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PI
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Operating Manual PZ 57 E

P-263

Three Channel HVPZT Amplifier

Operating Manual and Product Documentation

This Document is valid for following Products:

P-263.00 **Three Channel HVPZT Amplifier**

Release: *1.0*
Release Date: *29 June 1995*

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D-76337 Waldbronn, Germany

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General

The *P-263 HVPZT Amplifier* is a variable 3-channel voltage source and voltage amplifier to drive High Voltage Piezoelectric Translators (HVPZTs).

The device can be used to operate three PZTs. The output voltage range of each independent channel is 0 to -1500 V (the negative polarity is standard for Physik Instrumente HVPZTs).

P-263 provides an output power of 2 Watts per channel. The corresponding bandwidth depends on the capacitance of the connected HVPZT.

Features :

- Manual control of High Voltage PZT Translators (HVPZTs)
- Voltage amplifier mode
- On-line output voltage display
- Compatible with all PI HVPZTs





Warning !!! Danger !!! High Voltage !!!

Be aware that the P-263 is a **High Voltage Amplifier** capable of outputting voltages up to **1500 Volts.** The high output power may cause electrical shocks or even serious injuries if the device is handled improperly.

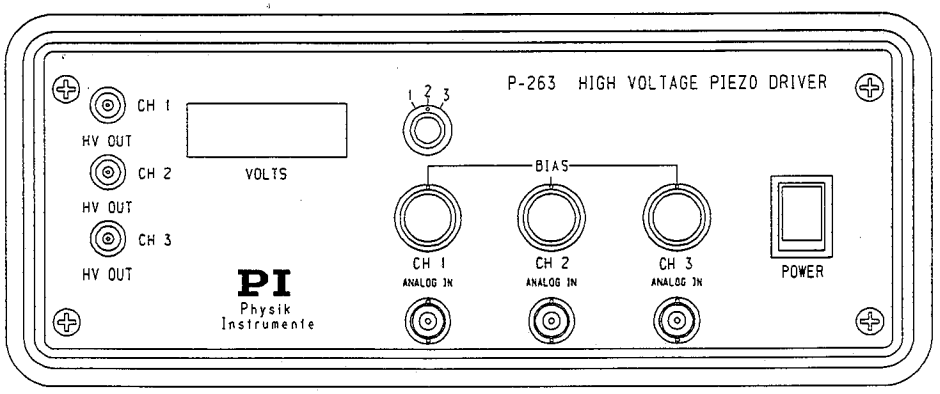
To avoid danger, follow the instructions below :

Do not open the chassis while the line power cord is connected!

Do not touch any part that may be connected to the High Voltage output!

Make sure that the metal casings of all PZT elements connected to the HV output are properly grounded.

Front Panel Layout



P-263 Front Panel Layout

Front Panel Operating Elements:

- Power Switch
- 3 Offset (BIAS) Potentiometers, 10-turn, one for each channel
- 3 Control voltage Input sockets (BNC, 0..+10V), one for each channel
- 3 High Voltage output sockets (LEMO, 0..-1500V) one for each channel
- 3 1/2 digit LED Display for output voltage
- Display select switch (positions 1-2-3)

Modes of Operation

The P-263 HVPZT amplifier can drive any PI High Voltage PZT (HVPZT). It contains three independent amplifiers with an output power of 2 W each. The P-263 can be operated in two ways:

Manual, Static Operation

For each channel a 10-turn potentiometer (**BIAS**) is mounted on the front panel to set the output voltage in the range of 0 to -1000 V.

External Static and Dynamic Operation

The output voltage is controlled by an analog signal applied to the BNC inputs, ranging from 0 to +10 V. Multiplying by the gain factor of -150 results in an operating voltage range from 0 to -1500 V. The DC offset (**BIAS**) potentiometers are active at the same time. Internally they produce an offset voltage of 0 to 6.6 V to the input signal.

Starting Operation

Manual operation

The front panel offset (BIAS) potentiometers allow operation of HVPZTs within their nominal expansion ranges as specified in the technical data sheets (catalog). The P-263 outputs a constant DC voltage to the PZT, depending on the **BIAS** setting. The expansion of the PZT depends on the PZT´s specific gain (μm/V).

Before powering-up the device, follow the instructions below :

- Read the WARNING note on page 2.
- While the device is **not** powered, connect the PZTs to the **HV OUT** connectors (LEMO).
- Turn the **BIAS** potentiometers to zero (CCW).
- Switch the device ON. The green switch lights up.
- Turn the display channel select switch to position **1, 2 or 3**.
- Turn the corresponding BIAS potentiometer CW. The voltage changes as indicated on the display.
- Each channel can be set individually, independent of the displayed channel.
- Before turning the P-263 off, set all channels to zero output (turn the BIAS potentiometers to CCW stop).

External Static/Dynamic Operation

In this mode the output voltage is controlled by an analog input signal within the range of 0 to +10 V, applied to the **ANALOG IN** BNC connectors. Output voltages up to -1500 V can be generated (gain factor -150)! Check the maximum operating voltage of each connected PZT and do not exceed this voltage.



Make sure to not exceed the allowed PZT operating voltage range when operating the P-263 with external signals!

The DC BIAS potentiometers produce an offset voltage of 0 to 6.6 V to the control input signal.

Example 1: A low frequency (< 1 Hz) sinusoidal signal with an amplitude of 0 to +5 V is applied to the **ANALOG IN** socket. The resulting output is a sinusoidal signal with an amplitude of 0 to -750 V.

Example 2: A function generator with a -2.5 to +2.5 V (peak-peak: 5V) sinusoidal signal is connected to the **ANALOG IN** socket. The

resulting output will be clipped for negative inputs, because the P-263 can not output positive voltages (negative gain!). The actual output is the negative half of the sine wave with peak value of -375 V (2.5 V multiplied by a gain factor of -150).

In order to get the full sine wave, the input can be offset with the **BIAS** potentiometer by 2.5 V. The resulting output is a sinusoidal signal with an amplitude of 0 to -750 V (peak-peak) like in example #1.

P-263 Specifications:

Application:	Driving three HVPZTs manually or by an external analog signals
Output Voltage Range:	0 to -1500 V
Output Voltage Polarity:	negative
Max. Output Current:	2.0 mA
Input Voltage Range:	0 to +10 V
Input Impedance:	1 MOhm
Gain:	-150
BIAS setting:	3 potentiometers (10-turn)
Bandwidth:	80 Hz (with 10 nF capacitive load)
Non-Linearity:	< 1%
Output Ripple:	< 0.3 V
Display:	3.5 Digits LED
Line Voltage:	90 to 240 VAC (wide range P/S)
Fuse:	0.5 A (medium)
Dimensions:	110 x 260 mm, 280 mm deep
Weight:	4.4 Kg

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