



Product Manual 26213
(Revision C, 7/2018)
Original Instructions



3055 VSV Actuators

Installation 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 Out-of-date translations are marked with .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.

Woodward reserves the right to update any portion of this publication at any time. Information provided by Woodward is believed to be correct and reliable. However, no responsibility is assumed by Woodward unless otherwise expressly undertaken.

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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.

Electrostatic Discharge Awareness

NOTICE

Electrostatic Precautions

Electronic controls contain static-sensitive parts. Observe the following precautions to prevent damage to these parts:

- Discharge body static before handling the control (with power to the control turned off, contact a grounded surface and maintain contact while handling the control).
- Avoid all plastic, vinyl, and Styrofoam (except antistatic versions) around printed circuit boards.
- Do not touch the components or conductors on a printed circuit board with your hands or with conductive devices.

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*.

Follow these precautions when working with or near the control.

1. Avoid the build-up of static electricity on your body by not wearing clothing made of synthetic materials. Wear cotton or cotton-blend materials as much as possible because these do not store static electric charges as much as synthetics.
2. Do not remove the printed circuit board (PCB) from the control cabinet unless absolutely necessary. If you must remove the PCB from the control cabinet, follow these precautions:
 - Do not touch any part of the PCB except the edges.
 - Do not touch the electrical conductors, the connectors, or the components with conductive devices or with your hands.
 - When replacing a PCB, keep the new PCB in the plastic antistatic protective bag it comes in until you are ready to install it. Immediately after removing the old PCB from the control cabinet, place it in the antistatic protective bag.

Regulatory Compliance

European Compliance for CE Marking:

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

ATEX 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
Zone 2, Category 3, Group II G, Ex nA IIC T4X Gc IP54

Other European Compliance:

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

EMC Directive: Not applicable to this product. Electromagnetic, EMC, passive devices are excluded from the scope of the 2014/30/EU Directive.

ATEX Directive: Exempt from the non-electrical portion of the ATEX Directive 2014/34/EU due to no potential ignition sources per EN ISO 80079-36:2016 for Zone 2 installation.

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.

Pressure Equipment Directive: Compliant as "SEP" per Article 4.3 to Pressure Equipment Directive 2014/68/EU on the harmonisation of the laws of the Member States relating to the making available on the market of pressure equipment.

Special Conditions for Safe Use:

Wiring must be in accordance with European Zone 2, Category 3 wiring methods as applicable, and in accordance with the authority having jurisdiction.

Field Wiring must be suitable for at least 131°C.

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.

The risk of electrostatic discharge is reduced by permanent installation of the VSV Actuator.



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 or Zone applications.



Due to the hazardous location listings associated with this product, proper wire type and wiring practices are critical to operation.

Chapter 1.

General Information

Introduction

This manual describes the operation and installation of the Woodward 3055 Variable Stator Vane (VSV) actuators, Woodward part numbers 9902-407 and 9902-408.

Description/Operation

The 3055 Variable Stator Vane (VSV) actuators operate with a pump/servo valve assembly and an electronic control to provide closed loop position control of the VSV actuator output shafts. Two VSV actuators are attached to the VSV hardware on the gas turbine. The hydraulic pump provides hydraulic pressure to operate the servo valve and the actuators (see manual 26212 for information on the pump/servo valve assembly).

Hydraulic ports on the side of the actuators are marked "ROD" and "HEAD". These ports are connected to similarly marked ports on the servo valve. Each actuator can provide up to 87.50 mm (3.445") of output. A Linear Variable Differential Transformer (LVDT) is an integral part of each actuator. The LVDT provides an exact position readout of the output position of each actuator.

Figures 1-1 and 1-2 illustrate the operating principle of the gear pump, servo valve, and actuators.

The servo valve controls the position of matched VSV actuators on the turbine. Each VSV actuator has an LVDT which is capable of sending an exact position signal to the electronic control. The electronic signals from both LVDTs are used simultaneously by the electronic control. The LVDT core rod is adjusted at the factory and the adjustment sealed with a plug. No field adjustment of the LVDT is possible. The rod end location is adjustable over a distance of ± 3.18 mm (± 0.125 ").

Increased "Head" pressure will cause the actuator to extend. Increased "Rod" pressure will cause the actuator to retract.

