

**Manual 26896 (Revision NEW, 5/2015)
3103 Gas Valve with EM35MR Actuator**

See manual 26734 for complete installation, operation, maintenance, and certification information. Publications can be found on our website at www.woodward.com/publications.

Important Definitions

This is the safety alert symbol. It is 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**

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.



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.



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.



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.

NOTICE

To prevent damage to a control system that uses an alternator or battery-charging device, make sure the charging device is turned off before disconnecting the battery from the system.

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*.

Go to www.woodward.com/publications for complete instructions (manual 26734).

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 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.

Flat Rate Repair: Flat Rate Repair is available for many of the standard mechanical products and some of the electronic 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.

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. 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 number;
- name and phone number of contact person;
- description of the problem;
- name and location where the control is installed;
- complete Woodward part number(s) and serial number(s);
- instructions describing the desired type of repair.

Contacting Woodward's Support Organization

For the name of your nearest Woodward Full-Service Distributor or service facility, please consult our worldwide directory published at www.woodward.com/directory.

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 (129) 4097100
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 (129) 4097100
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 (129) 4097100
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

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WOODWARD

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1000 East Drake Road, Fort Collins CO 80525, USA
Phone +1 (970) 482-5811 • Fax +1 (970) 498-3058

Email and Website—www.woodward.com

Regulatory Compliance & Declarations

European Compliance for CE Marking:

These listings are limited only to those units bearing the CE Marking.

Pressure Equipment Directive (Valve): Certified to Pressure Equipment Directive 97/23/EC of 29 May 1997 on the approximation of the laws of the Member States concerning pressure equipment, Category II by TUV Rheinland Certificate 01 202 USA/Q-11 6617, Module H

ATEX—Potentially Explosive Atmospheres Directive (Actuator & Resolver): Declared to 94/9/EC 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.
SIRA 13ATEX1188X Zone 1, Ex d IIB T3 Gb

IMPORTANT

EM35/EM35MR Actuator and 3103 Valve assemblies incorporating the minimum position switch are not suitable for use in an ATEX environment.

Other European Compliance:

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

ATEX (Valve): Exempt from the ATEX Directive 94/9/EC as non-electrical equipment bearing no potential ignition sources per EN 13463-1. Suitable for installation in a Zone 1, Group IIB environment.

EMC Directive: Not applicable to this product. Electromagnetically passive devices are excluded from the scope of the 2004/108/EC Directive.

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:

These listings are limited only to those units bearing the UL and/or CSA identification.

Suitability for use in North American Hazardous Locations is the result of compliance of the individual components:

Actuator and Resolver: CSA Certified for Class I, Division 1, Groups C & D, Class I, Division 2, Groups B, C, and D, T3 at 93 °C Ambient. For use in Canada and the United States. Certificate 1006295

Minimum Position Switch: CSA Certified for Class I, Division 1, Groups C & D, Class II, Division 2, Groups E, F, and G. LR57324.
UL Listed for Class I, Division 1, Groups C & D, Class II, Division 2, Groups E, F, and G. E14274

Special Conditions for Safe Use

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

Ambient Temperature: (–40 to +93) °C / (–40 to +200) °F

Fuel Temperature: (–40 to +149) °C / (–40 to +300) °F

Use supply wires suitable for a maximum ambient temperature of +93 °C.

For ATEX Zone 1 and Zone 2 Applications: A conduit seal must be installed within 50 mm (2 inches) of the conduit entries when the EM35MR Actuator and EM Resolvers are used in a Zone 1 or a Zone 2 ATEX classified explosive atmosphere. These are Category 2, flameproof, type 'd' products.

For Class I, Division 1 or Class I, Zone 1 North American Applications: A conduit seal must be installed within 45 cm (18 inches) of the conduit entry when the EM35MR Actuator or EM Resolvers are used in a Class I, Division 1 or Class I, Zone 1 hazardous atmosphere.

