

Trek Model PD07016

High-Voltage Power Amplifier

The Model PD07016 is a DC-stable, high-voltage power amplifier featuring an all solid-state design for high slew rate, wide bandwidth, and low-noise operation. It is configured as noninverting with a fixed gain of 1000 V/V and is protected against over-voltage and over-current conditions that may be generated by active loads or by output short circuits to ground. Precision voltage and current monitors provide low-voltage representations of the high-voltage output and load current for monitoring purposes or for use as feedback signals in a closed-loop system.

The 4-quadrant, active output stage sinks or sources current to reactive or resistive loads throughout the output voltage range. This is essential to achieve the accurate output response and high slew rates demanded by reactive loads.

Key Specifications

- Output Voltage Range: 0 to ± 10 kV DC or peak AC
- Output Current Range: 0 to ± 60 mA DC, 0 to ± 300 mA peak capability for 20 μ s
- Slew Rate: Greater than 1000 V/ μ s
- Large Signal Bandwidth (2% distortion): DC to greater than 10 kHz
- DC Voltage Gain: 1000 V/V

Typical Applications Include

- Automated or computer controlled systems
- Providing feedback signals in closed-loop systems

Features and Benefits

- 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
- Inverting and differential options available
- Low output noise for ultra-accurate outputs
- NIST-traceable Certificate of Calibration provided with each unit



Model PDO7016 Specifications

Performance

Output Voltage Range	0 to ± 10 kV DC or peak AC
Output Current Range	0 to ± 60 mA DC, 0 to 300 mA peak capability for 20 μ s
Input Voltage Range	0 to ± 10 V DC or peak AC
Input Impedance	25 k Ω nominal (inverting/differential option 50 k Ω , nominal)
DC Voltage Gain	1000 V/V
DC Voltage Gain Accuracy	Better than 0.1% of full scale
Offset Voltage	Less than ± 4 V
Output Noise	Less than 5 V rms*
Slew Rate (10% to 90%, typical)	Greater than 1000 V/ μ s
Small Signal Bandwidth (-3dB)	DC to greater than 20 kHz
Large Signal Bandwidth (2% distortion)	DC to greater than 10 kHz
Stability	
<i>Drift with Time</i>	Less than 50 ppm/hr, noncumulative
<i>Drift with Temperature</i>	Less than 100 ppm/ $^{\circ}$ C

Voltage Monitor

Ratio	1 V / 1000 V
DC Accuracy	Better than 0.1% of full scale
DC Offset Voltage	Less than ± 5 mV
Output Noise	Less than 20 mV rms*
Output Impedance	47 Ω

Current Monitor

Ratio	30 V/mA
DC Accuracy	Better than 2% of full scale
Offset Voltage	Less than ± 10 mV
Output Noise	Less than 30 mV rms*
Bandwidth (-3dB)	DC to greater than 5 kHz
Output Impedance	47 Ω

Features

Settling Time (to 1%)	Less than 200 μ s for a 0 to 10 kV step
Dynamic Adjustment	Graduated 1-turn panel potentiometer is used to optimize the AC response for various load parameters.

Features (cont.)

High-Voltage On/Off	
<i>Local</i>	Individual push-button switches
<i>Remote</i>	TTL compatible input. TTL high (or open) turns off high-voltage output. TTL low turns on high-voltage output.
Current Limit/Trip	Switch selectable for limit or trip. Graduated 1-turn panel potentiometer is used to adjust limit or trip level from 0 to ± 60 mA.
Out of Regulation Status Indicator and Connector	Illuminates and TTL low is provided when unit fails to produce required HV output such as during current limit.
Limit/Trip Status Indicator and Connector	Illuminates and a TTL low is provided when HV is disabled or when amplifier is out of regulation for more than 500 ms

Mechanical

Dimensions	91.4 cm H x 43 cm W x 87 cm D (36" H x 17" W x 34" D) Depth dimension includes handles and spacing for air flow.
Weight	73 kg (160 lb) approximate
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

Operating Conditions

Temperature	0 $^{\circ}$ C to 40 $^{\circ}$ C (32 $^{\circ}$ F to 104 $^{\circ}$ F)
Relative Humidity	To 75%, noncondensing
Altitude	To 1524 meters (5000 ft.)

Electrical

Line Voltage	Factory set for one of two ranges: 104 to 127 V AC or 180 to 250 V AC at 48 to 63 Hz (specify when ordering)
Power Consumption	1800 VA, maximum
AC Line Receptacle	Standard 3-prong with integral fuse holder

Supplied Accessories

Operators Manual	PN: 23383
Shorting BNC Cap	PN: B3060
HV Output Cable	PN: 43466
Line Cord, Fuses	Selected per geographic destination

Optional Accessories

Locking Wheel Kit	CN: 1K042
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*Measured using the true rms feature of the Hewlett Packard Model 34401A digital multimeter

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