Model ESA-CXA Electrostrictive Actuator Controller

Operation of ESA-CXA Electrostrictive Actuator Controller

Read and understand all instructions before operating.

Safety Terms and Symbols

The Following safety terms and symbols are uses in this manual and/or on the controller.

1. Terms

The **Warning** heading explains dangers that could result in personal injury or death.

The **Caution** heading explains hazards that could damage the controller.

2. Symbols

Refer to the documentation for proper operating instructions.

Protective earth ground connection

Fuse symbol

On (power)

Off (power)

Warning

The following precautions should be observed at all times:

- Care must be taken as high voltages are present inside the controller and at the actuators. Do not operate the unit with damaged cables or with the controller opened.
- Do not operate the unit with a damaged power cord or if the controller has been dropped or damaged. Contact Newport immediately and arrange to return it for service.

Warning

To avoid the danger of potential electrical shock to the user:

This instrument is intended for use by qualified personnel who recognize shock hazards and are familiar with safety precautions to avoid possible injury.

- Keep all fluids away from the controller and actuators.
- Do not insert metal (conductive) objects into the rear panel connectors or vent holes.
- **Do not remove the cover!** There are no user serviceable components inside the controller.
- Refer all service requirements to the factory or Newport authorized service facility.

Actuator Compatibility

This unit is intended for use only with Newport AD Series electrostrictive actuators.

Caution

Clamp-type micrometer/actuator mounts are capable of very high clamping forces. Do not over-clamp the actuators! Tighten the clamp only as much as necessary to firmly grip the actuator. Performance degradation and/or damage can occur if the clamps are overtightened.

Front Panel of ESA-CXA Controller

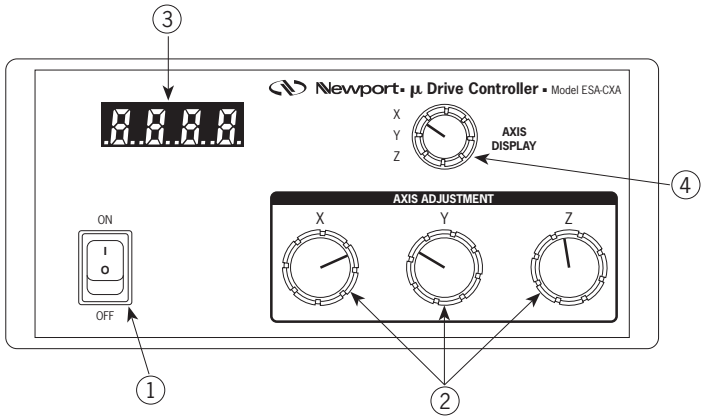

Figure 1: Front panel of the ESA-CXA controller

[Refer to numbers in Figure 1]

1. **On/Off switch**

   Power switch to turn the power of the ESA-CXA on and off. Be sure the controller is set to the "OFF" position when connecting actuators.

Caution

Do not insert or remove actuator connectors while power is on. Amplifier damage may result.

2. **Voltage adjust knob**

   The DC voltage can be adjusted with the 10-turn potentiometer and is limited from approximately 10 to 160 volts. Since voltage may be present at the output connector on the controller, do not probe this area with any conductive material.

3. **Voltage display**

   The LED readout display shows the voltage output to an actuator which is set by the voltage adjust knob (2) for X, Y, or Z axis.

4. **Axis display selection switch**

   This is a three-position switch which controls the selection of the actuator axes, X, Y, or Z, displayed on the LED voltage display (3). The voltage adjustment knobs (2) work independently of the selection switch (4).

Back Panel of ESA-CXA Controller

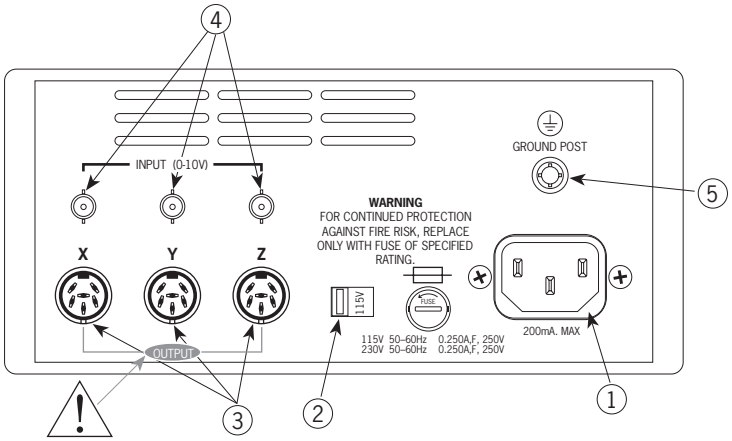

Figure 2: Back panel of the ESA-CXA controller

[Refer to numbers in Figure 2]

1. **Power-input module**

   The three prong input is compatible with standard electrical cords with the molded I.E.C. connector having a ground line (central prong).

2. **Voltage-selector switch**

   This switch selects the line voltage for your local area. Two positions are available: 115V (for 115V±10%, 50-60Hz) and 230V (for 230±10%, 50-60Hz).

