

Trek Model 10/10B-HS

High-Speed High-Voltage Power Amplifier



The Trek Model 10/10B-HS is a DC stable high-speed high-voltage power amplifier capable of precise control of output voltages. 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 is essential for monitoring the accurate output response and high slew rates when driving reactive loads.

Key Specifications

- Output Voltage Range: 0 to ± 10 kV DC or peak AC
- Output Current Range: 0 to ± 10 mA DC or 40 mA peak AC for 1 ms
- Slew Rate: Greater than 700 V/ μ s
- Large Signal Bandwidth (-3 dB): DC to greater than 19.5 kHz
- DC Voltage Gain: Fixed at 1000 V/V

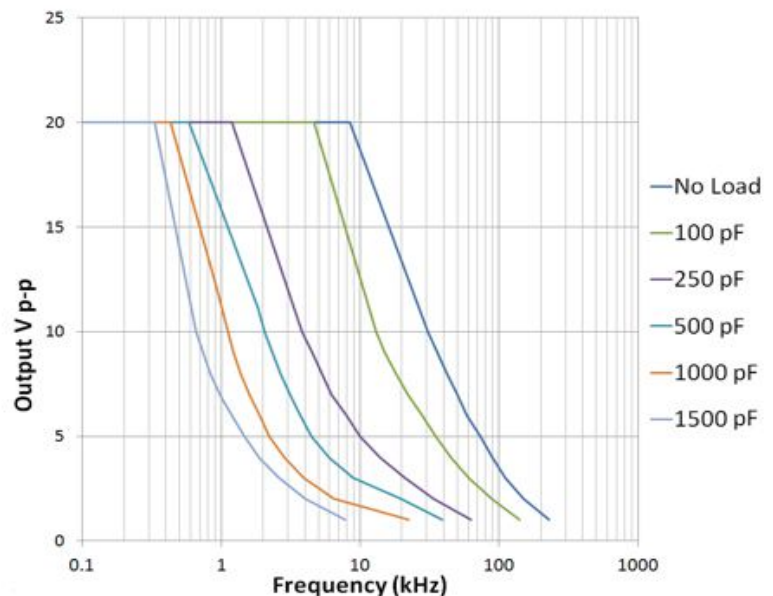
Typical Applications Include

- 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
- Electrophoresis, electrophotography
- Electrorheological fluids
- 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
- 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

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Model 10/10B-HS Specifications

Performance

Output Voltage Range	0 to ± 10 kV DC or peak AC
Output Current Range	0 to ± 10 mA DC or ± 40 mA peak for 1 ms
Input Voltage Range	0 to ± 10 V DC or peak AC
Input Impedance	20 k Ω , 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 0.5 V rms*
Slew Rate (10% to 90%, typical)	Greater than 700 V/ μ s
Small Signal Bandwidth (-3dB)	DC to greater than 60 kHz
Large Signal Bandwidth (-3 dB)	DC to greater than 19.5 kHz
Large Signal Bandwidth (1% distortion)	DC to greater than 9.5 kHz
Stability	
Drift with Time	Less than 100 ppm/hr, noncumulative
Drift with Temperature	Less than 100 ppm/ $^{\circ}$ C

Voltage Monitor

Ratio	1 V/1000 V
DC Accuracy	Better than 0.1% of full scale
DC Offset Voltage	Less than ± 3 mV
Output Noise	Less than 20 mV rms*
Output Impedance	47 Ω

Current Monitor

Ratio	1 V/4 mA
DC Accuracy	Greater than 1% of full scale
Offset Voltage	Less than ± 10 mV
Output Noise	Less than 50 mV rms*
Bandwidth (-3dB)	DC to greater than 10 kHz
Output Impedance	47 Ω

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

Features

High-Voltage On/Off	
Local	Individual push-button switches
Remote	TTL compatible input. TTL high (or open) turns off high-voltage output. TTL low turns on high-voltage output.
Dynamic Adjustment	Graduated 1-turn panel potentiometer is used to optimize the AC response for various load parameters.
Current Limit/Trip	Switch selectable for limit or trip. Graduated 1-turn panel potentiometer is used to adjust limit or trip level from 0 to ± 10 mA.
Out of Regulation Status Indicator and Connector	Illuminates and TTL low is provided when unit fails to produce required HV output such as during current limit.
Fault/Trip Status Indicator and Connector	Illuminates and a TTL low is provided when HV is disabled or when amplifier is out of regulation for more than 500 ms (in this instance, HV output is not disabled).

Mechanical

Dimensions	190 mm H x 432 mm W 417 mm D (7.5" H x 17" W x 16.4" D)
Weight	14.9 kg (31 lb)
HV Connector	Alden High Voltage Connector
BNC Connectors	Amplifier Input, Voltage Monitor, Current Monitor, Remote High Voltage ON/OFF, Out of Regulation Status, Fault/Trip Status

Operating Conditions

Temperature	0 $^{\circ}$ C to 40 $^{\circ}$ C (32 $^{\circ}$ F to 104 $^{\circ}$ F)
Relative Humidity	To 85%, noncondensing
Altitude	To 2000 meters (6561.68 ft.)

Electrical

Line Voltage	Factory Set for one of two ranges: 90 to 127 V AC or 180 to 250 V AC, either at 48 to 63 Hz
AC Line Receptacle	Standard 3-prong with integral fuse holder
Power Consumption	680 VA, maximum

Supplied Accessories

Operators' Manual	PN: 23442
HV Output Cable	PN: 43406
Line Cord, Spare Fuses	Selected per geographic destination

Optional Accessories

HV Output Cable Assembly	PN: 43421 (5 m), PN: 43422 (10 m), PN: 43423 (20 m)
19" Rack Mount Kit	Model: 608RA (with EIA hole spacing) Model: 608RAJ (with JIS hole spacing)

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