

Westinghouse



Type XL Solid State Automatic Synchronizers

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on request from
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Application

The Westinghouse Type XL automatic synchronizer is a practical and inexpensive device for the automatic synchronizing of small generators. The unit is compact and is entirely static except for the relay which actuates the generator breaker.

Units of this type are installed when automatic or unattended operation is required. Small municipalities, factories, mines and institutions having their own generating plants can use the XL synchronizer for synchronizing and dead bus energization.

The Westinghouse Type XL synchronizer is applied to relatively small engine-driven generators up to 600 volts and not exceeding 1000 Kva rating. The prime mover must be equipped with a suitable governor to closely regulate speed at no-load as sudden changes in speed (after the synchronizer contacts close and energize the generator main contactor) will cause undesirable synchronizing surge currents.

The electrically-operated breaker or contactor must be fast closing, that is, not exceeding 8 cycles (60 Hz basis) from the time the synchronizer contacts close until the generator switch contacts close. Where non-latched contactors are used, an auxiliary contact is required on the generator contactor for paralleling the contacts of the synchronizer to permit sealing-in the contactor coil. This insures a complete closing operation of the contactor as soon as the synchronizer closes its contacts.

Features

Safe Synchronizing: Eliminates the risk of low voltage, high current, and strain on equipment that sometimes happens with improper manual synchronizing.

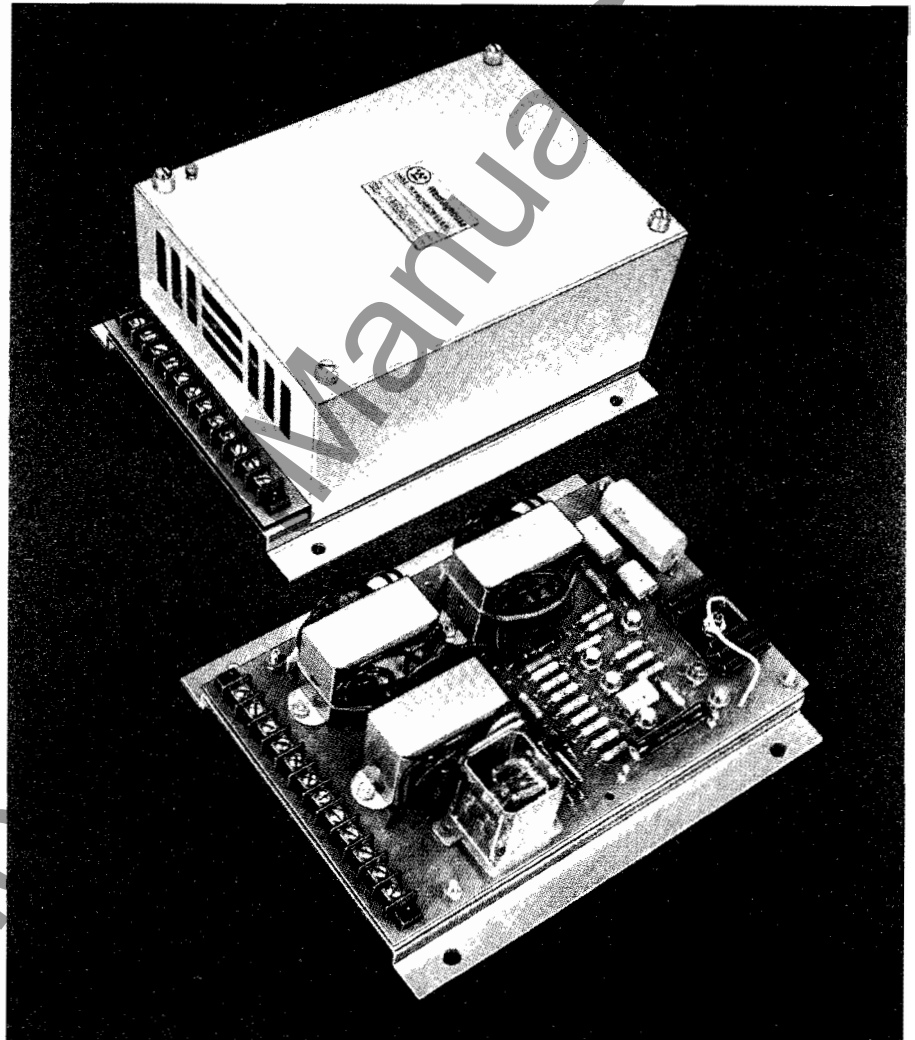
Quick Synchronizing: The generator is connected to the line automatically as soon as its speed, frequency, and phase position become the same as that of the line.

Uniform Synchronizing: No chances are taken by the Type XL Synchronizer. It operates only when conditions are satisfactory for connecting machines in parallel.

Quick, Easy, Paralleling: Generators, within the ratings handled by the Type XL Synchronizer can be paralleled easily and quickly.

