TREK 2200 SERIES

High voltage power amplifiers/piezo drivers with all-solid-state output stages, DC offset adjustment, and auto-recovery shutdown for overpower protection.

The Trek® 2200 series offers three high voltage 40 W amplifiers models. Provided at a competitive price and offering high performance, the units incorporate DC stability, wide bandwidth and well regulated/controlled AC output signals. It also features full four-quadrant class AB all-solid-state output stages, DC offset adjustment with front panel metering, and auto-recovery shutdown to protect the output from being overpowered. The instrument sinks or sources current into reactive or resistive loads throughout the output voltage range making it ideal to achieve the accurate output response and high slew rates demanded by reactive loads.

AT A GLANCE

Output Voltage Ranges

±500 V, ±1 kV, ±2 kV

Output Current Ranges

±80 mA, ±40 mA, ±20 mA peak AC

Large Signal Bandwidth (-3 dB)

75 kHz, 40 kHz, 7.5 kHz

PRODUCT HIGHLIGHTS

- Four-quadrant output for driving capacitive loads
- DC offset adjustment with front panel metering
- Auto-recovery shutdown protects the output from being overpowered
- Low output noise for ultra-accurate outputs
- All solid-state output stages
- HALT Tested
- NIST-traceable Certificate of Calibration provided with each unit

TYPICAL APPLICATIONS

- Piezoelectric driving/control
- Electro-optic
- MEMS
- Research

TECHNICAL DATA

Performance Specifications			
	2205	2210	2220
Output Voltage Range	0 to ±500 VDC or peak AC	0 to ±1 kVDC or peak AC	0 to ±2 kVDC or peak AC
Output Current Range	0 to ±40 mA DC or ±80 mA peak for 5 ms minimum	0 to ±20 mA DC or ±40 mA peak for 5 ms minimum	0 to ±10 mA DC or ±20 mA peak for 5 ms minimum
Input Voltage Range	0 to ±10 VDC or peak AC		
Input Impedance	10 kΩ, nominal		
DC Voltage Gain	50 V/V	100 V/V	200 V/V
DC Voltage Gain Accuracy	Better than 0.5% of full scale		
DC Offset Voltage	Less than 1 V		
Output Noise	Less than 25 mV rms[1]	Less than 30 mV rms[1]	Less than 50 mV rms[1]
Slew Rate (10% to 90%)	Greater than 150 V/µs	Greater than 150 V/µs	Greater than 100 V/µs
Small Signal Bandwidth (-3dB)	DC to greater 100 kHz	DC to greater than 100 kHz	DC to greater than 50 kHz
Large Signal Bandwidth (-3dB)	DC to greater than 75 kHz	DC to greater than 40 kHz	DC to greater than 7.5 kHz
Settling Time to 1%	Less than 30 µs for 0 to 500 V step	Less than 30 µs for 0 to 1 kV step	Less than 50 µs for 0 to 2 kV step
Internal Capacitance	300 pF (HV Output)		
Automatic Power Limit	Limits internal power dissipation for protection from overheating		
Stability	Drift with Time: Less than 300 ppm/hr, noncumulative		
	Drift with Temp: Less than 180 ppm/°C		

Voltage Monitor Specifications			
Ratio	1/50th of the high voltage output	1/100th of the high voltage output	-
Noise	5 mV rms		
DC Accuracy	Better than 0.5% of full scale		

Current Monitor Specifications			
Ratio	0.1 V/mA	0.2 V/mA	0.4 V/mA
Noise	10 mV rms	-	-
DC Accuracy	Better than 2% of full scale		

Mechanical Specifications	
Dimensions (H x W x D)	85 x 205 x 325 mm (3.3 x 8.1 x12.8 in)
Weight	2 kg (4.4 lb)
HV Connector	SHV Connector
BNC Connectors	Amplifier Input, Voltage Monitor, Current Monitor, Digital Enable

Electrical Specifications	
Line Voltage	90 to 265 VAC, at 50/60 Hz
Output Power	24 VDC, regulated at 1.75A maximum
HV Cable	3 m, 30.8 pF per foot

