Trek Model 609B-3

High-Voltage Power Amplifier

The Model 609B-3 is a DC-stable, high-voltage power amplifier used in industrial and research applications. It features an all-solid-state design for high slew rate, wide bandwidth and low-noise operation. The four-quadrant, active output stage sinks or sources current into reactive or resistive loads throughout the output voltage range. This type of output is essential to achieve an accurate output response and high slew rate demanded by a variety of loads such as 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.

Key Specifications

- Output Voltage Range: 0 to ±10 kV DC or peak AC
- Output Current Range: 0 to ±2 mA DC or peak AC
- Slew Rate: Greater than 30 V/µs
- Large Signal Bandwidth (1% distortion): DC to greater than 400 Hz
- DC Voltage Gain: 1000 V/V

Typical Applications Include

- 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

Features and Benefits

- 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

TREK Has Joined Advanced Energy

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Model 609B-3 Specifications

Performance

Output Voltage Range	0 to ±10 kV DC or peak AC
Output Current Range	0 to ±2 mA DC or peak AC
Input Voltage Range	0 to ±10 V DC 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*
Slew Rate (10% to 90%, typical)	Greater than 30 V/µs
Settling Time	Less than 700 µs for a 0-10 kV step
Large Signal Bandwidth (1% distortion)	DC to greater 400 Hz
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

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*
Output Impedance	47 Ω

Features

High-Voltage Switch	Three-position switch to select ON, OFF or REMOTE
Power Switch	Three-position switch to select ON, OFF or REMOTE
Amplifier Input Programming	A noninverting, inverting or differential amplifier input signal can be wired into the AMP INPUT receptacle on the rear of the unit.

*Measured using the true rms feature of the HP Model 34401A digital multimeter

Mechanical

Dimensions	149 mm H x 434 mm W x 370 mm D (5.9" H x 17" W x 14.3" D)
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

Operating Conditions

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

Electrical

Line Voltage	Factory Set for one of three ranges: 100 V AC, 115 V AC or 230 V AC at 48 to 63 Hz (specify when ordering)

Ordering Information

High Voltage Power Amplifier	
100 V AC	PN: 609B-3-F-CE
115 V AC	PN: 609B-3-G-CE
230 V AC	PN: 609B-3-K-CE

Supplied Accessories

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

Optional Accessories

HV Output Cable	PN: 43421 (5m); 43422 (10 m); 43423 (20 m)
19" Rack Mount Kit	Model 607RA (with EIA hole spacing)
19" Rack Mount Kit	Model 607RAJ (with JIS hole spacing)

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