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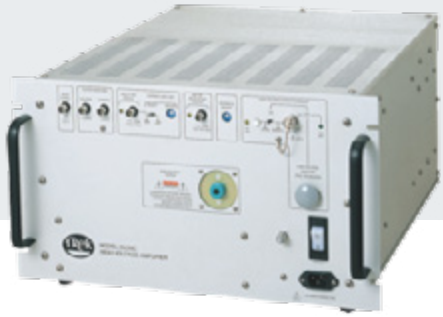
Advanced Energy

TREK 20/20C

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



The Trek® 20/20C 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

TYPICAL APPLICATIONS

- Electrostatic deflection
- Electrophoresis
- Electrorheological fluids
- Electro-optic modulation
- Material poling
- AC or DC biasing
- Ion beam steering
- Particle accelerators
- Mass spectrometers
- Material characterization
- Ferroelectrics
- Atmospheric plasma
- Dielectric barrier discharge

AT A GLANCE

Output Voltage Range

0 to ±20 kVDC or peak AC

Output Current Range

0 to ±20 mADC or peak AC

Slew Rate

Greater than 450 V/µs

Large Signal Bandwidth (-3 dB)

DC to greater than 7.5 kHz

DC Voltage Gain

Fixed at 2000 V/V

TECHNICAL DATA

Performance Specifications		
Output Voltage Range	0 to ±20 k VDC or peak AC	
Output Current Range	0 to ±20 mA DC or peak AC	
Input Voltage Range	0 to ±10 VDC or peak AC	
Input Impedance	25 kΩ, nominal	
DC Voltage Gain	2000 V/V	
DC Voltage Gain Accuracy	Better than 0.1% of full scale	
DC Offset Voltage	Less than ±2 V	
Output Noise	Less than 1.5 V rms[1]	
Slew Rate	Greater than 450 V/µs (10% to 90%, typical)	
Small Signal Bandwidth	DC to greater 20 Hz (-3dB)	
Large Signal Bandwidth	DC to greater than 7.5 kHz, typical (-3dB)	DC to greater than 3.75 kHz (1% distortion)
Stability	Drift with Time: Less than 50 ppm/hr, noncumulative	Drift with Temp: Less than 100 ppm/°C

Voltage Monitor Specifications	
Ratio	1/2000th of the high-voltage output
DC Accuracy	Better than 0.1% of full scale
DC Offset Voltage	Less than ±2 mV
Output Noise	Less than 10 mV rms[1]
Output Impedance	47 Ω

Current Monitor Specifications	
Ratio	0.5 V/mA
DC Accuracy	Better than 0.1% of full scale
Offset Voltage	Less than ±2 mV
Output Noise	Less than 10 mV rms[1]
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	Caton High Voltage Connector
BNC Connectors	Amplifier Input, Voltage Monitor, Current Monitor, Remote High Voltage ON/OFF, Out of Regulation Status, Fault/ 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

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

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

TECHNICAL DATA

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. Graduated one-turn panel potentiometer is used to adjust limit or trip level from 0 to ±20 mA	
Out of Regulation Status	Illuminates and a TTL low is provided when unit fails to produce required HV output such as during current limit or short circuit load conditions	
Trip Status	Illuminates and a TTL low is provided when the high-voltage output is disabled due to the output current exceeding the current trip level, the detection of a high-voltage supply fault or the removal of the top cover	
Fault Status	A BNC provides a TTL low when the Trek 20/20C is out of regulation for greater than 500 ms	

REFERENCE NUMBERS

Included Accessories	
PN	Description
23177	Operator's Manual
43466	HV Output Cable
N5011	Line Cord, Spare Fuses (selected per geographic destination)