Synchronization Meters

Iskra
Iskra MIS, d.d.

Synchronizing into unity - Iskra MIS d.d. Synchronization Meters

NEW!

NEW!

ADDING FUNCTIONALITY

REPLACING

REPLACING

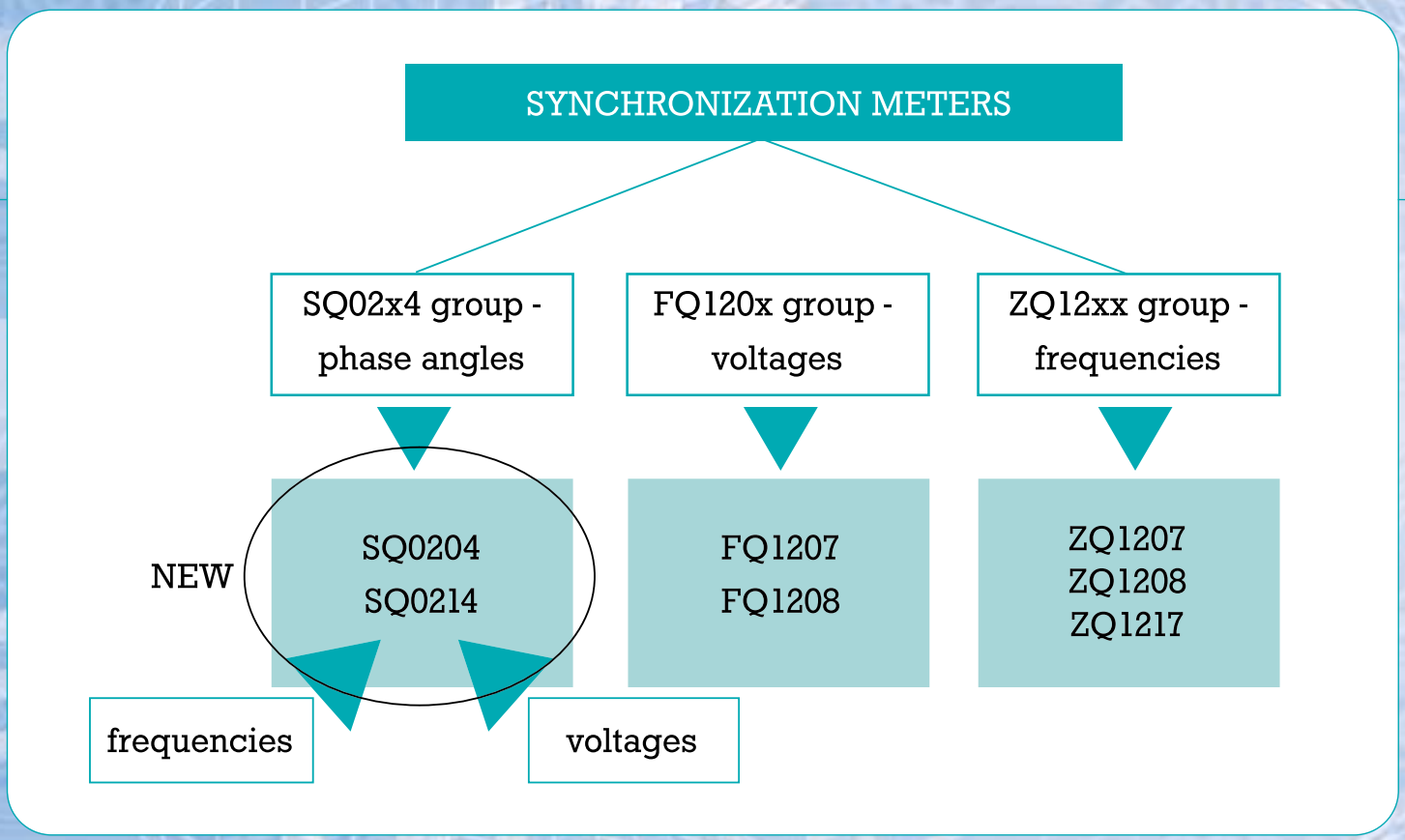
Features of SQ0204 and SQ0214

- FIVE INSTRUMENTS IN ONE (SQ0214)
- CIRCULAR DISPLAY OF Δφ PHASE DIFFERENCE
- MAGNIFIED DISPLAY OF PHASE DIFFERENCE Δφ = ± 20°
- MICROPROCESSOR PROCESSING
- SIMPLE SYNCHRONISATION CONDITIONS SETTING
- OUTPUT RELAY FOR SYNCHRONISATION (PULSE OR CONTINUOUS)
- "DEAD-BUSBAR" FUNCTIONALITY
- POWER SUPPLY FROM BUS BAR OR GENERATOR
- STANDARD 96 X 96 mm DIN CASING
- LCD WITH BACKLIGHT FOR VOLTAGE, FREQUENCY AND/OR Δφ MONITORING (SQ0214 ONLY)
- LCD FOR MONITORING OF VOLTAGE, FREQUENCY AND/OR Δφ (SQ0214 ONLY)
- FLASH MEMORY
- HIGH IMMUNITY TO EMC DISTURBANCES
- STATUS OUTPUT
- GREEN LED FOR INDICATION OF BOTH VOLTAGES

Synchronization meters' groups

Our synchronization meters are divided, according to their features, into more groups, each with its own qualities. One group is made up of synchroscopes SQ0204 and SQ0214. They are intended for measuring phase angle between two electro-energy systems. SQ0214 is capable of measuring also frequencies and voltages in both systems. The second group is made up of FQ1207 and FQ1208 for measuring voltages in two networks. The third group consists of ZQ1207, ZQ1208 and ZQ1217 for measuring frequencies in two systems. ZQ1217 is two-system reed frequency meter.