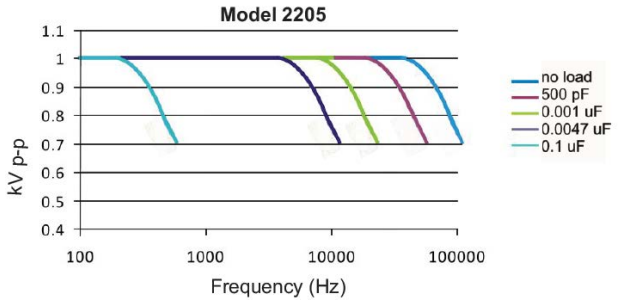
[1] Measured using the true rms feature of the Hewlett Packard Model 34401A digital multimeter
[2] The output cable supplied with this instrument uses a coaxial cable that has 30.8 pF/ft of capacitance at 1 kHz nominal. This cable capacitance must be factored in as a portion of the load and will reduce slew rates and large signal bandwidth. In applications that require maximum performance it is suggested that the supplied high voltage coaxial cable be kept as short as possible to reduce capacitance. Another option is to cut the coaxial cable short and add two break out leads (one for shield [ground] and one for the center conductor) for the connection to load.

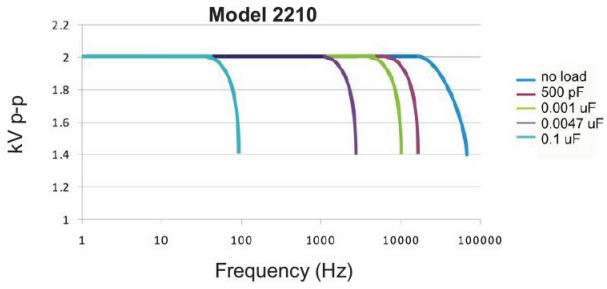
TECHNICAL DATA

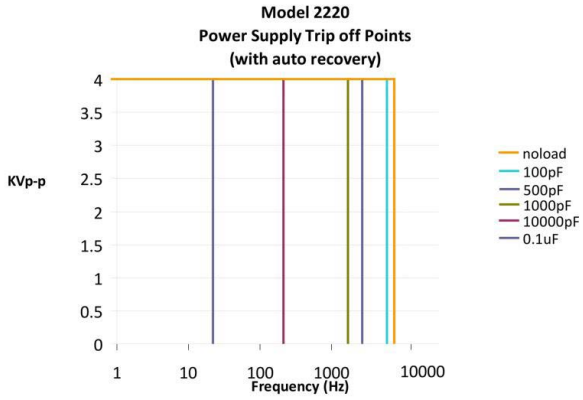
Environmental Specifications		
Temperature	0 to 40°C (32 to 104°F)	
Relative Humidity	To 85%, noncondensing	
Altitude	To 2000 meters (6561.68 ft)	

Features		
Digital Enable (2205, 2220)	A BNC connection for a TTL compatible signal to turn ON/OFF the high voltage output is provided. TTL high (or open) turns off the HV output; TTL low turns on the HV output.	
Response	A graduated one-turn panel potentiometer is used to optimize the AC response for various load parameters.	
High Voltage LED	Front panel red LED illuminates when the high voltage is on.	
DC Offset Adjustment (2205)	Range	0 to ±500 V (switch selectable polarity)
	Accuracy	Better than 1% of reading
	Offset	2 counts maximum

AMPLITUDE VS FREQUENCY GRAPHS







REFERENCE NUMBERS

Included Accessories	
PN	**Description**
TK-23445, TK-23446, or TK-23447	Operator's Manual
TK-F5058R	AC Adapter
TK-43874R	HV Cable with SHV Mating Connector

ABOUT ADVANCED ENERGY

Since 1981, Advanced Energy (AE) — and its UltraVolt® and Trek® product families — have perfected how power performs for its customers. For both end users and OEMs, AE's comprehensive portfolio of standard and custom high voltage components precisely match system specifications to deliver unparalleled energy, quality, and performance. Through close customer collaboration, design expertise, application insight, and world-class support, AE creates successful partnerships and enables customers to push the boundaries of innovation and stay ahead of evolving market needs.

PRECISION | POWER | PERFORMANCE | TRUST

CAUTION:
High Voltage

Read and understand all documentation before you install, operate, or maintain Advanced Energy high voltage power supplies. Follow all safety instructions and precautions to protect against property damage and serious or possibly fatal bodily injury. Never defeat safety interlocks or grounds.

Advanced Energy

For international contact information,
visit advancedenergy.com.

powersales@aei.com (Sales Support)
productsupport.ep@aei.com (Technical Support)
+1 888 412 7832