A small orifice between the Head and the Rod side of the power piston is provided to maintain a small bleed flow between the Rod and Head sides of the piston.

Table 1-1. Technical Specifications

Hydraulic Fluid:	US MIL-L-23699 or MIL-L-7808	
Dry Weight:	2.7 kg (6 lb)	
LVDT Excitation:	7.07 \pm 0.05 VRMS at 3000 \pm 10 Hz	
	Normal Operation	Extreme Operation
Ambient Operating Temperature Range:	-7 to +66 °C (+20 to +150 °F)	-40 to +121 °C (-40 to +250 °F)
Hydraulic Fluid Temperature Range US MIL-L-7808:	-29 to +93 °C (-20 to +200 °F)	-40 to +121 °C (-40 to +250 °F)
Hydraulic Fluid Temperature Range US MIL-L-23699:	-7 to +93 °C (+20 to +200 °F)	-40 to + 121 °C (-40 to +250 °F)
Head and Rod Port Pressure:	1586–8481 kPa (230–1230 psig)	8481–10342 kPa (1230–1500 psig)

Note: The unit will not operate in the extreme range for more than 2% of its total service life.

References

Manual 26212, 3055 Hydraulic Pump/Servo valve Assembly

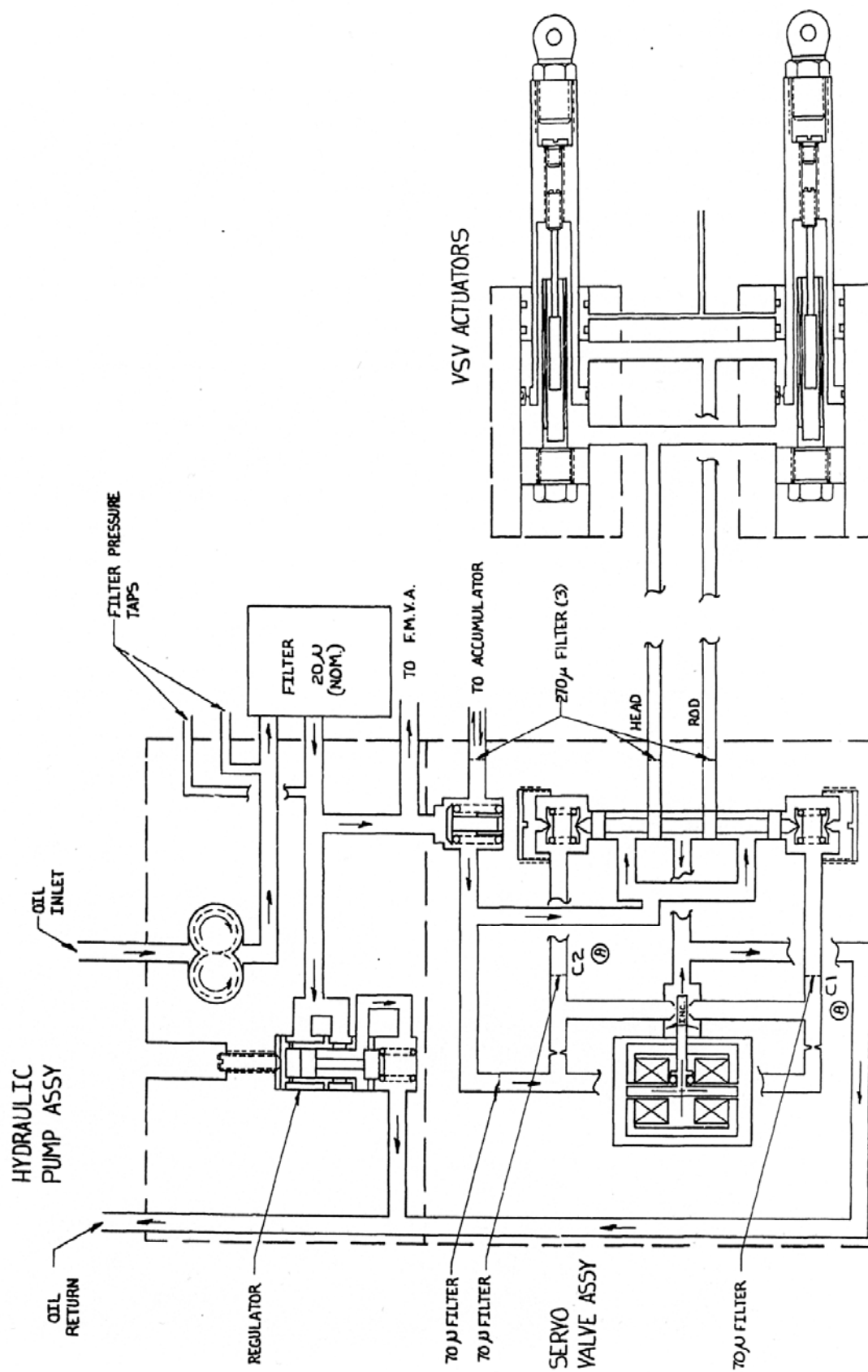


Figure 1-1. LM2500 VSV System Schematic

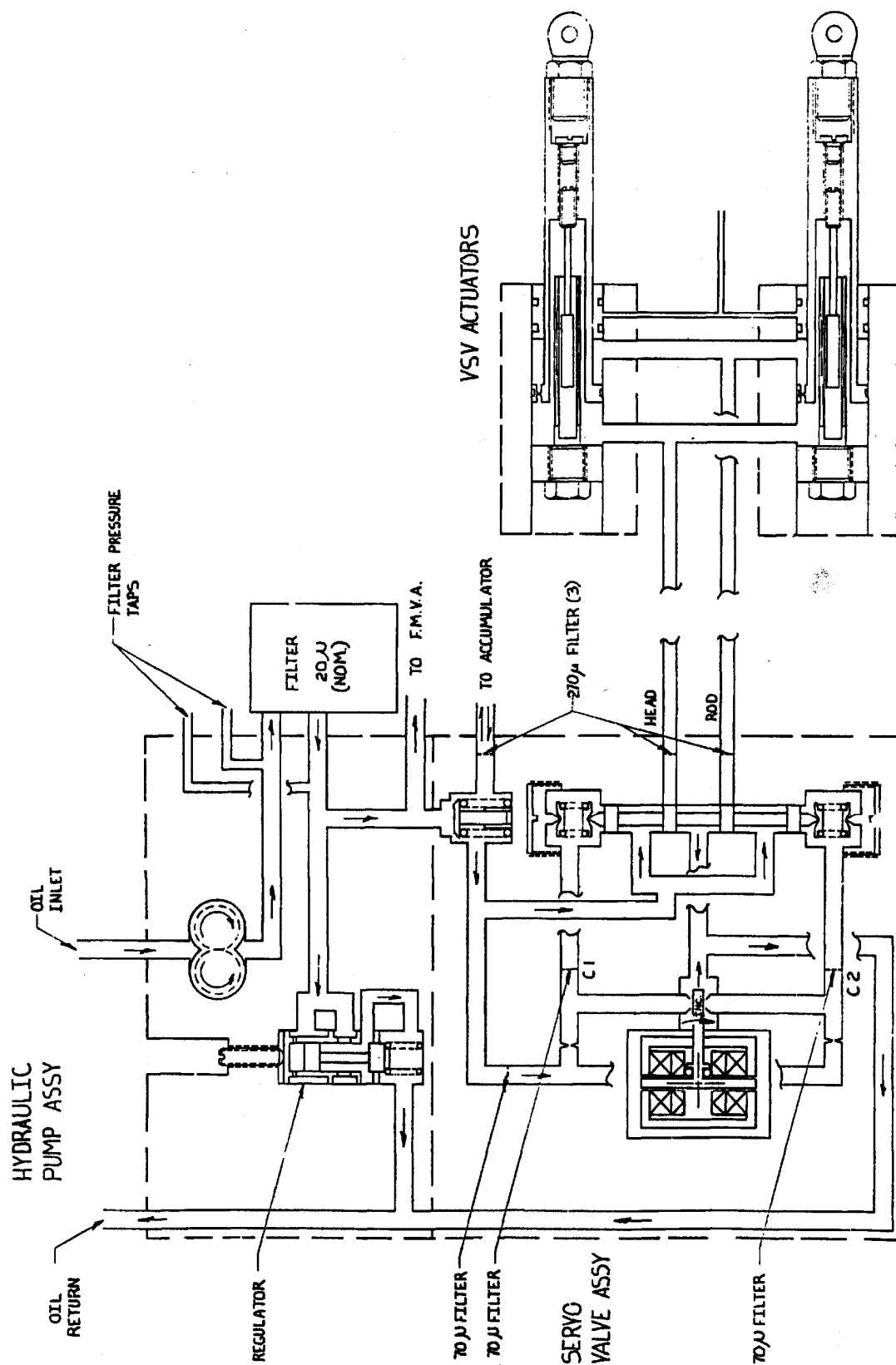


Figure 1-2 LM1600 VSV System Schematic

Chapter 2. Installation

Receiving

Use care while handling and installing the actuators. Be careful to avoid striking the hydraulic ports and the electrical connectors. Abuse can damage seals, installation surfaces, and factory adjustments. Protect hydraulic connections with plastic shipping caps whenever the actuator is not connected to the normal piping.

