



CATHODE-RAY TUBE	1338A (Color)	1304A	1310A	1311A	1317A	1321A
Viewing Area	≈9.6 x 11.9 cm (3.8 x 4.7 in.)	≈20 x 25 cm (7.9 x 9.8 in.)	≈28 x 38 cm (11 x 15 in.)	≈22 x 28 cm (8.5 x 11 in.)	≈26 x 34 cm (10.2 x 13.5 in.)	≈30.5 x 35 cm (12 x 14 in.)
Quality Area	≈8 x 10 cm (3.2 x 3.9)	≈20 x 25 cm (7.9 x 9.8 in.)	≈27.9 x 27.9 cm (11 x 11 in.)	≈21.6 x 21.6 cm (8.5 x 8.5 in.)	≈25.4 x 25.4 cm (10 x 10 in.)	≈30.5 x 30.5 cm (12 x 12 in.)
Spot Size (within quality area)	≤0.36 mm (0.014 in.)	≤0.5 mm (0.02 in.)	≤0.51 mm (0.02 in.)	≤0.38 mm (0.015 in.)	≤0.51 mm (0.02 in.)	≤0.51 mm (0.02 in.)
Resolution	28 lines/cm (70 lines/in.)	20 lines/cm (50 lines/in.)	19.7 lines/cm (50 lines/in.)	26.3 lines/cm (66.7 lines/in.)	19.7 lines/cm (50 lines/in.)	19.7 lines/cm (50 lines/in.)
Light Output (at 0.25 cm/μs, 60 Hz refresh)	Color Dependent	19.2 cd/m <sup>2</sup> (5.6 fl)	82.4 cd/m <sup>2</sup> (24 fl)	82.4 cd/m <sup>2</sup> (24 fl)	82.4 cd/m <sup>2</sup> (24 fl)	82.4 cd/m <sup>2</sup> (24 fl)

X & Y-AXES AMPLIFIERS	1338A	1304A	1310A	1311A	1317A	1321A
Deflection Factor Range	Internally Adjustable, ≈0.9 V to 2.5 V for full deflection	80-120 mV/div, 1 div = 20 mm (0.8 in.)	(Vertical) 35.80-60.9 mV/cm, 90-153 mV/in. (Horizontal) 26.2-45.9 mV/cm, 67-117 mV/in.	(Vertical) 46.3-81 mV/cm, 118-207 mV/in. (Horizontal) 35.8-60.9 mV/cm, 90-153 mV/in.	39-69 mV/cm, 100-175 mV/in.	33-58 mV/cm, 83-147 mV/in.
Settling Time	(Large and small step) ≤300 ns	(Large and small step) ≤300 ns	(Large step) ≤500 ns (Small step) ≤200 ns	(Large step) ≤500 ns (Small step) ≤200 ns	(Large step) ≤1 μs (Small step) ≤200 ns	(Large step) ≤500 ns (Small step) ≤200 ns
Linear Writing Speed	≥25 cm/μs (≥10 in./μs)	≥25 cm/μs (≥10 in./μs)	≥25 cm/μs (≥10 in./μs)	≥25 cm/μs (≥10 in./μs)	≥25 cm/μs (≥10 in./μs)	≥25 cm/μs (≥10 in./μs)
Repeatability error	Not Specified	<0.15%	<0.15%	<0.15%	<0.15%	<0.15%
Linearity	≤2%	≤3%	≤1%	≤1%	≤3%	≤1%
Dynamic Range	Up to 1/2 screen diameter offscreen in any direction					
Drift	≤2.5 mm in 24 hours					

Z-AXIS AMPLIFIER	1338A	1304A	1310A	1311A	1317A	1321A
Blanking Range	Internally adjustable from 1 V to 2.5 V p-p.					
Rise Time	≤30 ns	≤25 ns	≤20 ns	≤20 ns	≤20 ns	≤20 ns
X, Y, Z INPUTS	Differential, separate BNC's	Differential, separate BNC's	Single-ended BNC	Single-ended BNC	Single-ended BNC	Single-ended BNC
Input RC	≈100 Ω, ≈70 pF or 50 Ω	>100 kΩ, ≤65 pF (50 Ω selectable)	(X, Y inputs) ≈10 kΩ, ≈40 pF (Z input) ≈10 kΩ, ≈60 pF	(X, Y inputs) ≈10 kΩ, ≈40 pF (Z input) ≈10 kΩ, ≈60 pF	(X, Y inputs) ≈10 kΩ, ≈40 pF (Z input) ≈10 kΩ, ≈60 pF	(X, Y inputs) ≈10 kΩ, ≈40 pF (Z input) ≈10 kΩ, ≈60 pF
Maximum Input	(High Z) ±50 V (50 Ω) ±2.5 V	(High Z) ±50 V (50 Ω) ±2.5 V	(High Z) ±50 V (50 Ω) ±5 V	(High Z) ±50 V (50 Ω) ±5 V	(High Z) ±50 V (50 Ω) ±5 V	(High Z) ±50 V (50 Ω) ±5 V
TTL Blanking Input (rear panel BNC)	Standard	Optional	Standard	Standard	Standard	Standard
Primary Line Voltage	100, 120, 220, or 240 Vac +5%, -10%	100, 120, 220 or 240 Vac +5%, -20%	115 Vac ±10% or 230 Vac ±10%	115 Vac ±10% or 230 Vac ±10%	100, 120, 220 or 240 Vac +5%, -10%	100, 120, 220 or 240 Vac +5%, -10%
Maximum Power	≈100 W	≈85 W	≈100 W	≈100 W	≈100 W	≈110 W
UL Medical and Dental Listing	Not Available	Optional	Optional	Optional	Optional	Optional

Note: These are condensed specifications; refer to applicable data sheet for complete specifications, including options and accessories.

(0.38 mm, 0.015 in. for 1304A, 1338A), 5 to 55 Hz; 1 min./octave, 10 min. at each resonant frequency.

#### Common Specifications

##### Operating environment

**Temperature:** 0°C to 55°C (+32°F to +131°F), operating; -40°C to +70°C (-40°F to +158°F), non-operating.

**Humidity:** to 95% RH at +40°C (+104°F).

**Altitude:** to 4600 m (15 000 ft), operating; to 7600 m (25 000 ft), non operating (15 300 m, 50 197 ft for 1304A).

**Vibration:** 15 min. in each plane, 0.25 mm (0.010 in.) p-p excursions

#### Ordering Information

**1304A** 32 cm (13 in.) Display

**1310A** 48 cm (19 in.) Display

**1311A** 36 cm (14 in.) Display

**1317A** 43 cm (17 in.) Display

**1321A** 53 cm (21 in.) Display

**1338A** Tri-color Display

#### Price

\$2750

\$4200

\$3900

\$4100

\$4250

\$4750