E-470
E-471
E-472
E-420

High-Power, Modular HVPZT Amplifier/Controllers

Ordering Information

E-470.00
HVPZT Amplifier, 500 W, -3 to -1100 V, Bench-Top

E-471.00
HVPZT Amplifier, Controller & Interface/Display Upgrade Possible, 500 W, -3 to -1100 V, 19”

E-472.00
HVPZT Amplifier, 2 Channels, 500 W, -3 to -1100 V, Bench-Top, 19”

E-420.00
HVPZT Amplifier Module, 500 W, -3 to -1100 V

Upgrades

E-509.C1A
PZT Sensor-Controller module (capacitive sensor)

E-509.L1
PZT Sensor/Controller module (LVDT sensor)

E-509.S1
PZT Sensor/Controller module (strain gauge sensor)

Computer Interface and Display Module (see page 6-37)

E-516.i3
20-bit DAC Interface/Display module, IEEE 488 / RS-232

Voltage & Position Display Module (see page 6-38)

E-515.01
Display Module for PZT Voltage and Displacement

Sensor & Servo-Controller Modules for Closed-Loop PZT Operation (see page 6-36)

Custom Designs for Volume Buyers

Notes

Important Calibration Information: Please read details on page 6-41.

E-471.00 Configuration example: E-471.00 HVPZT amplifier, with optional E-509.S1 PZT servo-controller (strain gauges) and E-516.i3 20-bit DAC interface/display.

- **500 W Peak Power**
- **Output Voltage -3 to -1100 V & Bipolar**
- **1 and 2 Channel Versions**
- **Optional Position Servo-Control Modules**
- **Optional RS-232 & IEEE 488 Interface Module & Display**

The E-470 series high-power amplifier/controllers are specifically designed to drive high-capacitance PZT actuators. They are based on the E-420 amplifier module, which can output and sink a peak current of 500 mA and an average current of 100 mA in a voltage range of -3 to -1100 V (positive or bipolar range, jumper selectable). OEM, 19” rackmount, bench-top, and two-channel versions are available, some with servo-control module and display (see Ordering Information for standard combinations).

Standard versions can be operated in two ways:

I. **Manual operation:** The output voltage can be set by a 10-turn, DC-offset potentiometer in the range of -3 to -1000 Volts

II. **External operation:** Output voltage is controlled by an analog signal applied to the BNC input, ranging from 0 to 11 Volts. Multiplying by the gain factor of -100, an output voltage range of -3 to -1100 Volts results. The DC-offset potentiometer adds a DC bias to the input, allowing continuous shifting of the input range between 0 V to +10 V and -10 V to 0 V (see page 6.31).

See graph for frequency response with selected HVPZTs.

Upgrades

The E-471.00 version allows installation several upgrade options for enhanced versatility (see Ordering Information).

Two additional modes are possible with versions having the E-509 Sensor & Servo-Controller Module upgrade:

I. **Manual Closed-Loop Operation**
Displacement of the PZTs can be set by a 10-turn DC-offset potentiometer in the range of zero to nominal displacement.

II. **External Closed-Loop Operation**
Displacement of the PZT is controlled by an analog signal in the range of 0 to +10 V, applied to the BNC input. The controller is calibrated in such a way that 10 V corresponds to maximum nominal displacement and 0 V corresponds to 0 displacement. The DC-offset potentiometer can be used to add an offset voltage of 0 to 10 V to the input signal.

E-420.00 HVPZT amplifier module

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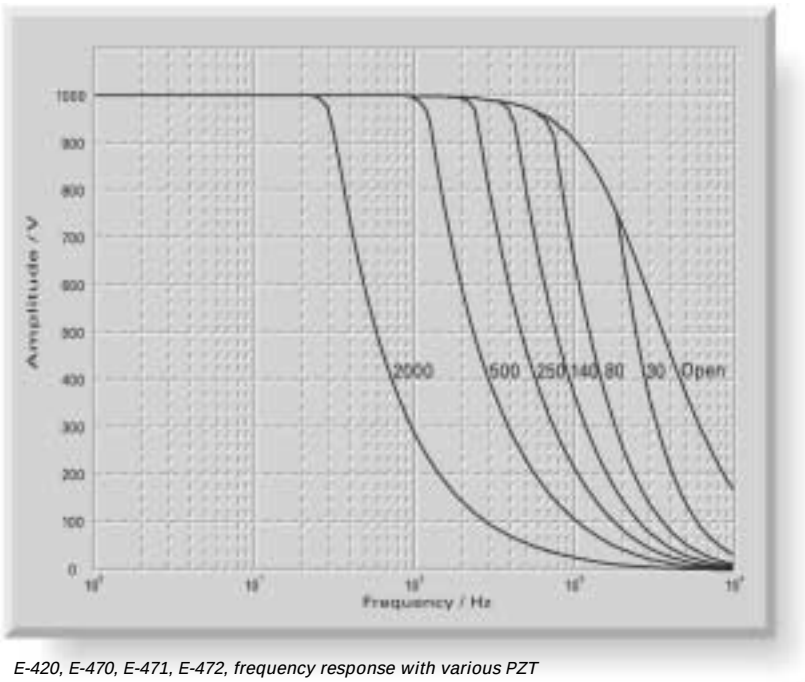

E-420, E-470, E-471, E-472, frequency response with various PZT loads. Values shown are capacitance in nF, measured in actual PZT.

E-472.00 HVPZT amplifier

Technical Data

Models	**E-470.00, E-471.00, E-472.00, E-420.00**
Function	power amplifier (servo-controller option for E-471)
Channels	1 (E-472: 2)
Maximum output power	500 W (see page 6-40)
Average output power	100 W
Peak output current < 50 ms:	500 mA
Average output current > 50 ms	100 mA
Current limitation	short-circuit proof
Voltage gain	-100 ±1, +100 ±1 (selectable)
Polarity	Negative/positive/bipolar (jumper selectable)
Control input voltage	0 to +11 V, 0 to −11 V (jumper selectable)
Output voltage	-3 to -1100 V (-780 to +260, -550 to +550, -260 to +780, +3 to +1100V, jumper selectable)
DC-offset setting	-3 to -1100 V at output with 10-turn pot.
Input impedance	1 MΩ
Control input sockets	BNC
PZT voltage output sockets	LEMO ERA.0A.250.CTL
Dimensions	235 x 158 x 288 mm (E-470); 450 x 158 x 288 mm (E-471, E-472); 215 x 123 x 185 mm (E-420) (s. page 6-7)
Weight	5.2 kg (E-470); 7.6 kg (E-471); 10.1 kg (E-472); 2.5 kg (E-420)
Operating voltage	90-120 / 220-264 VAC, 50-60 Hz