



# Product Information

DYNA Products

## Standard DYN1-10504-001 & DYN1-10504-004 <sup>CE</sup> Series Panel Mounted DYNA Controllers

### GENERAL

The panel mounted controllers for the DYNA governor series are all solid state design that measure three parameters to provide precise engine control. Separate circuits measure the proportional (amount of offspeed), integral (time of offspeed) and derivative (rate of change of offset) values. These three circuits provide control that results in fast, stable engine response to offspeed changes and precise speed regulation.

To provide a governing system these controllers must be used with one of the following DYNA actuators. The actuator specification can be obtained from the product information sheet.

Plus 1 or Plus 4 .....	F-18080
Plus 6 (Standard and Explosion-proof) ...	F-18081
Plus 8 or Plus 16 .....	F-18082

### SPEED GOVERNING

DYNA controllers are available for engine governing for speed and power control of piston and gas turbine engines where the fuel is controlled by the governor's output shaft. The controllers are also applicable for controlling steam and water turbines.

### SPEED SENSING

The DYNA all-electric governor requires a frequency signal to read engine speed. Typically, a hole is drilled and tapped in the flywheel housing perpendicular to the crankshaft, and a magnetic pickup is inserted into it so it senses the teeth on the flywheel. Many other techniques may be used to obtain a speed reference signal.

### SPEED CONTROL RANGE

The governed speed control range for the DYNA I controller can be as much as 10 to 1. The actual range attainable depends upon the type of engine, controller and load.

### REMOTE SPEED ADJUSTMENT

A remote speed adjustment can be added to any DYNA controller by simply connecting a remote speed potentiometer to three electrical wires which can be provided by Barber-Colman. The Barber-Colman part number for the remote potentiometer is DYN5 10000.



### FAILSAFE

The DYNA governor has two failsafe modes: 1) If d-c power to the governor is interrupted, the armature spring automatically moves the output shaft to the "minimum fuel" position. 2) If the speed reference signal is lost, a failsafe circuit in the control instantly removes d-c power from the governor actuator, returning the output shaft to the "minimum fuel" position.

### STANDARD CONTROLLER FEATURES

- All-electric
- All-engine compatibility
- Mounts in any position
- High reliability
- No special maintenance
- Temperature stable

### ALL-ENGINE COMPATIBILITY

Since the DYNA all-electric governor requires no mechanical drive or oil supply, it can be used on any engine. Newly-built engines may be ordered without a governor drive for a substantial savings.

### ACTUATOR INSTALLATION

The DYNA actuator mounts directly on the engine, usually with a simple bracket, and will withstand the temperatures and vibration common to this environment. Since no mechanical drive or hydraulic oil lines are needed, simple electrical wiring permits mounting the actuator in any position convenient to connect to the fuel control linkage.

## SPECIFICATIONS

- **Available Operating Voltages:** 12 or 24 volts, +20%. Other voltages on special request.

- **Input Signal Frequency:**

$$\text{Input Signal Frequency in Hertz} = \frac{\text{Engine RPM} \times \text{Number of Gear Teeth on Flywheel}}{60 \text{ Seconds}}$$

Select your controller for the correct input signal frequency range generated by the magnetic pickup at the maximum engine operated (RPM) speed.

- **Steady State Speed Band:**  $\pm 0.2$  percent, isochronous control.
- **Ambient Operating Temperature:**  $-40^{\circ}$  to  $+167^{\circ}\text{F}$  ( $-40^{\circ}$  to  $75^{\circ}\text{C}$ )
- **Temperature Stability:** Better than  $\pm 0.5$  percent over a temperature range of  $-40^{\circ}$  to  $+167^{\circ}\text{F}$  ( $-40^{\circ}$  to  $75^{\circ}\text{C}$ )
- **Speed Regulation (Droop):** Adjustable from 0 to 15 percent. Remote adjustment optional.
- **Mechanical Vibration:** Tested 5 to 500 Hz @ 25 G's (peak level on the governor).

- **Output Signal:** Pulse width modulated current to DYNA actuator. Maximum output current is 14 amperes.

- **Connections:** Terminal strip.

- **Circuit Boards:** Boards are covered with a heavy conformal coating for moisture and vibration protection.

- **Enclosure:** Die cast aluminum. This module is designed for panel mounting.

- **Weight:** 635 grams (1.4 lbs.).

## STANDARD PANEL MOUNTED DYNA CONTROLLER PART NUMBERS

Specify voltage 12 or 24 volts d-c when ordering.

