EGS 01 Control

- Fuel metering and speed/load control for stationary gas engines
- Lean burn control without the use of a lean oxygen sensor
- Adaptive stoichiometric control
- Integrated Pastor misfire detection system
- Optional FireFly™ detonation detection system
- RS-232 plant communication
- PC programmable
- Temperature protection
- Overspeed protection
- Overload protection

EGS 01 CONTROL

Efficiency, performance, and emissions are factors that play a key role in gas engine development. As engine performance improves, the need for a more accurate and flexible metering system such as an electronic control system is a logical step.

The EGS 01 is a state-of-the-art control module for stationary gas engines. It can be used to control the gas flow in relation to the air flow of an engine, at any load and speed condition.

The EGS 01 control is capable of keeping gas engine emissions constant over a longer period of time.

And the EGS control is not sensitive to the quality of the gas or the gas pressure and temperature. This is accomplished by the patented gas quality closed loop (lean burn) algorithm and lambda sensor after-catalyst (lambda=1).

The EGS 01 control can be applied on in-line and V-type engines of any power output, naturally aspirated or turbocharged.

The control can be easily programmed with the EGS monitoring program, and it covers the wide range of gas qualities, from landfill gas to propane.

Even a significant change in gas quality during normal operation of the engine will be compensated for by the control.

EGS System Types

The EGS control is available in different system types, with or without speed/load control:

- Open loop system in mono or stereo control*. An open loop system has a pre-programmed fuel quantity which depends on the load and speed of the engine. In this system, there is no feedback on the actual gas flow.

- Lean burn closed loop system in mono or stereo control. For this system type, an oxygen sensor is installed in the exhaust, which takes care of feedback on the actual gas flow. All inaccurate influences of sensors, engine parameters, and TecJet™ control (see product spec 36116) are eliminated by this system.

- Lambda=1 closed loop system in mono or stereo control. This system can be used for stoichiometric gas engines with three way catalyst to keep the A/F (air/fuel) ratio within a narrow band. In this band, the three-way catalyst reaches its optimum in oxidizing and reducing the CO, HC, and Nox emissions. A sensor after-catalyst will optimize the long term performance significantly.

*—Mono control means one gas flow calculation per engine. Stereo control means two gas flow calculations, one for each separate bank of a V-engine.

- Gas quality closed loop system only in mono control. This system has mainly been designed to be applied on generator sets where a kW-signal normally is available. However, a torque-signal also can be applied. Without a torque sensor, a gas-engine-driven compressor cannot be controlled by the system in the Gas Quality Closed Loop mode.

- Dual fuel system only in mono control. The dual fuel system is meant for applications where an engine has to run on a variable mix of two gasses. (This function is not available in version 3.00.)

- Woodward will configure the EGS control to one of these system types which is suitable for your application.

For EGS systems produced with speed control, an extra hardware print has to be implemented in the EGS control.

BENEFITS OF THE EGS

- Improves engine stability, performance, and efficiency.

- Gas quality closed loop system with EGS/TecJet™ applicable on every generator set, resulting in low emissions without the use of oxygen sensors.

- Reduction of costs due to user friendly system for commissioning, diagnostics, and monitoring.

- Reduced number of parts. One venturi fits all applications and gas compositions.

- Control software, sensors, and the control module will always be the same. Only the size of the actuator is related to the engine output.

- Control range unlimited because the TecJet unit controls the total gas flow. Naturally there is a limit to the maximum possible gas flow.

APPLICATION

The EGS 01 control is applicable for stationary gas engines which operate in island mode or in parallel with the utility. The EGS control always works in combination with one or more TecJet controls. In general, the EGS calculates the desired gas flow from the different engine and gas parameters. This gas flow is transmitted through a CAN link to the TecJet control(s). The TecJet control ensures that proper gas flow is maintained, regardless of gas pressure and temperature.