Solid State Circuitry: Provides zero maintenance and long life, no electrolytic capacitors.

Dead Bus Operation: Will close onto a de-energized bus if desired.



Operation

The XL synchronizer as shown in Figure 1 obtains its power from a reliable 120 V 50/60 Hz source; 120 V, 50/60 Hz bus and generator voltage are applied to the appropriate generator and bus sensing voltage terminals. The bus and generator voltage beat against each other to produce 0 volts at an in-phase condition. Providing the scope rate is slower than 4 sec./rev and the voltage difference between bus and generator voltages is less than 15 V ac, the synchronizing relay will close within 5 degrees of synchronism.

In general, fast synchroscope rates give relay closures slightly after synchronism while slower rates give relay closures slightly before synchronism. The synchronizing relay will remain closed until ap-

proximately 30 degrees past synchronism. Since a relay closure will close the generator line breaker, no relative phase difference between generator and bus can occur. Thus the synchronizing relay remains picked up until the XL synchronizer power supply is interrupted. Interruption can occur through the generator breaker "b" contact or through an external control switch.

A dead bus option is included which will close the generator on to a de-energized bus. This option is exercised by connecting terminals 5-6 together permitting the XL synchronizer to actuate the generator breaker when the bus voltage is below 10 V ac.

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Specifications

Synchronizing Limits

When a safe synchronizing zone is reached, the synchronizer picks up its relay to initiate the closing of the generator circuit breaker. The accuracy of the signal to close the breaker, coming from the contacts of this relay, will vary linearly with beat frequency from 8 degrees early on a beat frequency of .1 Hz (synchroscope speed of one rotation every 10 seconds) to 2° late on a beat frequency of .25 Hz (synchroscope speed of one rotation every 4 seconds).

At beat frequencies greater than .25 Hz (synchroscope rotating faster than one revolution every 4 seconds) the XL synchronizer locks out.

Input Voltages

Power (Term. 7-8) 120 V \pm 20 V, 50/60 Hz, 25 VA

Bus (Term. 3-4) 120 V \pm 20 V, 50/60 Hz, 10 VA

Generator (Term. 1-2) 120 V \pm 20 V, 50/60 Hz, 10 VA

Nominal voltage acceptance band \pm 15 V ac around rated.

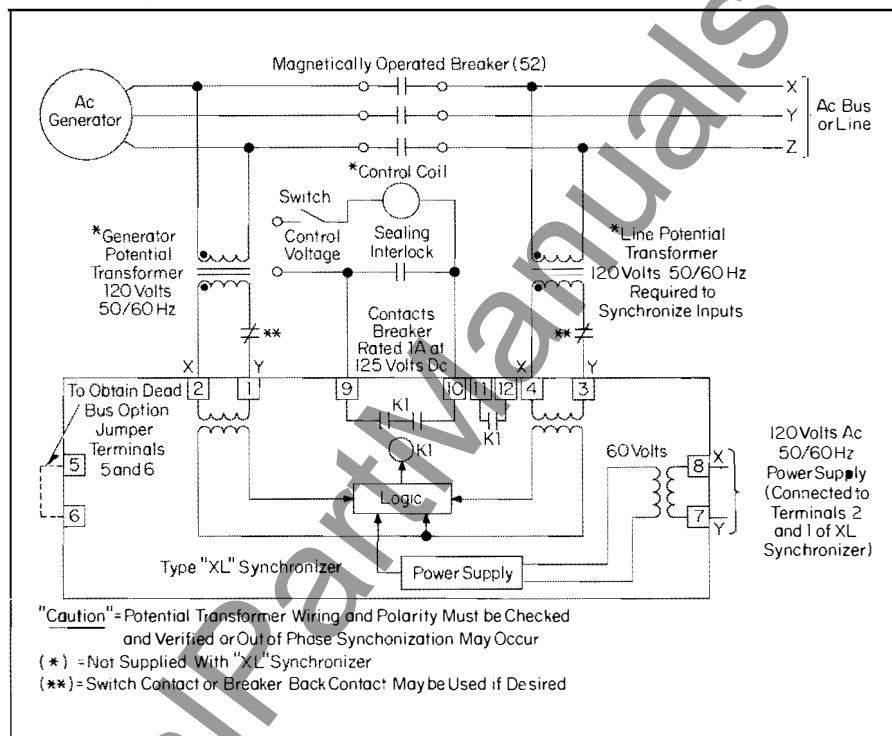
Rating of relay contacts 1 A @ 125 V dc interrupting
(Term. 9-10) 5 A @ 120 V ac interrupting

Installation

The XL synchronizer does not require any adjustments upon installation.

Refer to Figure 2 for outline and drilling plan. The XL synchronizer is normally mounted vertically with the terminal block mounted downward.

Figure 1. Typical Wiring Diagram Type 'XL' Automatic Synchronizer



Outline Dimensions in Inches