Figure 1:
Groups of Iskra MIS d.d. synchronization meters



Operation of SQ02x4

The instrument is equipped with a circular display of phase difference which consists of 24 LEDs. Momentary phase difference is displayed by a lit LED. Within synchronisation range ($\Delta\varphi$ = 0°, between -20°el. and +20°el.) resolution is increased to 5°el. If frequency difference between input voltages exceeds 3 Hz, three LEDs above the arrows are alternately lit.

A green SYNC LED is lit when synchronisation conditions are met. At the same time synchronization relay is activated. A red ΔU LED is lit when a difference between voltages is above the preset value.
The synchroscope is provided with three potentiometers for synchronization conditions setting:

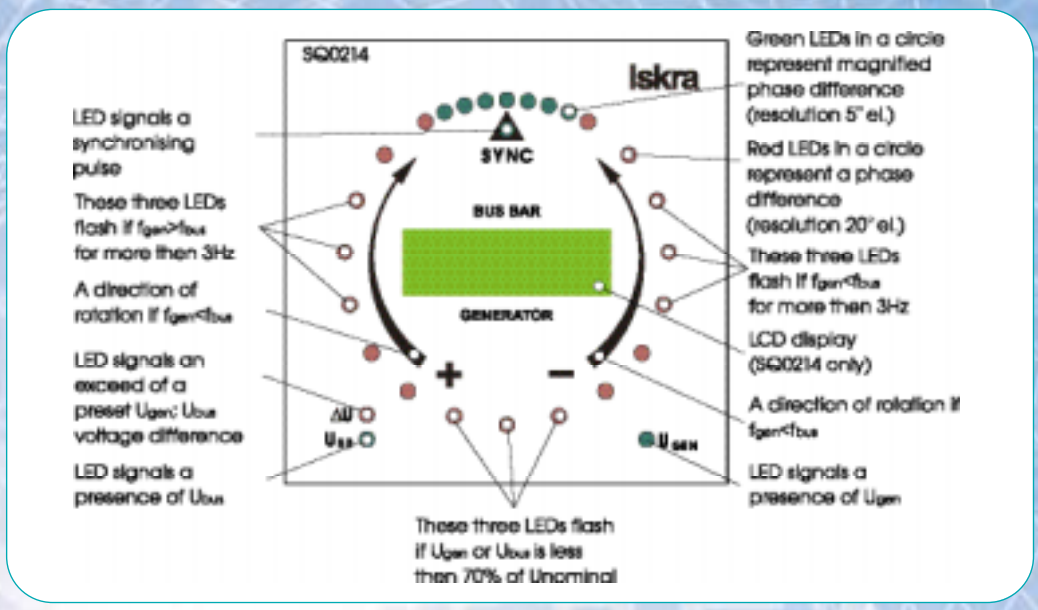
- for setting permitted phase difference $\Delta\varphi$:
- for setting permitted voltage difference ΔU;
- for a delay of synchronisation relay switch-on relay (DELAY)

and a switch-on relay at the instrument rear side. When a phase difference and a voltage difference between a generator and bus-bar for the time of delay of synchronisation check relay are within the set limits, the synchronisation check relay is activated for chosen period of time. In that time SYNC LED is lit as well.

