

Model PZD700A M/S

Piezo Driver/Amplifier Series



Trek's PZD700A M/S Piezo Driver/Amplifier system provides precise voltage control and delivers twice the current of our standard Model PZD700A. This high-voltage DC powered amplifier has an available bipolar voltage range of 0 to ± 700 V and unipolar ranges of 0 to +1400V or 0 to -1400V DC peak AC.

Its output current ratings are ± 200 mA for the bipolar range and ± 100 mA for the unipolar ranges. Voltage ranges are customer specified and factory set. The PZD700A M/S signal input is configured as a noninverting amplifier. An inverting amplifier configuration is also available.

Applications for the PZD700A M/S include piezoelectric driving/control, laser modulation, semiconductor research, MEMS and piezoelectric vibration damping. Features include an all-solid-state design, impressive slew rates of "greater than" 380 V/ μ s for the bipolar model and 370 V/ μ s for the unipolar models, and superior bandwidth capabilities with "DC to greater than" large signal bandwidth (-3 dB) of 150 kHz for the bipolar model, 125 kHz for the unipolar models, and small signal bandwidth (-3 dB) of 200 kHz (all models).

A four-quadrant active output stage sinks or sources current into reactive or resistive loads throughout the output voltage range. This is essential to achieve the accurate output responses and high slew rates demanded by reactive loads.

Precision voltage and current monitors provide buffered 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 Digital Enable feature provides a connection for a remote device to turn ON and OFF the high voltage of the instrument. A DC voltage gain adjustment allows the output to be adjusted from 0 to 300 V/V.

The PZD700A M/S has a Dynamics Adjustment feature that is used to optimize the AC response of the output signal under various load configurations. It is bench top operable or with optional equipment, in a standard 19-inch rack.

- Available Output Ranges:
0 to ± 700 V DC or Peak AC
 ± 200 mA Current (Bipolar)

0 to +1400 V or Peak AC
 ± 100 mA Current (Unipolar)

0 to -1400 V or Peak AC
 ± 100 mA Current (Unipolar)

- Adjustable Gain Ratio:
0 to 300 V/V gain
- DC Accuracy:
Better than 0.1% of full scale with 200 V/V gain
- Slew Rates:
Greater than 380 V/ μ s for Bipolar Model
Greater than 370 V/ μ s for Unipolar Models
- Precision Monitors For Voltage and Current
- Dynamic Adjustment Optimizes AC response
- CE Compliant



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Model PZD700A M/S Series Primary Specifications

All specifications are with no load unless otherwise noted.

Output (User Specified)

Factory set per customer requirements:

Bipolar Model

0 to ± 700 V DC or peak AC

Current

0 to ± 200 mA.

Slew Rate (10% to 90%, typical)

Greater than 380 V/ μ s.

Large Signal Bandwidth (-3 dB)

DC to greater than 150 kHz.

Unipolar Model (Positive)

0 to +1400 V DC or peak AC

and

Unipolar Model (Negative)

0 to -1400 V DC or peak AC

Current

0 to ± 100 mA.

Slew Rate (10% to 90%, typical)

Greater than 370 V/ μ s.

Large Signal Bandwidth (-3 dB)

DC to greater than 125 kHz.

Amplifier Input

Input Voltage Range

0 to ± 10 V DC or peak AC.

Input Impedance

90 k Ω , nominal (noninverting).

1 M Ω , nominal (inverting).

Features

Digital Enable

A BNC connection for a TTL compatible signal to turn the high-voltage output on and off 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 DC gain is adjustable to 0 to 300 V/V.

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

An amber indicator warns when the

Features (cont.)

Model PZD700A M/S 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 V/200 V of the high-voltage output.

Current Monitor

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

Scale Factor

1/200th of the high-voltage output.

Performance

DC Voltage Gain

0 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 ± 500 mV.

Output Noise (all ranges)

Less than 75 mV rms to 20 kHz for a 1 nF load.

Less than 125 mV rms to 20 kHz with no load.

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

Small Signal Bandwidth (-3dB)

DC to greater than 200 kHz

Stability (with a set gain of 200 V/V)

Drift with Temperature

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

Drift with Time

Less than 50 ppm/hr, noncumulative.

Settling Time to 1%

Less than 50 μ s when critically damped.

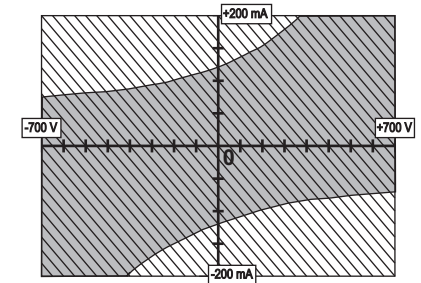
Automatic Power Limit

This function automatically limits the internal power dissipation to protect the Model PZD700A M/S from overheating.

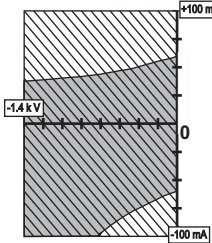
The following graphs illustrate the ranges of automatic power limit.

Model PZD700A M/S
Output Operating Ranges

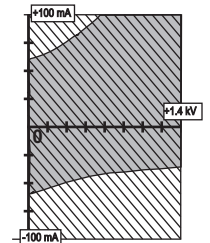
Bipolar Range ± 700



Unipolar Range -1.4 kV



Unipolar Range +1.4 kV



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

General

Dimensions

110 mm H x 432 mm W x 445 mm D
(4.3" H x 17" W x 17.5" D).

Weight

10 kg (22 lb).

High-Voltage Output Connector

SHV connector.

Amplifier Input

BNC connector.

Power Requirements

Line Voltage

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

175 VA.

Model PZD700A M/S Series Ordering Information

Item	Part No.	Item	Part No.
Model PZD700A M/S (90 to 127 V AC)	PZD700A-L M/S CE	Model PZD700A M/S (90 to 127 V AC)	
Model PZD700A M/S (180 to 250 V AC)	PZD700A-H M/S CE	Line cord (90 to 127 V AC)	N5002
		(2) 3.15 A, 250 V AC, 5 mm x 20 mm (T)	H0015R

NOTE: The Model PZD700A M/S comes from the factory with settings for an output voltage of ± 700 V DC or peak AC, a voltage gain ratio of 200 V/V, with a noninverting input. Please specify voltage range (± 700 V, +1400 V, or -1400 V) and input configuration (inverting or noninverting) when ordering.

Included Accessories

Operator's Manual 23456
High-Voltage Output Connector (SHV mating connector) 43874R

Model PZD700A M/S (180 to 250 V AC)
Line Cord (180 to 250 V AC) Contact Factory
(2) 1.6 A, 250 V AC, 5 mm x 20 mm (T) H0058R

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

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