



- Precision check synchronoscope, sector principle
- Dead-bus facility
- Bi-directional synchronising
- Integral voltage differential protection, adjustable
- "Easy view" status presentation
- System status output

**Specifications**

Monitored Voltage Input:	100-120, 200-240, 380-415V, or 440-460VAC, 40-70Hz (Fuse 0,5A)
Optional aux. Supply (Only for KCQ332G2)	100-120, 200-240, 380-415V, or 440-460VAC, 40-70Hz (Fuse 0,5A) DC: 24, 48 or 110VDC (Fuse 2A)
Contact Rating:	AC: 100VA - 250V/2A max. DC: 50W - 100V/1A max.
Adjustments:	High voltage: 2-15% of bus voltage Low voltage: 2-15% of net voltage Phase angle: 4-30 degrees Retention time: 100-600mS
Analogue output:	N/A
Temperature:	-20 to +70°C
Weight:	0.7kgs
Front protection:	IP21

Unit meets IEC60092-504 and relevant environmental and EMC tests specified in IEC60068/60092 and IEC61000/60533 respectively, to comply with Classification Societies requirements.

*Megacon is the inventor of the original, now industry standard "rotating" LED display, and a trendsetter in modern synchronisation control.*

**Description**

The digitally controlled KCQ332x2 provides visual presentation of relative speed and output signal necessary to permit check synchronising between two systems.

KCQ332E2 is the standard and it takes the auxiliary voltage from the monitored voltage on terminal 3 & 4. KCQ332G2 have separate auxiliary supply on terminal 19 & 20.

The synchronising relay will close when the voltage and phase angle have been within the set limits for the set retention time.

A green lamp will indicate the close command to the breaker.

There is lamp indication for reference source present (BUS PWR) and incomer (generator, busbar, etc.) status (GEN PWR). An additional green lamp for the voltage comparator (Voltage OK) is lit when incomer voltage is within the set limits.

When used as a dead-bus relay, the CB close relay will energise when the busbar supply is "dead", generator voltage is connected and the enable contact is closed.

**Applications**

The KCQ332x2 can be used for both single and three phase systems. Any two phases (or phase-neutral) can be used for synchronising as long as they are the same two phases on both sides of the breaker.

The unit is meant for manual and semi-automatic synchronising only since there is no compensation for the breaker closing time.

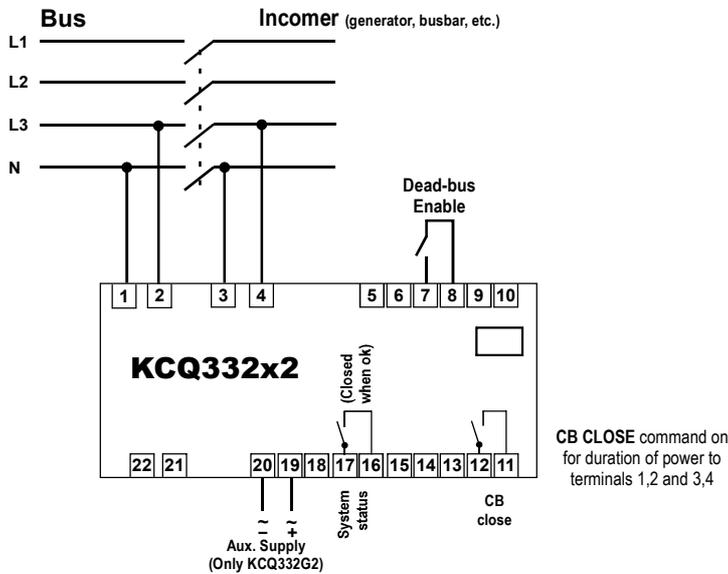
For automatic synchronising the KCQ104x2 or KSQ104x2 "SPOT ON" principle should be used to provide compensation for the breaker closing delay.

User settable limits and retention time.

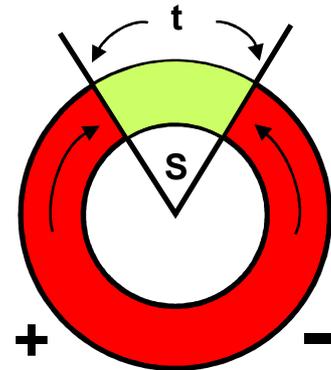
**System status:**

KCQ332x2 is fitted with a system status relay. As standard the unit is powered from generator side (terminal 3 & 4), when power is ok and unit is working correctly the relay activates. It will release on alarm or when unit is not powered. Separate auxiliary supply is needed for continuously system status.

Normal operation	: Closed contact
Alarm condition/unpowered	: Open contact



## System "S" Low-differential SECTOR synchronising



### Description

System "S" the sector synchronising principle:

The KCQ332x2 is a low differential bi-directional check synchronising relay.

The synchronising relay closes when the incomer (generator, busbar, etc.) Frequency is close enough (diff 0,01 - 0,5Hz) to stay within the phase angle sector (S) for the set retention period (t).

Sector synchronisation is the classic alternative for applications which allows synchronisation accuracy and speed of synchronisation to be interrelated. There is no compensation for the breaker closing time.

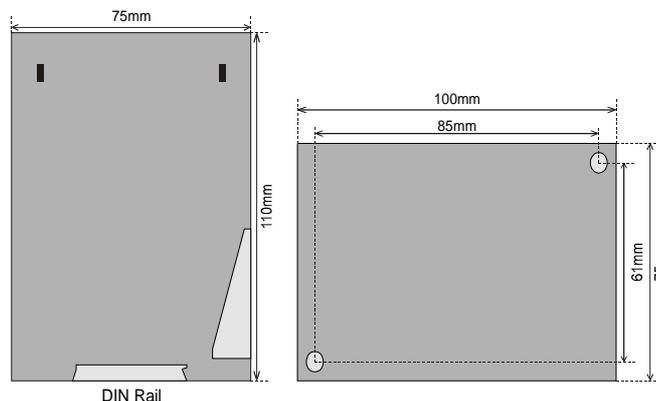
Synchronisation accuracy (Df) can be calculated by the following formula:

$$Df = S : 360 \times t$$

Example: Set phase angle (S) to 10 degrees and retention time (t) to 500mS to obtain an accuracy (Df) of 0,05Hz

If the phase angle limit is set too low and retention time too high for very low differential synchronising, it can be difficult to achieve synchronisation if there is a continuously fluctuating load between the two systems (for example to synchronise against a shaft generator when a vessel is in rough weather). For this application the KCQ104F2 or KSQ104F2 "SPOT-ON" principle is more suitable.

### Dimensions



The MEGACON policy is one of continuous improvement, consequently equipment supplied may vary in detail from this publication.

#### ORDERING INFORMATION

Product type :  
 Auxiliary supply :  
 Network voltage :  
 Example : KCQ332G2, Aux:230VAC, I/P: 450VAC

