WOODWARD

Product Manual 40183
(Revision K, 8/2018)

Original Instructions

EML100 Actuator

Instruction and Operation Manual

General Precautions

Read this entire manual and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment.

Practice all plant and safety instructions and precautions.

Failure to follow instructions can cause personal injury and/or property damage.

Revisions

This publication may have been revised or updated since this copy was produced. To verify that you have the latest revision, check manual *26455*, *Customer Publication Cross Reference and Revision Status & Distribution Restrictions*, on the *publications page* of the Woodward website:

www.woodward.com/publications

The latest version of most publications is available on the *publications page*. If your publication is not there, please contact your customer service representative to get the latest copy.

Proper Use

Any unauthorized modifications to or use of this equipment outside its specified mechanical, electrical, or other operating limits may cause personal injury and/or property damage, including damage to the equipment. Any such unauthorized modifications: (i) constitute "misuse" and/or "negligence" within the meaning of the product warranty thereby excluding warranty coverage for any resulting damage, and (ii) invalidate product certifications or listings.

Translated Publications

If the cover of this publication states "Translation of the Original Instructions" please note:

The original source of this publication may have been updated since this translation was made. Be sure to check manual *26455*, *Customer Publication Cross Reference and Revision Status & Distribution Restrictions*, to verify whether this translation is up to date. Out-of-date translations are marked with ⚠. Always compare with the original for technical specifications and for proper and safe installation and operation procedures.

Revisions— A bold, black line alongside the text identifies changes in this publication since the last revision.

Manual 40183

Contents

Illustrations and Tables

Warnings and Notices

Important Definitions

This is the safety alert symbol used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

- **DANGER** - Indicates a hazardous situation, which if not avoided, will result in death or serious injury.
- **WARNING** - Indicates a hazardous situation, which if not avoided, could result in death or serious injury.
- **CAUTION** - Indicates a hazardous situation, which if not avoided, could result in minor or moderate injury.
- **NOTICE** - Indicates a hazard that could result in property damage only (including damage to the control).
- **IMPORTANT** - Designates an operating tip or maintenance suggestion.

⚠WARNING

Overspeed / Overtemperature / Overpressure

The engine, turbine, or other type of prime mover should be equipped with an overspeed shutdown device to protect against runaway or damage to the prime mover with possible personal injury, loss of life, or property damage.

The overspeed shutdown device must be totally independent of the prime mover control system. An overtemperature or overpressure shutdown device may also be needed for safety, as appropriate.

⚠WARNING

Personal Protective Equipment

The products described in this publication may present risks that could lead to personal injury, loss of life, or property damage. Always wear the appropriate personal protective equipment (PPE) for the job at hand. Equipment that should be considered includes but is not limited to:

- **Eye Protection**
- **Hearing Protection**
- **Hard Hat**
- **Gloves**
- **Safety Boots**
- **Respirator**

Always read the proper Material Safety Data Sheet (MSDS) for any working fluid(s) and comply with recommended safety equipment.

⚠WARNING

Start-up

Be prepared to make an emergency shutdown when starting the engine, turbine, or other type of prime mover, to protect against runaway or overspeed with possible personal injury, loss of life, or property damage.

Regulatory Compliance

European Compliance for CE Marking:
These listings are limited only to those units bearing the CE Marking.

ATEX – Potentially Explosive Atmospheres Directive: Directive 2014/34/EU on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres
LCIE 01ATEX 6033 X
Zone 1, Category 2, Group II G, Ex db IIB T3 Gb

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

EMC Directive: Directive 2014/30/EU on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres

Machinery Directive: Compliant as partly completed machinery with Directive 2006/42/EC of the European Parliament and the Council of 17 May 2006 on machinery.

North American Compliance:

CSA: CSA Certified for Class I, Division 1, Groups C and D and Division 2, Groups B, C, D, T3C at 93 °C Maximum Ambient for use in Canada and the United States
Certificate 1018524

Special Conditions for Safe Use

Wiring must be in accordance with North American Class I, Division 1 or 2 (dependent upon application), or European Zone 1, Category 2 wiring methods as applicable, and in accordance with the authority having jurisdiction.

The conduit entry and the connecting device must be certified for the mode of protection concerned (“d”) according to the European standards.

The Special Fasteners used on this product are hexagon socket head cap screws per ASME B18.3 with length 0.750 in (19 mm), and 1/4-28 UNF-3A thread made from austenitic stainless steel (passivated) with minimum tensile strength 80 ksi.

The gaps and widths of the different flame paths are different than the values specified in the tables of EN 60079-1.

Field Wiring must be suitable for at least 110 °C.

The EML100 Actuator is certified to a Zone 1-Category 2 ATEX method of protection “d”. Wiring methods must comply with the Zone 1-Category 2 method of protection when installed in a Zone 2 classified atmosphere.

Compliance with the Machinery Directive 2006/42/EC noise measurement and mitigation requirements is the responsibility of the manufacturer of the machinery into which this product is incorporated.

⚠WARNING

EXPLOSION HAZARD—Do not remove covers or connect/disconnect electrical connectors unless power has been switched off or the area is known to be non-hazardous.

Substitution of components may impair suitability for Class I, Division 1 or 2, or Zone 1.

⚠AVERTISSEMENT

RISQUE D'EXPLOSION—Ne pas enlever les couvercles, ni raccorder / débrancher les prises électriques, sans vous en assurez auparavant que le système a bien été mis hors tension; ou que vous vous situez bien dans une zone non explosive.

