GENERAL DESCRIPTION

The RSSx Synchronoscope / Synchronizing Relay is designed to both display the phase and voltage magnitude of two independent power sources, and to perform the synchronization operation between them.

The unit features a circular display indicating the phase angle between the two voltages, along with two numerical displays showing the voltage magnitude of each source. It allows configuration of the permissible voltage difference, phase angle difference, and synchronization delay time.

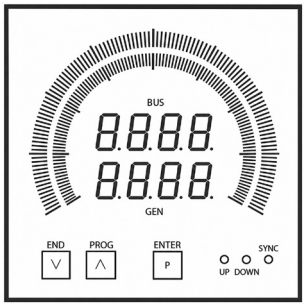
Once the programmed synchronization conditions are met, the output relay is energized either for a fixed period (300 ms) or continuously while the synchronization conditions remain valid.

The device is powered from the busbar voltage. When operating in automatic synchronizing mode, it provides speed increase/decrease pulses to control the generator governor. Front-panel LEDs indicate the status of the output relays.

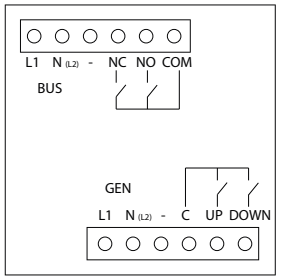
FEATURES

- Voltage input: 63.5, 110, 230, 400, 440 V ± 20%
- Accuracy: 0,5%
- Frequency range: 45 - 65 Hz
- Accuracy: 0,1%
- Phase angle range: +180°
- Accuracy: 1°
- Dimensions: 96x96. Depth 70 mm
- Panel cut-out: 91x91
- Voltage difference range: ± 100 %
- Accuracy: 1%
- Operating temperature: -10 /+60°C. R.H. < 95%
- Protection rating: Front panel, IP54.
  Terminals, IP20.
- Double insulation
- Installation category: III
- Pollution degree: 2
- Enclosure: UL94-V0
- Synchronization output: Relay, 250 V, 8 A
- Control outputs: Relays, 250 V, 3 A
- Control Relay Operation
  - Pulse duration: 120 ms
  - Pulse repetition: Every 2 s

FRONT PANEL



WIRING



PROGRAMMING

Programming is carried out using the front-panel Up, Down, and Enter keys. The parameters are displayed on the numerical indicators.

To modify a value:

- Press Up to edit the displayed parameter.
- Press Down to select the digit to be modified.
- Press Enter to confirm the value or leave it unchanged.

To enter programming mode, press Enter and Up simultaneously.

RSS1
SYNCHRONIZING RELAY/
SYNCHROSCOPE

USER MANUAL

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The display will show PASS, requesting the access password. Enter 0010, provided the factory password has not been changed. If the password has been modified, the new password must be entered, as programming cannot be accessed without it.

After confirming the password with Enter, the instrument enters the Primary Voltage programming page (UPr). Enter the primary voltage of the voltage transformers.

After validating the voltage setting, the Phase Angle Difference parameter (AnGL) is displayed.

Press Enter again to access the Voltage Difference setting (Dif U).

After confirming this parameter, the display shows SEC, where the synchronization delay time is programmed in tenths of a second.

The final programmable parameter is the Output Mode (ModE), which can be set to:

- Pulse: Single 300 ms output pulse.
- CONT: Continuous output while synchronization conditions remain valid.

The following screen displays IDEN, a factory parameter intended only for manufacturing adjustments.

Programming is cyclical. To exit programming mode, press Enter and Down simultaneously.

PROGRAMMING LIMITS

- Voltage difference: ±10%
- Phase angle difference: ±20°
- Synchronization delay: 0.1 to 5 s
- Synchronization relay operation:
  - -300 ms pulse
  - -Continuous mode

OPERATION

The unit is powered from the busbar voltage.

At startup, the numerical displays indicate the busbar frequency and the generator frequency, when available.

Pressing the Up or Down key cycles through the following display pages:

- Busbar and generator voltages
- Voltage difference
- Phase angle between both voltages

The phase angle is displayed from 0 to 359.9°.

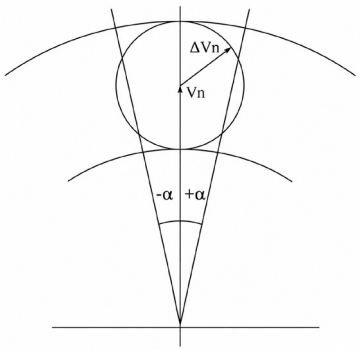
The synchronization relay is enabled when all of the following conditions are met:

- Frequency difference is less than 1 Hz.
- Vector voltage difference is below the programmed limit.
- Phase angle difference is below the programmed limit.
- These conditions remain valid for longer than the programmed delay time.

If the frequency difference exceeds 0.1 Hz, the unit generates advance or retard control pulses to increase or decrease the generator speed until both frequencies match.

Once the frequency difference falls below 0.1 Hz, the control pulses are automatically inhibited.

The accompanying diagram illustrates the synchronization permission area.



SACI reserves the right to modify these specifications without prior notice.