Advanced Energy

TREK 677B

High voltage power amplifier/supply designed to provide precise control of output voltages using an all-solid-state design for wide bandwidth, high slew rate, and low-noise.

The Trek® 677B is a high voltage power amplifier/supply that can operate one of two modes: as a high voltage amplifier when it is configured as a non-inverting amplifier with a fixed gain or as high voltage power supply that responds to front panel controls to command exact output voltage or current. 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.

PRODUCT HIGHLIGHTS

- Operable as a high voltage amplifier (in a non-inverting configuration) or as a high voltage power supply
- 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

TYPICAL APPLICATIONS

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

AT A GLANCE

Output Voltage Range

0 to ±2 kV DC or peak AC

Output Current Range

0 to ±5 mA DC or peak AC

Slew Rate

Greater than 15 V/µs

Large Signal Bandwidth (-3 dB)

DC to greater than 1.2 kHz

DC Voltage Gain

200 V/V

TREK 677B HIGH VOLTAGE POWER AMPLIFIER

TECHNICAL DATA

Performance Specifications		
Output Voltage Range	0 to ±2 kV DC or peak AC	
Output Current Range	0 to ±5 mA DC or peak AC	
Input Voltage Range	0 to ±10 VDC or peak AC	
Input Impedance	10 kΩ, nominal	
DC Voltage Gain	200 V/V	
DC Voltage Gain Accuracy	Better than 0.1% of full scale	
DC Offset Voltage	Less than ±5 V	
Output Noise	Less than 100 mV rms[1]	
Slew Rate	Greater than 15 V/µs (10% to 90%, typical)	
Settling Time	Less than 300 µs for a 2 kV step	
Large Signal Bandwidth	DC to greater 1.2 kHz (1% Distortion)	
Small Signal Bandwidth	DC to greater than 5 kHz (-3dB)	
Stability	Drift with Time	Less than 100 ppm/hr, noncumulative
	Drift with Temp	Less than 350 ppm/°C

Voltage Monitor Specifications	
Ratio	1/200th of the high voltage output signal
DC Accuracy	Better than 0.1% of full scale (May degrade to 0.6% in the presence of RF fields up to 3 V/m)
DC Offset Voltage	Less than 5 mV
Output Noise	Less than 10 mV rms[1]
Output Impedance	0.1 Ω

Current Monitor Specifications	
Ratio	1 V/mA
DC Accuracy	Better than 1% of full scale
DC Offset Voltage	Less than 5 mV
Output Noise	Less than 10 mV[1]
Bandwidth	DC to greater than 800 Hz (-3 dB)
Output Impedance	0.1 Ω

Mechanical Specifications	
Dimensions (H x W x D)	110 x 223 x 432 mm (4.3 x 8.7 x 17 in)
Weight	4 kg (9 lb)
Mode Switch	Selects either Amplifier or Supply operation
HV Connector	Alden High Voltage Connector
BNC Connectors	Voltage monitor, Current Monitor, Digital Enable, Amplifier Input
Amplifier Input	Three-pin connector may be configured for inverting, non-inverting or differential amplification

Electrical Specifications	
Line Voltage	Factory set for one of three ranges (specify when ordering): 100 VAC, 115 VAC or 230 VAC at 48 to 63 Hz
Power Consumption	220 VA, maximum

[1] Measured using the true rms feature of the HP Model 34401A digital multimeter

TECHNICAL DATA

Environmental Specifications	
Temperature	0 to 40°C (32 to 104°F)
Relative Humidity	To 85%, noncondensing
Altitude	To 2000 meters (6561.68 ft.)

Features		
Digital Enable	An open collector, TTL compatible input to turn on and off the high voltage when the High Voltage switch is in the Remote position.	
High Voltage On/Off	A three-position rocker switch to select ON, OFF, or REMOTE.	
Current Limit	Adjustable from 0 to ±5 mA. A multiturn control is used to set the current limit as indicated by the digital display. An amber LED will illuminate when the instrument is in a current limit condition.	
Current Limit Set Accuracy	Better than 1% of setting.	
Supply Mode Voltage Control	Voltage Selection	A multiturn control to set the desired output voltage as indicated by the digital display.
	Polarity	A two-position rocker switch.

REFERENCE NUMBERS

Included Accessories	
PN	**Description**
23113	Operator's Manual
43406	HV Output Cable, 3 m (other lengths available)
43418	Input Cable Connector Assembly
H0050	Fuse, 90 to 127 VAC
H0049	Fuse, 180 to 250 VAC
N5002	Line Cord, 90 to 127 V operational
Contact Factory	Line Cord 230 VAC

Other Accessories	
PN	**Description**
43421	HV Output Cable, 5 m length
603RA	19 in Rack Mount Kit, Full Rack Mounting Kit
603RA-2	19 in Rack Mount Kit, Dual Instrument Full Rack Kit
604RA	19 in Rack Mount Kit, Metric Rack Mounting Kit

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.

PRECISION | POWER | PERFORMANCE

Advanced Energy

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