La substitution de composants peut rendre ce matériel inacceptable pour les emplacements de Classe I, Division 1 ou 2, ou Zone 1.

Chapter 1.
General Information

Introduction

The EML100 electric linear actuator is an accurate, rugged, and highly reliable actuator which can be used in applications that require a linear operator with a stroke length between 13 and 38 mm (0.5 and 1.5 inches). The actuator is designed to be used with the Woodward EM Driver or Woodward 24 V DVP (Digital Valve Positioner).

Description

The EML100 electric actuator uses 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 wide servo system bandwidth. Two brushless resolvers are used within the actuator, one for motor commutation, the other for output shaft position. An optional dual position feedback resolver is also available. The actuator incorporates a clutch between the motor and gear train to prevent damage to the unit if a rigid mechanical stop is encountered.

The EML100 electric actuator receives power from and is controlled by the Woodward EM Driver or Woodward 24 V DVP. Command signals are received from the driver to accurately position the actuator. Detailed information regarding the driver can be found in manual 26159 for the EM Driver or manual 26329 for the 24 V DVP.

The following performance parameters describe the EML100:

Force Output	445 N (100 lbf) continuous
Stroke Length	12.7, 25.4, or 38.1 mm (0.5, 1.0, or 1.5 inch) using different mechanical stops. Electrical stops provide infinite variation within mechanical stops.
Slew Time	150 ms for all stroke lengths (10–90% positions on a 0–100% step)
Bandwidth	Greater than 6 Hz at –6 dB
Linearity	±0.05 mm (±0.002 inch)
Repeatability	0.05 mm (0.002 inch)
Output Resolution	0.03 mm (0.001 inch)
Hysteresis	0.05 mm (0.002 inch)
Input Voltage (Driver)	28 Vdc nominal for EM Driver 24 Vdc nominal for DVP
Ambient Temperature	–40 to +93 °C (–40 to +200 °F)
Vibration	Mil-Std-810C, Method 514.2, category b.1, Figure 514.2-II curve J (5 g's max. 5–2000 Hz)
Shock	Mil-Std-810C, Method 516.2, half sine shock Basic design-ground (20 g's for 11 ms)
MTBO	50 000 hours
MTBF	100 000 hours
Mass/Weight	10 kg (23 lb)

Electrical Motor Ratings:

Motor Current	37 A maximum phase current, with an exponential decay and time constant of 2.5 s to a maximum continuous phase current of 14.7 A

Refer to the driver manual for power supply ratings and input voltage details.

Chapter 2.
Installation

Introduction

⚠WARNING

EXPLOSION HAZARD—Do not remove covers or connect/disconnect electrical connectors unless power has been switched off or the area is known to be non-hazardous.

Substitution of components may impair suitability for Class I, Division 1 or 2, or Zone 1.

During installation, handle the actuator with care. Improper handling can ruin seals, mating surfaces, and factory adjustments. Keep all plastic shipping caps and covers in place until ready to connect normal service/supply lines.

Packaging and Storage

The assembly is bolted to a transportation skid and shipped in a protective box. Additional cleaning prior to installing and operating unit is not necessary.

The actuator may be stored as received from the factory for an extended period of time prior to installation.

General Installation

Refer to the outline drawing, Figure 2-1, for:

- Overall dimensions
- Location of installation holes
- Electrical connection locations

Actuator Installation

The EML100 actuator may be mounted in any position or attitude and may be lifted by hand (mass/weight = 10 kg/23 lb). Use six 0.375 inch (M8) fasteners of appropriate length to attach the actuator to the customer mounting surface. The mounting surface should be a flat metal surface with a minimum pilot hole diameter of 74.7 mm (2.940 inches) to accommodate the piloting section on the bottom surface of the actuator.

The 0.625 inch (15.9 mm) diameter output shaft is internally threaded with a 0.312-24 UNF-3B thread to a depth of 25 mm (1.0 inch). The external linkage or load attached to the actuator should not exceed 445 N (100 lbf). The mounting arrangement should minimize side loading of the actuator output shaft. Commercially available side load reducing couplings are recommended. Excessive side loading will reduce actuator performance and cause premature wear and/or failure. Do not mount the EML100 actuator near sources of excessive radiant heat such as exhaust manifolds or other engine components.