Ship versions of instruments

Our synhronization meters: SQ0204, SQ0214, ZQ1207, FQ1207, ZQ1217 are availlable also for mounting on ships. Their constructions is very mechanically robust and is approved by CRS (Croatian register of Shipping). Meter has mark ⚓ and letter L at the end of the type designation.

Figure 2:
Operation of LED display and LEDs of synchronization meters



Display screens of SQ0214

v1.15	220 V
SN: 000000001	

At power on, a software version, nominal voltage and a serial number is displayed

229 V	50.07 Hz
231 V	50.73 Hz

Normal operation mode. U_{GEN} and U_{BUS} voltage and frequency are displayed

22.9 kV	f50.7
23.1 kV	f50.8

229 V	50.07 Hz
231 V	+015.4°

When a frequency difference is less then 0.02 Hz, a phase difference is displayed

Ubb TOO LOW
231 V +50.73 Hz

When the voltage (U_{GEN} or U_{BUS}) is not present "Ubb TOO LOW" or "Ugn TOO LOW" is displayed

231 V	50.73 Hz
Ugn TOO HIGH	

When the voltage (U_{GEN} or U_{BUS}) is higher then 120% of Un "Ubb TOO HIGH" or "Ugn TOO HIGH" is displayed

Fbb TOO LOW	
231 V	50.73 Hz

When a frequency (f_{GEN} or f_{BUS}) is too low for an accurate representation "Fgn TOO LOW" or "Fbb TOO LOW" is displayed (at approx. 20Hz and lower)

231 V	50.73 Hz
Fgn TOO HIGH	

When a frequency (f_{GEN} or f_{BUS}) is too high for an accurate representation "Fgn TOO HIGH" or "Fbb TOO HIGH" is displayed (at approx. 80Hz and higher)

DBB ON 10 %	
231 V	50.73 Hz

When a DEAD BUS BAR function is active, a dead bus offset level (%U_N) is displayed

