

# LCS Air/Fuel Ratio Control for OEMs

## APPLICATIONS

The LCS Air/Fuel (A/F) Ratio Control may be used with the LC-50 family of integrated throttles and mixers for engines between 5 and 100 kW (7 and 134 hp). The LCS A/F Ratio Control provides precise air/fuel ratio control for engines using three-way catalytic converters to reduce exhaust emissions. The LCS A/F with an LC-50 mixer with standard production (stoichiometric) fuel hole sizes will allow closed-loop stoichiometric operation with gaseous fuels from low-quality pipeline natural gas to HD-5 LPG (propane).

The A/F Ratio Control and standard LC-50 configurations for mixer sizes 30, 36, 43, and 50 will accommodate the full range of fuel types and fuel qualities. The 25 mm size can use the standard 0014-11-000 configuration for natural gas but must use configuration 8404-548 for propane.

## DESCRIPTION

This control is a microprocessor-based air/fuel ratio control for four-stroke, gaseous-fueled engines operating with a near-stoichiometric air/fuel ratio. It is designed to work in conjunction with a three-way catalytic converter to efficiently reduce exhaust emissions. By automatically maintaining an optimum air/fuel mixture, emissions compliance is achieved and catalyst life is maximized without operator supervision.

A catalyst that simultaneously eliminates hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NOx) is referred to as a “three-way” catalyst. The use of a three-way catalyst will reduce the emissions of a stoichiometric engine. However, for these reductions to be reliable and maximized, and to protect the catalyst element from premature aging or damage, a very precisely controlled air/fuel ratio is required.

The heated exhaust gas oxygen sensor (HEGO) will generate a voltage signal that is characteristic of this ideal stoichiometric window. The HEGO sensor operates as a reference-gas sensor, and compares the residual oxygen in the exhaust gas with the oxygen in the reference atmosphere (air circulating inside the sensor). The active sensor ceramic is heated by the internal heating element. Sensor heating reduces the influence of the exhaust gas temperature on the sensor-ceramic temperature and therefore the temperature-dependent sensor functions. The LCS A/F Ratio Control monitors the system HEGO output and adjusts fuel flow for optimum emissions.

LCS A/F Ratio Control assemblies have part numbers 8404-515 (16 mm) and 8404-516 (22 mm). These assemblies can only be used with heated exhaust gas oxygen sensors (1680-6005). Please see manual 26164 for more information.

System features include:

- Pre-catalyst, closed-loop, exhaust oxygen feedback control
- Compatible with wide range of fuel qualities: 850 BTU/SCF (34.0 MJ/m<sup>3</sup>) to 2325 BTU/SCF (93 MJ/m<sup>3</sup>)
- “On-the-fly switchable” between two sets of control targets and position limits for bi-fuel operation
- Manually switchable to enable open-loop operation
- LED/Alarm driver to indicate diagnostic states
- Diagnostics for minimum and maximum positions and O<sub>2</sub> sensor voltage
- 9–16 Vdc power supply compatibility

- Fully integrated control and trim valve
- Reduced wiring and installation time
- Compatible with natural gas or propane or both
- Tamperproof
- Does not use vacuum hoses

Woodward  
 Industrial Controls  
 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

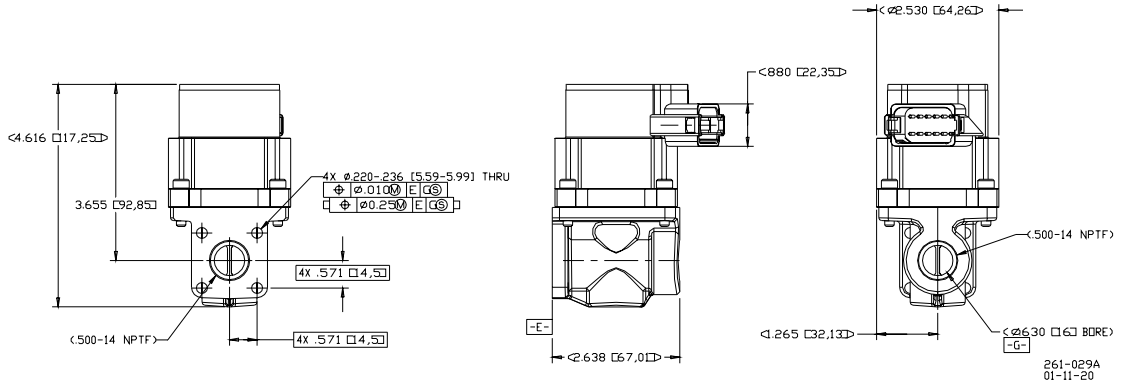
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**Corporate Headquarters**  
 Rockford IL, USA  
 Ph: +1 (815) 877-7441

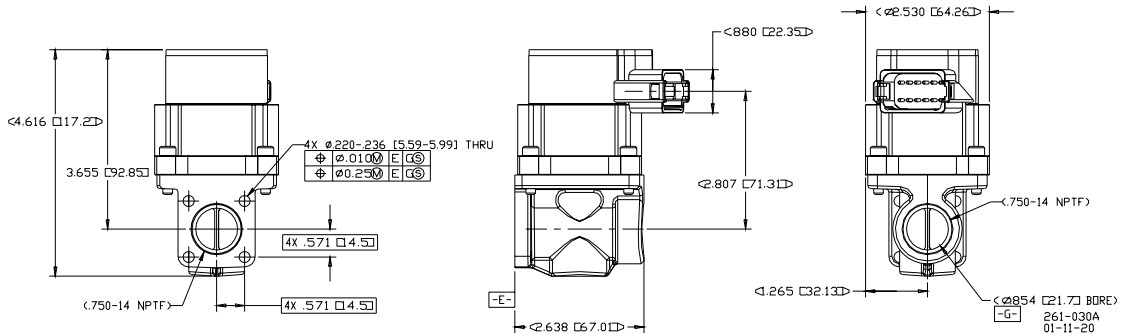
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# SPECIFICATIONS

Power Supply:	12 volt system, 8 to 16 Vdc
Power Consumption:	Reverse polarity protection, 64 W max.
Ambient Operating Temperature:	-40 to +85 °C (-40 to +185 °F)
Storage Temperature:	-40 to +125 °C (-40 to +257 °F)
EMI/RFI:	EN50081-2(Emissions) EN055082-3(Immunity)
Shock/Vibration:	US MIL-STD 810E
Listings:	UL/cUL listed (requires a Class 2 power source or isolated source)



LCS A/F Ratio Control Outline Drawing (16 mm)



LCS A/F Ratio Control Outline Drawing (22 mm)

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