After factory testing and calibration, the VSV actuator is drained of oil. This leaves a light film of oil on internal parts to prevent rust. They are then placed in cardboard containers filled with urethane foam for delivery to the customer. The little oil left in the actuator is clean hydraulic fluid which will not contaminate a hydraulic system. Additional cleaning or calibration is not necessary before installation or operation.

IMPORTANT

The center pieces in the actuator rod ends will drop out of the body if they are turned 90 degrees from parallel. Take care that the center pieces in the rod ends are not dropped. They are retained in the sockets with plastic straps when shipped from the factory. These ties should be left in place until ready for installation.

Storage

Short Term Storage (Less than 1 year)

Flush the unit with a corrosion-resistant oil (US MIL-C-6529, type 3, or equivalent).

Record the date the unit was prepared and identify the oil used on two identification tags. Attach one tag to the unit and one tag to the exterior of the storage container.

Place protective closures in open ports, wrap, and seal the unit in barrier material (US MIL-B-121, Type 1, Grade A, Class 1, or equivalent). Cushion the unit and place in the container.

Long Term Storage (More than 1 year)

Perform all steps outlined in the short-term storage instructions. In addition, place a proper amount of desiccant (US MIL-D-3464, Class 1, or equivalent) with the unit before wrapping it in the barrier material.

IMPORTANT

Once the unit has been properly prepared for storage, it does not require periodic flushing.

Installation

See the outline drawings, Figure 2-1a and 2-1b, for overall dimensions, installation hole locations, hydraulic fitting sizes, output shaft dimensions, and electrical connectors.

Connections

The hydraulic connections between the servovalve and the actuators are provided by the turbine manufacturer, as are the fasteners. Take care during installation that dirt is not introduced into the hydraulic system, as it could seriously damage the equipment. All system filters and screens must be in place during operation.

The VSV actuators are installed on 0.625" (15.88 mm) diameter pivots at the turbine. The turbine manufacturer provides instructions for the pivot installation. The turbine manufacturer will specify installation of hoses between the servovalve, actuators, and accumulator.

Attitude

Installation attitude does not affect actuator performance.

Electrical Connections

Electrical connections to the VSV Actuator are made using the MIL-DTL-5015, Class H / MS3142-H-S-14S-C-6-P, 6-pin receptacle for use with the LVDT control channels. Both LVDTs are used simultaneously by the electronic control.

Figures 2-1a and 2-1b show the receptacle locations and plant wiring diagrams.

Connect the proper cable-end connectors to the two receptacles on the VSV Actuator, following GE instructions.



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



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.



