



Model 2200 Series High-Voltage Amplifier Specifications

All specifications are with no load unless otherwise noted.

Parameters:	Model 2205	Model 2210	Model 2220
Output Voltage Range	0 to $\pm 500\text{V}$	0 to $\pm 1000\text{V}$	0 to $\pm 2000\text{V}$
Output Current Range	0 to $\pm 40\text{ mA DC}$ 0 to $\pm 80\text{ mA peak AC}$ (Better than 5 ms)	0 to $\pm 20\text{ mA DC}$ 0 to $\pm 40\text{ mA peak AC}$ (Better than 5 ms)	0 to $\pm 10\text{ mA DC}$ 0 to $\pm 20\text{ mA peak AC}$ (Better than 5 ms)
Input Voltage Range	0 to $\pm 10\text{ V DC}$ or peak AC	0 to $\pm 10\text{ V DC}$ or peak AC	0 to $\pm 10\text{ V DC}$ or peak AC
Input Impedance	10 k Ω , nominal	10 k Ω , nominal	10 k Ω , nominal
DC Voltage Gain (Accuracy)	50 V/V (Better than 0.5% of full scale)	100 V/V (Better than 0.5% of full scale)	200 V/V (Better than 0.5% of full scale)
Offset Voltage	Less than 1 V	Less than 1 V	Less than 1 V
Output Noise	Less than 25 mV rms (measured using the true rms feature of the Hewlett Packard Model 34401A digital multimeter).	Less than 30 mV rms (measured using the true rms feature of the Hewlett Packard Model 34401A digital multimeter).	Less than 50 mV rms (measured using the true rms feature of the Hewlett Packard Model 34401A digital multimeter).
Slew Rate (10% to 90%, typical)	Greater than 150 V/ μs	Greater than 150 V/ μs	Greater than 100 V/ μs
Large Signal Bandwidth (-3dB)*	DC to 75 kHz	DC to 40 kHz	DC to 7.5 kHz (minimum trip off frequency)
Small Signal Bandwidth (-3dB)	DC to 100 kHz	DC to 100 kHz	DC to 50 kHz
Settling Time to 1%	Less than 30 μs for a 0 to 500 V step	Less than 30 μs for a 0 to 1000 V step	Less than 50 μs for a 0 to 2000 V step
Stability			
Drift with Time	Less than 300 ppm/hr, noncumulative	Less than 300 ppm/hr, noncumulative	Less than 300 ppm/hr, noncumulative
Drift with Temp.	Less than 180 ppm/ $^{\circ}\text{C}$	Less than 180 ppm/ $^{\circ}\text{C}$	Less than 180 ppm/ $^{\circ}\text{C}$
Voltage Monitor			
Scale Factor	1/50th of the high-voltage output	1/100th of the high-voltage output	1/200th of the high-voltage output
DC Accuracy	Better than 0.5% of full scale	Better than 0.5% of full scale	Better than 0.5% of full scale
Offset Voltage	Less than 10 mV	Less than 10 mV	Less than 10 mV
Output Noise	Less than 5 mV rms (measured using the true rms feature of the Hewlett Packard Model 34401A digital multimeter).	Less than 5 mV rms (measured using the true rms feature of the Hewlett Packard Model 34401A digital multimeter).	Less than 5 mV rms (measured using the true rms feature of the Hewlett Packard Model 34401A digital multimeter).
Output Impedance	Less than 0.1 Ω	Less than 0.1 Ω	Less than 0.1 Ω
Current Monitor			
Scale Factor	0.1 V/mA	0.2 V/mA	0.4 V/mA
DC Accuracy	Better than 2% of full scale	Better than 2% of full scale	Better than 2% of full scale
Offset Voltage	Less than 10 mV	Less than 10 mV	Less than 10 mV
Output Noise	Less than 10 mV rms (measured using the true rms feature of the Hewlett Packard Model 34401A digital multimeter).	Less than 10 mV rms (measured using the true rms feature of the Hewlett Packard Model 34401A digital multimeter).	Less than 20 mV rms (measured using the true rms feature of the Hewlett Packard Model 34401A digital multimeter).
Output Impedance	Less than 0.1 Ω	Less than 0.1 Ω	Less than 0.1 Ω

*Large Signal Bandwidth, Square Wave Response and output noise are optimized using the "Response" adjustment on the front panel of the amplifier



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Parameters (cont.)	Model 2205	Model 2210	Model 2220
DC Offset Adjustment (Front Panel Meter)			
Range	0 to ±500V (switch selectable polarity)	0 to ±1000V (switch selectable polarity)	0 to ±2000V (switch selectable polarity)
Accuracy	Better than 1% of reading	Better than 1% of reading	Better than 1% of reading
Offset	2 counts maximum	2 counts maximum	2 counts maximum
Internal Capacitance (HV Output)	300 pF	300 pF	300 pF

GENERAL

Power Supply

Input Power

90 to 265 V AC, at 50/60 Hz line power.

Output Power

24 V DC, regulated at 1.75 A maximum.

Output Cable/Plug

Cable length T.B.D.

Operating Conditions

Temperature

0 °C to 40 °C.

Relative Humidity

To 85%, noncondensing.

Dimensions

Single Channel Instrument

85 mm H x 205 mm W x 325 mm D.
(3.3" H x 8.1" W x 12.8" D).

Weight

Single Channel Instrument

2 kg (4.4 lb).

High-Voltage Output Connector

SHV connector.

Amplifier Input

BNC connector.

Voltage Monitor

BNC connector.

Current Monitor

BNC connector.

Digital Enable Connector

BNC connector.

ACCESSORIES SUPPLIED

Operator's manual, SHV high-voltage cable assembly and external 24 VDC (±0.5 V) regulated power supply.

CERTIFICATION AND COMPLIANCE

Certification

TREK, INC. certifies that each Model 2200 series high-voltage amplifier is tested and calibrated to specifications using measurement equipment traceable to the National Institute of Standards and Technology or traceable to consensus standards.

Low Voltage Safety Compliance (EN 61010-1)

Installation Category

CAT II: Local-level mains, appliances, portable equipment.

Pollution Category

Degree 1: Operate in environments where no pollution occurs or only dry, nonconductive pollution occurs.



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