



# DATA SHEET

## RSQ-3 Read Synchroscope



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# 1. General information

- Precision LED synchroscope
- High immunity to harmonic distortion

## 1.1 Application and measuring principle

### 1.1.1 Application

The RSQ-3 is a microprocessor-based synchronising unit, providing visual indication of relevant values for synchronising a generator to a net (busbar). It can be used in any kind of installation where manual synchronising is required.

### 1.1.2 Measuring principle

The unit measures the busbar ( $U_{\text{BUSBAR}}$ ) and generator ( $U_{\text{GEN}}$ ) voltages and frequencies and compares these, plus compares the phase angle relationship.

#### Operation:

The rotation of the red LED circle indicates the frequency difference. The faster the rotation, the larger the frequency difference. One rotation per second equals 1 Hz difference.

The position of the lit red LED indicates the phase difference between  $U_{\text{GEN}}$  and  $U_{\text{BUSBAR}}$ . The circle represents a degree scale from 0 to 360 degrees with zero degree at the 12 o'clock position. With 36 LEDs the resolution on the reading is 10 degrees.

If the frequency difference between  $U_{\text{GEN}}$  and  $U_{\text{BUSBAR}}$  is higher than 3 Hz, the rotation of the LED circle stops. If it stops with a lit red LED at "TOO SLOW", the frequency of the  $U_{\text{GEN}}$  is lower than  $U_{\text{BUSBAR}}$ . If it stops with a lit red LED at "TOO FAST", the frequency of the  $U_{\text{GEN}}$  is higher than  $U_{\text{BUSBAR}}$ .

## 2. Technical information

### 2.1 Technical specifications and dimensions

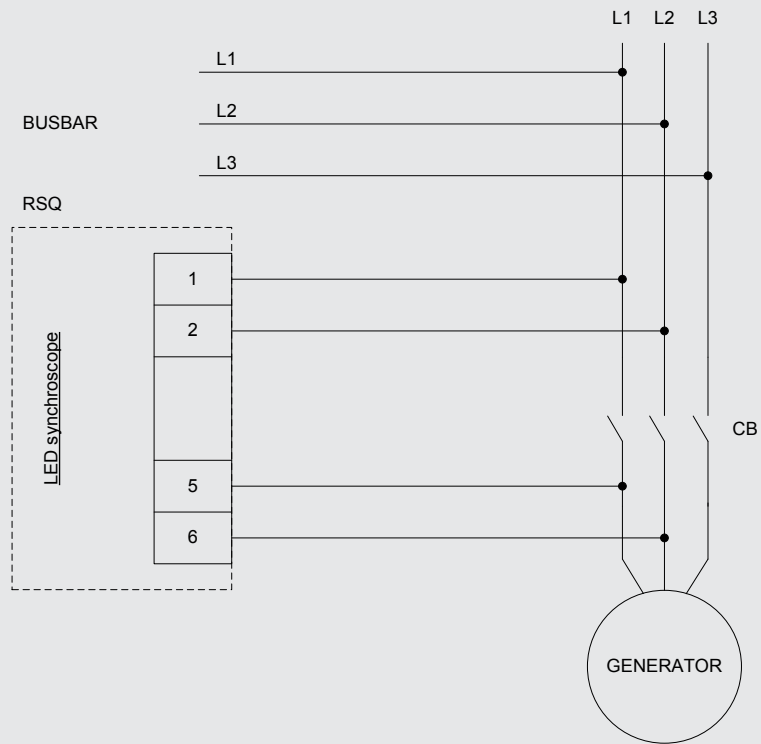
#### 2.1.1 Technical specifications

Accuracy	±2 electrical degrees
Resolution	10 electrical degrees
Max. frequency difference	No limit
Frequency range	40 to 70 Hz (supply)
Temperature	-25 to 70 °C (operating)
Temperature drift	Set points: Max. ±0.2 % of full scale per 10 °C
Shock test	15 g - 6 times - 3 directions 50 g/6 ms 22 g/20 ms
Galvanic separation	Between inputs and ground: 3750 V - 50 Hz - 1 min
Input range (U <sub>N</sub> )	100 to 127 V <sub>ac</sub> ±20 % 220 to 240 V <sub>ac</sub> ±20 % 380 to 415 V <sub>ac</sub> ±20 % 440 to 480 V <sub>ac</sub> ±20 % (Note: Above 450 V <sub>ac</sub> : Only +10 %)
Busbar input	Load: 2 kΩ/V
Generator input	(Max. 3.0 VA at nominal voltage) Supply for the unit
Max. input voltage	1.2 × U <sub>N</sub> , continuously Above 450 V: 1.1 × U <sub>N</sub> , continuously 2 × U <sub>N</sub> , for 10 sec
Climate	HSE, to DIN 40040
EMC	CE-marked according to EN 50081-1/2, EN 50082-1/2 and IEC 255-3
Safety	To EN 61010-1. Installation cat. III, 600 V. Pollution degree 2
Connections	Max. 2.5 mm <sup>2</sup> (single-stranded) Max. 1.5 mm <sup>2</sup> (multi-stranded)
Materials	All plastic parts are self-extinguishing to UL94 (V0)
Protection	Front: IP52. Terminals: IP20, to IEC 529 and EN 60529
Type approval	For current approvals see <a href="http://www.deif.com">www.deif.com</a> or contact DEIF A/S
UL listing	On request, the instrument can be delivered according to UL listing: UL508, E230690

#### 2.1.2 Indication

LEDs	Light
TOO FAST	Red LED stopped. Frequency difference too high. GEN too high
TOO SLOW	Red LED stopped. Frequency difference too high. GEN too low

### 2.1.3 Connections/dimensions



Dimensions: 96 × 96 × 76 mm

Weight: Approx. 0.40 kg

## 3. Ordering information

### 3.1 Order specifications and disclaimer

#### 3.1.1 Available variants

Item no.	Variant no.	Variant description
2918080010	01	RSQ-3, all measuring voltages

#### 3.1.2 Order specifications



##### INFO

There are no additional options to the standard variant.

#### Variants

Mandatory information				
Item no.	Type	Variant no.	Version	Measuring voltage

Example:

Mandatory information				
Item no.	Type	Variant no.	Version	Measuring voltage
2918080010-01	RSQ-3	01		230 V <sub>ac</sub>
2918030010-01	RSQ-3	01	UL Listed	230 V <sub>ac</sub>

#### 3.1.3 Disclaimer

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