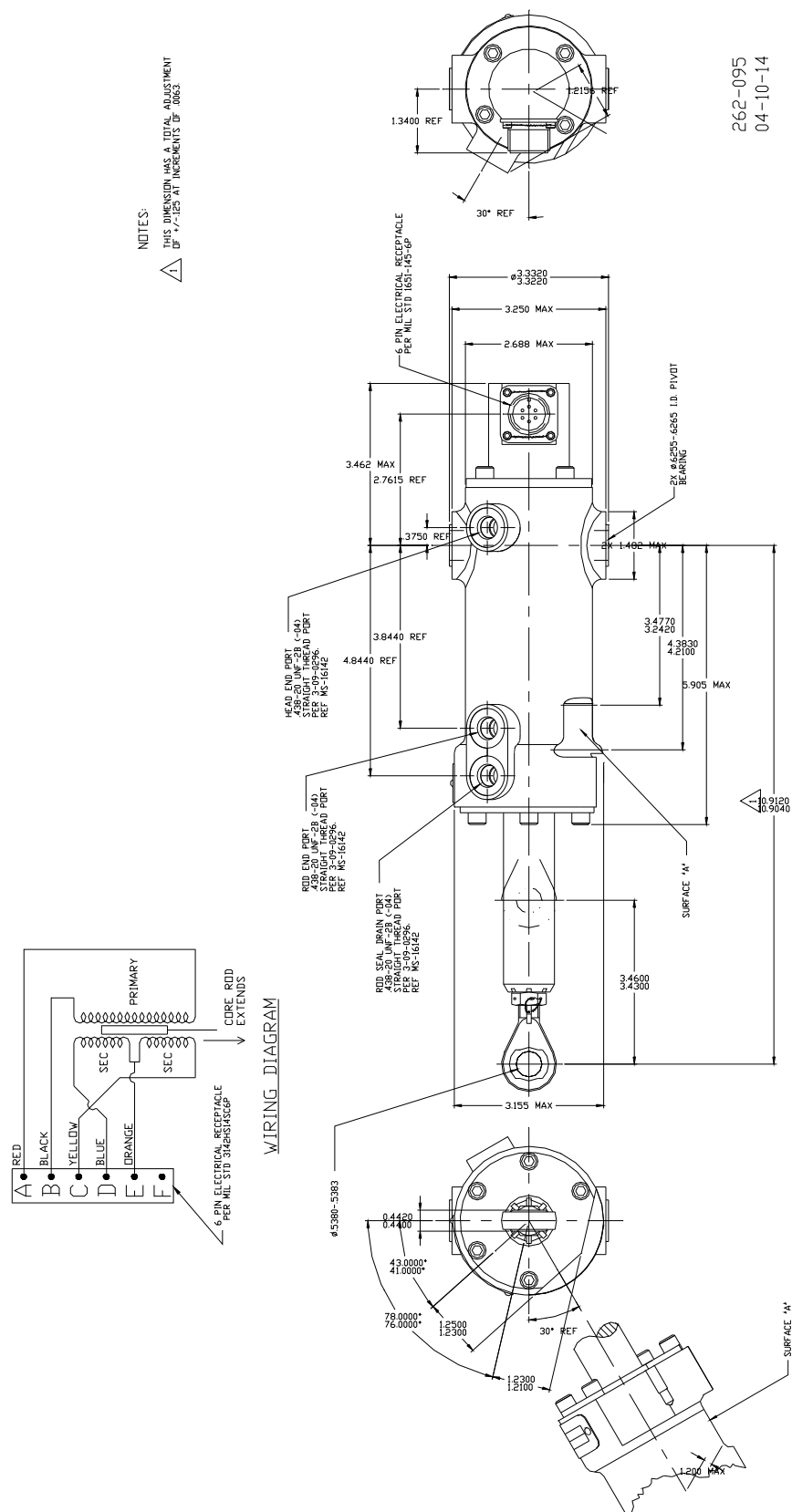
Due to the hazardous location listings associated with this product, proper wire type and wiring practices are critical to operation.



Due to typical noise levels in turbine environments, wear hearing protection when working on or around the VSV Actuator.



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.



262-095
04-10-14

Figure 2-1a. Outline Drawing of LM2500 VSV Actuator



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Chapter 3.

Initial Operation and Adjustments

Initial Operation

Before initial operation of the actuator, make sure that all previous installation and hookup steps are accomplished and that all linkages, electrical connections, and hydraulic fittings are secure and properly attached.

Trapped air within the hydraulic system may cause erratic behavior of the VSV actuators during the first few minutes of initial operation.

The turbine must be operated according to GE instructions, therefore, there are no operating instructions included in this manual. Use the GE instructions.



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.

Adjustments

The LVDTs in the VSV actuators were adjusted and sealed at the factory. No LVDT adjustment is available in the field. The location of the rod end on the actuators is adjustable up to ± 3.18 mm (± 0.125 ") in increments of 0.160 mm (0.0063").



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.



Due to typical noise levels in turbine environments, wear hearing protection when working on or around the VSV Actuator.



