

# Synchrosopes for Varying and Steady Load 3-Phase Current

Technical Data

## Electrodynamic Ratio Element, Narrow Bezel per DIN 43718, Dull Black

Front Dimensions Type	96 x 96 mm SY 96	144 x 144 mm SY 144
Weight in kg, Approx.	1.0	1.1
Nominal Frequency	50 Hz	50 Hz
Intrinsic Consumption (at 100 V, 50 Hz)		
– Mains Side		
Active Component	approx. 4.5 W	approx. 4.5 W
Reactive Component	approx. 4.2 var cap.	approx. 4.2 var cap.
– Generator Side		
Active Component	approx. 4 W	approx. 4 W
Reactive Component	approx. 0.2 var ind.	approx. 0.2 var ind.
Nominal Insulation Voltage	660 V	660 V
Test Voltage	2 kV	2 kV
Front Housing-Panel Protection	IP 52	IP 52
Fasteners	type B (DIN 43835)	type B (DIN 43835)
Housing Material	sheet metal	sheet metal



Type SY 96

### Description

Analog Panel Meter with Electrodynamic Ratio Elements and Rotating Pointer

### Display

Scale Labelling Red arrow identified with "+" and black arrow with "-"  
 Pointer Beam pointer

### Synchrosopes

Synchrosopes are circular scales with iron-free electrodynamic ratio elements. The scale has an indicator mark, as well as a red arrow identified with "+" and a black arrow identified with "-". The pointer is capable of rotating in both directions. It only points to the indicator mark if frequency and phase sequence are identical for both electrical circuits. If the pointer comes to rest at any other point, the frequencies may be identical but the voltages are not in phase. The direction of movement of the pointer varies depending upon how the circuit and the generator are connected to the synchroscope (pointer can be made to move clockwise or counterclockwise for higher generator frequency).

### Mechanical Design

Housing Material Sheet metal housing  
 Terminals M3 for size 96 x 96 mm  
 M4 for size 144 x 144 mm  
 Contact Protection Available as option

### Reference Conditions

Reference Quantities	Reference Condition
Ambient Temperature	23 °C ± 2 °C
Position of Use	control panel vertical ± 1 °
Input Voltage	rated voltage range
Frequency	nominal frequency (see meas. movement variants) ± 0.2%
Other	DIN EN 60051

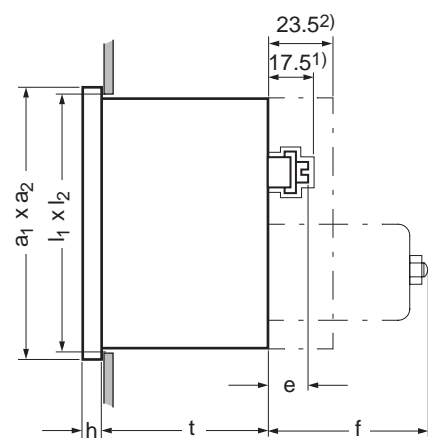
### Nominal range Of Use Limits

Frequency	nom. frequency	50 Hz:	48.5 ... 51.5 Hz
		60 Hz:	58.5 ... 61.5 Hz
		16 <sup>2</sup> / <sub>3</sub> Hz:	16 <sup>1</sup> / <sub>3</sub> ... 17 Hz

### Dimensions for Separate Series Resistors

102±0.2 x 78±0.4 x 59.5±0.5 (W / D / H)  
 Dimensional Drawing no. 1402 A40a (available upon request)

### Dimensions



Front Dim. in mm	Nominal Dimensions, mm		Cutout, mm	Installation Depth	Terminals	Attachment from Rear
	a <sub>1</sub> x a <sub>2</sub>	h	l <sub>1</sub> x l <sub>2</sub>	t	e	f
96 x 96	96 x 96	5	92 <sup>+0.8</sup> x 92 <sup>+0.8</sup>	97.5	6 (M3)	58
144 x 144	144 x 144	8	138 <sup>+1</sup> x 138 <sup>+1</sup>	95	12.5 (M4)	58

1) Individual contact protection only possible with 144 x 144 mm front dimensions  
 2) Full contact protection only available with 96 x 96 mm front dimensions and with separate series resistor

Order Information

Synchronoscopes

for Varying and Steady Load 3-Phase Current

Code: B0

Order Example: Synchronoscope, 96 x 96 mm, Nominal Voltage: 220 ... 230 V, Nominal Frequency: 50 Hz Order No.: 3240Q IL726 IK20		Front Dim. in mm	96 x 96	144 x 144
		Type	SY 96	SY 144
		Order no. ➡ + ↓	3240Q	3290Q
Nominal Voltage Range (phase-to-phase voltage)	<u>100 ... 110 V</u>	IL 710	+	+
	<u>220 ... 230 V</u>	IL 726	+	+
	<u>380 ... 400 V</u>	IL 727	+	+
	440 V	IL 344	+	+
	<u>450 ... 500 V</u>	IL 720	+	+
Nominal Frequency	nominal freq.: 50 Hz	IK 20	+	+
	nominal freq.: 60 Hz	IK 21	+	+
	nominal freq.: 16 2/3 Hz	IK 1	+	+
Applications	<b>standard</b> conditionally tropic-proof	– LB1	+	+
Protection	<b>standard</b> front panel: IP 54, terminals: IPO0	– LH21	+	+
Resistance to Vibration / Marine Applications	<b>standard</b> vibration resistance: 2.5 g, shock resistance: 30 g marine applications, German Lloyds	– LN56 LN2	+	+
Bezel	<b>dull black</b> dull gray, RAL 7037	– MA11	+	+
Glass Faceplate	<b>standard</b> anti-glare	– MG1	+	+
Contact Protection	<b>none</b> full contact protection individual contact protection	– VB2 VB1	+	+
Identification	<b>none</b> at rear: .....	– MZ998 ...	+	+
Scale Inscription (Latin lettering)	<b>none</b> ≤15 characters in German ..... ≤15 characters in other language	– SM991 ... SM993 ...	+	+

Order Number Instructions:

- Select one model each for order numbers with the same sequence of letters.
- No additional entries are required for standard models (identified with bold typeface and "–" in order no. column).
- An entry with "..." in the order no. column means that the order number must be supplemented with written text.

1) Only with separate series resistor (see opposite)