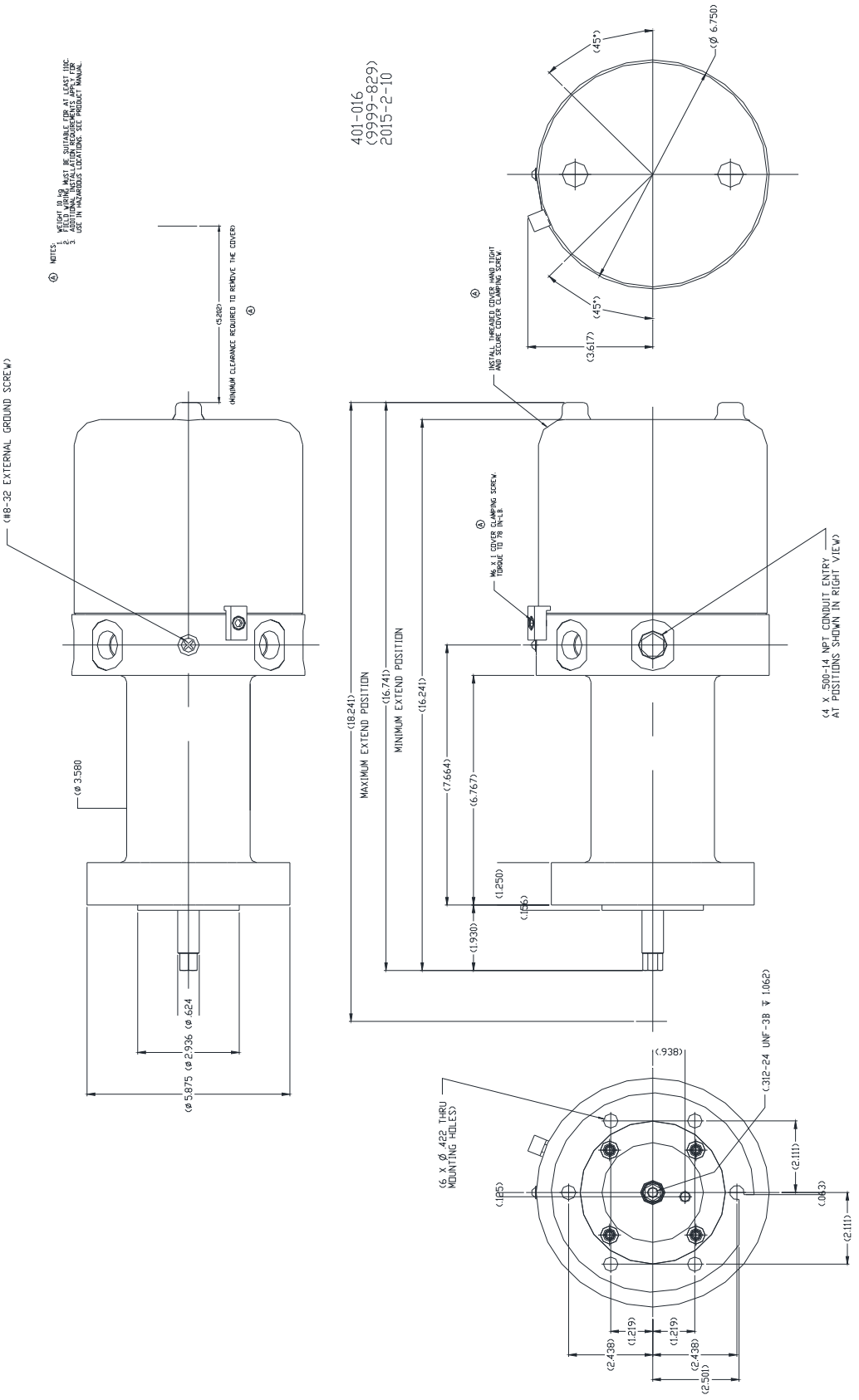


Figure 2-1. Actuator Outline Drawing

Electrical Connections

See Figure 2-2 for the wiring diagram. Consult the EM Driver manual (26159) or 24 V DVP manual (26329), for specific wiring requirements and procedures.

The EML100 actuator has four 0.500-14 NPTF female conduit connections for customer wiring. This permits the actuator motor power wires to be separated from each of the low voltage resolver wire bundles to minimize the possibility of noise interference. A #8, 0.164-32 UNF female thread external ground screw is also provided.

⚠WARNING

Due to the hazardous location listings associated with this product, proper wire type and wiring practices are critical to operation. As applicable, the electrical installation shall be carried out according to EN 60079-14.

The use of cable with individually-shielded twisted pairs is recommended. All signal lines should be shielded to prevent picking up stray signals from nearby equipment. Installations with severe electromagnetic interference (EMI) may require shielded cable run in conduit, double-shielded wire, or other precautions. Connect the shields at the control system side or as indicated by the control system wiring practices, but never at both ends of the shield such that a ground loop is created. Wires exposed beyond the shield must be less than 2 inches
(51 mm). The wiring should provide signal attenuation to greater than 60 dB.

The resolver cable should consist of three individually shielded twisted pairs. Each pair should be connected to one coil of the resolver as indicated in Figure 2-2 (wiring diagram). Refer to the EM Driver manual (26159) or 24 V DVP manual (26329) for system wiring requirements.

⚠WARNING

EXPLOSION HAZARD—External fire protection is not provided in the scope of this product. It is the responsibility of the user to satisfy any applicable requirements for their system.

⚠WARNING

EXPLOSION HAZARD—For Zone 1/Division 1 installation of the EML100, the threaded cover must be installed hand-tight with the cover lock screw torqued to 8.8 N·m (78 in-lb).

The EML100 Actuator is certified to a Zone 1-Category 2 ATEX method of protection “d”. Wiring methods must comply with the Zone 1-Category 2 method of protection when installed in a Zone 2 classified atmosphere.

Take care to protect the cover threads and mating actuator threads when they are exposed, as they are critical to the Zone 1/Division 1 methods of protection.

⚠CAUTION

Due to typical noise levels in turbine environments, hearing protection should be worn when working on or around the EML100 Actuator.

⚠CAUTION

The surface of this product can become hot enough or cold enough to be a hazard. Use protective gear for product handling in these circumstances. Temperature ratings are included in the specification section of this manual.

