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

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
- CE compliant
### Model 609B-3 Specifications

#### Performance

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Voltage Range</td>
<td>0 to ±10 kV DC or peak AC</td>
</tr>
<tr>
<td>Output Current Range</td>
<td>0 to ±2 mA DC or peak AC</td>
</tr>
<tr>
<td>Input Voltage Range</td>
<td>0 to ±10 V DC or peak AC</td>
</tr>
<tr>
<td>Input Impedance</td>
<td></td>
</tr>
<tr>
<td>Noninverting</td>
<td>10 kΩ, nominal</td>
</tr>
<tr>
<td>Inverting</td>
<td>20 kΩ, nominal</td>
</tr>
<tr>
<td>DC Voltage Gain</td>
<td>1000 V/V</td>
</tr>
<tr>
<td>DC Voltage Gain Accuracy</td>
<td>Better than 0.1% of full scale</td>
</tr>
<tr>
<td>DC Offset Voltage</td>
<td>Less than ±2 V</td>
</tr>
<tr>
<td>Output Noise</td>
<td>Less than 50 mV rms*</td>
</tr>
<tr>
<td>Slew Rate (10% to 90%, typical)</td>
<td>Greater than 30 V/µs</td>
</tr>
<tr>
<td>Settling Time</td>
<td>Less than 700 µs for a 0-10 kV step</td>
</tr>
<tr>
<td>Large Signal Bandwidth (1% distortion)</td>
<td>DC to greater 400 Hz</td>
</tr>
<tr>
<td>Small Signal Bandwidth (-3dB)</td>
<td>DC to greater than 10 kHz</td>
</tr>
<tr>
<td>Stability</td>
<td></td>
</tr>
<tr>
<td>Drift with Time</td>
<td>Less than 50 ppm/hr, noncumulative</td>
</tr>
<tr>
<td>Drift with Temp</td>
<td>Less than 200 ppm/°C</td>
</tr>
</tbody>
</table>

#### 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.

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

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### 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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