

E-509

Sensor & Position Servo-Control Modules for Piezo-Driven Nanopositioning Systems

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■ Position Servo-Control for Piezo-Driven Nanopositioning Systems

- Improves Linearity
- Eliminates Drift & Hysteresis
- For Capacitive Sensors, Strain Gauge Sensors & LVDT Sensors
- Increases Piezo Stiffness
- Notch Filter for Improved Dynamics

The E-509 is a displacement sensor module with an integrated position servo-controller for closed-loop PZT positioning systems. Versions for three different sensor types are available: strain gauge sensors, LVDT (linear variable differential transformers) and capacitive sensors. For strain gauge and LVDT sensors, 1- and 3-channel modules are available. The capacitive sensor module is available in a 1-, 2-, or 3-channel version.

The position servo-control portion of the E-509 is identical for all versions, consisting of an analog P-I (proportional, integral) controller. Proportional and integral gain can be set internally with trimmers. Sensor bandwidth and control bandwidth can also be set. A notch filter allows operation of the piezo positioning system closer to its mechanical resonant frequency.

The E-509 compensates for the drift and hysteresis of PZT actuators. It also increases the virtual stiffness of a PZT by quickly adjusting the operating voltage on the PZT as soon as a change in force or load occurs.

Ordering Information

- E-509.C1A**
PZT Sensor & Controller Module, Capacitive Sensor, 1 Channel
- E-509.C2A**
PZT Sensor & Controller Module, Capacitive Sensor, 2 Channels
- E-509.C3A**
PZT Sensor & Controller Module, Capacitive Sensor, 3 Channels
- E-509.S1**
PZT Sensor & Controller Module, Strain Gauge Sensor, 1 Channel
- E-509.S3**
PZT Sensor & Controller Module, Strain Gauge Sensor, 3 Channels
- E-509.L1**
PZT Sensor & Controller Module, LVDT Sensor, 1 Channel
- E-509.L3**
PZT Sensor & Controller Module, LVDT Sensor, 3 Channels

Ask about custom designs!

Notes

E-509 PZT servo-controller is not a stand-alone device. It is designed to work in the E-500/E-501 chassis (p. 6-18), the E-471 or E-480 amplifier (p. 6-48, p. 6-50) with integrated power supply.

Important Calibration Information: Please read details on page 6-53.

Technical Data

Models	E-509.C1A, E-509.C2A, E-509.C3A, E-509.L1, E-509.L3, E-509.S1, E-509.S3
Function	Displacement sensor electronics and position servo-controller for PZTs
Channels	1 (E-509.x1), 2 (E-509.C2A), 3 (E-509.x3)
Sensor types	Strain gauges (E-509.Sx), LVDTs (E-509.Lx), capacitive sensors (E-509.CxA)
Servo characteristics	P-I (analog) + notch filter
Rear connector	32-pin connector, DIN 41612
Sensor socket	LEMO ERA.0S.304.CLL (E-509.CxA: LEMO EPL.00.250.NTD)
Sensor monitor output socket	LEMO 6 pin FGG.0B.306.CLAD56 (E-509.C3A); BNC (1- & 2-channel versions) ERA.05.303.CLL (E-509.S3, E-509.L3)
Dimensions	One 7 T slot wide, 3 H high
Weight	0.35 kg (E-509.x3); 0.25 kg (E-509.x2); 0.2 kg (E-509.x1)
Operating voltage	Requires E-530/E-531 power supply (E-500/E-501 system, etc.)