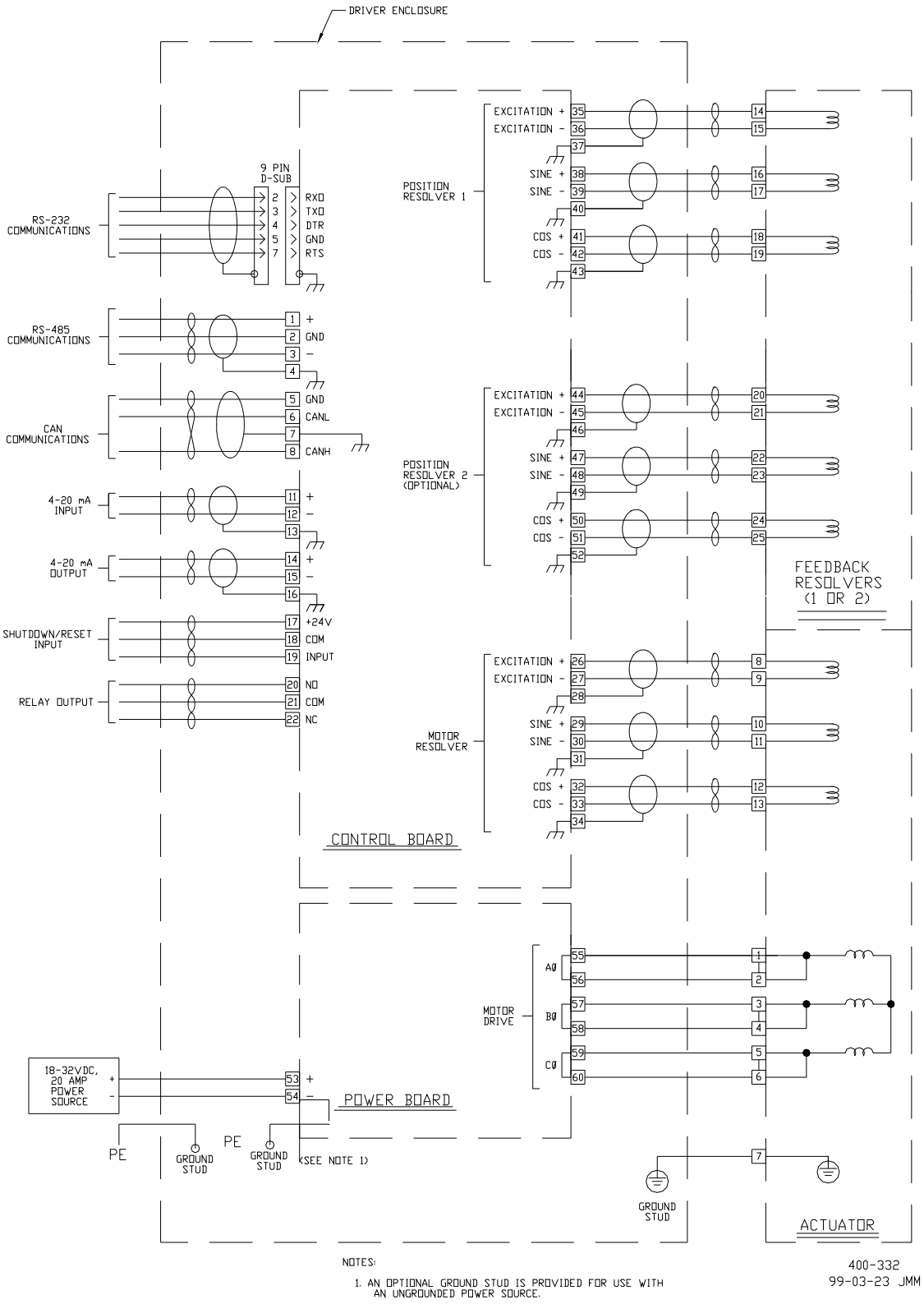


Figure 2-2a. Wiring Diagram (EM Driver Connections Shown)