The surface of the gas valve is dependent upon the temperature of the fuel. Refer to the burn hazard warning statement below for safe handling. Fuel temperature effects on valve surface temperature must be taken into consideration when this product is used in an explosive atmosphere.

WARNING

It should be noted that the following flame paths have a maximum constructional gap that is smaller than IEC 60079-1 requires.

Flame Path	Max Gap, ic (mm) Comment
Actuator Cover to Housing	Per drawing 9989-4011. The max gap permitted on this flat joint is 0.099 mm / 0.0039 inch.
Actuator Adaptor Plate to Housing	Per drawing 9989-4011. The max gap permitted on this flat joint is 0.099 mm / 0.0039 inch.
Resolver Cover to Housing	Per drawing 9989-4013. The max gap permitted on this flat joint is 0.102 mm / 0.004 inch.
Resolver Shaft	Per drawing 9989-4013. The max gap permitted on this cylindrical joint is 0.152 mm / 0.006 inch.
Actuator Shaft	Per drawing 9989-4011. The max gap permitted on this cylindrical joint is 0.152 mm / 0.006 inch.

WARNING

EXPLOSION HAZARD—Do not connect or disconnect while circuit is live unless area is known to be non-hazardous.

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

AVERTISSEMENT

RISQUE D'EXPLOSION—Ne pas raccorder ni débrancher tant que l'installation est sous tension, sauf en cas l'ambiance est décidément non dangereuse.

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

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.

WARNING

GENERAL CONDITIONS FOR SAFE USE—Turbine control system alarms, faults, or shutdowns that are initiated by the valve or valve driver should not be ignored. These alarms, faults, and shutdowns are intended to alert equipment operators of a potentially unsafe condition and to protect against personal injury, loss of life, or property damage. Valve position error alarm and shutdown thresholds should be set to values that prevent improper fuel metering flow rates during turbine light-off. Equipment operators should strictly follow turbine OEM start procedures, including purging of the gas turbine after failed start attempts.

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

Manufacturer's Name: WOODWARD INC.

Manufacturer's Address: 1000 E. Drake Rd.
Fort Collins, CO, USA, 80525

3800 N. Wilson Ave.
Loveland, CO, USA 80538

Model Names: EM35MR1 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

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: Ralf Friedrich, Group Quality Director
Address: Woodward GmbH, Handwerkstraße 29, 70565 Stuttgart, Germany

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 Inc 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

Chris Perkins

Full Name

Engineering Support Manager

Position

Woodward Inc., Fort Collins, CO, USA

Place

6/21/2013

Date

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

Manufacturer's Name: WOODWARD INC.

Manufacturer's Address: 1000 E. Drake Rd.
Fort Collins, CO, USA, 80525

3800 N. Wilson Ave.
Loveland, CO, USA 80538

Model Names: EM/TM Resolver

**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

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: Ralf Friedrich, Group Quality Director
Address: Woodward GmbH, Handwerkstraße 29, 70565 Stuttgart, Germany

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 Inc 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

Chris Perkins

Full Name

Engineering Support Manager

Position

Woodward Inc., Fort Collins, CO, USA

Place

Date

6/21/2013

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

Manufacturer's Name: WOODWARD INC. (WGC)

Manufacturer's Address: 1000 E. Drake Rd.
Fort Collins, CO, USA, 80525

3800 N. Wilson Ave.
Loveland, CO, USA 80538

Model Names: 3103 Gas Valves

Part Numbers: 6945-XXXX

**This product complies, where
applicable, with the following**

Essential Requirements of Annex I: 1.1, 1.2, 1.3, 1.5, 1.6, 1.7

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: Ralf Friedrich, Group Director, Quality, EPS

