ENGINE GOVERNING SYSTEM

# ECC328
# Generator Frequency Sensing Speed Control Unit

GOVERNORS AMERICA CORP.®

- Isochronous Operation
- No Magnetic Speed Pick-Up Required
- For Genset Only/Max 260 VAC
- Rugged Hard Potted Design
- Gain And Stability Adjustments
- Lower System Cost

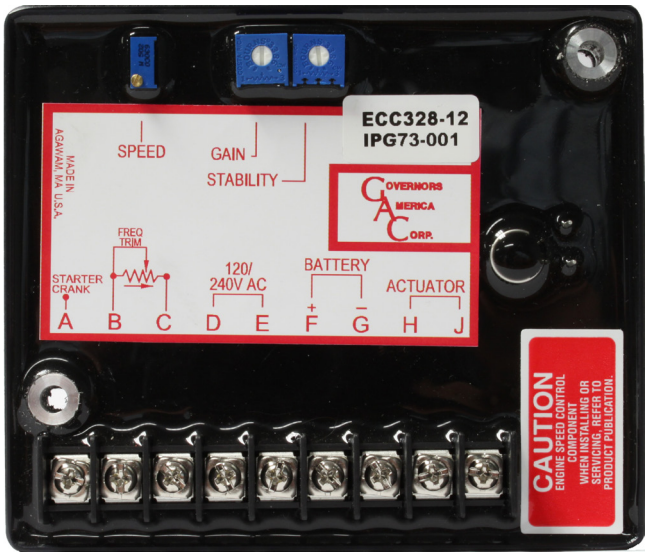
## INTRODUCTION

The ECC328 speed control unit is an electronic device designed to control engine speed with precise response to transient engine loads changes. The closed loop speed control, when connected to a proportional actuator and supplied with a speed signal/ frequency from the main AC generator, will control a wide variety of engines in an isochronous mode. The speed signal input must be in the frequency range of 40 to 80 Hz.

The ECC328 is a hard potted module designed to operate with high reliability in harsh environments. The adjustment procedure is simple and easy.

Standard features include: protection against reversal of the battery supply, accidental shorts in the actuator wiring, high voltage transient on the DC and AC lines, and the loss of the speed signal or battery supply.

The ECC328 is designed to be used for actuators with less then 4.5 AMP's Max current.




## DESCRIPTION

The generator's frequency, when used as an engine speed signal, can be either 50 or 60 Hz nominally. The minimum and maximum amplitude levels required to operate the ECC328 are 1V AC to 260V AC. The generator's residual voltage must reach 1V AC, so the loss of speed signal will be defeated and allow the actuator to open the fuel valve to start the engine. Other than the Min and Max AC input values, the control is insensitive to sine wave shape or the voltage levels from the generator.

When the speed signal is received by the controller, the signal is conditioned to operate the GAC proprietary speed sensor circuit. If the speed signal disappears for longer than approximately 0.2 seconds, the actuator output will be shut off (loss of speed signal protection). When cranking the engine, the control unit will sense a very low frequency and operate the actuator to start the engine.

The internal summing circuit receives the speed signal and combines it with the speed setting reference adjustment along with the remote speed trim setting. The output of the summing circuit is the input to the dynamics control circuits of which the gain and stability adjustments are apart. These control functions provide isochronous and stable performance.

During engine cranking, the actuator should be fully energized and should move to the maximum fuel position. The actuator will remain in that state during engine cranking and acceleration up to the operating speed. With the engine at a steady load, the actuator will be energized with sufficient current to maintain the governed speed set point.

The output circuit to the actuator provides a controlled switching current loop to the proportional actuator at a frequency of about 200 Hz. This switching frequency is well beyond the natural frequency response of the actuator, thus there is no visible motion of the actuator due to this switching circuit. Switching of the output transistor reduces internal power dissipation and provides for efficient power control up to 5 Amps of continuous current at 25°C. A proportional actuator will respond to the average current to position the engine fuel control lever.