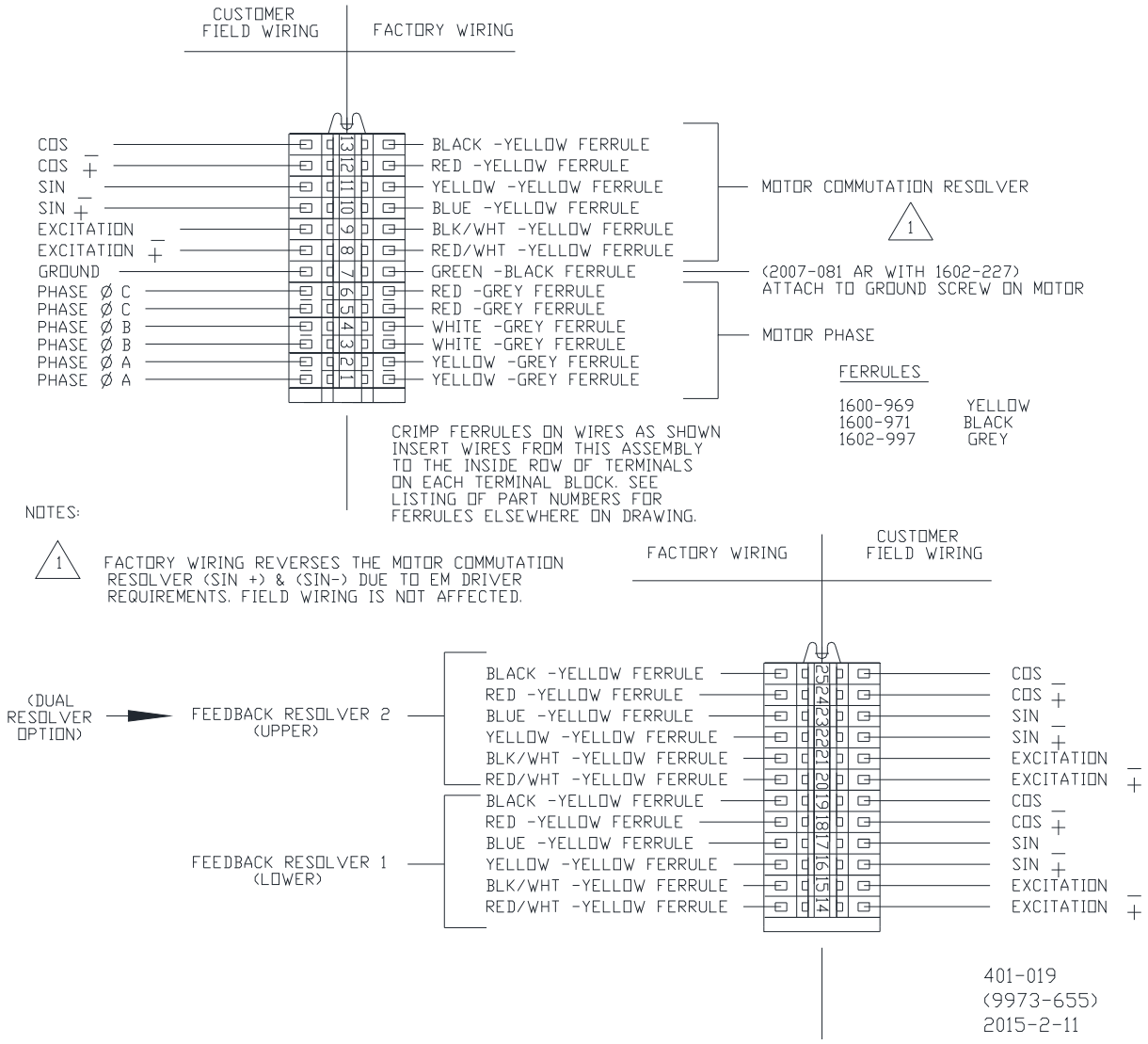


Figure 2-2b. Wiring Diagram (EM Driver Connections Shown)

Chapter 3.
Start-up and Adjustment

Introduction

This section describes the initial operation of the EML100 actuator.

Initial Operation

Before initial use of the associated actuator, be sure that all installation steps found in this manual and the driver manual have been completed. All electrical connections must be properly and securely installed. The EML100 actuator must be calibrated to its associated Driver before initial use. Specific calibration instructions are explained in the EM Driver manual (26159) or 24 V DVP manual (26329), which accompanies the EM Driver.

Each EML100 actuator is shipped from the factory with at least one copy of a “Production Test Data Sheet”. This data sheet contains the latest calibration data specific to a particular actuator based on serial number and designation number. See Figure 3-1 for an example. This information must be used during the calibration procedure to assure the highest positional accuracy possible.

⚠CAUTION

Due to typical noise levels in turbine environments, hearing protection should be worn when working on or around the EML100 Actuator.

⚠CAUTION

The surface of this product can become hot enough or cold enough to be a hazard. Use protective gear for product handling in these circumstances. Temperature ratings are included in the specification section of this manual.

Important calibration information is circled and numbered with explanations below (see Figure 3-1):

1. Woodward actuator part number.

2. Woodward actuator serial number, unique to this unit.

3. Position resolver reading at minimum hard stop position. This resolver reading will be used during the calibration procedure as the “Hard Stop Minimum” position. This resolver reading will be stamped on a decal attached to the actuator motor. The actuator cover must be removed to view this decal.

4. Position resolver reading at maximum hard stop position. This resolver reading will be used during the calibration procedure as the “Hard Stop Maximum” position. This resolver reading will be stamped on a decal attached to the actuator motor. The actuator cover must be removed to view this decal.

5. Total actuator linear travel from minimum to maximum hard stop positions. Depends on designation number: available strokes are 12.7, 25,4, or 38.1 mm (0.500 inch, 1.00 inch, or 1.50 inches). 101 resolver degrees equals 12.7 mm (0.500 inch) linear travel.

IMPORTANT

The actuator may be calibrated between any two resolver readings as long as they are between the minimum and maximum values from items 3 and 4. If the full stroke of the actuator is to be used, calibrate the minimum and maximum resolver positions to just inside the hard stop positions to prevent the actuator motor from stalling against a hard stop. As an example, if the hard stops from the test sheet are 100 degrees at minimum and 200 degrees at maximum, calibrate minimum position at 102 degrees and maximum position at 198 degrees. You will still use 100 and 200 degrees as the hard stop positions during calibration.

On Dual position resolver units, there will be two sets of min and max resolver readings to be used during calibration.

If the EML100 actuator is shipped as part of a valve assembly, the calibration data for the entire valve assembly will be used for field calibration and not the standalone actuator calibration.

Adjustments

⚠WARNING

EXPLOSION HAZARD—External fire protection is not provided in the scope of this product. It is the responsibility of the user to satisfy any applicable requirements for their system.

⚠WARNING

EXPLOSION HAZARD—For Zone 1/Division 1 installation of the EML100, the threaded cover must be installed hand-tight with the cover lock screw torqued to 8.8 N·m (78 in-lb).

