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Advanced Energy

TREK 609B-3

High voltage power amplifier for industrial and research applications that features an all solid-state design for a high slew rate, wide bandwith, and low-noise operation.

The Trek® 609B-3 is a DC-stable high voltage power amplifier. The four-quadrant, active output stage sinks or sources current into reactive or resistive loads throughout the output voltage range. This output is essential to achieve an accurate output response and high slew rate demanded by a highly capacitive or reactive loads. It is configured as a non-inverting amplifier, an inverting amplifier, or as a differential amplifier. Different input configurations can be wired into the unit.

PRODUCT HIGHLIGHTS

- Four-quadrant output for driving capacitive loads
- Closed loop system for high accuracy
- Short-circuit protected for equipment protection
- DC-stable for programmable supply applications
- Low output noise for ultra-accurate outputs
- NIST-traceable Certificate of Calibration provided with each unit

TYPICAL APPLICATIONS

- AC or DC biasing
- Atmospheric plasma
- Dielectric barrier discharge
- Electroactive polymers (EAP)
- Electrophoresis, electrophotography
- Electrorheological fluids
- Electrostatic deflection
- Electro-optic modulation
- Ferroelectric material characterization
- Ion beam steering
- Mass spectrometers
- Material poling and particle accelerators

AT A GLANCE

Output Voltage Range

0 to ±10 kVDC or peak AC

Output Current Range

0 to ±2 m ADC or peak AC

Slew Rate

Greater than 30 V/µs

Large Signal Bandwidth

DC to greater than 400 Hz (1% distortion)

DC Voltage Gain

1000 V/V

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TECHNICAL DATA

Performance Specifications		
Output Voltage Range	0 to ±10 k VDC or peak AC	
Output Current Range	0 to ±2 m ADC or peak AC	
Input Voltage Range	0 to ±10 VDC or peak AC	
Input Impedance	Noninverting: 10 kΩ, nominal	Inverting: 20 kΩ, nominal
DC Voltage Gain	1000 V/V	
DC Voltage Gain Accuracy	Better than 0.1% of full scale	
DC Offset Voltage	Less than ±2 V	
Output Noise	Less than 50 mV rms[1]	
Slew Rate	Greater than 30 V/µs (10% to 90%, typical)	
Settling Time	Less than 700 µs for a 0-10 kV step	
Large Signal Bandwidth	DC to greater 400 Hz (1% distortion)	
Small Signal Bandwidth (-3dB)	DC to greater than 10 kHz	
Stability	Drift with Time: Less than 50 ppm/hr, noncumulative	Drift with Temp: Less than 200 ppm/°C

Voltage Monitor Specifications	
Ratio	1/1000th of the high-voltage output signal
DC Accuracy	Better than 0.1% of full scale
DC Offset Voltage	Less than ±5 mV
Output Noise	Less than 5 mV rms[1]
Output Impedance	47 Ω

Mechanical Specifications	
Dimensions (H x W x D)	149 x 434 x 370 mm (5.9 x 17 x 14.3 in)
Weight	11 kg (24 lb)
External Control Connector	Connections from customer supplied remote switching devices can turn ON and OFF the high voltage output and/or the AC power to the unit using a multi-pin connector on the rear of the unit

Electrical Specifications	
Line Voltage	Factory set for one of three ranges (specify when ordering): 100 VAC, 115 VAC or 230 VAC at 48 to 63 Hz

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

[1] Measured using the true rms feature of the HP Model 34401A digital multimeter

REFERENCE NUMBERS

High Voltage Power Amplifier	
PN	**Description**
609B-3-F	High Voltage Power Amplifier, 100 VAC
609B-3-G	High Voltage Power Amplifier, 115 VAC
609B-3-K	High Voltage Power Amplifier, 230 VAC

Included Accessories	
PN	**Description**
23353	Operators' Manual
43406	HV Output Cable
B1023 connector, B1042 hood, and B1062 socket	Input Mating Connector
B1024 connector, B1042 hood and B1064 pin	Remote Input Connector
N5002	Line Cord (100 V and 115 V operation)
Contact factory	Line Cord 230 VAC

Other Accessories	
PN	**Description**
43421	HV Output Cable (5 m)
43422	HV Output Cable (10 m)
43423	HV Output Cable (20 m)
607RA	19" Rack Mount Kit (with EIA hole spacing)
607RAJ	19" Rack Mount Kit (with JIS hole spacing)

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ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than four decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

AE's power solutions enable customer innovation in complex semiconductor and industrial thin film plasma manufacturing processes, demanding high and low voltage applications, and temperature-critical thermal processes.

With deep applications know-how and responsive service and support across the globe, AE builds collaborative partnerships to meet rapid technological developments, propel growth for its customers and power the future of technology.

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Advanced Energy

For international contact information, visit advancedenergy.com.

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

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ENG-HV-Amplifier-Trek-609B3-235-2.12.24