# Trek Model 2220

## Piezo Driver/Power Amplifier



Trek's Model 2220 is one of several models within our 2200-series of high-voltage 40 W amplifiers. Provided at an attractive price and offering high performance, the unit incorporates DC stability, wide bandwidth and well regulated/controlled AC output signals. It also features full four-quadrant class AB all-solid-state output stages, DC offset adjustment with front panel metering, and autorecovery shutdown to protect the output from being overpowered. The instrument sinks or sources current into reactive or resistive loads throughout the output voltage range, making it ideal to achieve the accurate output response and high slew rates demanded by reactive loads.

## **Key Specifications**

Output Voltage Range: 0 to ±2 kV DC or peak AC

Output Current Range: 0 to ±10 mA DC or ±20 mA peak AC for 5 ms minimum

Slew Rate: 100 V/µs, typical

• Large Signal Bandwidth (-3 dB): DC to greater than 7.5 kHz (minimum trip off frequency)

Small Signal Bandwidth(-3 dB): DC to greater than 50 kHz

DC Voltage Gain: 200 V/V

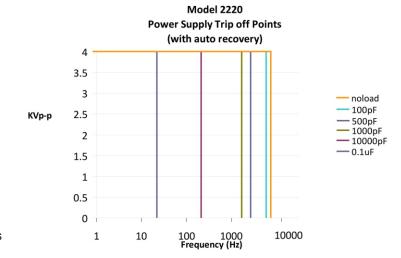
## Typical Applications Include

• Piezoelectric driving/control

Electro-optic

MEMS

Many areas of research



#### **Features and Benefits**

- Four-quadrant output for driving capacitive loads
- 2-year warranty
- DC offset adjustment with front panel metering
- Auto-recovery shutdown protects the output from being overpowered
- Low output noise for ultra-accurate outputs
- All solid-state output stages
- RoHS compliant
- HALT Tested
- NIST-traceable Certificate of Calibration provided with each unit
- C€ compliant





### Model 2220 Specifications

#### Performance

**Output Voltage** 

Range

0 to ±2 kV DC or peak AC

**Output Current** 

0 to ±10 mA DC or ±20 mA peak (for 5 ms

Input Voltage Range

0 to ±10 V DC or peak AC

Input Impedance

10 k $\Omega$ , nominal

DC Voltage Gain

200 V/V

DC Voltage Gain

Better than 0.5% of full scale

Accuracy

Offset Voltage

Less than 1 V

**Output Noise** 

Less than 50 mV rms\*

Slew Rate

(10% to 90%, typical)

Greater than 100 V/µs

Large Signal Bandwidth (-3 dB)

DC to greater than 7.5 kHz

Small Signal

Bandwidth (-3dB)

DC to greater than 50 kHz

Settling Time to 1%

Less than 50 µs for 0 to 2 kV step

Internal Capacitance

(HV Output)

300 pF

**Automatic Power** 

Limits internal power dissipation for protection

from overheating

Stability

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Drift with Time Less than 300 ppm/hr, noncumulative

Drift with Temp Less than 180 ppm/°C

#### Voltage Monitor

Noise 5 mV rms

Ratio 1/200th of the high voltage output

#### **Current Monitor**

Ratio 0.4 V/mA

DC Offset Adjust Better than 2% of full scale

\*Measured using the true rms feature of the Hewlett Packard Model 34401A digital multimeter

**Features** 

Digital Enable A BNC connection for a TTL compatible signal

to turn ON/OFF the high voltage output is provided. TTL high (or open) turns off the HV output; TTL low turns on the HV output.

A graduated 1-turn panel potentiometer is used Response

to optimize the AC response for various load

parameters.

High Voltage LED Front panel red LED illuminates when the high

voltage is on.

Mechanical

**Dimensions** 85 mm H x 205 mm W 325 mm D

(3.3" H x 8.1" W x 12.8" D)

Weight 2 kg (4.4 lb)

**SHV Connector HV Connector** 

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

Digital Enable

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** 

Input Power 90 to 265 V AC, at 50/60 Hz

**Output Power** 24 V DC, regulated at 1.75A maximum

**HV** Cable 2 m, 30.8 pF per foot

Supplied Accessories

Operators' Manual PN: 23447 AC Adapter PN: F5058R

HV Output Connector PN: 43874R

(SHV Mating Connector)

Optional

None Accessories

#### Note

The output cable supplied with this instrument uses a coaxial cable that has 30.8 pF/ft of capacitance at 1 kHz nominal. This cable capacitance must be factored in as a portion of the load and will reduce slew rates and large signal bandwidth. In applications that require maximum performance it is suggested that the supplied high voltage coaxial cable be kept as short as possible to reduce capacitance. Another option is to cut the coaxial cable short and add two break out leads (1 for shield [ground] and 1 for the center conductor) for the connection to load.

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