Trek Model 20/20C

High-Voltage Power Amplifier



The Model 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.

Key Specifications

Output Voltage Range:

Output Current Range:

Slew Rate:

Large Signal Bandwidth (-3 dB):

DC Voltage Gain:

0 to ±20 kV DC or peak AC 0 to ±20 mA DC or peak AC Greater than 450 V/µs DC to greater than 7.5 kHz Fixed at 2000 V/V

Typical Applications Include

- 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

Features and Benefits

- Four-quadrant output for driving capacitive loads
- Closed loop system for high accuracy
- Short-circuit protected for equipment protection
- CE compliant for assured reliability
- All solid-state design for maintenance free operation
- DC-stable for programmable supply applications
- · Low output noise for ultra-accurate outputs



Model 20/20C Specifications

Performance

Output Voltage Range 0 to ±20 kV DC or peak AC

Output Current Range 0 to ±20 mA DC or peak AC

Input Voltage Range 0 to ±10 V DC 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*

Slew Rate

(10% to 90%, typical)

Greater than 450 V/µs

Large Signal Bandwidth

DC to greater than 7.5 kHz (-3 dB)

Large Signal Bandwidth

(1% distortion)

DC to greater than 3.75 kHz

Small Signal Bandwidth

(-3dB)

DC to greater than 20 kHz

Stability

Drift with Time Less than 50 ppm/hr, noncumulative

Less than 100 ppm/°C Drift with Temp

Voltage Monitor

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*

Output Impedance 47 Ω

Current Monitor

Ratio 0.5 V/ mA

DC Accuracy Better than 1% of full scale

Offset Voltage Less than ±10 mV

Output Noise Less than 30 mV rms*

Bandwidth (-3dB) DC to greater than 10 kHz

Output Impedance 47 Ω

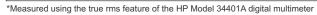
Features

High-Voltage On/Off

Local Individual push-button switch

TTL high (or open) turns off high-voltage Remote (TTL compatible input) output. TTL low turns on high-voltage

output.





Dynamic Adjustment Graduated 1-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 1-turn panel potentiometer is used to adjust limit or trip level from 0 to ±20 mA

Out of Regulation Illuminates and a TTL low is provided when unit

Status 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

A BNC provides a TTL low when the Model **Fault Status**

20/20C is out of regulation for greater than

500 ms

Mechanical

279 mm H x 482 mm W 654 mm D **Dimensions**

(11" H x 19" W x 25.75" D)

Weight 24.9 kg (55 lb)

HV Connector Caton High Voltage Connector

Amplifier Input, Voltage Monitor, Current Monitor. **BNC Connectors**

Remote High Voltage ON/OFF, Out of Regulation

Status, Fault/Trip Status

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:

104 to 127 V AC or 180 to 250 V AC,

either at 48 to 63 Hz

AC Line Receptacle Standard IEC 320 three-prong AC line

connector

1000 VA, maximum Power Consumption

Supplied Accessories

Operators' Manual PN: 23177

HV Output Cable PN: 43466

Line Cord, Spare PN: N5011; selected per geographic

Fuses destination

Optional Accessories

19" Rack Mount Kit Model: 608RA (with EIA hole spacing)

Model: 608RAJ (with JIS hole spacing)

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