

TEK 500 kHz DUAL-TRACE OSCILLOSCOPE 200 SERIES MINISCOPES

212 Oscilloscope

TYPICAL APPLICATIONS

- Electromechanical Measurements
- Biomedical

FEATURES

- 500 kHz, 1 mV/Div to 50 V/Div
- Internal Battery Pack
- Integral 1 M Ω Probe
- Weighs \approx 1.6 kg (3.5 lb)

The 212 is lightweight (only 3.5 pounds), compact (3 \times 5.25 \times 9.5 inches), and built of impact-resistant plastic and fully self-contained. It permits "floating" measurements since it is double insulated, and can be elevated to 700 V (dc+peak ac) above ground when operated from batteries.

CHARACTERISTICS

VERTICAL SYSTEM

Bandwidth—DC to at least 500 kHz from 10 mV/div to 50 V/div, reducing to at least 100 kHz at 1 mV/div. Lower -3 dB point ac coupled is \approx 2 Hz.

Deflection Factors—1 mV/div to 50 V/div (1-2-5 sequence). Accuracy: \pm 5%. Uncalibrated: Continuously variable between steps to at least 125 V/div.

Display Modes—CH 1 only, CH 2 only, or CH 1 and CH 2 Chopped (chop rate \approx 50 kHz) from 500 ms/div to 2 ms/div of time base, alternate from 1 ms/div to 5 μ s/div of time base.

Input R and C— \approx 1 M Ω paralleled by \approx 160 pF from 1 mV/div to 50 mV/div; and 140 pF from 100 mV/div to 50 V/div.

Maximum Input Voltage*

1 to 50 mV/div	600 V (dc + peak ac), ac not over 2 kHz.
0.1 to 50 V/div	600 V (dc + peak ac), 600 V p-p ac 5 MHz or less

*1 1X probe only.

HORIZONTAL SYSTEM

Time Base—5 μ s/div to 500 ms/div \pm 5%.

Variable Magnifier—Increases each sweep rate X5 with a maximum sweep speed of 1 μ s/div.

External Horizontal Input—(CH 1) 1 mV/div to 50 V/div \pm 10%; dc to 100 kHz; X-Y phasing to 5 kHz <3 $^\circ$. Input characteristics same as CH 1.

Maximum External Horizontal Input Voltage and Impedance—Same as for vertical inputs.

TRIGGERING

Modes—Automatic or normal. Level and slope selected with a single control. Automatic operation minimizes trigger adjustment and provides a bright baseline with no input. In dual-channel operation at a setting of 1 mV/div, a bright baseline may not appear in the Auto Trigger Mode.

Trigger Sensitivity and Coupling

DC Coupling	To 500 Hz
Internal w/composite trigger source	0.2 div
Internal w/CH 2 trigger source	0.2 div
External	1 V

Maximum External Trigger Input Voltage—8 V (dc+peak ac), 16 V (p-p ac) at 500 kHz or less.

Input Impedance—R and C, 1 M Ω paralleled by \approx 30 pF.

CRT AND DISPLAY FEATURES

CRT—6 \times 10 div (0.52 cm/div) display. Standard phosphor: GH (P31).

Graticule—Internal, black line, nonilluminated.

OTHER CHARACTERISTICS

Insulation Voltage—500 V RMS or 700 V (dc + peak ac) when operated from internal batteries, with the line cord and plug stored. When operated from ac, line voltage plus floating voltage not to exceed 250 V RMS; or 1.4X line + (dc + peak ac) not to exceed 350 V.

Power Sources—Internal NiCad batteries provide \approx three to five hours operation for a charging and operating temperature between +20 and +30 $^\circ$ C. Internal charger charges the batteries when connected to an ac line with instrument turned off. Battery operation is automatically interrupted when battery voltage drops to \approx 10 V to protect batteries against deep discharge. Full recharge requires \approx 16 hours. Extended charge times will not damage the batteries. A pilot light battery-charge indicator light will extinguish when oscilloscope has about ten minutes of operating time remaining in the batteries.

POWER REQUIREMENTS

Line-Voltage Range—110 to 126 V ac. Can be operated at 104 to 110 V ac with resulting slow discharge of internal batteries. Option 01 is 220 to 250 V. Option 02 is 90 to 110 V.

Line Frequency—58 to 62 Hz. Options 01 and 02 are 48 to 52 Hz.

Maximum Power Consumption—3 W.

ENVIRONMENTAL

Ambient Temperature—See 221, page 190 for description.

Altitude—See 221, page 189 for description.

Vibration—See 221, page 190 for description.

Humidity—95%, five cycles (120 hours). Referenced to MIL-T-28800C, par 4.5.5.1.2.2.

Shock—See 221, page 190 for description.

PHYSICAL CHARACTERISTICS

Dimensions	mm	in.
Width	133	5.2
Height	76	3.0
Depth	241	9.5
Weight \approx	kg	lb
Net, w/o accessories	1.6	3.5
Shipping	3.2	7.0

ORDERING INFORMATION

212 Dual-Trace Oscilloscope
Includes: Integral probes, batteries, viewing hood (016-0199-01); carrying case (016-0512-00); two 4-A fuses (159-0121 00); identification tags (000-7983-00); identification tag (334-2614 00); carrying strap (346-0104-00); service manual (070-5053-00); operator manual (070-5052-00).

OPTIONS

Option 01—For 220 to 250 V (48 to 52 Hz).

Includes: Batteries.

Option 02—For 90 to 110 V (48 to 52 Hz).

Includes: Batteries.

OPTIONAL ACCESSORIES

10X Attenuator Package—Tip to provide lower circuit loading (4.4 M Ω , \approx 20 pF) and higher maximum input voltage 1000 V (dc + peak ac) includes: 10X attenuator (010-0378-01); pincher tip (013-0071-00); flex tip (206-0060-00); banana tip (134-0013-00); IC adapter (206-0203-00).

Order 010-0378-01

Alligator Clip Kit—See 221, page 190 optional accessories for description. Order 015-0231-00

Probe Tips—To BNC Adapters (Panel Connector) Order 013-0084-01 (Cable Adapter) Order 103-0096-00

Power Cable Adapter Assembly—See 221, page 90 optional accessories for description. Order 161-0077-01