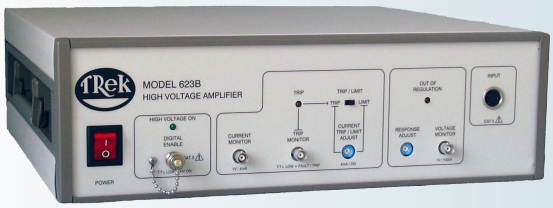
Trek Model 623B

High-Voltage Power Amplifier



The Model 623B is a DC-stable, high-voltage power amplifier designed to provide precise control of bi-polar output voltages. It features an all-solid-state design for high slew rate, low-noise operation and a wide bandwidth of DC to greater than 10 kHz .

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.

Key Specifications

- Output Voltage Range: 0 to ±2 kV DC or peak AC
- Output Current Range: 0 to ±40 mA DC or peak AC
- Slew Rate: Greater than 300 V/µs
- Large Signal Bandwidth (1% distortion): DC to greater than 10 kHz
- DC Voltage Gain (Noninverting Configuration): 1000 V/V (V_A)
- DC Voltage Gain (Inverting Configuration) : -1000 V/V (V_B)
- Differential Configuration: Function of the difference between two input signals. Represented by the equation: $V_{out} = 1000 (V_A - V_B)$

Typical Applications Include

- Electrostatic beam deflection
- Electrooptic modulation
- Electrophoresis research
- Piezoelectric poling and driving

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

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Model 623B Specifications

Performance

Output Voltage	0 to ±2 kV DC or peak AC
Output Current	0 to ±40 mA DC or peak AC
Input Voltage Range	0 to ±2 V DC or peak AC
Input Impedance	
Noninverting	25 kΩ, nominal
Inverting	50 kΩ, nominal
Differential	50 kΩ, nominal
DC Voltage Gain	1000 V/V
Noninverting (V_A) Configuration	1000 V/V
Inverting (V_B) Configuration	-1000 V/V
Differential Configuration	Function of the difference between two input signals. Represented by the equation: $V_{OUT} = 1000 (V_A - V_B)$
DC Voltage Gain Accuracy	Better than 0.1% of full scale
DC Offset Voltage	Less than ±1 V
Output Noise	Less than 80 mV rms*
Slew Rate (10% to 90%, typical)	Greater than 300 V/µs
Settling Time (to 1%)	Less than 150 µs for a 2 kV step
Large Signal Bandwidth (1% distortion)	DC to greater 10 kHz
Small Signal Bandwidth (-3dB)	DC to greater than 40 kHz
Stability	
Drift with Time	Less than 100 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 ±2.5 mV
Output Noise	Less than 2 mV rms*
Output Impedance	0.1 Ω

Current Monitor

Ratio	0.25 V/mA
DC Accuracy	Better than 5% of full scale
Offset Voltage	Less than ±5 mV
Output Noise	Less than 10 mV*
Small Signal Bandwidth (-3 dB)	DC to greater than 10 kHz
Output Impedance	47 Ω

Features

High Voltage On/Off	
Local	Individual push-button switches
Remote	TTL high turns OFF the high voltage; TTL low turns on the high voltage
Dynamics Adjustments	Graduated 1-turn potentiometer used to optimize the AC response for various load parameters
Current Limit/Trip	Switch selectable for limit or trip. Graduated 1-turn potentiometer adjusts from 0 to 40 mA
Out of Regulation	LED illuminates and BNC provides a TTL low when Model 623B fails to produce HV output such as during a current limit
Trip Status	LED illuminates and BNC provides a TTL low when HV is disabled due to the output current exceeding the current trip level, a high voltage fault is detected or the top cover is removed

Mechanical

Dimensions	134 mm H x 432 mm W x 439 mm D (5.25” H x 17” W x 17.25” D)
Weight	13.2 kg (29 lb)
HV Connector	Alden High Voltage Connector
BNC Connectors	Voltage monitor, current monitor, remote HV ON/OFF, out of regulation, fault/trip status
Amplifier Input	3-pin connector may be configured for inverting, noninverting or differential amplification

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: 90 to 127 V AC or 180 to 250 V AC, either at 48 to 63 Hz
Power Consumption	220 VA, maximum

Supplied Accessories

Operator’s Manual	PN: 23185
HV Output Cable	PN: 43406
Input Cable Connector Assembly	PN: 43418
Line Cord (90 V to 127 V operation)	PN: N5011
Line Cord 230 V AC	Contact factory

Optional Accessories

HV Output Cable	PN: 43406
19” Rack Mount Kit	Model 607RA (with EIA hole spacing) Model 607RAJ (with JIS hole spacing)

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