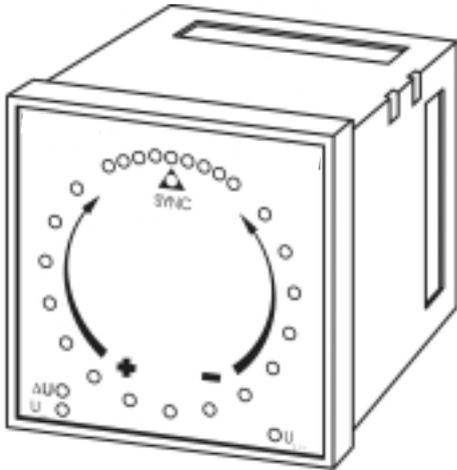


Check Synchronising Relay

SCQ 96



- Circular display of D_j phase difference
- Magnified display of phase angle $D_j = \pm 15^\circ$
- Microprocessor processing
- Setting of conditions for synchronisation
- Output relay for synchronisation
- Standard 96 x 96 mm DIN casing
- Case for protection of connection terminals

Description

SCQ 96 is a synchroscope with switch-on check relay. It is intended for measuring phase difference D_j between a bus-bar and a generator. The instrument is provided with a synchronisation check relay which enables switch-on of synchronisation when the set parameters are reached. Conditions for synchronisation switch-on can be set. A display consist LEDs of a circle for a display of phase difference. A magnifier which magnifies the measurement resolution is added within a synchronisation range $\pm 15^\circ$ el.

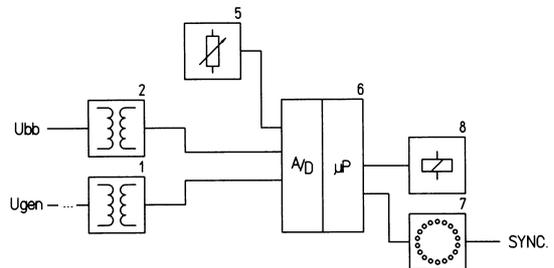
Description of operating

A sampling method of input voltages of generator U_{gen} and bus-bar U_{bb} with A/D converter in the microprocessor (6) is used in the instrument. Input voltages are electrically isolated via input transformers (1, 2). The microprocessor (6) controls complete operation of the synchroscope. It calculates rms values from samples of input voltages from the A/D converter and determines D_j phase difference between the generator and the bus-bar. Phase difference is indicated with a corresponding LED in a circular display (7).

The synchroscope is provided with three potentiometers (5) for setting conditions of a synchronisation relay switch-on (8) at the instrument rear side:

- for setting permitted phase difference D_j ;
 - for setting permitted voltage difference DU ;
 - for a delay of synchronisation relay switch-on (DELAY).
- When phase difference and voltage difference between a generator and bus-bar for time of delay of synchronisation check relay are within the set limits, the synchronisation check relay is switched on for approx. 150 ms. In that time SYNC LED is lit as well.

1. Input bus-bar transformer U_{bb}
2. Input generator transformer U_{gen}
5. Setting potentiometers
6. Microprocessor
7. Circular display
8. Synchronisation check relay



Display

The instrument is equipped with a circular display of phase angle which consists of 18 LEDs. Momentary phase difference is displayed by LED. Within synchronisation range ($D_j = 0^\circ$, between -15° el. and $+15^\circ$ el.) resolution is increased to 5° el. If difference of frequency between input voltages exceeds 3 Hz, three LEDs above FAST ($f_{gen} > f_{bb}$) or SLOW ($f_{gen} < f_{bb}$) inscription are alternately lit. A green SYNC LED is lit when synchronisation conditions are met. A red DU LED is illuminated when difference between voltages is above the set value or when the bus-bar voltage is lower than 80% of nominal value U_n .

Input voltage

Nominal voltage U_n : 57, 100, 230, 400 V
 Voltage range: $U_n \pm 20\%$
 Frequency range: 45...65 Hz
 Self consumption (bus-bar): < 4 VA
 Overload: continually $1.2 U_n$ short $2 U_n$, 3s

Measuring part

Resolution of phase difference display: 20° el.
 Magnifier range: $\pm 15^\circ$ el.
 Magnifier resolution: 5° el.
 Accuracy at $D_j = 0$: $\pm 3^\circ$ el.

LCD Quantities Accuracy

Voltage (U_{gen} , U_{bb}): 1,5%
 Frequency (f_{gen} , f_{bb}): 0,5%
 Phase difference between U_{gen} and U_{bb} : $\pm 3^\circ$ el.

Check Synchronising Relay SCQ 96

Synchronisation Part

Voltage difference setting range: 1...10%
 Accuracy: $\pm 2,5\%$
 Phase difference setting range: 2...20°el.
 Accuracy: $\pm 3^\circ\text{el.}$
 Switch-on delay time range: 0,1...1 s
 Accuracy: $\pm 10\%$
 Synchronisation pulse duration: 150 ms
 Relay: 250 V, 6A, 50 Hz, 1500 VA

Design

Case: poli arbonate, in compliance with UL 94 V0
 Protection: IP52 for case, IP00 for terminals
 Safety: in compliance with EN61010
 400 V: Installation category II, pollution degree 2
 300 V: Installation category III, pollution degree 2
 Weight: 0,5 kg

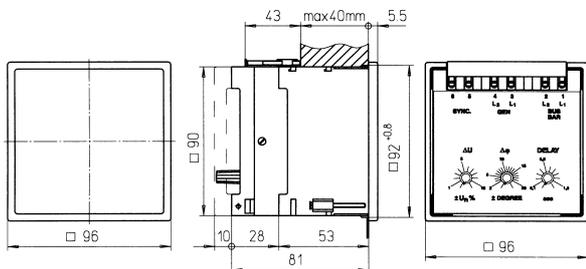
Ambient conditions

Temperature
 Reference range of operation
 0...50°C
 Nominal range of operation
 -10...55°C
 Storing: -40...70°C
 Humidity: up to 95% (without condensing)

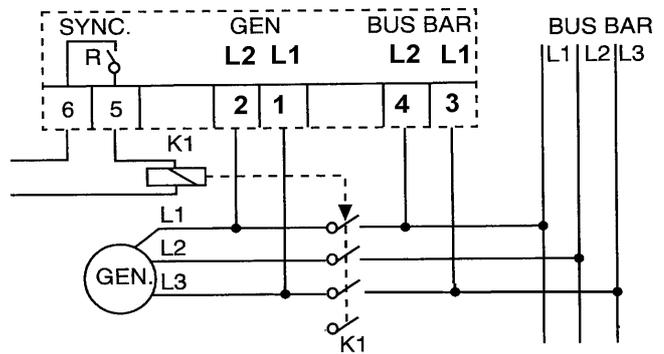
Connection terminals

Connection terminals for connecting network voltage and a generator as well as a synchronisation check relay are provided on the rear side of the instrument. Setting potentiometers for setting permitted voltage and phase difference between the generator and bus-bar and switch-on delay are provided below terminals.

Dimensions



Connection



Data for ordering - example

Type - nominal voltage
 SCQ96, 400V