Take care to protect the cover threads and mating actuator threads when they are exposed, as they are critical to the Zone 1/Division 1 methods of protection.

⚠CAUTION

Due to typical noise levels in turbine environments, hearing protection should be worn when working on or around the EML100 Actuator.

⚠CAUTION

The surface of this product can become hot enough or cold enough to be a hazard. Use protective gear for product handling in these circumstances. Temperature ratings are included in the specification section of this manual.

IMPORTANT

The actuator assembly is not field adjustable. See "Troubleshooting" in Chapter 4 of this manual.

EML100 ACTUATOR PRODUCTION TEST DATA SHEET

P/N_____①_____ S/N_____②_____

TESTED BY_____ DATE_____

SALES ORDER NO._____ WORK ORDER NO. _____

3.2 b Actuator electrical markings are correct and the unit is wired according to wiring diagram. ( )

3.2 c Actuator has no external damage and shows good workmanship. ( )
Note exceptions on field returned or repair units.

3.3 Dielectric Strength test on all wires except ground at 600 Vac for one second or 500 VAC or one minute. (Repair units to be tested at 250 Vac for one minute.)
( )

3.4 Insulation Resistance test on each wire except ground at 250 Vdc for 10 seconds.
Each wire shall have greater than 10 MΩ insulation resistance. ( )

3.6 Calibrate the EML100 actuator to the test stand EM Driver. Record minimum and maximum position resolver readings from HMI (degrees) with the actuator at the min and max hard stops. (Mark N/A for resolver # 2 on single resolver units).

Position resolver # 1: minimum____③____ maximum____④____
Position resolver # 2: minimum_____ maximum_____

Actuator full stroke length from min to max: ____⑤_____ inches. ( )

3.7 Functional check with 100 lbf opposing load. Record readings from the HMI Run page. ( )

Control Input Signal (± 0.05 milliamp)	Demand Input (%)	Actuator Position (%) (± 0.4 of Demand max)	Actuator current (amps)
4.00			
8.00			
12.00			
16.00			
20.00			
16.00			
12.00			
8.00			
4.00			

3.8 Stall force of the actuator at steady state current limit: _____ lbf
(115 lbf min) ( )

4.1 Install shipping caps in conduit outlets and tighten cover-locking device.( )

4.2 Position feedback resolver readings found in step 3.6 are stamped on adhesive decal and attached to the actuator motor. ( )
Note: If actuator to be mounted to 3151 water valve, leave decal blank.

Figure 3-1. EML100 Actuator Production Test Data Sheet

Chapter 4.
Maintenance

Introduction

This section describes basic preventative maintenance and troubleshooting for the EML100 actuator.

There are no maintenance requirements for the EML100 actuator.

Refer to the appropriate valve manual for valve maintenance requirements.

Troubleshooting

If variations in actuator shaft position occur, inspect all components, including the turbine, for proper operation. Refer to the correct Woodward control manual for assistance in isolating the problem.

Field disassembly or adjustment of the EML100 actuator is not recommended. All work and adjustments should be performed by personnel thoroughly trained in the proper procedures.

When requesting information or service from Woodward, be sure to specify the part number and serial number of your valve/actuator assembly.

⚠WARNING

EXPLOSION HAZARD—Do not remove covers or connect/disconnect electrical connectors unless power has been switched off or the area is known to be non-hazardous.

Substitution of components may impair suitability for Class I, Division 1 or 2, or Zone 1.

⚠WARNING

For Zone 1 / Division 1 products: Proper torque is very important to ensure that the unit is sealed properly. Torque the EML100 cover lock screw to 8.8 N·m (78 lb-in).

⚠CAUTION

Due to typical noise levels in turbine environments, hearing protection should be worn when working on or around the EML100 **Actuator.**

⚠CAUTION

The surface of this product can become hot enough or cold enough to be a hazard. Use protective gear for product handling in these circumstances. Temperature ratings are included in the specification section of this manual.

Chapter 5.
Product Support and Service Options

Product Support Options

If you are experiencing problems with the installation, or unsatisfactory performance of a Woodward product, the following options are available:

- Consult the troubleshooting guide in the manual.
- Contact the manufacturer or packager of your system.
- Contact the Woodward Full Service Distributor serving your area.
- Contact Woodward technical assistance (see “How to Contact Woodward” later in this chapter) and discuss your problem. In many cases, your problem can be resolved over the phone. If not, you can select which course of action to pursue based on the available services listed in this chapter.

OEM or Packager Support: Many Woodward controls and control devices are installed into the equipment system and programmed by an Original Equipment Manufacturer (OEM) or Equipment Packager at their factory. In some cases, the programming is password-protected by the OEM or packager, and they are the best source for product service and support. Warranty service for Woodward products shipped with an equipment system should also be handled through the OEM or Packager. Please review your equipment system documentation for details.

Woodward Business Partner Support: Woodward works with and supports a global network of independent business partners whose mission is to serve the users of Woodward controls, as described here:

- A **Full Service Distributor** has the primary responsibility for sales, service, system integration solutions, technical desk support, and aftermarket marketing of standard Woodward products within a specific geographic area and market segment.
- An **Authorized Independent Service Facility (AISF)** provides authorized service that includes repairs, repair parts, and warranty service on Woodward's behalf. Service (not new unit sales) is an AISF's primary mission.
- A **Recognized Turbine Retrofitter (RTR)** is an independent company that does both steam and gas turbine control retrofits and upgrades globally, and can provide the full line of Woodward systems and components for the retrofits and overhauls, long term service contracts, emergency repairs, etc.