Caution

Select the proper local line voltage BEFORE applying power to the ESA-CXA controller. Damage will result if an improper line voltage setting is selected.

3. **Actuator drive output connector**

   The high voltage-output connector is label by axis (X, Y, Z) and supplies voltage to the ESA Series actuator. When the controller is switched on, the output is active at all times (maximum current = 2.2mA, maximum voltage =170VDC) and precautions should be taken not to probe this area with any conductive material. Figure 3 shows the connector pin wiring.

4. **Analog input connectors**

   The analog input connectors can be used to modulate the output voltage to the actuators. The inputs have a 10 kΩ impedance and 0-10V range. The maximum guaranteed output slew rate is 125 volts per second. For a sine-wave input, the maximum undistorted output frequency is given by $f_s = {}^{20}/_{A}$, and for a triangle-wave input, the maximum undistorted frequency is given by $f_t = {}^{63}/_{A}$, where A is the peak-to-peak output voltage amplitude. As $A \rightarrow 0$, the frequency $f \rightarrow 10$ Hz. Connecting a voltage source to the input connector almost completely disables the corresponding adjustment knob on the front panel.

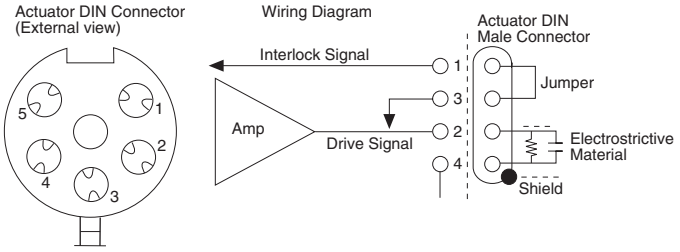

Figure 3: DIN connector wiring diagram

5. **Ground connector lug**

   This is needed for connection if the center prong of the plug on the power outlet is not attached to a ground.

Warning

The ESA-CXA is designed for use with a GROUNDED supply. The ground line in the power connector is the central prong. Do not operate without the power-connector ground prong or the case lug connected to a good earth ground.

6. **Fuse replacement**

Warning

Disconnect AC power before replacing fuses

Before replacing a fuse, turn power off and disconnect the AC power cord. Using only the fuse value indicated below.

Line voltage: 115 VAC. Fuse Replacement: 0.250A,F, 250V

Line voltage: 230 VAC. Fuse Replacement: 0.250A,F, 250V

General Specifications:

Temperature: 40°C

Relative humidity: 70% non-condensing

Pollution degree: 2

Installation category: II

Altitude: <200m

Instrument use: The Model ESA-CXA is intended for indoor use only.

Warranty

Newport Corporation warrants this product to be free from defects in material and workmanship for a period of one year from date of shipment. If found to be defective during the warranty period, the product will either be repaired or replaced at Newport's option.

To exercise this warranty, write or call your local Newport office or representative, or contact Newport's headquarters in Irvine, California, U.S.A. You will be given prompt assistance and return instructions including a "Return Authorization Number", which must accompany all paperwork with the returned unit. Send it, transportation prepaid, to the instructed service facility. Repairs or replacement will be made and the instrument returned, transportation prepaid. Repaired products are warranted for the balance of the original warranty period, or 90 days, whichever is longer.

This warranty does not apply to defects resulting from modification or misuse of any product or part. This warranty also does not apply to fuses.

This warranty is in lieu of all other warranties, expressed or implied, including any implied warranty of merchantability or fitness for a particular use. Newport Corporation shall not be liable for any indirect, special, or consequential damages.

Newport®

EC DECLARATION OF CONFORMITY

We declare that the accompanying product, identified with the "CE" mark, meets the intent of the Electromagnetic Compatability Directive, 89/336/EEC and Low Voltage Directive 73/23/EEC.

Compliance was demonstrated to the following specifications:

EN50081-1 EMISSIONS:

Radiated and conducted emissions per EN55011, Group 1, Class A

EN50082-1 IMMUNITY:

Electrostatic Discharge per IEC 1000-4-2, severity level 3
Radiated Emission Immunity per IEC 1000-4-3, severity level 2
Fast Burst Transients per IEC 1000-4-4, severity level 3
Surge Immunity per IEC 1000 4-5, severity level 3

IEC SAFETY:

Safety requirements for electrical equipment specified in IEC 1010-1.

Alain Danielo

VP European Operations
Zone Industrielle
45340 Beaune-la-Rolande, France

Jeff Cannon

General Manager-Precision Systems
1791 Deere Avenue
Irvine, CA USA

Newport Corporation
Worldwide Headquarters

1791 Deere Avenue
Irvine, CA 92606

(In U.S.): 800-222-6440
Tel: 949-863-3144
Fax: 949-253-1680

Internet: sales@newport.com

Newport®

Visit Newport Online at: **www.newport.com**

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Newport Corporation, Irvine, California, has been certified compliant with ISO 9001 by the British Standards Institution.

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