

GECO™ Stoichiometric Air/Fuel Ratio Control System

The Gas Engine Control (GECO) is designed to upgrade your gas engine to meet today's and tomorrow's emissions standards.



APPLICATIONS

The GECO™ Stoichiometric was designed as an inexpensive, state-of-the-art air/fuel ratio control for natural gas engines. The GECO is an easy-to-install, low maintenance solution for natural gas engines. Woodward is the only manufacturer offering a system for the stationary engine market combining air/fuel ratio with adaptive catalyst control and oxygen sensor health monitoring. GECO's wide range of control authority quickly manages engine speed and load variations.

OPTIMIZED FUEL AND CATALYST MANAGEMENT

GECO complements existing engine controls to provide an air/fuel ratio management system. Closed-loop exhaust oxygen feedback assures optimum catalytic efficiency and the lowest level of emissions possible. Catalyst inlet and exit temperature monitoring ensures that the catalyst will not be damaged by poor ignition, engine tuning, or fuel quality.

With downstream oxygen feedback and adaptive control, GECO will correct for fuel variations and catalyst and oxygen sensor aging, which extends tuning maintenance intervals.

EASY INSTALLATION

All components needed for installation are available through Woodward distributors. The system has a wide supply voltage range and flexible control interface options. The electronic control module accepts all control signals directly, so no additional signal interface modules or complicated wiring plans are needed. The rugged enclosure and system components provide conduit connections for clean, protected plant wiring. Plug-in terminal strip connectors allow ease of installation and make diagnostics quick and uncomplicated.

The control is also available without the enclosure, for installation in existing enclosures or cabinets.

- Closed-loop, adaptive air/fuel ratio control
- Catalyst efficiency monitoring
- Oxygen sensor health monitoring
- Manages wide engine speed and load variations
- Exhaust oxygen set point can be varied over load range of engine
- Fast transient response for reliable generator set performance
- Open loop failsafe operation mode continuously learns best valve positions
- Comprehensive system diagnostics
- Data communications
- Improved fuel control valve options