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 4.

Maintenance and Troubleshooting

Maintenance

Maintenance is not required for the VSV Actuator. Maintenance consists of removal and replacement of complete actuators only.

General Cleanliness

Take great care not to introduce contamination into the system should the connections between the servovalve and the actuators or the accumulator be removed.

Drain Line

The drain line from the VSV actuators must remain open without back pressure. Back pressure at the drain port could decrease the effectiveness of the shaft seals.

Troubleshooting

Redundant control channels are provided for the VSV actuators. At the first sign of trouble, the control channel should be switched. If using the alternate channel cures the problem, then the system elements should be replaced as soon as possible.

If hydraulic pressures are present, and changing the control channel does not correct a problem, carefully inspect the electronic control for the source of the problem.

Should the VSV actuators not provide identical positions, inspect the hydraulic connections for blockage between the servovalve and the actuators. If the hydraulic lines appear open and clean, carefully inspect the linkage and mechanical connections which the actuators are operating.

Repair

Because assembly and calibration of the VSV Actuator requires special tools, it cannot be repaired in the field. If you suspect the unit, return it to Woodward for repair or replacement. Contact information is on the Woodward website (www.woodward.com) and is also stated in the following chapter. Be sure to call for a return authorization number before shipping a Hydraulic Pump and Servovalve. When shipping, include:

- Your name
- The name of your company, department or mail drop, and address
- The address where you want the unit returned (if different from above)
- The Woodward part number from the nameplate of the Hydraulic Pump and Servovalve.
- The serial number from the nameplate of the Hydraulic Pump and Servovalve
- A description of the reason the unit is being returned

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 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

<u>Facility</u>	<u>Phone Number</u>
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

<u>Facility</u>	<u>Phone Number</u>
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

<u>Facility</u>	<u>Phone Number</u>
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 C—

- Replaced Regulatory Compliance section
- Replaced Declarations and removed Kavlico DOC
- Removed French language Warning and Notice from Regulatory Compliance section
- Moved Technical Specifications table from back of manual to Chapter 1 creating Table 1-1
- Added new row with LVDT Excitation to Table 1-1
- Added new warning boxes and removed caution and notice boxes from the Installation section in Chapter 2
- Changed Caution boxes to Warning boxes in Chapter 3

Changes in Revision B—

- Updated Regulatory Compliance information
- Updated Declaration of Conformity pages
- Revised manual structure

Declarations

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

File name: 00324-04-EU-02-01
Manufacturer's Name: WOODWARD INC.
Manufacturer's Address: 1041 Woodward Way
 Fort Collins, CO 80524 USA
Model Names: Variable Stator Vane (VSV) Actuators – 9902-407, 9902-408

This product complies, where applicable, with the following Essential Requirements of Annex I: 1.1, 1.2, 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.

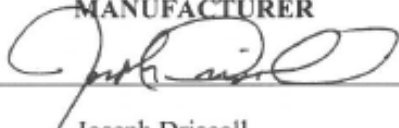
The person authorized to compile the technical documentation:

Name: 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


Full Name Joseph Driscoll

Position Engineering Manager

Place Woodward Inc., Fort Collins, CO, USA

Date 5/3/18

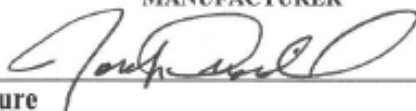
EU DECLARATION OF CONFORMITY

EU DoC No.: 00324-04-EU-02-02
Manufacturer's Name: WOODWARD INC.
Manufacturer's Contact Address: 1041 Woodward Way
 Fort Collins, CO 80524 USA
Model Name(s)/Number(s): Variable Stator Vane (VSV) Actuators 9902-407, 9902-408
The object of the declaration described above is in conformity with the following relevant Union harmonization legislation: Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014 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:  II 3 G, Ex nA IIC T4X Gc
Applicable Standards: EN60079-0:2012/A11:2013 : Explosive atmospheres – Part 0: Equipment – General requirements
 EN60079-15:2010 : Explosive atmospheres – Part 15: Type of protection 'n'

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



Joseph Driscoll

Full Name

Engineering Manager

Position

Woodward, Fort Collins, CO, USA

Place

Date

5/3/18

5-09-1183 Rev 28

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