Connection diagrams of SQ02x4

Figure 3:
Connection terminals and dimensions

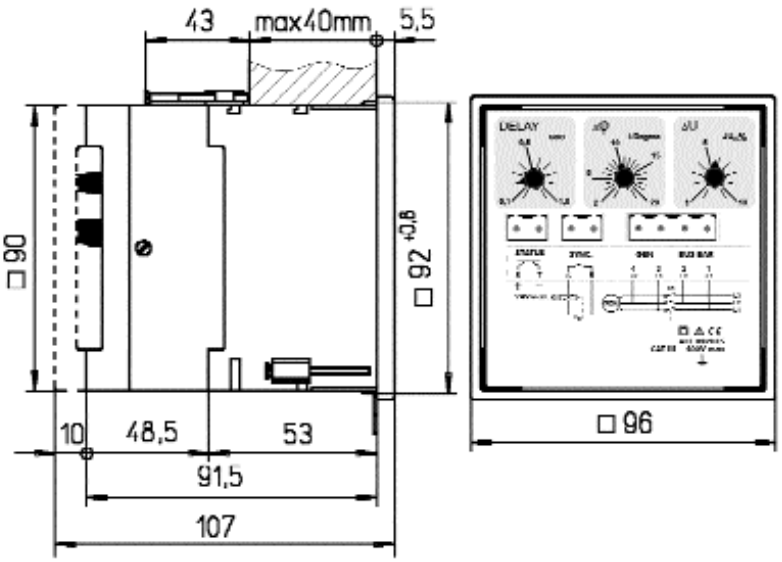


Figure 4:
Phase to phase wiring diagram for SQ02x4

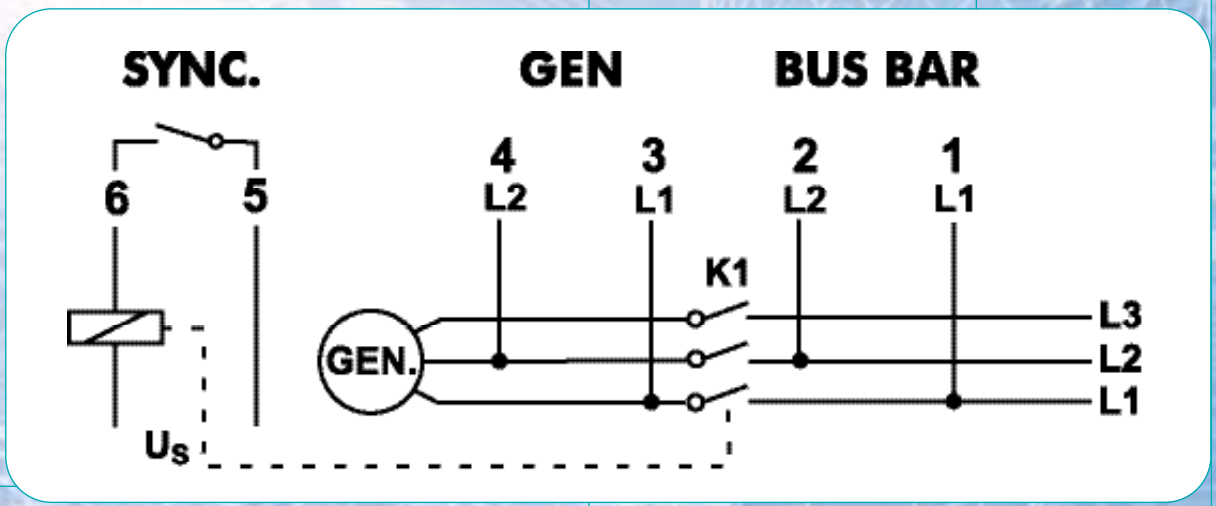
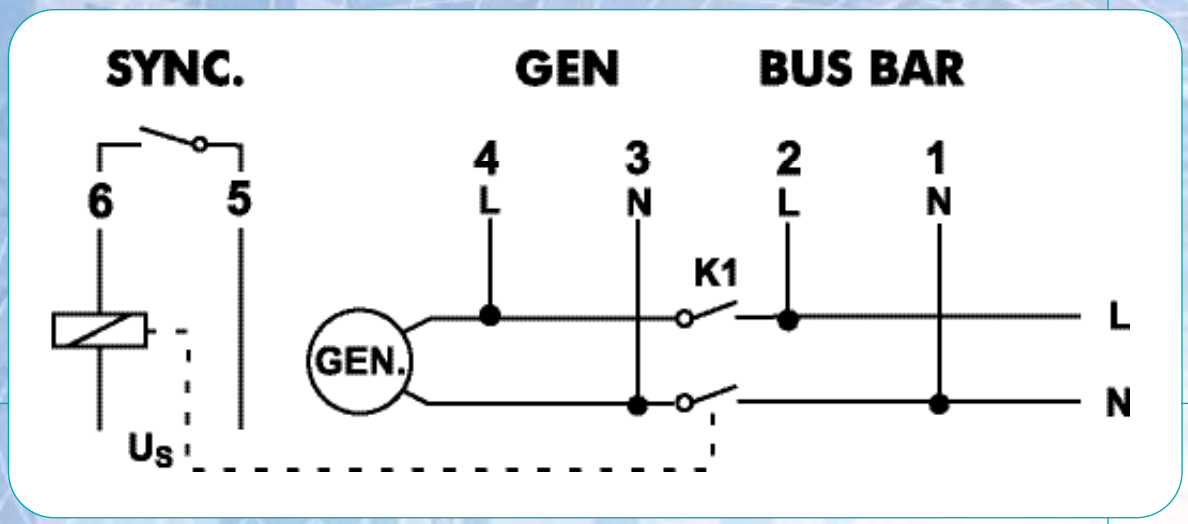


Table 1: Wiring for phase to phase connection

Connection terminal number	Connection designation	Usage of terminal
1	L1[1]	System's voltage
2	L2[1]	System's voltage
3	L1[1]	Generator's voltage
4	L2[1]	Generator's voltage
5	SYNC.	Relay output
6	SYNC.	Relay output
7	STATUS	Status output (open collector)
8	STATUS	Status output (open collector)

