WOODWARD

Manual 40142
(Revision A)
Original Instructions

Dry Low Emission Fuel Metering Valves: Warnings, Calibration, and Installation

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 *26311* , *Revision Status & Distribution Restrictions of Woodward Technical Publications*, 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 *26311* , *Revision Status & Distribution Restrictions of Woodward Technical Publications*, 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 Out-of-date translations are marked with ⚠.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.

Warnings and Notices

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

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.

⚠WARNING

Automotive Applications

On- and off-highway Mobile Applications: Unless Woodward's control functions as the supervisory control, customer should install a system totally independent of the prime mover control system that monitors for supervisory control of engine (and takes appropriate action if supervisory control is lost) to protect against loss of engine control with possible personal injury, loss of life, or property damage.

NOTICE

Battery Charging Device

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.

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.

Dry Low Emissions Fuel Metering Valves: Warnings, Calibration, and Installation

Warnings

⚠WARNING

Significant turbine damage, high emissions levels, release of high temperature gas, fire, damage to nearby equipment, injury to personnel, or death may result from incorrect fuel valve calibration. To correctly operate the fuel metering valve(s), the NetCon® controller must be programmed with the correct valve characterization curve for the specific valve being used. Woodward provides the programming information to the valve purchaser in the form of a data file specifically identified by the valve serial number and date. The supplier of the application program must incorporate the valve characterization data file into the application program by following the procedure described in this manual. Failure to follow the procedure herein, or any non-Woodward alteration (including attempt to repair), or damage to the valve, may result in a change of characteristics leading to the same potential hazards.

⚠WARNING

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.

Installation of Fuel Metering Valve Calibration Software (Valve Characterization Information) into the Application Program

The following is the procedure for downloading the correct valve characterization information to the NetCon or MicroNet™ control which utilize the 68040 or 68060 processor.

⚠WARNING

This procedure is intended for use by qualified engineering personnel only. Familiarity with the use of Woodward GAP™ programming is required.

1. Obtain the serial number and calibration date of the fuel metering valve that is being used on the system. These are located on the nameplate and date sticker on the valve assembly.

2. Obtain the valve characterization data file for the valve in number one above from Woodward. The valve characterization file name and the valve serial number must match. The date on the valve and the date on the data file must match. If either of these items do not match, DO NOT continue with this procedure. Contact Woodward.

3. Rename this file to FMVx.VLV (where x equals I, O, or P depending on which flow leg the valve is being used) and place this file in the same directory as the <application filename>.CDR file, and recode the program using the Woodward GAP coder.

4. Install this application in the NetCon or MicroNet controller CPU.

To load new serial number files after the application has been compiled and loaded perform the following steps.

Shut down the prime mover.

1. Copy the valve file onto a PCMCIA card.
2. Insert the PCMCIA card into the PCMCIA slot on the CPU.
3. Enter the System Information menu.
4. Enter the ACT_CORR block tables Update menu by scrolling right.
5. Enter the download data password.
6. Select the ACT_CORR block in the application which needs to updated.
7. Select the correct file for the valve which needs to be updated from the PCMCIA card.
8. Exit the System Information mode by pressing exit twice.
9. Enter the Debug mode.
10. Verify the Serial number for each ACT_CORR in the control matches the serial number of the appropriate valve in the system.

The following is the procedure for downloading the correct valve characterization information to the MicroNet control which utilizes the N/T operating system.

1. Obtain the serial number of the metering valve being used in the system.
2. Obtain the valve characterization data file for the valve from Woodward. The valve characterization file name and the valve serial number must match. The date on the valve and the date on the data file must match. If either of these items do not match, DO NOT continue with this procedure. Contact Woodward.
3. Copy the valve characterization file to the folder on the CPU which contains the executable application file.
4. Shutdown the Prime mover.
5. Set the input of the ACT_CORR serial number to the serial number of the valve. Save the tunables to the control.
6. Stop the application.
7. Restart the application. The application will read the Serial Number which is defined on the input of the ACT_CORR block.
8. Verify the Serial number for each ACT_CORR in the control matches the serial number of the valve in the system.

IMPORTANT

The information contained above will appear in all valve/actuator/ driver hardware manuals that are intended for use with dry low emissions systems. The warnings and procedures in those manuals will supersede this manual and any other preliminary information.

We appreciate your comments about the content of our publications.

Send comments to: icinfo@woodward.com

Please reference publication 40142A.

B40142:A

PO Box 1519, Fort Collins CO 80522-1519, USA
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

**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.

2013/1/Colorado