The EGS 01 control can be used for:
- Single speed and variable speed engines
- Mono fuel, dual fuel, and variable fuel
- Mono control or stereo control on V-engines
- Engine protection, emissions control, and speed/load control
- 'V' and/or inline, 4-cylinder engine types

ADJUSTMENTS

All monitoring and adjustments can be made quickly and easily via a laptop or PC connected to the EGS control. With EGS monitoring software installed, seven menus are available. Through these menus the user can perform all settings, authorization, commissioning, logging, overview of malfunctions, and so on.
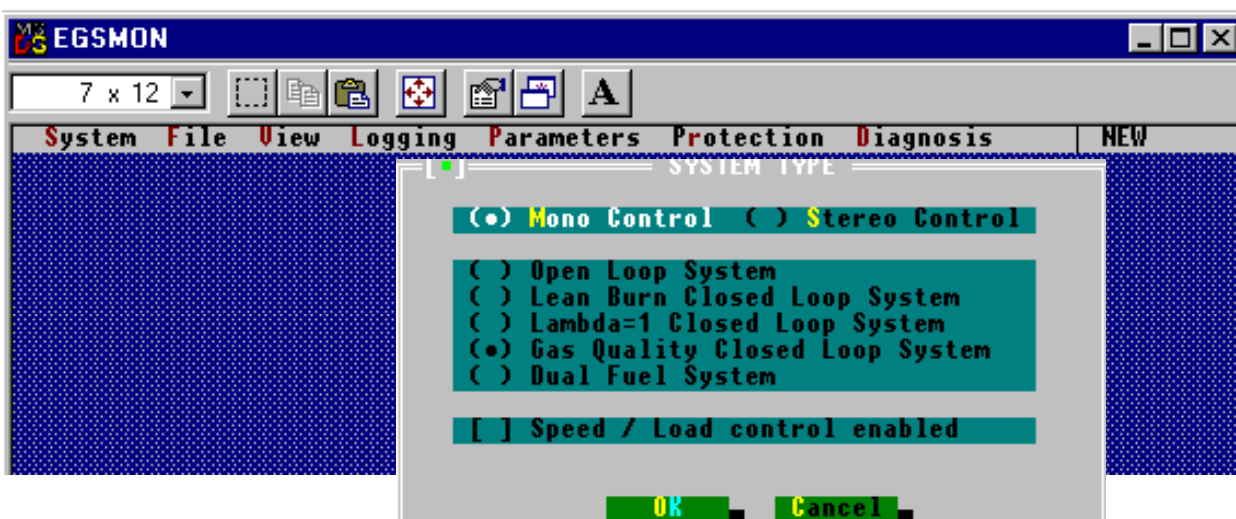
EGS Monitoring Program

SPECIFICATIONS

Analog Inputs

Lambda_1 thru Lambda_3	0–25 V / 0–5 V
Map_1 thru Map_2	0–5 V / 0–10 V / 0–20 mA
TPS	0–5 V / 0–10 V / 0–20 mA
Detonation_1/Detonation _2	0–5 V / 0–10 V / 0–20 mA
Power	0–5 V / 0–10 V / 0–20 mA
CH4	0–5 V / 0–10 V / 0–20 mA
Analog_1 thru Analog_2	0–5 V / 0–10 V / 0–20 mA
For all analog inputs:	Accuracy 1% of full scale / Linearity 0.1% / Resolution 12 bit / Stability 1% per year / Common mode voltage. Every input has an input range of –7 V up to +14 V for the high and the low input.

PT-100 Inputs

Resolution	11 bit over 120 °C / Accuracy 0.5% of 100°

Thermocouple Inputs

Range	–40 to +40 mV / Resolution 12 bit / Accuracy

Phase Inputs

Maximum Frequency	100 Hz
Block Signal	Turn-over 0 V / Hysteresis 0.2 V / Min. amplitude 6 V / Max. amplitude 32 V. Common mode 10 V on the I/O input
AC Signal	Turnover 0 V / Min. amplitude 6 V / Max. amplitude 60 V. Common mode 10 V on the I/O input
Ignition Coil Signal	Turnover 100–150 V / Max. voltage 400 V

Speed Input

Accuracy	0.01% / Maximum frequency 9 kHz
Block signal	Turnover 2.5 V / Hysteresis 0.2 V / Min. amplitude 5 V / Max. amplitude 32 V. Common mode 10 V on the I/O input
AC signal	Turnover 0 V / Min. amplitude 6 V / Max. amplitude 60 V. Common mode 10 V on the I/O input

Digital Inputs

Logic	0 -> 0 – 6 V /Logic 1 -> 4 – 32 V

Relays

Current	1 A

TecJet™ Power Supply

	Maximum current peak 10 A during 1 second continuous 6 A
TecJet On/Off	Maximum current 10 mA

