

# Model PZD700A Series

## Piezo Driver/Amplifier Series



The Trek Model PZD700A high-voltage DC-stable piezo driver/amplifier is designed to provide precise control of output voltages in one of three, user specified, voltage ranges: 0 to  $\pm 700$  V ( $\pm 100$  mA), 0 to +1.4 kV ( $\pm 50$  mA), or 0 to -1.4 kV ( $\pm 50$  mA). Inverting and noninverting input configurations are available. The Model PZD700A has an adjustable gain to 300 V/V. Applications for the Model PZD700A include piezoelectric driving/control, laser modulation, MEMS, semiconductor research, and piezoelectric vibration damping. Features include solid-state design, high slew rate, and small signal bandwidth greater than 200 kHz for all voltage ranges.

A four-quadrant active output stage sinks or sources current into reactive or resistive loads throughout the output voltage range. This technique is essential for achieving the accurate output responses and high slew rates demanded by reactive loads. The Model PZD700A is protected against overvoltage and overcurrent 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 a feedback signals in a closed-loop system.

The Digital Enable feature provides a connection for a remote device to turn ON and OFF the high-voltage of the instrument. This makes the Model PZD700A suitable for automated or computer controlled systems.

The Model PZD700A has a Dynamics Adjustment feature which can be used to optimize the AC response of the output signal. Front panel LEDs display power on, high-voltage and voltage regulation or limit status of the unit. The Model PZD700A is available in single channel or dual channel configurations and can be operated on a bench top or, with optional hardware, in a standard 19-inch rack.

- Available Output Ranges:  
0 to  $\pm 700$  V DC or Peak AC  
 $\pm 100$  mA Current (Bipolar)
- 0 to +1.4 kV, DC or Peak AC  
 $\pm 50$  mA Current (Unipolar)
- 0 to -1.4 kV, DC or Peak AC  
 $\pm 50$  mA Current (Unipolar)
- Adjustable Gain Ratio:  
To 300 V/V
- DC Accuracy:  
Better Than 0.1% of Full  
Scale with 200 V/V Gain
- Slew Rates:  
Greater Than 380 V/ $\mu$ s for  
Bipolar Model  
Greater than 370 V/ $\mu$ s for  
Unipolar Models
- Precision Monitors For  
Voltage and Current
- Remote High-Voltage  
ON/OFF Suitable for  
Automated Systems
- Dynamic Adjustment  
Optimizes AC Response
- $\text{CE}$  Compliant



Measurement and Power Solutions™

www.trekinc.com

# Model PZD700A Series Primary Specifications

All specifications are with no load unless otherwise noted.

## Output (User Specified)

Factory set per customer requirement:

### Bipolar Model 0 to $\pm 700$ V DC or peak AC Current

0 to  $\pm 100$  mA.

**Slew Rate (10% to 90%, typical)**  
Greater than 380 V/ $\mu$ s.

**Large Signal Bandwidth (-3 dB)**  
DC to greater than 125 kHz.

### Unipolar Model 0 to +1.4 kV DC or peak AC Current

0 to  $\pm 50$  mA.

**Slew Rate (10% to 90%, typical)**  
Greater than 370 V/ $\mu$ s.

**Large Signal Bandwidth (-3 dB)**  
DC to greater than 120 kHz.

### Unipolar Model 0 to -1.4 kV DC or peak AC Current

0 to  $\pm 50$  mA.

**Slew Rate (10% to 90%, typical)**  
Greater than 370 V/ $\mu$ s.

**Large Signal Bandwidth (-3 dB)**  
DC to greater than 120 kHz.

## Amplifier Input

### Input Voltage Range

0 to  $\pm 10$  V DC or peak AC.

### Input Impedance

90 k $\Omega$ , nominal (noninverting).  
1 M $\Omega$ , nominal (inverting).

## Features

The Model PZD700A is available as a one or two channel instrument. The following features are specific to each amplifier channel.

### Digital Enable

A BNC connection for a TTL compatible signal to turn on and off the high-voltage output is provided for each channel. A TTL high (or open) turns off the high-voltage output. A TTL low turns on the high-voltage output.

### Gain Control

The gain of the Model PZD700A is adjustable from 0 to 300 V/V.

## Features (cont.)

### Dynamics Adjustment

A graduated potentiometer is used to optimize the AC output for various load configurations.