A current list of Woodward Business Partners is available at **www.woodward.com/directory**.

Product Service Options

The following factory options for servicing Woodward products are available through your local Full-Service Distributor or the OEM or Packager of the equipment system, based on the standard Woodward Product and Service Warranty (5-01-1205) that is in effect at the time the product is originally shipped from Woodward or a service is performed:

- Replacement/Exchange (24-hour service)
- Flat Rate Repair
- Flat Rate Remanufacture

Replacement/Exchange: Replacement/Exchange is a premium program designed for the user who is in need of immediate service. It allows you to request and receive a like-new replacement unit in minimum time (usually within 24 hours of the request), providing a suitable unit is available at the time of the request, thereby minimizing costly downtime. This is a flat-rate program and includes the full standard Woodward product warranty (Woodward Product and Service Warranty 5-01-1205).

This option allows you to call your Full-Service Distributor in the event of an unexpected outage, or in advance of a scheduled outage, to request a replacement control unit. If the unit is available at the time of the call, it can usually be shipped out within 24 hours. You replace your field control unit with the like-new replacement and return the field unit to the Full-Service Distributor.

Charges for the Replacement/Exchange service are based on a flat rate plus shipping expenses. You are invoiced the flat rate replacement/exchange charge plus a core charge at the time the replacement unit is shipped. If the core (field unit) is returned within 60 days, a credit for the core charge will be issued.

Flat Rate Repair: Flat Rate Repair is available for the majority of standard products in the field. This program offers you repair service for your products with the advantage of knowing in advance what the cost will be. All repair work carries the standard Woodward service warranty (Woodward Product and Service Warranty 5-01-1205) on replaced parts and labor.

Flat Rate Remanufacture: Flat Rate Remanufacture is very similar to the Flat Rate Repair option with the exception that the unit will be returned to you in “like-new” condition and carry with it the full standard Woodward product warranty (Woodward Product and Service Warranty 5-01-1205). This option is applicable to mechanical products only.

Returning Equipment for Repair

If a control (or any part of an electronic control) is to be returned for repair, please contact your Full-Service Distributor in advance to obtain Return Authorization and shipping instructions.

When shipping the item(s), attach a tag with the following information:

- Return authorization number
- Name and location where the control is installed
- Name and phone number of contact person
- Complete Woodward part number(s) and serial number(s)
- Description of the problem
- Instructions describing the desired type of repair

Packing a Control

Use the following materials when returning a complete control:

- Protective caps on any connectors
- Antistatic protective bags on all electronic modules
- Packing materials that will not damage the surface of the unit
- At least 100 mm (4 inches) of tightly packed, industry-approved packing material
- A packing carton with double walls
- A strong tape around the outside of the carton for increased strength

NOTICE

To prevent damage to electronic components caused by improper handling, read and observe the precautions in Woodward manual 82715, *Guide for Handling and Protection of Electronic Controls, Printed Circuit Boards, and Modules*.

Replacement Parts

When ordering replacement parts for controls, include the following information:

- The part number(s) (XXXX-XXXX) that is on the enclosure nameplate
- The unit serial number, which is also on the nameplate

Engineering Services

Woodward offers various Engineering Services for our products. For these services, you can contact us by telephone, by email, or through the Woodward website.

- Technical Support
- Product Training
- Field Service

Technical Support is available from your equipment system supplier, your local Full-Service Distributor, or from many of Woodward's worldwide locations, depending upon the product and application. This service can assist you with technical questions or problem solving during the normal business hours of the Woodward location you contact. Emergency assistance is also available during non-business hours by phoning Woodward and stating the urgency of your problem.

Product Training is available as standard classes at many of our worldwide locations. We also offer customized classes, which can be tailored to your needs and can be held at one of our locations or at your site. This training, conducted by experienced personnel, will assure that you will be able to maintain system reliability and availability.

Field Service engineering on-site support is available, depending on the product and location, from many of our worldwide locations or from one of our Full-Service Distributors. The field engineers are experienced both on Woodward products as well as on much of the non-Woodward equipment with which our products interface.

For information on these services, please contact us via telephone, email us, or use our website: **www.woodward.com**.

Contacting Woodward's Support Organization

For the name of your nearest Woodward Full-Service Distributor or service facility, please consult our worldwide directory at **www.woodward.com/directory**, which also contains the most current product support and contact information.

You can also contact the Woodward Customer Service Department at one of the following Woodward facilities to obtain the address and phone number of the nearest facility at which you can obtain information and service.

