

# EML-100

## Electric Linear Actuator

### Applications

The Woodward EML-100 electric actuator is designed to provide highly accurate, closed loop position control of steam and fuel valves that require a linear operator with a stroke length between 0.5 to 1.5 inches (13 to 38 mm). The actuator is designed to be used with the Woodward EM Digital Driver.

### Description

The EML-100 actuator utilizes a high performance brushless dc servomotor, a precision planetary gearbox, and a leadscrew/ballhead to produce a linear output. The use of this highly efficient gear train results in a high servo system bandwidth. Two brushless resolvers are used within the actuator, one for motor commutation, the other for output shaft position. The actuator also incorporates a clutch between the motor and gear train to prevent damage to the unit when a rigid mechanical stop is encountered.

### Performance

**Force Output**

100 lb (445 N) continuous

**Stroke Length**

0.5, 1.0, or 1.5 inch (13, 25, or 38 mm) using different mechanical stops.  
Electrical stops provide infinite variation

**Slew Time**

150 ms for all stroke lengths  
(10–90% slew rate on a 2–98% step)

**Bandwidth**

Greater than 6 Hz at –6 dB

**Linearity**

±0.002 inch (±0.05 mm)

**Repeatability**

0.002 inch (0.05 mm)

**Output Resolution**

0.001 inch (0.03 mm)

**Hysteresis**

0.002 inch (0.05 mm)



- Highly accurate electric linear actuator
- Available in stroke lengths up to 1.5" (38 mm)
- 100 lb (445 N) continuous force output
- Used with Woodward EM Driver
- Corrosion-resistant construction
- Certified for North American Hazardous Locations
- Compliant with applicable CE Directives—ATEX and Machinery
- Optional dual resolver feedback

## Environment

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Ambient Temperature	–40 to +257 °F (–40 to +125 °C)
Vibration	US MIL-STD-810C, Method 514.2, Category b.1, figure 514.2-II curve J (5 g's max. 5–2000 Hz)
Shock	US MIL-STD-810C, Method 516.2, half sine shock Basic design-ground (20 g's for 11ms)
MTBO	50 000 hours
MTBF	100 000 hours

## Electrical

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The EM100L actuator is designed to be used with the Woodward EM Digital Driver. See manual 26159 for more details.

### Electrical Motor Ratings

Motor Voltage	28 Vdc nominal
Motor Current	37 A max phase current with an exponential decay and a time constant of 2.5 s to a maximum continuous phase current of 14.7 A

## Installation

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See the outline drawing for other information.

Attitude	Can be mounting in any orientation
Output Shaft	0.625 inch (15.88 mm) diameter, internally threaded 0.312-24 UNF 1.0 inch (25 mm) deep
Pilot Mounting Hole	2.940 inch (74.68 mm), 0.170 inch (4.32 mm) deep minimum
Flange Pattern	Qty 6, 0.425 inch (10.80 mm) through holes, equally spaced on a 4.875 inch (123.82 mm) bolt circle. Use 0.375 inch or M8 threaded fasteners (not included).
Conduit Connections	Four 0.500-14 NPTF female connections
External Ground	#8, 0.164-32 UNF female thread
Technical Manual	40183

## Regulatory Compliance

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### European Compliance for CE Marking:

<b>ATEX – Potentially Explosive Atmospheres Directive:</b>	Declared to 94/9/EEC COUNCIL DIRECTIVE of 23 March 1994 on the approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres. LCIE 01 ATEX 6033 X Zone 1, Category 2, Group II G, EEx d IIB T3 X
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**Note**—The conduit entry and the connecting device must be certified for the mode of protection concerned (“d”) according to the European standards.