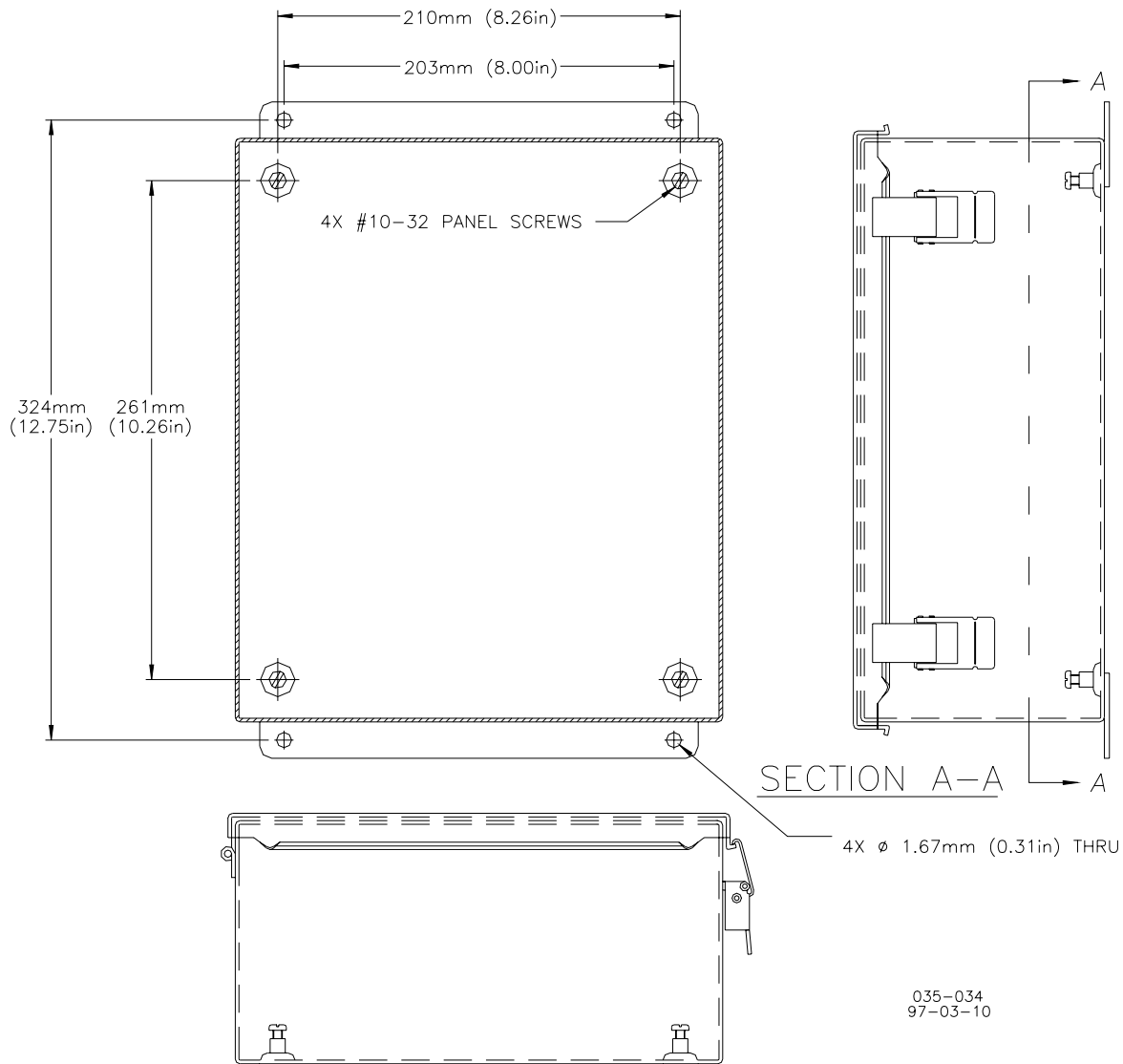
SIMPLE OPERATION, LOW MAINTENANCE

The GECO Stoichiometric can be equipped with a handheld terminal for data monitoring and for checking and clearing faults, alarms or shutdowns. The system includes PC software, which allows you to do diagnostics, monitoring and calibration. GECO's self-diagnostics pinpoint problems and provide the operator with alarm warnings and fault codes, reducing downtime for repairs.

The Data Transmission feature allows for transmission of control measurements and status via Modbus®* communications to a data logging system or supervisory control.

WOODWARD RELIABILITY & SUPPORT

Since GECO works with original air and fuel controls, the expense and complexity of emissions compliance is minimized. Years of field development combined with Woodward's stationary engine experience have resulted in this low cost and extremely reliable control. Consistently low fuel consumption and improved engine operation ensure maximum efficiency and minimum operating costs. In addition to reduced operating costs, the value of your GECO investment is enhanced by the same strong commitment to training and service that Woodward has provided its customers for decades.



GECO Stoichiometric Outline Drawing
(Do not use for construction)

*—Modbus is a trademark of Modicon, Inc.

SPECIFICATIONS

Power Supply	
Power Supply Operating Voltage	9–30 Vdc (12 Vdc or 24 Vdc nominal)
Power Supply Rated Voltage	8-32 Vdc
Power Consumption	70 W maximum (application specific)
Fuel Metering Valve Supply Pressure	
	103–241 kPa (15–35 psig) (application specific)
Inputs	
	2 unheated Zirconia exhaust oxygen sensors (0–1 Vdc), p/n 6910-315 or equivalent
	1 heated Zirconia exhaust oxygen sensor (0–1 Vdc), p/n 6910-316 or equivalent
	2 K-type thermocouples, p/n 1736-919 or equivalent
	1 intake manifold absolute pressure sensor (0–5 Vdc; 0–3 bar absolute), p/n 6910-314
	1 magnetic pickup, p/n 5430-929 or equivalent (0.20–100 Vrms; 8–10 000 Hz)
	1 “G-lead” pulse from ignition system(±250 V max)
Outputs	
	2 PWM fuel metering valves
	1 alarm relay (250 Volts @ 75 mA max non-inductive load)
	1 shutdown relay (250 Volts @ 75 mA max non-inductive load)
Diagnostics	
	Power Supply Voltage
	Oxygen Sensor Health
	Oxygen Sensor Heater Circuits
	Manifold Pressure Sensor
	Closed-Loop Functions
	Catalyst Efficiency
	Catalyst Temperature
	Control Failsafe Operating Modes
	Pre-catalyst exhaust oxygen closed loop control on failure of post-catalyst oxygen sensor
	Open loop valve positioning mode on failure of pre-catalyst exhaust oxygen sensor
	Valve default position on failure of manifold pressure sensor
Communications	
	RS-232 Handheld Interface 6-Pin RJ-12
	RS-232 PC Interface DB9
	RS-485/ModBus Data Transmission (optional)
Technical Manual	03554

ENVIRONMENTAL SPECIFICATIONS

Temperature Ranges

Ambient Operating Temperature	–40 to +70 °C (–40 to +158 °F)
Storage Temperature	–40 to +105 °C (–40 to +221 °F)
Regulatory Compliance	CSA, UL/cUL, Class 1, Division 2, Groups A, B, C, and D
Enclosure	305 x 254 X 127 mm (12 x 10 x 5 in) NEMA 12/13, Quick-Release Latches

FUEL CONTROL VALVE OPTIONS

New L-Series GECO Fuel Control Valves

Fast, responsive fuel control valves provide extended range of operation.

