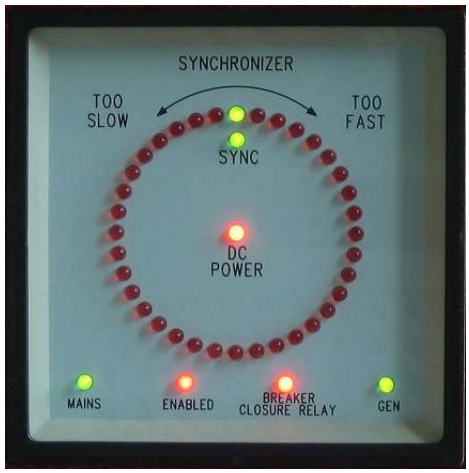
SYC6716 Synchronizer with display

A. Introduction

SYC6716 synchronizer is a high-tech designed product; there is no need to install synchronous controllers when using synchronizer so the cost of generators and machine control cabinet is reduced and the line is simplified. And what's the most important; it improves the stability of generators and machine control cabinet.

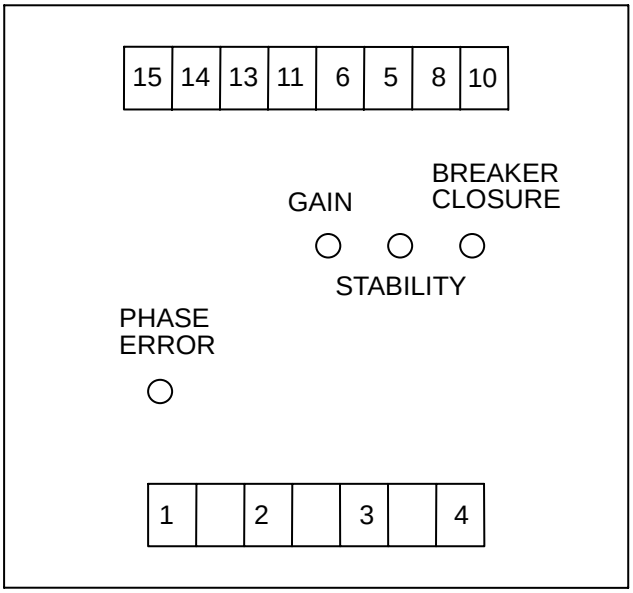


B. The functions of LEDs

LED	Function
36 LEDs in a circle	When it is synchronous, the phase difference is near 0^o, the top green LED shall be lit. when $f_{GEN} > f_{MAINS}$, the phase difference is timing angle, LED shall be lit in the direction of "**TOO FAST**", a phase difference of 10^o will be increased when a more LED is lit in that direction. When $f_{GEN} < f_{MAINS}$, the phase difference is in inverted angle, LED shall be lit in the direction of "**TOO SLOW**", a phase difference of 10^o shall be decreased when a more LED is lit in that direction. If the frequency of the generator sets is on the high side or on the low side, the LED shall be lit in timing direction or inverted direction accordingly.
SYNC	Lights up when the phase difference is lower the presetting difference.
DC POWER	Lights up when the power is supplied.
MAINS	Lights up when mains is supplied power
ENABLED	Lights up when the synchronization is been accepted.
BREAKER CLOSURE RELAY	The switching signal shall be showed synchronously if the phase difference is lower than presetting difference and meanwhile the

	LED is lit when the synchronization is been accepted.
GEN	Lights up when generator is running.

C. Terminals and installations



Terminal	name	Installation instruction
1、2	**GEN**	Shall be connected with the A, C phase of generator(voltage range: AC110V~400V 50/60Hz)
3、4	**MAINS**	Shall be connected with the A, C phase of electric network or Bus-bat(voltage range: AC110V~400V 50/60Hz)
10	**GND**	Shall be connected to the Battery–.
8	**B+**	Shall be connected to the Battery+ (DC24V).
5	**ENABLE**	The synchronization shall be accepted when connection to the Battery+ (DC24V)
6	**OUTPUT**	Shall be connected to the terminal "**N**" of GAC speed controller when synchronization outputs.
14	**COM**	The common of the output relay.
13	**N.O**	The normal open of the output relay.
15	**N.C**	The normal close of the output relay.

D. Adjustments （in most cases, do not need to adjust can work）

The governor must be in good working order and adjusted correctly for the synchronizer to properly operate in the system. Optimize the governor if necessary.

A. While the synchronizer performance is being adjusted. Disconnect the relay wires at Terminals 13 -15. This test mode allows the generator set to synchronize to the mains without paralleling.

B. Trim the governor speed setting so that the generator frequency is within 0.1 Hz. Of the mains frequency. Note the status of the LED's on the SYC6716. The **MAINS**. **GENERATOR**, and **DC POWER** LED's should be lighted. Close the synchronizer ON/OFF switch between the governor system and the SYC6716. The auxiliary contacts should be closed at this time. The red SYNC **ENABLED** LED should light. The SYC6716 will immediately attempt to synchronize. When synchronized, the green **SYNC** LED will light.

C. Adjust the performance of the synchronizer by turning the **GAIN** as far CW as possible without causing instability in the system. Set the **GAIN** one division CCW from the point where instability occurs. When the system is unstable, the main breaker is inhibited from closing.

D. Optimization of the **GAIN** setting
Unsynchronize the system with one of the following methods.
Set the SYC6716 ON/OFF switch to OFF.
Disconnect the mains signal at Terminal 3 or 4.
Momentarily move the engine throttle.
Reinstate the synchronizer and observe the speed and stability of the synchronization. Readjust the **GAIN** for fast synchronization without instability.

E. **STABILITY** adjustment
If necessary, adjust the **STABILITY** for fast, smooth synchronization. A more CCW setting will result in a slower (more damped) but smoother response.

F. **PHASE ERROR** adjustment
The **PHASE ERROR** has been set correctly in factory.

G. **BREAKER CLOSURE** angle adjustment
With the system operating and synchronized, set the breaker closure angle to zero. Adjust the **BREAKER CLOSURE** CCW until the **BREAKER CLOSURE RELAY** LED lights. And continue CCW one additional division.

H. Reenable BREAKER CLOSURE function
Reconnect the relay wires at Terminals 13 -15. Synchronization and paralleling may now be performed.

I. For a final check, start the engine and synchronize the system to insure that all adjustments are optimized. If the performance is unsatisfactory. Contact the sales please.