Address: Woodward GmbH, Handwerkstraße 29, 70565 Stuttgart, Germany

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

Suhail Horan

Full Name

Quality Manager

Position


WGC, Fort Collins, CO, USA

Place

Date

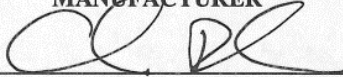
01-Feb-2012

DECLARATION OF CONFORMITY

Manufacturer's Name: WOODWARD INC
Manufacturer's Address: 1000 E. Drake Rd.
Fort Collins, CO, USA, 80525
Model Name(s)/Number(s): EM35MR1 Actuators
Conformance to Directive(s): 94/9/EC 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
Marking(s):  Category 2 Group II G, Ex d IIB T3 Gb
Applicable Standards: EN60079-0:2009 Electrical apparatus for potentially explosive
atmospheres - General Requirements
EN60079-1, 2007 Electrical apparatus for potentially explosive
atmospheres - Flameproof enclosure 'd'
Third Party Certification: SIRA 13 ATEX 1188 X
Conformity Assessment: ATEX Production Quality Assessment Certificate: 01 220 113542
Notified Body TUV Rheinland Industrie Service GmbH (0035)
For ATEX/IECEx: Am Grauen Stein, D-51105 Koln

We, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s).

MANUFACTURER



Signature

Chris Perkins

Full Name

Engineering Support Manager

Position


Woodward Inc, Fort Collins, CO, USA

Place

6/21/2013

Date

DECLARATION OF CONFORMITY

DoC No.: 00144-04-HL-LCIE-02-01.DOCX
Manufacturer's Name: WOODWARD, INC.
Manufacturer's Address: 1000 E. Drake Rd.
Fort Collins, CO, USA, 80525
Model Name(s)/Number(s): EM/TM Resolver 9907-106, 9907-965 thru 9907-970
Conformance to Directive(s): 94/9/EC 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.
The object of the declaration described above is in conformity with the following Directives of the European Parliament and of the Council:
Markings in addition to CE mark:  II 2G, Ex d IIB T3 Gb
Applicable Standards: EN60079-0:2009 Explosive atmospheres – Part 0: Equipment- General Requirements
EN60079-1:2007 Explosive Atmospheres- Part 1: Equipment protection by flameproof enclosures “d”
Third Party Certification Information SIRA 13 ATEX 1188X
Conformity Assessment: ATEX 01 220 113542
Notified Body TUV (0035)
For ATEX: TÜV Rheinland Ind. Service GmbH
Am Grauen Stein, D-51106 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

Chris Perkins

Full Name

Engineering Support Manager

Position

Woodward Inc, Fort Collins, CO, USA

Place

6/21/2013

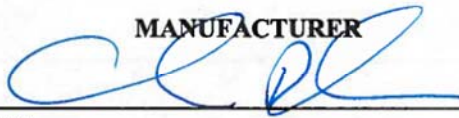
Date

DECLARATION OF CONFORMITY

Manufacturer's Name: WOODWARD INC. (WGC)
Manufacturer's Address: 1000 E. Drake Rd.
Fort Collins, CO, USA, 80525
Model Name(s)/Number(s): 3103 Gas Valve
Part Numbers 6945-xxxx
Conformance to Directive(s): 97/23/EC COUNCIL DIRECTIVE of 29 May 1997 on the
approximation of the laws of the Member States concerning Pressure
Equipment
Applicable Standards: ASME B31.3 Process Piping, 2012
ASME Boiler and Pressure Vessel Code VIII, Div. 1, 2010
EN 13463-1:2009, Non-Electrical Equipment for Potentially Explosive
Atmospheres – Part 1: Basic Method and Requirements
Conformity Assessment: PED Module H –
Full Quality Assurance, Certificate 01 202 USA/Q-11 6617
Notified Body TUV Rheinland – Certification Body
For Pressure Equipment: TUV Rheinland Industrie Service GmbH (0035)
Am Grauen Stein, D-51105 Köln

We, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s).

MANUFACTURER



Signature

Christopher Perkins

Full Name

Engineering Support Manager

Position

Woodward Inc, Fort Collins, CO, USA

Place

9/17/13

Date