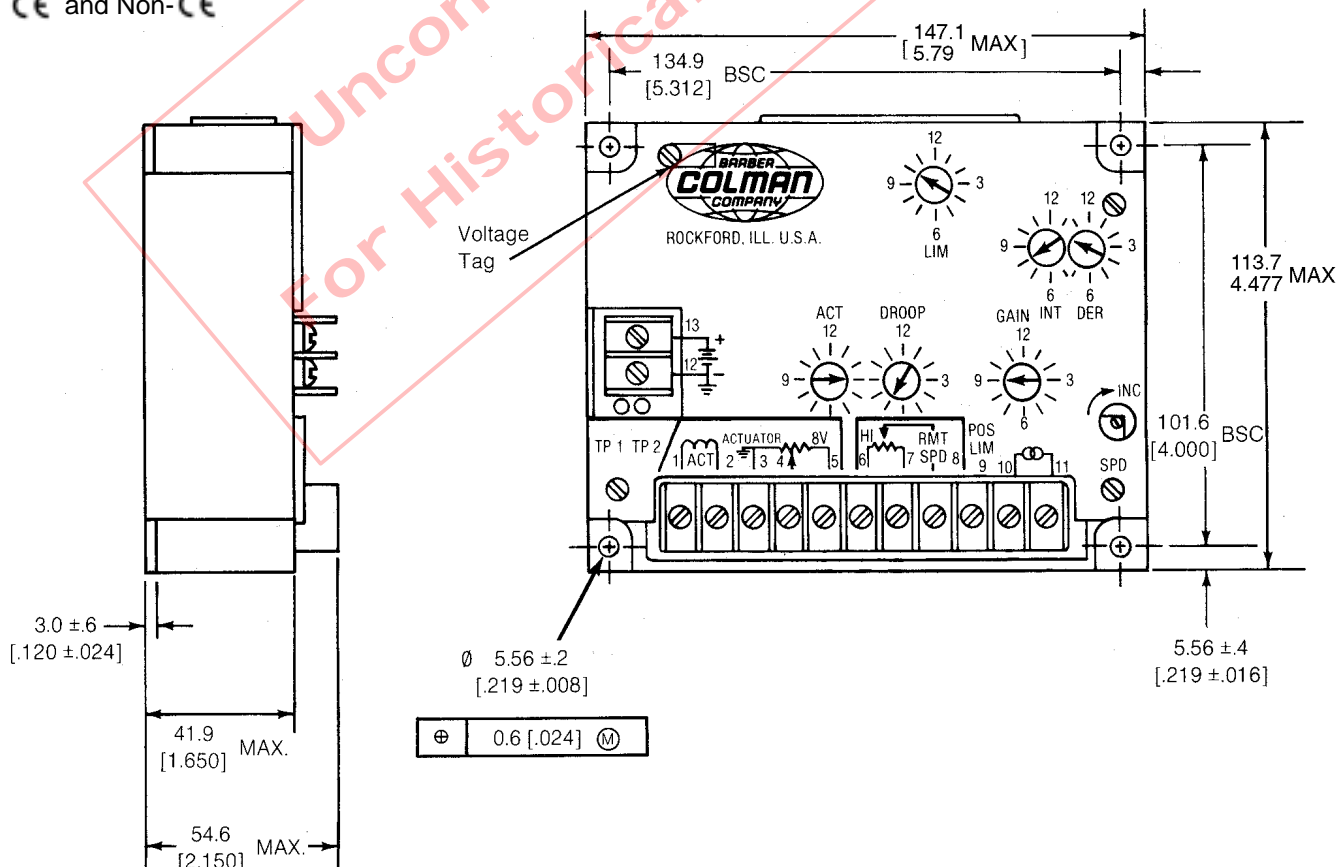
## SPEED CONTROLLERS

Part Number	Input Signal Frequency
DYN1-10502-001/DYN1-10502-004*	250 to 1200 Hz
DYN1-10503-001/DYN1-10503-004*	1200 to 2500 Hz
DYN1-10504-001/DYN1-10504-004*	2500 to 5000 Hz
DYN1-10506-001/DYN1-10506-004*	5000 to 9500 Hz

