

SIRAX BM920 Synchroscope

Description

The SIRAX BM920 synchroscope is an electronic measuring device that uses an illuminated display to show the frequency and phase deviation between voltages in two separate AC systems (e.g. a generator and a busbar). It is also checked whether the two systems are live or not.

The frequency deviation is indicated by a moving light point and the size of the deviation is indicated by the speed and direction of the movement.

If the light point moves clockwise, it indicates that the frequency of the incoming system is too high. If the light point moves counterclockwise, this means that the frequency is too low. A constant red glowing point indicates a frequency deviation and a phase deviation. Exact synchronization is achieved when the two green LEDs light up at the 12 o'clock position.

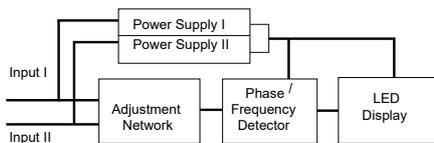
Example:

If 'T' is the time required for one revolution, the frequency difference can be calculated as $1 / T = \Delta f$. The bus frequency is 50 Hz. The vector spot needs 10 seconds for one clockwise rotation. $1/10 = 0.1\text{Hz}$. The frequency difference = 0.1 Hz. From this we can conclude that the generator frequency is 50.1 Hz.

Favorable condition for switching on the generator

1. Make sure that the frequency difference between two inputs is within the user's requirements. Measure the time in seconds (T) it takes for the illuminated dot to rotate completely. The frequency difference will be $\Delta f = 1/T$ (Hz).
2. If the frequency difference is within acceptable limits, wait until the SYNC marker LEDs (two green LEDs at 12 o'clock position) light up. The generator can now be safely switched on.

Functional Principle

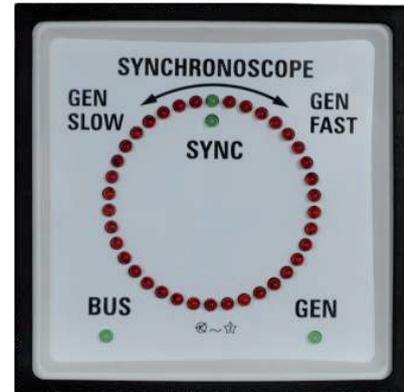


The Bus & Gen inputs are fed to the Frequency & Phase detection network. The output duty cycle of the network corresponds to the frequency difference between Bus & Generator Voltage. The detector network also determines the actual phase difference.

Technical Data

Mechanical Data

Case details	Moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels
Material of case	Polycarbonate
Flammability class	UL94 V-0, self-extinguishing, non-dripping, halogen-free
Material of window	Glass
Front frame (bezel)	Polycarbonate black



Position of use	Vertical ±5°
Mounting	stackable next to each other
Panel thickness	≤40mm
Panel fixing	Swivel screw
Connections/terminals	M4 screws and wire clamps form E3
Gewicht	□96
	□144
	0.60kg
	0.70kg

Electrical Data

Measuring unit	Frequency and phase difference
Nominal voltage	100 ... 500 VAC
Frequency range	35 ... 70 Hz
Pull in / drop out frequency	± 9 Hz
Power consumption	max. 6 VA

Referenzbedingungen

Reference temperature	23 °C / ± 3 °C
Input voltage	nominal voltage ±2%
Nominal frequency	50 Hz ±1%

Environmental conditions

Climatic suitability	Climate category 2 acc. to DIN EN 60 051 Climate category 3 acc. to VDE/VDI 3540
Operating temperature	-10 ... +55 °C
Storage temperature	-25 ... +65 °C
Relative humidity	≤75% annual average, non condensation
Shock	150 m/s ² (15g) / 11 ms
Vibration	10 ... 150 ... 10 Hz, 0.15 mm amplitude, 5 cycles, 10 octave per minute