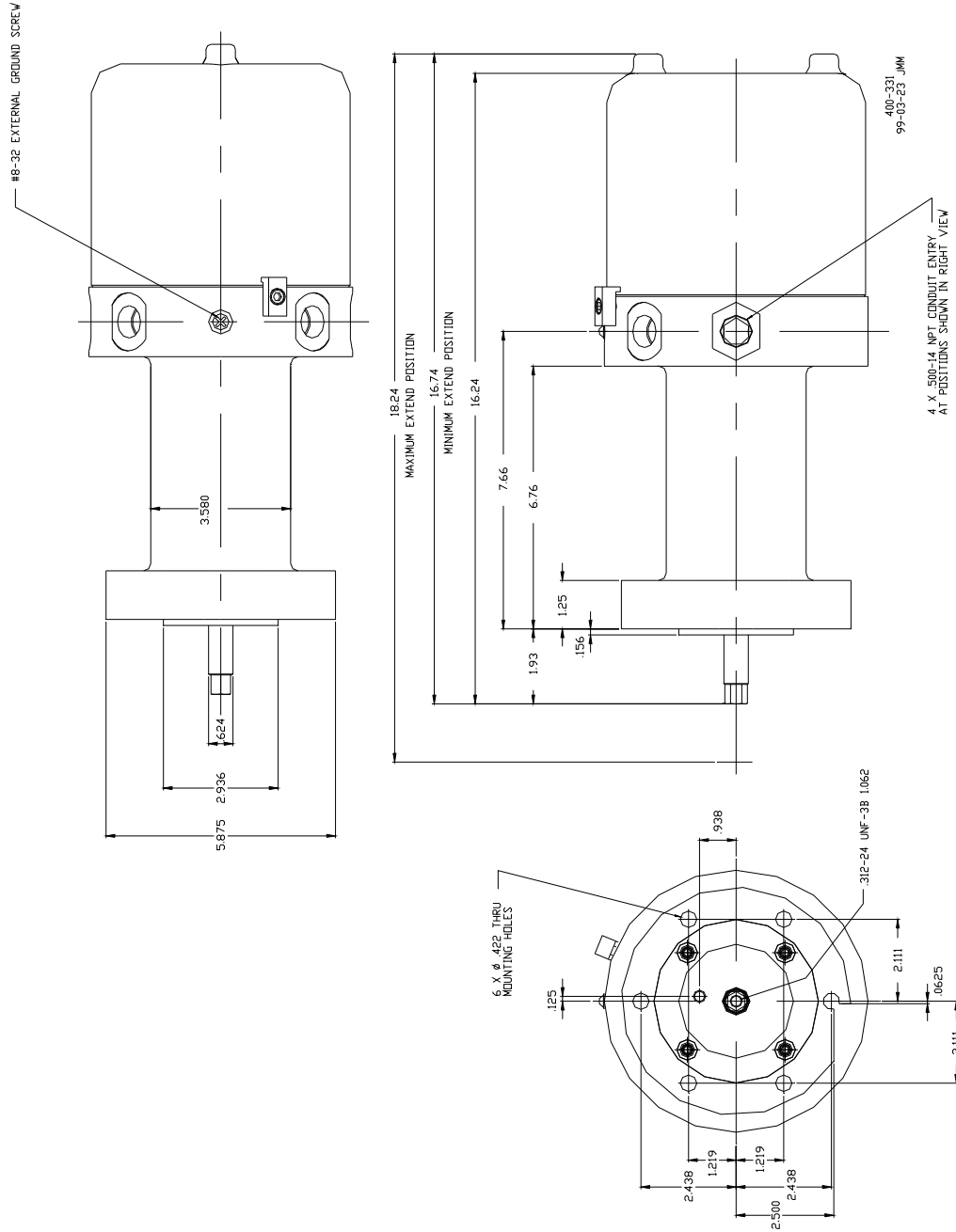
### Other European Compliance:

Compliance with the following European Directives or standards does not qualify this product for application of the CE Marking:

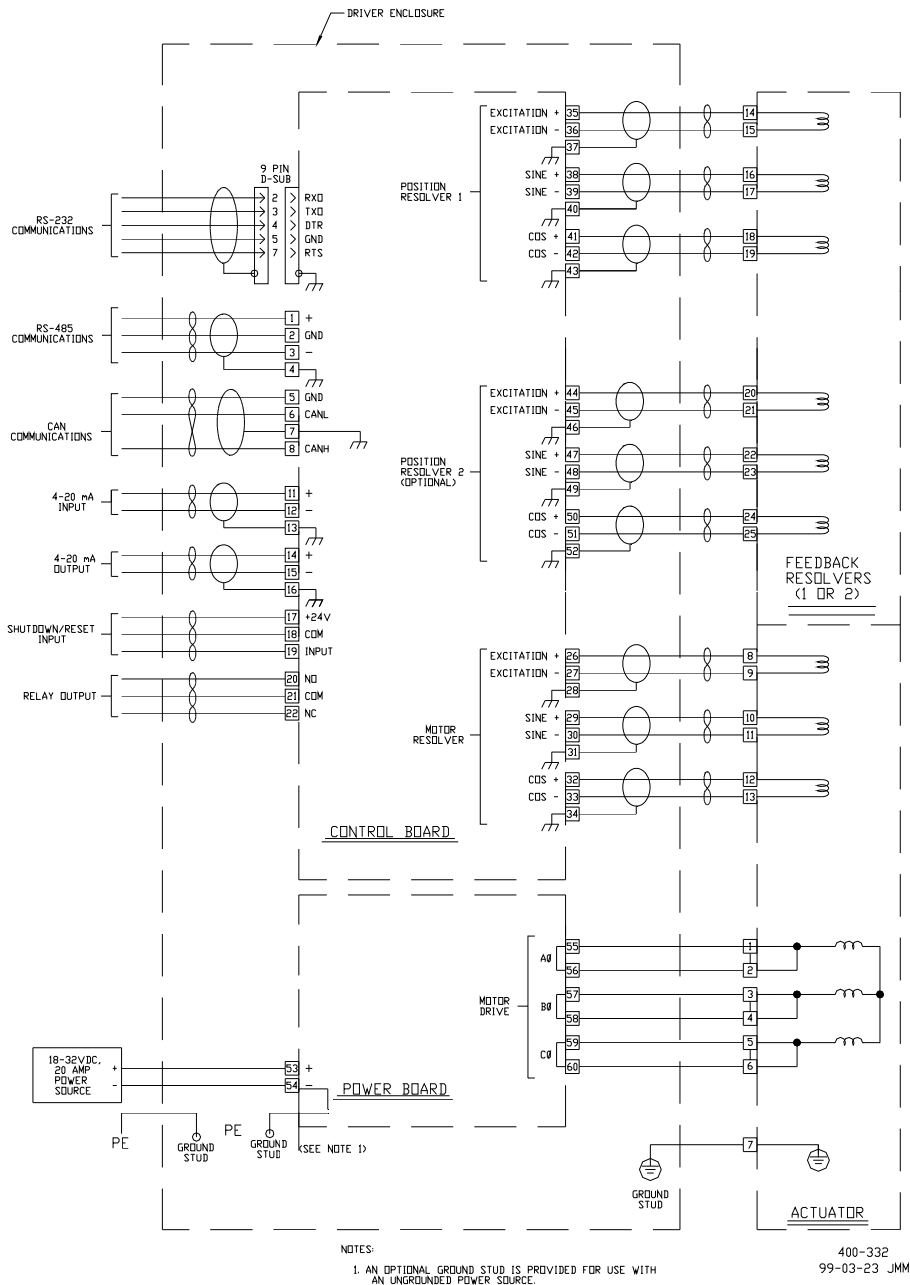
<b>EMC Directive:</b>	Not applicable to this product. Electromagnetically passive devices are excluded from the scope of the 89/336/EEC Directive.
<b>Machinery Directive:</b>	Compliant as a component with 98/37/EC COUNCIL DIRECTIVE of 23 July 1998 on the approximation of the laws of the Member States relating to machinery.

### North American Compliance:

<b>CSA:</b>	CSA Certified for Class I, Division 1, Groups C and D and Division 2, Groups B, C, D, T3C at 125 °C Maximum Ambient for use in Canada and the United States
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**Outline Drawing**  
(Do not use for construction)



Wiring Diagram



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