

## L-Series

### Integrated Engine Speed Control

#### Description

The Woodward L-Series Integrated Engine Control System is the first engine speed control to deliver so much in a package this compact.

It can also deliver a big savings in production and field support. Since the L-Series Control System is microprocessor-based, it can easily be programmed to match the operating parameters of every engine you produce. The L-Series offers speed control with software-selectable speed setpoints, dynamics, fuel limiting, and start/stop behavior. All it takes is a PC and a simple, plug-in download on your production line.

With many built-in functions, this microprocessor-based speed control allows a high-volume OEM or packager to stock one part number, but implement a wide variety of engine control strategies by configuring the four auxiliary inputs at their factory.

Besides the traditional bracket mount using external linkage, the L-Series Control System is available in a variety of mechanical configurations, including one integrated into a rotary diesel fuel pump and one integrated with a throttle body or a throttle body and mixer (product spec 03222). The externally mounted systems can be configured for clockwise or counter-clockwise (standard) shaft rotation for increasing fuel.

The L-Series control's high-efficiency torque motor delivers 0.34 N·m (0.25 lb-ft) nominally over 60° travel range to operate fuel or air control devices (see specifications for torque performance over the full product temperature range).

Other L-Series control features:

- state-of-the-art speed sensing and control algorithms
- comprehensive diagnostics for easy troubleshooting
- end-of-line programmability simplifies inventory
- optional transient smoke limiter for turbocharged diesel engines
- customer configurable auxiliary inputs available on board to match your specific application
- optional mounting kits for Stanadyne DB-series or Delphi DP200 & DP210 fuel injection pumps provides integrated control solution
- speed setpoint adjustment using Idle/Rated1/Rated2, Raise/Lower, and external analog settings
- dual sets of speed dynamics can be set by engine speed, discrete input, or even an external signal



- Low cost engine control
- Fully integrated actuator and speed control
- Small package—greater design flexibility
- Suitable for gasoline, gaseous, and diesel fueled engines
- Microprocessor-based
- Tamper-resistant
- Easy setup and tuning using PC-based Service Tool
- Discrete output driver for fault indication
- Voltage output for throttle position indication
- Configurable I/O

Flexible design. More intelligent engine control. Streamlines production process.

### Specifications

|                    |  |
|--------------------|--|
| Power Supply       | 12/24 volt system, 10 to 32 Vdc  |
| Power Consumption  | Reverse polarity protection, 32 W max  |
| Torque             | Nominal: 0.34 N·m (0.25 lb-ft) at 25 °C<br>Maximum Transient (at 105 °C): 0.20 N·m (0.15 lb-ft)<br>Minimum Continuous (at 105 °C): 0.14 N·m (0.10 lb-ft) |
| Dimensions (WxHxL) | 75.7 x 88.4 x 111.3 mm (2.98 x 3.48 x 4.38 in.)  |
| Weight             | 425 g (15 oz)  |
| Connector          | 12-pin Deutsch connector (DT06-12SA-P012)  |

### Control Characteristics

|                       |  |
|-----------------------|--|
| Speed Input and Range | Magnetic pickup or ignition coil<br>MPU input: 1–12 000 Hz, 1–720 teeth, 1 Vrms min.<br>IGN input: 1–480 Hz, 1–20 cylinders with rated speed up to 4000 rpm<br>Target speed: programmable<br>Speed range: programmable |
|-----------------------|--|

### Steady State Speed Regulation

| Fuel Type      | Gasoline | Diesel | Gaseous |
|----------------|----------|--------|---------|
| MPU input      | ±0.35%   | ±0.25% | ±0.35%  |
| Ignition input | ±0.50%   | n/a    | ±0.50%  |

### Functions/Auxiliary Inputs

|                      |  |
|----------------------|--|
| Function Options     | Isochronous Speed (50 or 60 Hz); Two or Three Speed; Droop; Start Fuel Limiter; Load Sharing; Dual Dynamics; Adjustable Max Fuel Stop; Manifold Air Pressure Biased Fuel Limiter; Cold Start Timer |
| Programming Port I/O | Programmable with Windows GUI software (9927-1222) and harness (8923-1061)<br>0–5 V throttle position indication<br>Discrete out for fault indication<br>4 aux inputs, configurable functions      |

### Environment

|                       |  |
|-----------------------|--|
| Operating Temperature | –40 to +105 °C (–40 to +221 °F)  |
| Storage Temperature   | –40 to +125 °C (–40 to +257 °F)  |
| EMC                   | EN61000-6-2: Immunity for Industrial Environments<br>EN61000-6-4: Emissions for Industrial Environments<br>SAE J1113-21: Radiated Immunity (100 V/m)<br>SAE J1113-11: Conducted Transient Immunity – Pulse 5b, Suppressed Load Dump (45 V) |
| Humidity              | US MIL-STD 810E, Method 507.3, Procedure III   |
| Shock                 | MS1-40G 11 ms sawtooth   |
| Vibration             | Random: 0.3 G <sup>2</sup> /Hz, 10–2000 Hz (22.1 Grms) 3 h/axis<br>Sine: 5 G 2.5 mm peak-to-peak, 5–2000 Hz, 3 h/axis, 90 min dwells,<br>1 octave/min  |
| Thermal Shock         | SAE J1455, Paragraph 4.1.3.2   |
| Fluid Resistance      | IP56 per EN60529   |

### Compliance

|       |   |
|-------|---|
| CE    | Compliant with EMC Directive 89/336/EEC   |
| Other | Compliant as a component with Machinery Directive 98/37/EC  |
| CSA   | Class I, Division 2, Groups A, B, C, D T3C<br>These listings are limited only to those units bearing the CSA agency identification. |

Technical Manual 26250



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