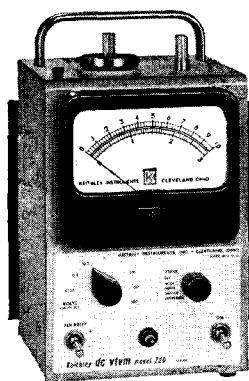


TRANSISTORIZED ELECTROMETER

combined preamplifier and dc vtvm has 10^{14} ohms input, 1 mv sensitivity

HIGH input impedance is only part of the story with the new Keithley Model 220. As a sensitive dc vtvm, it's especially convenient when measuring voltages of transistors, dc amplifiers and computers, as well as many electrochemical and biological tests. In its alternate role as a dc pre-amplifier, the 220 has gains of 0.05 to 167 with suitable outputs. Uses include recording the variations in piezo-electric and pH voltages; currents in photocells, vacuum tube grids and ion chambers; and other long-term monitoring functions.



**KEITHLEY
MODEL 220
DC VTVM**

LINE-OPERATED, the 220 has 8 voltage ranges from 30 millivolts to 100 volts full scale. With added accessories, the instrument measures voltages from 1 mv to 20 kv, currents from 10^{-3} to 5×10^{-14} ampere, resistances from 10^4 to 10^{16} ohms.

USEFUL FEATURES include a 5-volt unbalanced output for amplifiers and oscilloscopes, and a one-milliamper output for sensitive recorders; a polarity reversing switch; and zero drift below 3 mv/hr.

DETAILS about the Model 220 are given in Keithley Engineering Notes, Vol. 5 No. 2. A request on your company letterhead will bring a copy promptly.



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eter method. Spans as low as 10 mv. Limit of error 1%. Maximum source resistance 50K ohms or higher. Instrument Div., Varian Assoc., Palo Alto 4, Calif. **23A**

Refractometers. Complete data available on company's line of industrial refractometers cited as being accurate to 0.0001. Fast loading, reading, cleaning. No adjustments, no moving parts. Bausch & Lomb Optical Co., 60918 St. Paul St., Rochester 2, N. Y.

4th Cover

Refractometers. Detailed literature available on the Abbe refractometer. Range of measurements: nd 1.3 to nd 1.71 and sugar percentage scale 0% to 95%. For liquids and solids by transmitted and reflected light. Carl Zeiss, Inc., 485 Fifth Ave., N. Y. 17, N. Y. **89A-1**

Refractometers. Bulletin available on automatic, recording chromatographic refractometer. Where great differentials are encountered the exclusive range-extension system permits studying the indicator on scale without changing cells. Phoenix Precision Instrument Co., 3805 N. 5th St., Phila. 40, Pa. **86A-1**

Regulators, Voltage. Details available on company's distortion eliminating voltage regulator. Recovery time: 1/50th cycle, or 330 microseconds. Reduces typical power line distortion to less than 0.3%. Capacity is 1.4 KVA. Electronics Div., Curtiss-Wright Corp., Carlstadt, N. J. **86A-2**

Shakers. Bulletin available on variable speed shaker for general purpose agitation. Speeds between 60 and 260 oscillations per minute. Mechanical speed control performs on continuous duty without varying from speed selected. Eberbach Corp., Ann Arbor, Mich. **27A-1**

Spectrographs. 8-page catalog available on 3.4 meter convertible spectrograph. Instrument provides precision and sensitivity for analysis of ordinary materials as well as super-alloys, rare earths and transuranic materials. Jarrell-Ash Co., 33 Farwell St., Newtonville, Mass. **90A-2**

Spectrometers. With the "Tri-Carb" spectrometer up to 100 samples can be handled automatically, with the original data accurately and permanently recorded on paper tape. Packard Instrument Co., P. O. Box 528, LaGrange, Ill. **88A**

Spectrometers, N-M-R. Circle 7A for latest "Radio Frequency Spectroscopy

(Continued on page 66 A)

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