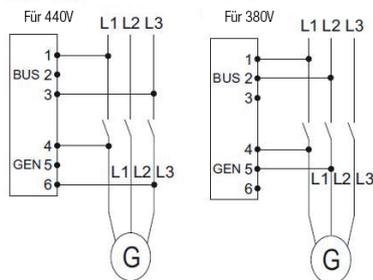
SIRAX BM920

Synchroscope

Safety

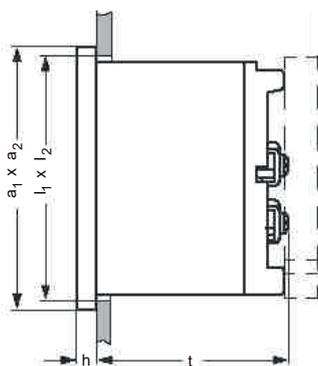
EMC resistance	acc. to EN 61 000-6-2
EMC emission	acc. to EN 61 000-6-4
Safety	acc. to EN 60 010-1
Installation category	300 V CATIII
Pollution degree	2
Rated insulation voltage	660 V
Insulation resistance	> 50 MΩ at 500 V DC
Insulation class	A (acc. to VDE 0110)
Insulation test voltage	2 kV
Housing protection class	IP52 Housing on the front IP00 Connections without contact protection IP20 Connections with contact protection

Electrical connections



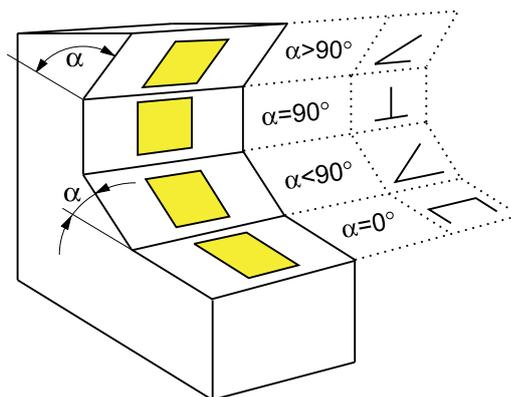
Type	Terminal	
BUS	1-3	1-2
GEN	4-6	4-5
Input range	110V	100V
	120V	120V
	240V	220V
	240V	240V
	400V	380V
	450V	400V
480V	415V	

Dimensions



Front [mm]	Nominal Dimensions [mm]		Cutout [mm]	Installation depth (t) including terminal [mm]
	a ₁ x a ₂	h	l ₁ x l ₂	
□96	96 x 96	5.5	92 ^{+0.8} x 92 ^{+0.8}	106
□144	144 x 144	8.5	138 ⁺¹ x 138 ⁺¹	

Working position



Code	Working position	Code	Working position	Code	Working position
A	α = 0°	D	α = 45°	G	α = 90° (vertical)
B	α = 15°	E	α = 60°	H	α = 105°
C	α = 30°	F	α = 75°	I	α = 120°

Order details

Description	Blockingcode	No-go with blockingcode	Article No. / Feature
SIRAX BM920, Synchroscope			BM920-
Features, Selection			
01. Dimensions Frontframe			
□96 (96 x 96 mm)			1
□144 (144 x 144 mm)			2

SIRAX BM920 Synchroscope

02 Inputrange			
Terminal 1-3 / 4-6	Terminal 1-2 / 4-5		
110 V	100 V		1
120 V	120 V		2
240 V	220 V		3
240 V	240 V		4
400 V	380 V		5
450 V	400 V		6
480 V	415 V		7
Other inputranges on request (... V / ... V)			X
03 Working position			
$\alpha = 0^\circ$			A
$\alpha = 15^\circ$			B
$\alpha = 30^\circ$			C
$\alpha = 45^\circ$			D
$\alpha = 60^\circ$			E
$\alpha = 75^\circ$			F
$\alpha = 90^\circ$ (vertical)			G
$\alpha = 105^\circ$			H
$\alpha = 120^\circ$			I
04 Front window			
Glass			1
05 Scalefactor			
Standard			1
Non Standard (Customized)			2
06 Color of Dial and letters			
Standard (dial white / letters black)		1	
Non Standard (dial / pointer / letters customized)		2	



Camille Bauer Metrawatt AG
 Aargauerstrasse 7
 CH-5610 Wohlen / Switzerland
 Telefon: +41 56 618 21 11
 Telefax: +41 56 618 21 21
 info@camillebauer.com
 www.camillebauer.com