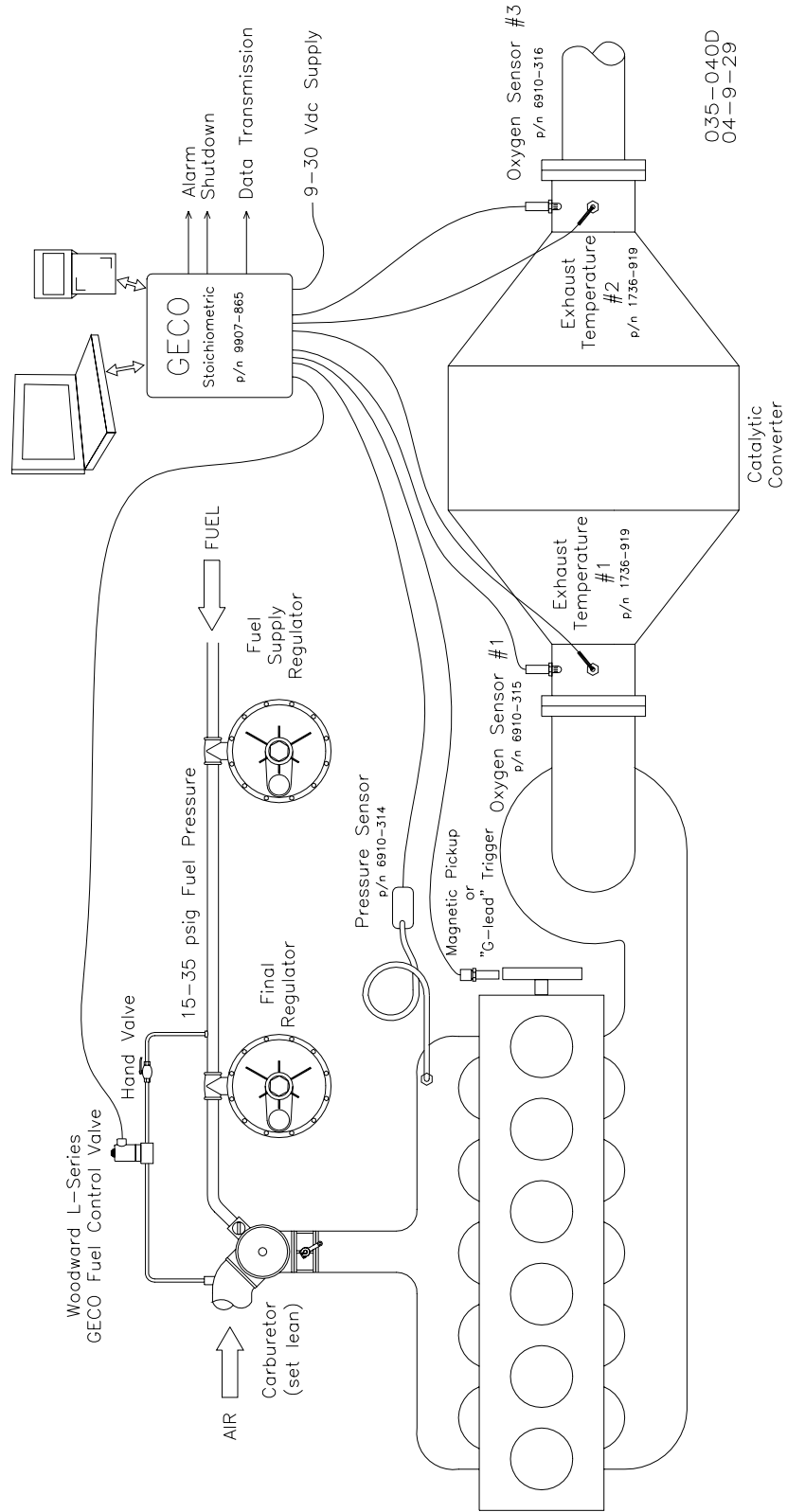
Configuration	Trim Bypass or Full-Flow
Multiple Sizes	25 mm, 30 mm, 36 mm, 43 mm, and 50 mm
Power Supply	10–32 Vdc, 32 W maximum
Regulatory Compliance	CSA Class 1, Division 2, Groups A, B, C, D T3C CE EMC Directive 89/336/EEC

PO Box 1519
 Fort Collins CO, USA
 80522-1519
 1000 East Drake Road
 Fort Collins CO 80525
 Ph: (1)(970) 482-5811
 Fax: (1)(970) 498-3058

Distributors & Service
 Woodward has an international network of distributors and service facilities. For your nearest representative call (1)(800) 835-5182 or see the Worldwide Directory on our web site.

Corporate Headquarters
 Rockford IL, USA
 Ph: (1)(815) 877-7441

www.woodward.com



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GECO Stoichiometric Schematic

For more information contact:

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