

## TREK 5/80

High voltage power amplifier with an all-solid-state design for high slew rate, wide bandwidth, and low noise operation for use in industrial and research applications.



The Trek® 5/80 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.

### PRODUCT HIGHLIGHTS

- 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

- 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
- Material poling and particle accelerators

### AT A GLANCE

#### Output Voltage Range

0 to  $\pm 5$  kVDC or peak AC

#### Output Current Range

0 to  $\pm 80$  mADC or peak AC

#### Slew Rate

Greater than 1000 V/ $\mu$ s

#### Large Signal Bandwidth (-3 dB)

DC to greater than 60 kHz

#### DC Voltage Gain

Fixed at 1000 V/V

**TECHNICAL DATA**

Performance Specifications		
Output Voltage Range	0 to ±5 k VDC or peak AC	
Output Current Range	0 to ±80 mA DC or peak AC	
Input Voltage Range	0 to ±5 VDC or peak AC	
Input Impedance	10 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 1.0 V rms <sup>1</sup>	
Slew Rate	Greater than 1000 V/μs (10% to 90%, typical)	
Small Signal Bandwidth	DC to greater 75 Hz (-3dB)	
Large Signal Bandwidth	DC to greater than 60 kHz, typical (-3dB)	DC to greater than 50 kHz (3% distortion)
Stability	Drift with Time: Less than 50 ppm/hr, noncumulative	Drift with Temp: Less than 200 ppm/°C

  

Voltage Monitor Specifications	
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 <sup>1</sup>
Output Impedance	47 Ω

  

Current Monitor Specifications	
Ratio	0.1 V/mA
DC Accuracy	Better than 1% of full scale
Offset Voltage	Less than ±10 mV
Output Noise	Less than 30 mV rms <sup>1</sup>
Bandwidth (-3dB)	DC to greater than 10 kHz
Output Impedance	47 Ω

  

Mechanical Specifications	
Dimensions (H x W x D)	279 x 482 x 654 mm (11 x 19 x 25.75 in)
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

  

Electrical Specifications	
Line Voltage	Factory set for one of two ranges: 104 to 127 VAC or 180 to 250 VAC, either at 48 to 63 Hz
AC Line Receptacle	Standard IEC 320 three-prong AC line connector
Power Consumption	1000 VA, maximum

<sup>1</sup> 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**

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 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. A graduated 1-turn panel potentiometer is used to adjust limit or trip level from 0 to ±80 mA	
Out of Regulation	Indicator illuminates and BNC provides TTL low when the high voltage output fails to produce required HV output (e.g. during a current limit)	
Trip Status	Illuminates and a TTL low is provided when the high voltage output is disabled due to the output current exceeding the trip level, the detection of a high voltage supply fault for the removal of the top cover	
Fault Status	TTL low is provided when out of regulation for greater than 500 ms.	

**REFERENCE NUMBERS**

**Included Accessories**

PN	Description
23189	Operator's Manual
43406	HV Output Cable
N5011	Line Cord, Spare Fuses (selected per geographic destination)

**Optional Accessories**

PN	Description
43421	HV Output Cable, 5 m
43422	HV Output Cable, 10 m
43423	HV Output Cable, 20 m