Heater Outputs

Duty Cycle	0–100% / frequency f = 25 Hz / Accuracy 1% / Resolution 8 bit
Peak Current	20 A during 1 second (one single peak) / Nominal current 5 A

PWM Output

Current	1.5 A / Frequency 1000 Hz / Resolution 12 bit / Accuracy 0.1% Push-pull

5 V Reference Output

Accuracy	0.5% / Current 70 mA

RS-232

Plant Communication Port	Maximum 9600 baud / Monitoring connection

Certification

Incorporation (DOI) for CE approval

Weight	2.9 kg (6.33 lb)
Power Supply	10–32 Vdc nominal (10 V minimum)

Climatics

Temperature, Ambient	0 to 70 °C
Humidity	85%
Enclosure Protection, Water	IEC 529 Class IP56

Dynamics

Vibration, Swept Sine	4 G, 5 mm, 5–2000 Hz, 3 h min./axis, 90 min dwells
Vibration, Random	0.04 G²/Hz, 10–2000 Hz, 90 min/axis, 8.2 Grms
Shock	40 G, 11 ms Sawtooth Pulse

EMC

EMC Immunity	EC Generic Immunity, EN50082-2
EMC Emissions	EC Generic Emissions, EN50081-2
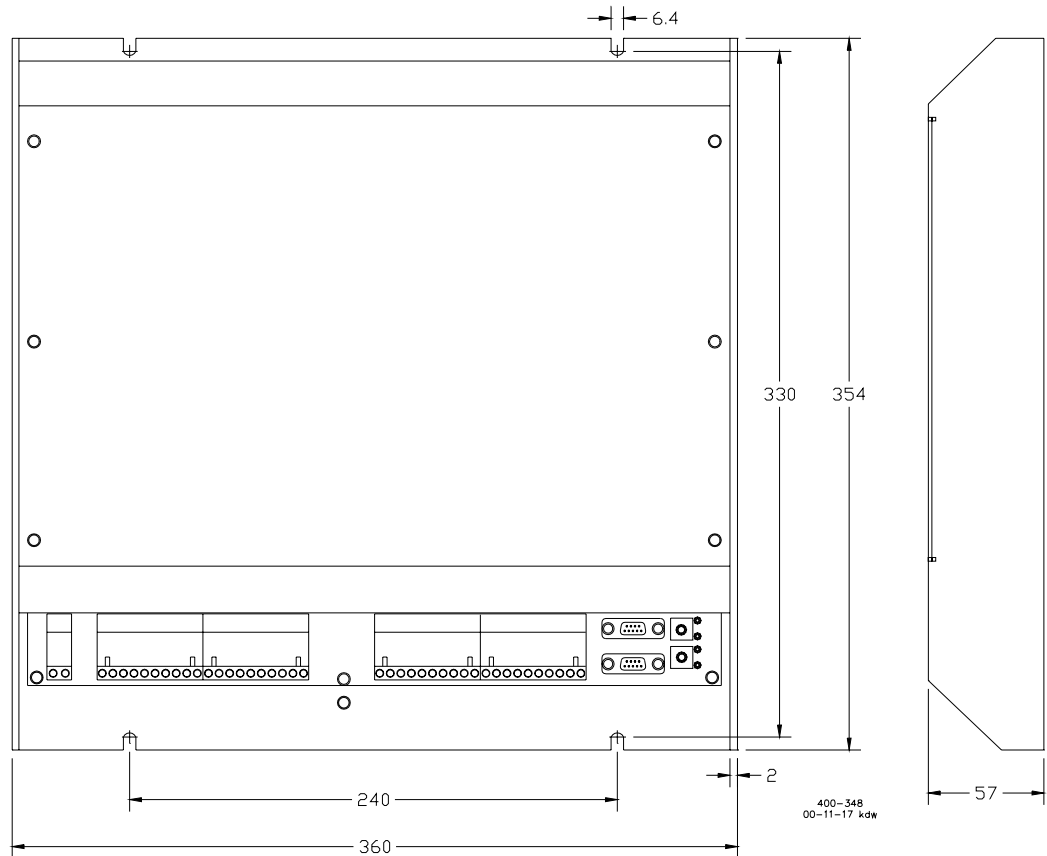
EGS 01 Control Outline Drawing

For more information contact:

01/12/F