The Model 10/40A 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.

Key Specifications

- Output Voltage Range: 0 to ±10 kV DC or peak AC
- Output Current Range: 0 to ±40 mA DC or peak AC
- Slew Rate: Greater than 750 V/µs
- Large Signal Bandwidth (-3 dB): DC to greater than 23 kHz, typical
- DC Voltage Gain: 1000 V/V

Typical Applications Include

- Electrostatic deflection
- Electrophoresis
- Electro rheological fluids
- Electro-optic modulation
- Material poling
- AC or DC biasing
- Ion beam steering
- Particle accelerators
- Mass spectrometers
- Material characterization
- Ferroelectrics
- Atmospheric plasma
- Dielectric barrier discharge

Features and Benefits

- Four-quadrant output for driving capacitive loads
- Closed loop system for high accuracy
- Short-circuit protected for equipment protection
- All solid-state design for maintenance free operation
- DC-stable for programmable supply applications
- Low output noise for ultra-accurate outputs
- NIST-traceable Certificate of Calibration provided with each unit
- CE compliant (230 VAC unit only)
**Model 10/40A Specifications**

### Performance

- **Output Voltage Range**: 0 to ±10 kV DC or peak AC
- **Output Current Range**: 0 to ±40 mA DC or peak AC (must not exceed 40 mA rms, max)
- **Input Voltage Range**: 0 to ±10 V DC or peak AC
- **Input Impedance**: 25 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 5 V rms
- **Slew Rate**: Greater than 750 V/µs (10% to 90%, typical)
- **Small Signal Bandwidth (-3dB)**: DC to greater than 25 kHz
- **Large Signal Bandwidth (-3 dB)**: DC to greater than 23 kHz, typical
- **Large Signal Bandwidth (1% distortion)**: DC to greater than 7.5 kHz, typical
- **Stability**
  - **Drift with Time**: Less than 50 ppm/hr, noncumulative
  - **Drift with Temp**: Less than 100 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 ±2 mV
- **Output Noise**: Less than 10 mV rms
- **Output Impedance**: 47 Ω

### Current Monitor

- **Ratio**: 0.1 V/mA
- **DC Accuracy**: Greater than 1% of full scale
- **Offset Voltage**: Less than ±10 mV
- **Output Noise**: Less than 30 mV rms
- **Bandwidth (-3dB)**: DC to greater than 5 kHz
- **Output Impedance**: 47 Ω

### Features

- **High-Voltage On/Off**
  - **Local**: Individual push-button switch
  - **Remote (TTL compatible input)**: TTL high (or open) turns off high-voltage output. TTL low turns on high-voltage output

### Dynamic Adjustment

Graduated one-turn panel potentiometer is used to optimize the AC response for various load parameters.

### Current Limit/Trip

Switch selectable for either limit or trip. Graduated 1-turn panel potentiometer is used to adjust the limit or trip level from 0 to ±40 mA.

### Out of Regulation Status

Illuminates and a TTL low is provided when unit fails to produce required HV output such as during a current limit.

### Trip Status

An amber indicator will illuminate and a BNC will provide a TTL low when the high-voltage output is disabled due to the activation of the current trip or the removal of the top cover.

### Fault Status

A BNC will provide a TTL low when the Model 10/40A is out of regulation for greater than 500 ms

### Mechanical

- **Dimensions**: 279 mm H x 482 mm W x 654 mm D (11" H x 19" W x 25.75" D)
- **Weight**: 24.9 kg (55 lb)
- **HV Connector**: Alden High Voltage Connector
- **BNC Connectors**: Amplifier Input, Voltage Monitor, Current Monitor, Remote High Voltage On/Off, Out of Regulation Status, Limit/Trip Status

### 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 two ranges: 104 to 127 V AC or 180 to 250 V AC, either at 48 to 63 Hz
- **AC Line Receptacle**: Standard IEC 320 three-prong AC line connector
- **Power Consumption**: 1000 VA, maximum

### Supplied Accessories

- **Operators’ Manual**: PN: 23228
- **HV Output Cable**: PN: 43463
- **Line Cord, Spare**: PN: N5011. Selected per geographic destination
- **Fuses**: PN: N5011.

### Optional Accessories

- **HV Output Cable**: PN: 43463
- **19” Rack Mount Kit**: Model: 608RA (with EIA hole spacing)
  - Model: 608RAJ (with JIS hole spacing)

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