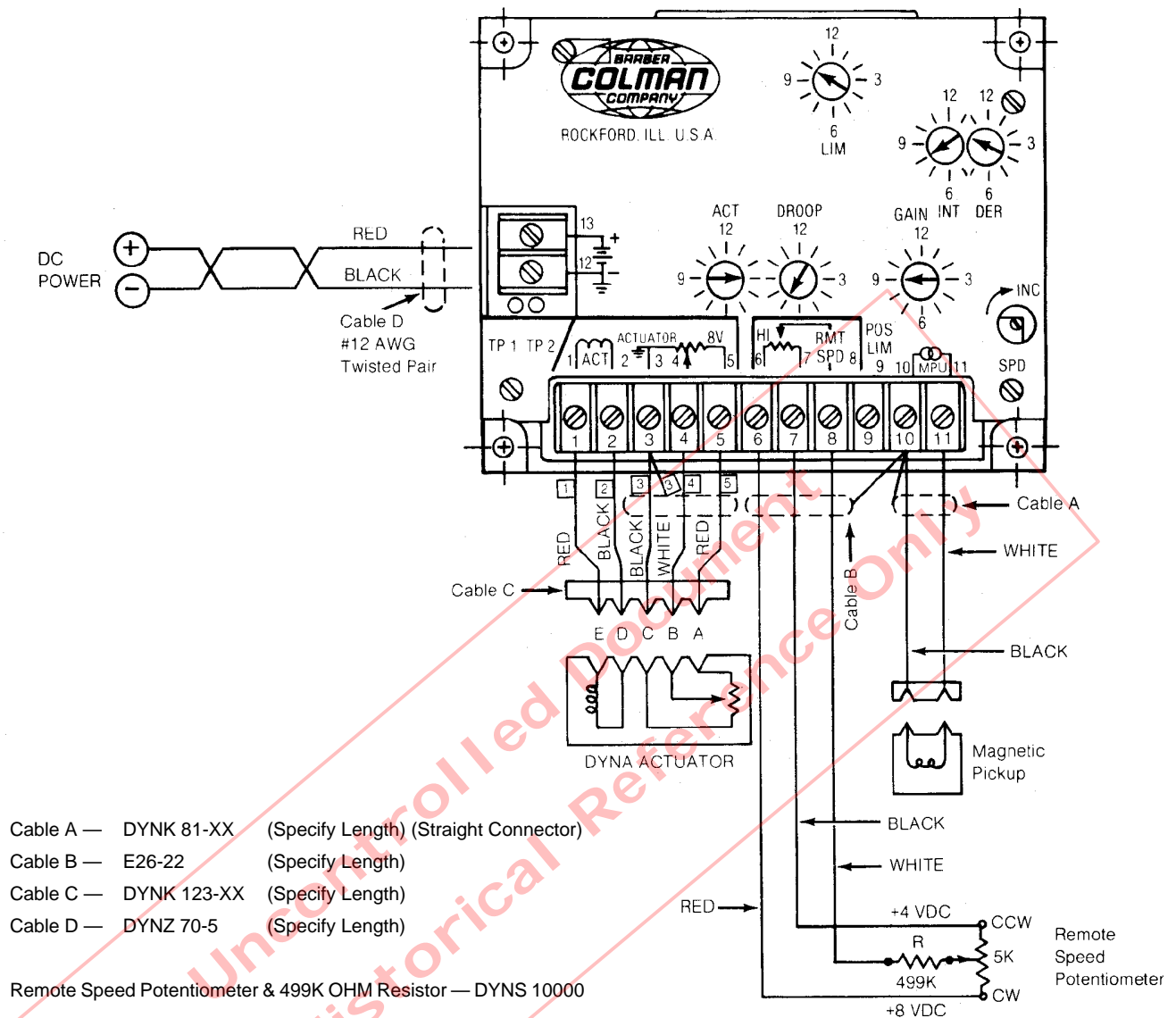
\* CE

## DIMENSIONS

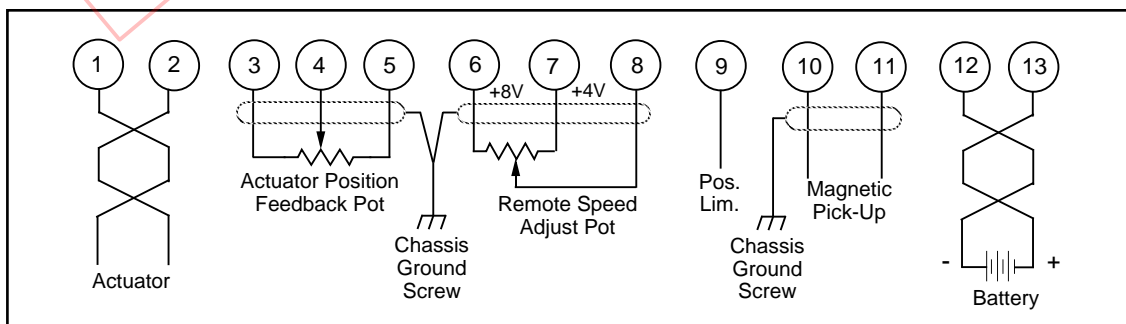
CE and Non-CE



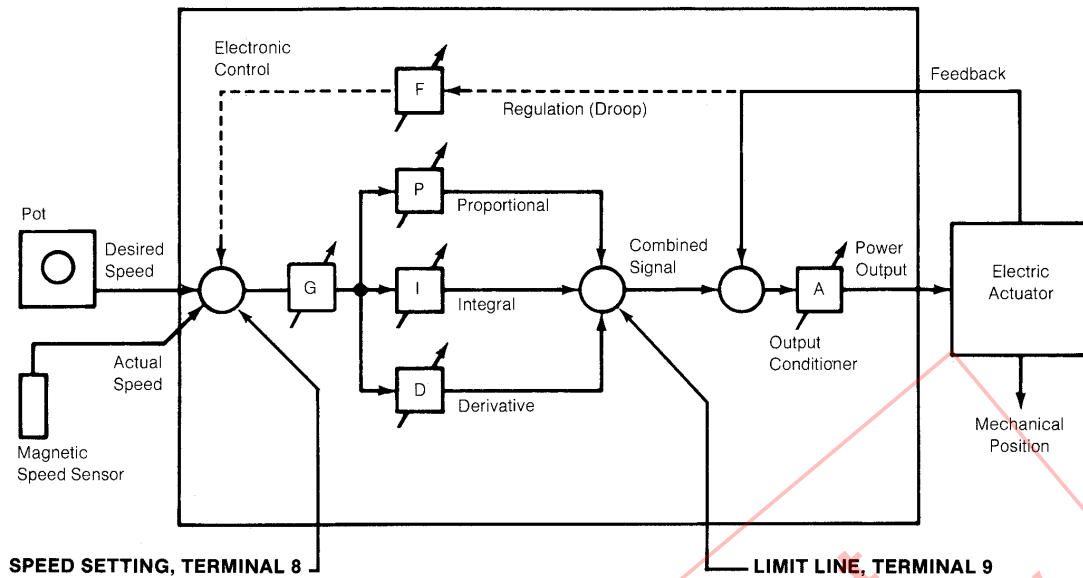
## TYPICAL WIRING DIAGRAM



## CE WIRING DIAGRAM



## DYNA CONTROLLER INPUTS



### Modify speed with respect to:

- Remote Speed Setting
- Time (Ramp Generator)
- Electrical Load Change (Load Pulse)
- Electrical Load (Isochronous Load Sharing)
- Electrical Phase Angle (Synchronizer)

### On Pump Applications:

- Output Pressure
- Output Temperature
- Liquid Level
- (Controller/Recorder Output)

### Limit fuel (rack or throttle position) with respect to:

- Maximum Fuel Permitted (Load Limit)
- Temperature (Exhaust)
- Manifold Pressure (Smoke Limit)
- Oil Pressure
- Time (some ramp generator applications)
- Requested Speed (Torque Limit)
- Actual Speed (Torque Limit)

### AUXILIARY CONTROL MODULES

Four auxiliary control modules are available: Isochronous Load Sharing Control, Auto-Synchronizer, Ramp Generator, and Single Phase Load Pulse Control. These and other auxiliary functions can be installed at the time of the initial governor installation or, just as easily, added later when the need arises. No modification is required to the basic governor when these modules are added.

### FEATURES ARE EASY TO ADD

It is easy to add features to the electric governor to provide benefits the customer needs. Remote speed setting, isochronous load sharing, automatic synchronizing, ramp generator, single phase load pulse and KW limits can be added at the time of initial governor installation or, just as easily, added later when the need arises. No modification to the basic governor is required when these features are added. In fact, if the pre-wired harness is used, the wires necessary to add these features are often already provided, so it is indeed easy to add features.

### Barber-Colman DYNA Products

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#### — NOTE —

Barber-Colman believes that all information provided herein is correct and reliable and reserves the right to update at any time. Barber-Colman does not assume any responsibility for its use unless otherwise expressly undertaken.

#### — CAUTION —

As a safety measure, the engine should be equipped with an independent overspeed shutdown device in the event of failure which may render the governor inoperative.