



TREK 610E

High voltage power supply/amplifier/controller that provides six modes of high-voltage operation.



The Trek® 610E provides six modes of high voltage operation. As a high voltage amplifier, the Trek 610E amplifies an externally applied signal with a switch-selectable setting of 100 V/V or 1000 V/V. As a high voltage reference supply, a front panel dial commands the output voltage. As a transconductance amplifier, an externally applied voltage signal produces a proportional output current. As a current supply, a front-panel dial commands the output currents. As a high voltage controller, the high voltage amplifier mode is maintained but the amplifier input and feedback elements are uncommitted and configured by the user.

PRODUCT HIGHLIGHTS

- Multi-mode operation for enhanced utility
- 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

TYPICAL APPLICATIONS

- Closed-loop charge control
- Electrophotographic research
- Insulation testing
- Dielectric material evaluation
- AC or DC calibrators and supplies

AT A GLANCE

Output Voltage Range

0 to ± 1 kV or 0 to ± 10 kV

Output Current Range

0 to ± 200 μ A or 0 to ± 2000 μ A
peak AC

Slew Rate

Greater than 35 V/ μ s

Large Signal Bandwidth (-3 dB)

DC to greater than 1.2 kHz

Voltage Gain

1 kV range: 100 V/V
10 kV range: 1000 V/V

TREK 610E HIGH VOLTAGE POWER AMPLIFIER

TECHNICAL DATA

Performance Specifications			
Output Voltage Ranges	As a High Voltage Supply	0 to ± 1 kV or 0 to ± 10 kV; switch selectable/adjustable with potentiometer. Resolution of 1 kV range is 1 V, resolution of 10 kV range is 10 V	
	As a High Voltage Amplifier and Controller	0 to ± 1 kV or 0 to ± 10 kV DC or peak AC; switch selectable	
Output Current Ranges	As a Current Supply	0 to ± 200 μ A or 0 to ± 2000 μ A; switch selectable/ adjustable with potentiometer. Resolution of 200 μ A range is 0.2 μ A, resolution of 2000 μ A range is 2 μ A	
	As a Transconductance Amplifier and Controller	0 to ± 200 μ A or 0 to ± 2000 μ A DC or peak AC, switch selectable	
Input Voltage Ranges	As a High Voltage Amplifier and Controller	0 to ± 10 V DC or peak AC	
	As a Transconductance Amplifier and Controller	0 to ± 10 V DC or peak AC	
Gain and Accuracy	As a High Voltage Amplifier and Controller	Gain	1 kV range: 100 V/V 10 kV range: 1000 V/V
		Accuracy	Better than 0.3% of full scale (controller mode is dependent on user-specified components)
	As a Transconductance Amplifier and Controller	Gain	200 μ A range: 20 μ A/V 2000 μ A range: 200 μ A/V
		Accuracy	Better than 0.3% of full scale, typical and 1% full scale, max (controller mode is dependent on user-specified components)
Compliance	Voltage Range	Adjustable range 0 to ± 10 kV DC (or peak AC) using the potentiometer	
	Current Range	Adjustable range 0 to ± 2 mA DC (or peak AC) using the potentiometer	

Performance Specifications (When Used as a High Voltage Amplifier and Controller)	
DC Offset Voltage	Less than 2 V
Output Noise	Less than 700 mV rms (measured with a 20 kHz true rms meter)
Slew Rate	Greater than 35 V/ μ s (10% to 90%, typical)
Large Signal Bandwidth	DC to greater than 600 Hz (1% Distortion)
	DC to greater than 1.2 kHz
Small Signal Bandwidth	DC to 10 kHz (-3dB)
Settling Time to 1%	Less than 1 ms for a 0 to 10 kV step

Voltage Monitor Specifications	
Scale Factor	1/1000th of the output voltage
DC Scale Accuracy	Better than 0.1% FS as referred to the high-voltage output
Offset Voltage	Less than ± 2.5 mV
Noise	Less than 20 mV p-p
Output Impedance	47 Ω , nominal

Current Monitor Specifications	
Scale Factor	1 V/200 μ A
DC Scale Accuracy	Better than 0.1% FS as referred to the high voltage output
Offset Voltage	Less than 10 mV
Noise	Less than 30 mV p-p
Output Impedance	1 k Ω , nominal

TECHNICAL DATA

Mechanical Specifications

Dimensions (H x W x D)	140 x 432 x 374 mm (5.5 x 17 x 15 in)	
Weight	10.6 kg (23.5 lb)	
HV Control	Three-position switch: On, Off, Remote	
Mode Control	Three-position switch: Supply, Amplifier, Controller	
Supply Mode Voltage Control	Range Select	Two-position switch: 0 to ± 1 kV to 0 to ± 10 kV
	Output Select	Precision potentiometer with graduated dial
	Polarity Select	Three-position switch: Positive, Negative, Off

Electrical Specifications

Line Voltage	Factory Set for one of four nominal voltages: 100 V, 120 V, 230 V at 48 to 63 Hz
AC Receptacle	Standard three-prong
Power Consumption	220 VA, maximum

Environmental Specifications

Temperature	0 to 40°C (32 to 104°F)
Relative Humidity	To 85%, noncondensing

Features

Input Config Programming	May be configured for inverting, non-inverting, or differential	
High-Voltage On/Off	Local: Individual push-button switch	Remote: TTL high (or open) turns off the HV output; TTL low turns on the HV output
Compliance Level Selection	Precision potentiometer is used to set the current limit when operating in the voltage mode or to set a voltage limit when operating in the current mode	
Compliance Indicator	LED illuminates in a compliance limit condition	
Compliance Limit	Current mode is adjustable to within 20 V of the output voltage. Voltage mode is adjustable to within 0.5 μ A of the output current	

REFERENCE NUMBERS

Included Accessories

PN	Description
23291	Operator's Manual
43406	HV Output Cable
Varies	Line Cord, Fuses (selected per geographic area)

Other Accessories

PN	Description
43421	HV Output Cable, 5 m
43422	HV Output Cable, 10 m
43423	HV Output Cable, 20 m
607RA	19 in Rack Mount Kit (with EIA hole spacing)
607RAJ	19 in Rack Mount Kit (with JIS hole spacing)



ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

Our products enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing, and medical. With deep applications know-how and responsive service and support across the globe, we build collaborative partnerships to meet rapid technological developments, propel growth for our customers, and innovate the future of power.

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