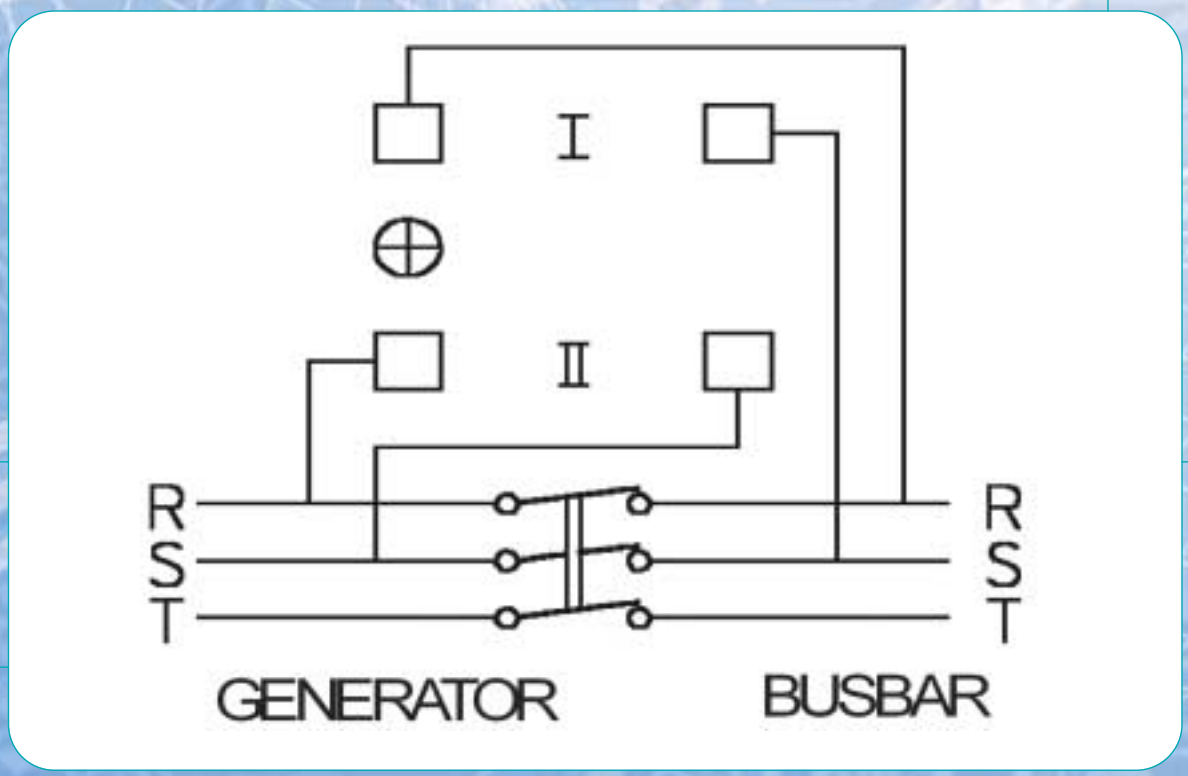
[1] In the case of phase to neutral connection, connection scheme on the back side of the synchroscope (upper pictures) is different, connection terminals' designations are »L« and »N«.

Figure 5:
Phase to neutral wiring
diagram for SQ02x4



Connection diagrams of ZQ120x, FQ120x

Figure 6:
Connection diagram for
ZQ1207, ZQ1208, FQ1207, FQ1208



Ordering info for SQ0204, SQ0214

SQ0214 - E L 2 2 0 0

Type
SQ0204
SQ0214

Voltage inputs
A - 57 V
B - 63 V
C - 100 V
D - 110 V
E - 230 V
F - 400 V
G - 500 V
H - others

Type of connection
L - phase to phase
N - phase to neutral

Output relay
1 - impulse 100 ms
2 - impulse 300 ms
3 - other impulse length (100 ms < x < 1000 ms) - to be specified at placing order
4 - continuous impulse
0 - without relay

"Dead busbar" function
0 - none
1 - 10 % Un
2 - 20 % Un
3 - 30 % Un
4 - 40 % Un

Status output (ship version option)
0 - none
S - status relay

Potentiometer for setting Δφ:
0 - default value +/- 2..20 el.
1 - setting range +2..+20 el.
2 - setting range -2..-20 el.

Ordering info for ZQ1217

ZQ1217 - 1 C

Type
ZQ1217

Frequency
1 - 2 x 47...53 Hz
2 - 2 x 57...63 Hz
3 - 2 x 45...55 Hz
4 - 2 x 55...65 Hz

Voltage
A - 100 V
B - 110 V
C - 230 V
D - 380 V
E - 400 V
F - 500 V
G - others

Special versions (options):
L - ship version

Ordering info for ZQ1207, ZQ1208

ZQ1207 - 3 C

Type
ZQ1207
ZQ1208

Frequency
1 - 2 x 48...52 Hz
2 - 2 x 45...65 Hz
3 - 2 x 45...55 Hz
4 - 2 x 55...65 Hz

Voltage
A - 100 V
B - 110 V
C - 230 V
D - 380 V
E - 400 V
F - 500 V
G - others

Special versions (options):
L - ship version

Ordering info for FQ1207, FQ1208

FQ1207 - 2x150V/ E 150V L

Type
FQ1207
FQ1208

Primary Voltage
any with appropriate VT

Voltage
A - 2x100 V
B - 2x110 V
C - 2x120 V
D - 2x130 V
E - 2x150 V
F - 2x250 V
G - 2x400 V
H - 2x500 V
I - 2x600 V
J - others

Scale
any value

Special versions (options):
L - ship version

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design: kompare k.d., menges

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