

KS3 SYNCHRONIZING UNIT

FeATureS:

MOD
BUS

Password
protection

VT

INPUTS:

AC

OUTPUTS:

2x

RS
485

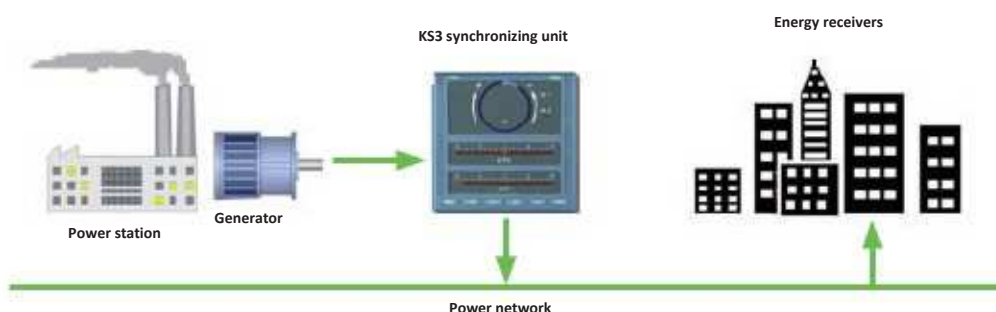
GAIVANIC ISOLATION:



CE

- Destined to automatic synchronizing of three-phase generators connected in parallel with power networks of 50 or 60 Hz rated frequency.
- Measurement through voltage transformers.
- Measurement and visualization of phase, frequency and voltage differences.
- Signaling of the synchronizing conditions (AI1) – programmable parameters.
- Signaling of the generator and network voltage value beyond the 80-120% rated range value (AI2).
- RS-485 interface with MODBUS protocol.
- Measurement of minimum and maximum voltage and frequency values.

Example of application



Measured parameters and admissible errors

Measured value	Range	Basic error	Remarks
Voltage U _i	100.0 V (Ku=1) 110.0 V (Ku=1) 240.0 V (Ku=1) 400.0 V (Ku=1) 15.0...500.0 Hz	± (0.2% m.v + 0.1% range)	Ku=1...4000 (max. 400 kV)
Frequency f		± (0.5% m.v + 2c)	
Voltage difference	-20...0...20%	KS3.1: ± (0.5% m.v. + 2c) KS3.2: ± (0.5% range + 1 segment)	KS3.2: resolution 0.6%
Frequency difference	-10...0...10%	KS3.1: ± (0.5% m.v + 2c) KS3.2: ± (0.2% range + 1 segment)	KS3.2: resolution 0.3%
Phase shift	0...360°	±1°	in KS3.2: resolution 5° for the circle, ±2 for zero indication 357<000

in KS3.2, the value monitoring is available through the interface. Ku - voltage transformer ratio, m.v.-measured value, range-measured range, C - the less significant display digit

Outputs

Output type	Properties
Relay	• Voltageless NO contacts, load capacity: 0.5 A a.c./250 V a.c.

Digital interface

Interface type	Transmission protocole	Mode	Baud rate
RS-485	MODBUS RTU and ASCII	8N2, 8E1, 8O1, 8N1, 7E1, 7O2	4,8; 9,6; 19,2 kbit/s

External features

Readout field	KS3.1: 4 x 5 LED digits, 14 mm, red colour	KS3.2: synchroscope: circle with 72 diodes; voltmeter and differential frequency meter: bargraph with zero in the middle (68 diodes)
Overall dimensions	144 x 144 x 77 mm	Panel cut-out : 138 ^{+0,5} x 138 ^{+0,5} mm
Weight	0.8 kg	with packing
Protection grade	from frontal side: IP40	from terminal side: IP10

Rated operating conditions

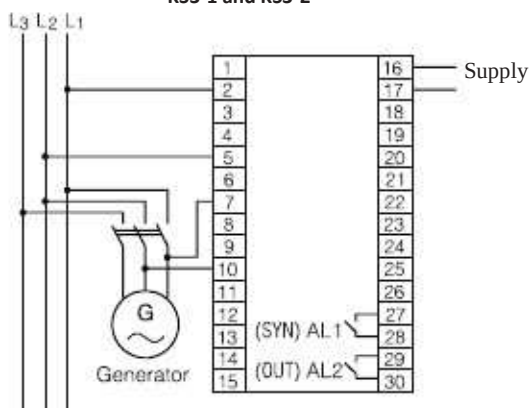
Supply voltage	18...30 V d.c./a.c. 40...400 Hz	85...250 V d.c./a.c. 40...400 Hz
Input power	Supply circuit : ≤12 VA	Voltage circuit: ≤0.5 VA
Input signal	• 0...0.1...1,2 Un for voltage and frequency	• frequency 15...45...65...500 Hz; • sinusoidal (THD ≤ 8%)
Temperature ambient : 0...23...55°C		
Relative humidity 25...95%	—	
Operating position any		inadmissible condensation
External magnetic field 0...40...400 A/m		
Short duration overload (5 sec) 2 Un (max. 1000 V)		
Admissible voltage peak		
factor	2	

Safety and compability requirements

Electromagnetic compatibility	noise immunity noise emmisions	acc. to EN 61000-6-2 acc. to EN 61000-6-4
Isolation ensured by the casing	double	
Isolation between circuits	basic	
Polution level	2	
Installation category	III	
Maximum phase-to-earth operating voltage	600 V a.c.	acc. to EN 61010-1
Altitude above sea level	< 2000 m	

Connections diagrams

KS3-1 and KS3-2



Types of versions



KS3-1 type
Synchronizing unit
with digital indications



KS3-2 type
Synchronizing unit with bargraph

Ordering

	KS3	X	XX	X	X	XX	X
Kind of display:							
LED digits		1					
bargraphs (diode lines)		2					
Input voltages:							
100 V			01				
110 V			02				
240 V			03				
400 V			04				
Digital output:							
without interface				0			
with RS-485 interface				1			
Supply voltage:							
85 ... 250 V d.c./a.c.					0		
24 V d.c./a.c.					1		
Version:							
standard						00	
custom-made						xx	
Acceptance tests:							
without additional quality requirements							8
with an extra inspection quality certificate							7
acc.to customer's request*							x

Semi-indirect measurement in a 4-wire network

* - only after agreeing with the manufacturer

See Also:



P43 - 3 - phase
transistor
of power network
parameters



ND20 - meter
of power network
parameters



ND1 - analyser
of power network
parameters



Order example 1:

The code: **KS3 - 1.04.1.0.00.8** means:

- KS3** - synchronizing unit of KS3 type
- 1** - with digital displays
- 04** - input voltage 400 V
- 1** - digital output with RS-485 interface
- 0** - supply voltage : 85...250 V d.c./a.c.
- 00** - standard version
- 8** - without additional quality requirements

Order example 2:

The code: **KS3 - 2.04.1.0.00.8** means:

- KS3** - synchronizing unit of KS3 type
- 2** - with diode lines
- 04** - input voltage 400 V
- 1** - digital output with interface RS-485
- 0** - supply voltage 85...250 V d.c./a.c.
- 00** - standard version
- 1** - without additional quality requirements

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