



### DYNA II SILVERLINE Microprocessor Auto-Synchronizer — DYN2-90200 DYN2-90300

#### General

The DYN2-90200/DYN2-90300 provides automatic synchronization of an incoming generator to a bus in a minimum of time by controlling the speed and phase of the generator to match it to the bus. As the generator comes up to speed, the auto-synchronizer compares its frequency, phase and voltage to the bus. Any difference in frequency or phase results in a proportional signal to the governor control circuit. As the difference is reduced, so is the amplitude of the signal until the generator output is phase matched to the bus. When the generator output has reached the preset levels of synchronization, a relay inside the auto-synchronizer is energized to provide an isolated single-pole, double-throw contact for the circuit breaker control.

#### Operational Modes

##### • Automatic

The auto-synchronizer performs as a speed and voltage matching automatic synchronizer. The speed and phase of the incoming generator are controlled and up/down contact signals indicate direction for voltage to ramp; an isolated contact is closed when the voltage, frequency and phase are within limits.

##### • Permissive

The auto-synchronizer performs as a synchronizing check relay only, with circuit breaker contact output but not control of the incoming generator

##### • Reset

The auto-synchronizer is still sensing but provides no contact output and no control signal.

The auto-synchronizer has three LED lights in the front of the unit to help the technician when first starting a control panel or when troubleshooting the control panel after it has been started. The LED lights indicate whether the synchronizing limits have been met by the incoming generator.

#### Typical Applications

- Automatic Synchronization with Generators Operated Isochronously
- Automatic Synchronization with Generators Operated in Droop
- Automatic Synchronization with an Infinite Bus
- Automatic Synchronization with Another AC 50/60/400 Hz Power Source to Allow Bumpless Transfer



#### Standard Features

- Automatic Frequency and Phase Matching
- Microprocessor Reliability
- Visual Indication of Frequency, Phase and Voltage Differentials

- Built-in Synch Check Relay
- Voltage Matching Relays
- Adjustable Phase Angle Differential
- Adjustable Voltage Matching Window
- Remote Reset

##### • Electric Governor Compatibility

The DYNA II Auto-Synchronizer will function with the Barber-Colman DYNA I All-Electric Governor. It will operate with any governor actuator in the DYNA Series.

##### • Safety

The DYNA II Auto-Synchronizer eliminates the risk of human error that might occur with manual paralleling. Operating personnel need not be present.

##### • Proportional Plus Integral Output

The Auto-Synchronizer has a proportional plus integral output which allows it to be used with a wide variety of engine generator sets.

##### • Voltage Matching Relay Outputs

The auto-synchronizer provides two N.O. relay contracts to indicate direction of voltage error. This can be used with a motorized potentiometer or any other device which increases or decreases generator voltage based on up/down signals.

##### • Capture Range

$\pm 3.0$  Hz; synchronizes equally well from both directions.

##### • High Reliability

The DYNA II Auto Synchronizer employs integrated circuits and digital components for high reliability. Each unit is subjected to thorough functional testing under operating conditions.

##### • Chassis Design

The chassis is sturdily constructed of steel and is intended for behind-the-panel mounting.



## Specifications

Input Power	Incoming Generator	Bus
Voltage*	115/230 VAC	115/230 VAC
Frequency	50/60/400 Hz	50/60/400 Hz
Phase	1	1
Burden (VA)	7	2

\*Stepdown potential transformers may be necessary to reduce other generator/bus voltages to the 115/230 VAC inputs.

- **Breaker Closing Angle**  
Potentiometer adjustable  $\pm 5^\circ$  to  $\pm 20^\circ$  for 50/60 Hz.  
Potentiometer adjustable  $\pm 10^\circ$  to  $\pm 40^\circ$  for 400 Hz.
- **Output Signal** -4 volts to +4 volts DC.
- **Contact Ratings** SPDT; make and break 10A at 240 VAC, resistive.
- **Synchronizing Time (typical)** Less than 6 seconds based on an engine-generator acceleration rate of 55% per second.
- **Operating Temperature**  $-40^\circ$  to  $+70^\circ\text{C}$  ( $-40^\circ$  to  $+158^\circ\text{F}$ )
- **Environment** Printed circuit is tropicalized with conformal coating.
- **Vibration** Withstands the following vibration without failure or degraded performance: 0.06 inch double amplitude at 5 to 18 Hz; 1 G at 18 to 30 Hz; 0.02 inch double amplitude at 30 to 48 Hz; 2.5 Gs at 48 to 70 Hz.

- **Shock** Withstands 15 Gs in each of three mutually perpendicular axes.
- **Finish** Dark blue, baked enamel.
- **Weight** 4.4 lbs. (2.0 kg).
- **Manual for Auto Synchronizer**  
See Instruction Manual F-23448.
- **Ordering Information**  
The Barber-Colman Part Number for the DYNA II Auto Synchronizer is DYN2-90200/DYN2-90300\*.
- \* CE

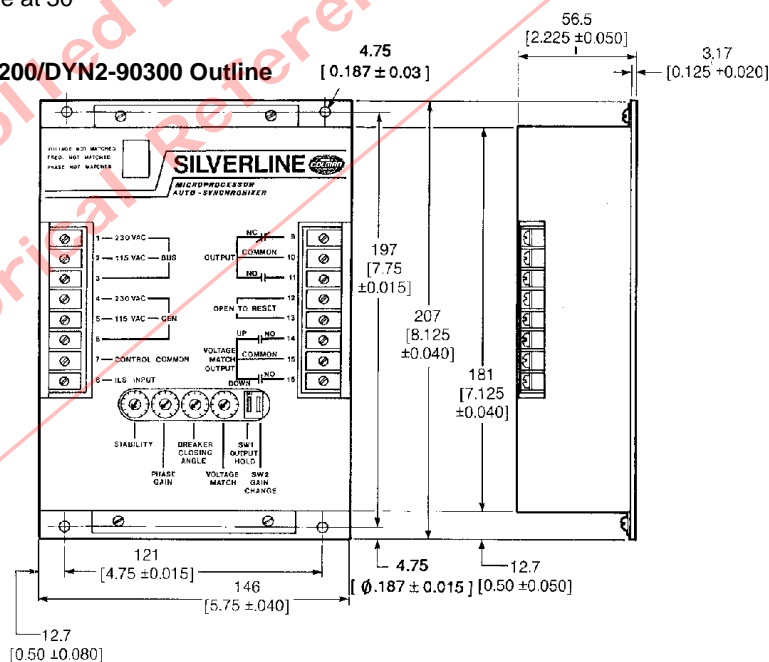
## Sample Specifications

The synchronizing function shall be accomplished by means of an auto-synchronizer that can operate with an electric governor. It shall employ a phase locking method of synchronization. The unit shall employ single phase sensing. Phase angle shall be adjustable between  $\pm 5^\circ$  and  $\pm 20^\circ$ .

The unit shall be designed for behind-the-panel mounting. Environmentally, the unit shall be capable of operating in an ambient environment of  $-40^\circ$  to  $+70^\circ\text{C}$  ( $-40^\circ$  to  $+158^\circ\text{F}$ ). It shall withstand vibration up to 2.5 Gs at 48 to 70 Hz in any plane and withstand shock of up to 15 Gs in any plane.

## Dimensions in Millimeters [Inches in Brackets]

### DYN2-90200/DYN2-90300 Outline



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### — 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.

### — 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.

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