The ECC328 is compatible with ALN, ALR, 100, 103 GAC actuators.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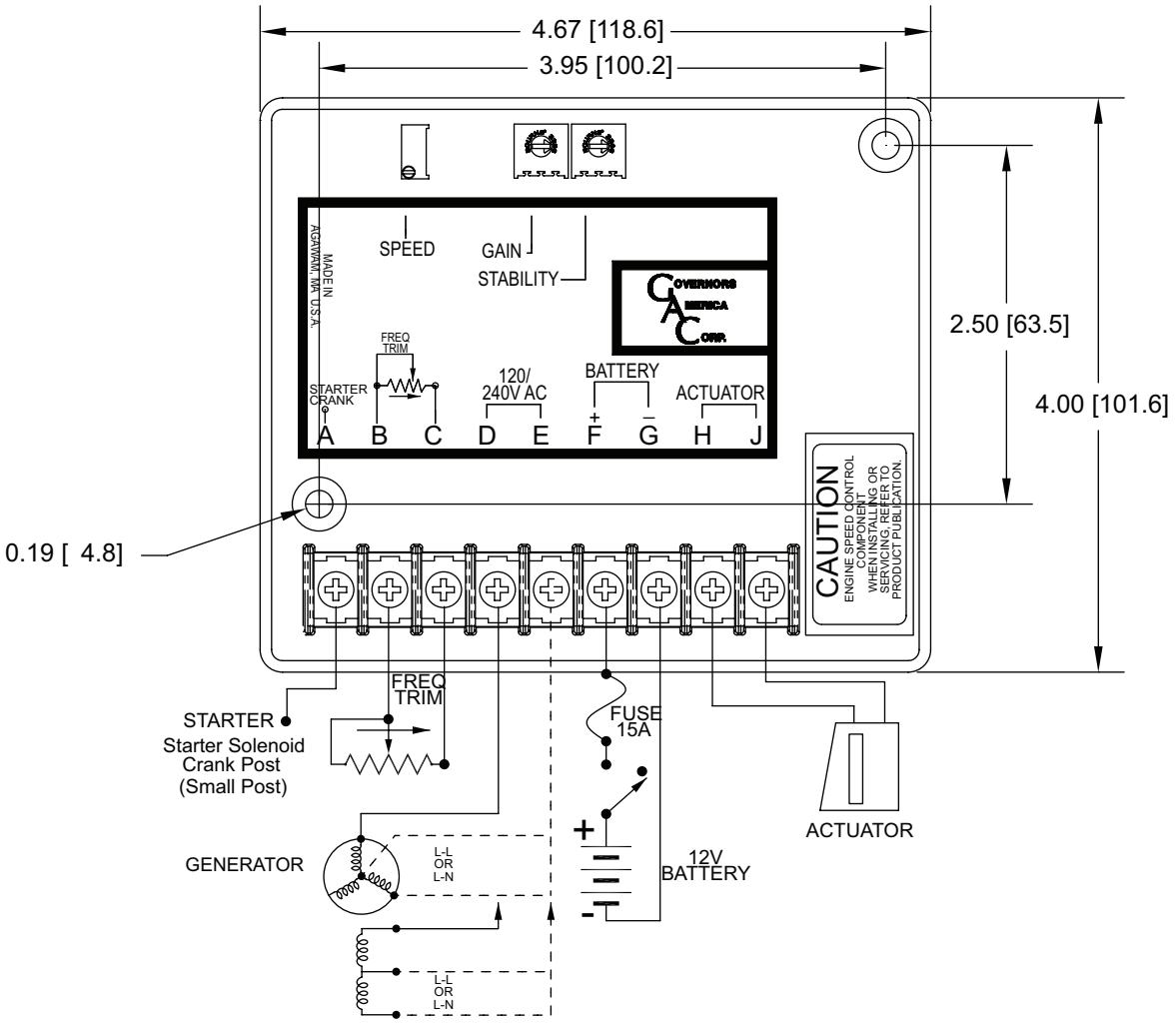
EGSA Electrical Generating Systems Association

ISO9001 CERTIFIED

## DIAGRAM 1 SYSTEM WIRING/OUTLINE




## SPECIFICATIONS

### PERFORMANCE

Isochronous Operation..... ±0.250%
Speed Range (unless stated in units specifications).....40 - 80 HZ
Speed Drift with Temperature..... ±1%
Speed Trim (see units specifications)..... +/- 2 Hz

### ENVIRONMENTAL

Ambient Temperature..... -40° to 185°F (-40 to +85C)
Relative Humidity.....up to 100%

### INPUT POWER

DC Supply.....12V DC (8 - 15 VDC) Nominal
.....(24 VDC available as special order)
Polarity.....Negative Ground (case isolated)
Power Consumption.....<50 mA + Actuator Current
Maximum Actuator Current.....5 Amps
Generator Frequency Sensing.....Load on generator, 40K OHMS
.....Minimum sensing 1 VAC RMS
.....Maximum voltage 260 VAC

### RELIABILITY

Vibration.....5G, 20-500 Hz
Shock.....20G's
Testing.....100% Functional Testing before and after potting

### PHYSICAL

Dimensions..... See Wiring Diagram (Fig. 1)
Weight.....0.75 lb (0.34 kg)
Mounting.....Any Position