



## **Application Guidelines for TecJet™ with E3 Fuel Blending System**

**System Part Numbers 9906-720 & 9906-721**

# Application Guidelines for TecJet™ with E3 Fuel Blending System

## Introduction

The E3 Fuel Blending System uses TecJet™ fuel metering valves for independent, full-authority control of two different fuel streams into a single engine. The system is designed to be able to meter the two fuels in any ratio from 0% to 100%. However, except for the TecJet Precision Flow variants, TecJet valves are unable to meter fuel down to 0% flow due to leakage past the butterfly valve when fully closed. This means the system will be unable to reach target blend ratios approaching 0% or 100% while in fuel blending mode.

## TecJet Application Recommendations

### TecJet for Biogas

Since blending a very small percentage of biogas with pipeline gas is not a typical operating condition, it is recommended that the externally requested fuel blending ratio via the fuel blending ratio analog input or via CANopen be set to a value always greater than 0% (for example, 10%) that allows the biogas TecJet to be in control at the required flow rate. The actual minimum ratio should be determined experimentally during commissioning by observing the blend ratio at the minimum expected load for fuel blending at which the biogas TecJet begins to approach 0% open. This should be considered the minimum blend ratio to be requested externally. If, during fuel blending operation it is desired to operate at ratio less than the minimum ratio as determined above, it will be necessary to exit fuel blending mode and shut off the biogas supply completely.

### TecJet for Pipeline Gas

If the engine's maximum desired load on 100% pipeline gas can be met with a Precision Flow TecJet, then we recommend using a Precision Flow TecJet for pipeline gas, since this TecJet can effectively meter fuel down to nearly zero flow.

If a larger TecJet is needed, we recommend that the externally requested fuel blending ratio via the fuel blending ratio analog input or via CANopen be limited to a value less than 100% (for example, 90%) that allows the pipeline gas TecJet to be in control at the required flow rate. The actual maximum ratio should be determined experimentally during commissioning by observing the blend ratio at the minimum expected load for fuel blending at which the pipeline gas TecJet begins to approach 0% open. This should be considered the maximum blend ratio to be requested externally. It is also possible and recommended to set a maximum fuel blending ratio internally in the fuel blending system. On ToolKit screen 1.5, the user-configurable parameter "Ratio maximum limit" (see Figure 1) will limit the fuel blending ratio to the user-specified value and override any higher requested blend ratio received via the fuel blending ratio analog input or via CANopen. If, during fuel blending operation it is desired to operate at ratio greater than the minimum ratio as determined above, it will be necessary to exit fuel blending mode and shut off the pipeline gas supply completely.



Figure 1. Fuel Blending Ratio Maximum Limit (ToolKit Screen 1.5)

## 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](http://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.

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## 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 \_\_\_\_\_

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### Prime Mover Information

Manufacturer \_\_\_\_\_

Engine Model Number \_\_\_\_\_

Number of Cylinders \_\_\_\_\_

Type of Fuel (gas, gaseous, diesel,  
dual-fuel, etc.) \_\_\_\_\_

Power Output Rating \_\_\_\_\_

Application (power generation, marine,  
etc.) \_\_\_\_\_

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### Control/Governor Information

#### Control/Governor #1

Woodward Part Number & Rev. Letter \_\_\_\_\_

Control Description or Governor Type \_\_\_\_\_

Serial Number \_\_\_\_\_

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#### Control/Governor #2

Woodward Part Number & Rev. Letter \_\_\_\_\_

Control Description or Governor Type \_\_\_\_\_

Serial Number \_\_\_\_\_

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#### Control/Governor #3

Woodward Part Number & Rev. Letter \_\_\_\_\_

Control Description or Governor Type \_\_\_\_\_

Serial Number \_\_\_\_\_

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### 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.*

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**Please reference publication **51388**.**



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