### Input Configuration

The input is configured as a noninverting amplifier. An inverting amplifier configuration is available.

### Limit Indicator

A yellow indicator warns when the Model PZD700A fails to produce the required high-voltage output.

### Voltage Monitor

A buffered output provides a low-voltage replica of the high-voltage output.

#### Scale Factor

1/200th,  $\pm 0.1\%$  of full scale.

### Current Monitor

A buffered voltage output provides a representation of the load current.

#### Scale Factor

0.1 V/mA,  $\pm 1\%$  of full scale.

## Performance

### DC Voltage Gain

To 300 V/V, adjustable using front panel potentiometer.

### DC Voltage Gain Accuracy (input to output)

Better than 0.1% for factory set gain of 200 V/V.

### Offset Voltage

Less than  $\pm 500$  mV.

### Small Signal Bandwidth (-3 dB)

DC to greater than 200 kHz.

### Output Noise (all ranges)

Measured with the true rms feature of the Hewlett Packard Model 34401A digital multimeter.

Less than 50 mV rms to 20 kHz for a 1 nF load.

Less than 100 mV rms to 20 kHz with no load.

### Stability (with factory set gain of 200 V/V)

#### Drift with Temperature

Less than 100 ppm/ $^{\circ}$ C.

#### Drift with Time

Less than 50 ppm/hr, noncumulative.

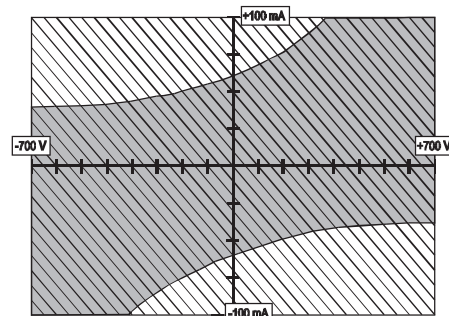
## Performance (cont.)

### Settling Time to 1%

Less than 50  $\mu$ s.

### Automatic Power Limit

Automatically limits the internal power dissipation to protect the Model PZD700A from overheating. The following graph illustrates the automatic power limit for the  $\pm 700$  volt range.



AC Operating Range (frequencies above 50 Hz, 50% duty cycle, and no DC offset)  
 DC Operating Range

## General

### Dimensions (Single Channel Instrument)

110 mm H x 220 mm W x 445 mm D  
(4.3" H x 8.7" W x 17.5" D).

### Weight (Single Channel Instrument)

5 kg (11 lb).

### High-Voltage Output Connector

SHV connector.

### Power Requirements

#### Line Supply

Factory set for one of two ranges:  
90 to 127 V AC or 180 to 250 V AC, at 48 to 63 Hz (specify when ordering).

#### Power Consumption

90 VA, single channel.  
175 VA, dual channel.

### AC Line Receptacle

Standard three-prong AC line connector with an integral fuse holder.

Copyright © 2011 TREK, INC.

1127/DEC

All specifications are subject to change.

## Model PZD700A Series Ordering Information

Item	Part No.	Included Accessories
Model PZD700A single unit (90 to 127 V AC)	PZD700A-1-L	Operator's Manual . . . . . 23439
Model PZD700A dual unit (90 to 127 V AC)	PZD700A-2-L	High-Voltage Output Cable Assembly (3 meters) . . . . . 43874
Model PZD700A single unit (180 to 250 V AC)	PZD700A-1-H	Line cord (90 to 127 V AC) . . . . . N5002
Model PZD700A dual unit (180 to 250 V AC)	PZD700A-2-H	Line Cord (180 to 250 V AC) . . . . . Contact Factory

The Model PZD700A comes from the factory with settings for an output voltage of  $\pm 700$  V DC or peak AC, a voltage gain ratio of 200 V/V, with a noninverting input. Please specify voltage range ( $\pm 700$  V, +1.4 kV, or -1.4 kV) and input configuration (inverting or noninverting) when ordering.

Also available is the Model PZD700A M/S with twice the current capability of the standard PZD700A



TREK, INC. • 11601 Maple Ridge Road • Medina, NY 14103 • USA • 800-FOR TREK  
585-798-3140 • 585-798-3106 (fax) • www.trekinc.com • sales@trekinc.com

