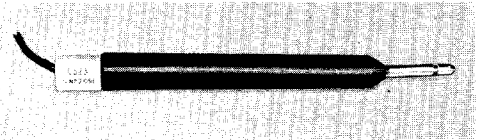
**C221** Basically identical to the C121, but in place of the test tube the C221 has a socket-ended air condenser type

C2/22 with a Quickfit and Quartz B19 cone. Although intended for measuring the conductivity of flowing liquids, it can be fitted with a B19 glass plug and mounted vertically for sampling tests. Holes in the metal mounting bar permit the two electrode assemblies to be spaced at 5, 10, 15, 20 or 25 cm. Measurement capability, dependent on the spacing adopted, is in the range  $10^{-10}$  to  $10^{-4}$  mho-cm.



**Platinum Electrode Cell C522B** This employs a pair of black platinum electrodes, arranged to give a cell-constant of approximately unity, and the cell is designed for suspension in not less than 50ml of liquid at temperatures of up to  $80^{\circ}\text{C}$ . A fitted cover is provided so that the electrode structure can be kept immersed in distilled water during all periods of non-use. The outside diameter of the cell is  $1\frac{1}{4}$  in. (3.2 cm) and the overall length is 6 in. (15 cm). The measurement range extends from  $10^{-6}$  to  $10^{-2}$  mho-cm.

**Needle Probe C523B** Designed primarily for insertion into pastes, creams or tissue, the active tip of this probe can also be immersed in very dilute solutions (up to N/1000 strength). The cell constant is  $0.5 \pm 1$  per cent and the safe maximum operating temperature is  $80^{\circ}\text{C}$ . A cap is supplied for protection of the tip during periods of non-use. Standard length of probe cable is 4 feet but this can be extended. The probe tip is  $\frac{1}{8}$  in. in diameter, 1 in. long and the handle is 0.4 in. in diameter,  $3\frac{5}{8}$  in. long.



### Micro Sampling Cell C524B

This employs a short length of capillary tube from each end of which platinum wires can be inserted by preset amounts. Measurements are

made by taking the difference of two readings. The cell is particularly valuable when only a small sample is available — the amount of liquid required is about 0.02 to 0.5ml, depending on the capillary tube in use. Provided the bore measurement is known, absolute values are obtained, without the need for any standardization procedure. The range is  $10^{-5}$  to  $10^{-1}$  mho-cm.



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