Products Used in Electrical Power Systems

Facility	Phone Number
Brazil	+55 (19) 3708 4800
China	+86 (512) 6762 6727
Germany:	
Kempen	+49 (0) 21 52 14 51
Stuttgart	+49 (711) 78954-510
India	+91 (124) 4399500
Japan	+81 (43) 213-2191
Korea	+82 (51) 636-7080
Poland	+48 12 295 13 00
United States	+1 (970) 482-5811

Products Used in Engine Systems

Facility	Phone Number
Brazil	+55 (19) 3708 4800
China	+86 (512) 6762 6727
Germany	+49 (711) 78954-510
India	+91 (124) 4399500
Japan	+81 (43) 213-2191
Korea	+82 (51) 636-7080
The Netherlands	+31 (23) 5661111
United States	+1 (970) 482-5811

Products Used in Industrial Turbomachinery Systems

Facility	Phone Number
Brazil	+55 (19) 3708 4800
China	+86 (512) 6762 6727
India	+91 (124) 4399500
Japan	+81 (43) 213-2191
Korea	+82 (51) 636-7080
The Netherlands	+31 (23) 5661111
Poland	+48 12 295 13 00
United States	+1 (970) 482-5811

Technical Assistance

If you need to contact technical assistance, you will need to provide the following information. Please write it down here before contacting the Engine OEM, the Packager, a Woodward Business Partner, or the Woodward factory:

General

Your Name _____

Site Location _____

Phone Number _____

Fax Number

Prime Mover Information

Manufacturer _____

Turbine Model Number _____

Type of Fuel (gas, steam, etc.) _____

Power Output Rating _____

Application (power generation, marine, etc.)

Control/Governor Information

Control/Governor #1

Woodward Part Number & Rev. Letter _____

Control Description or Governor Type _____

Serial Number

Control/Governor #2

Woodward Part Number & Rev. Letter _____

Control Description or Governor Type _____

Serial Number

Control/Governor #3

Woodward Part Number & Rev. Letter _____

Control Description or Governor Type _____

Serial Number

Symptoms

Description _____

_____

If you have an electronic or programmable control, please have the adjustment setting positions or the menu settings written down and with you at the time of the call.

Revision History

Changes in Revision K—
- Updated ATEX Directive
- Updated DOC

Changes in Revision J—
- Updated ATEX and EMC Directives
- Updated Declarations

Changes in Revision H—
- General Compliance updates
- Updated Figures 2-1 & 2-2b

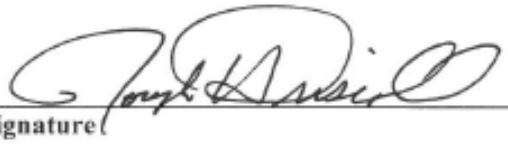
Declarations

EU DECLARATION OF CONFORMITY

EU DoC No.:	00109-04-CE-02-01
Manufacturer's Name:	WOODWARD INC.
Manufacturer's Contact Address:	1041 Woodward Way Fort Collins, CO 80524 USA
Model Name(s)/Number(s):	EML100 Actuator / 9907-621, 9907-779, 9908-376
The object of the declaration described above is in conformity with the following relevant Union harmonization legislation:	Directive 2014/34/EU on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres
Markings in addition to CE marking:	Ex Category 2 Group II G, Ex d IIB T3 Gb
Applicable Standards:	EN 60079-0:2012/A11:2013 – Explosive atmospheres – Part 0: Equipment – General requirements EN 60079-1:2007 – Explosive atmospheres – Part 1: Equipment protection by flameproof enclosures 'd' (A review against EN 60079-1:2014, which is harmonized, shows no significant changes relevant to this equipment and continue to represent "State of the Art"
Third Party Certification:	LCIE 01 ATEX 6033 X LCIE Bureau Veritas Siège Social : 33, Avenue du Général Leclerc F92260 Fontenay-aux-Roses, France
Conformity Assessment:	ATEX Annex IV - Production Quality Assessment, 01 220 113542 TUV Rheinland Industrie Service GmbH (0035) Am Grauen Stein, D51105 Cologne

This declaration of conformity is issued under the sole responsibility of the manufacturer
We, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s).

MANUFACTURER



Signature

Joe Drisoll
Full Name

Engineering Manager
Position

Woodward, Fort Collins, CO, USA
Place

1/23/18
Date

5-09-1183 Rev 26

DECLARATION OF INCORPORATION
Of Partly Completed Machinery
2006/42/EC

File name:	00109-04-CE-02-02
Manufacturer's Name:	WOODWARD INC.
Manufacturer's Address:	1041 Woodward Way Fort Collins, CO 80524 USA
Model Names:	EML100 Actuator
This product complies, where applicable, with the following Essential Requirements of Annex I:	1.1, 1.3, 1.4, 1.5, 1.6, 1.7
Applicable Standards:	EN ISO 12100:2010

The relevant technical documentation is compiled in accordance with part B of Annex VII. Woodward shall transmit relevant information if required by a reasoned request by the national authorities. The method of transmittal shall be agreed upon by the applicable parties.

The person authorized to compile the technical documentation:

Name: Dominik Kania, Managing Director
Address: Woodward Poland Sp. z o.o., ul. Skarbowa 32, 32-005 Niepolomice, Poland

This product must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of this Directive, where appropriate.

The undersigned hereby declares, on behalf of Woodward Governor Company of Loveland and Fort Collins, Colorado that the above referenced product is in conformity with Directive 2006/42/EC as partly completed machinery:

MANUFACTURER

Signature

Christopher Perkins
Full Name

Engineering Manager
Position

Woodward Inc., Fort Collins, CO, USA
Place

01-JUN-2016
Date

Document: 5-09-1182 (rev. 16)

Released

We appreciate your comments about the content of our publications.

Send comments to: icinfo@woodward.com

Please reference publication 40183.

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Email and Website—www.woodward.com

Woodward has company-owned plants, subsidiaries, and branches, as well as authorized distributors and other authorized service and sales facilities throughout the world.

Complete address / phone / fax / email information for all locations is available on our website.