



**C10-24**

**SPECIFICATION FOR SYNCHRONOSCOPE RELAYS**

(according to the document C10/11- version 06.2012)



## 1. **Procedure**

A manufacturer willing to classify a synchronoscope relay according to this specification should provide :

- A complete file providing a clear, unambiguous answer to the requirements hereafter; this file should be provided in paper form (2 copies) and in electronic form
- One relay to be classified, for testing purposes, including a complete set of documentation

These documents and relay should be sent to Synergrid (att. Secretary of the commission CE10), Rodestraat 125, 1630 Linkebeek.

After receipt of all documents and relay, Synergrid will send a quotation to the manufacturer for the requested analysis and classification. The analysis will start only after receipt of the order from the manufacturer.



## 2. Identification form

<i>Manufacturer :</i>				
<i>Type :</i>				
<i>Version :</i>				
<i>Date start approval :</i>				
<i>Type of approval:</i>	New relay	New version of approved relay	New version of existing file	

## 3. Additional information

*Comments :*

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#### 4. Technical characteristics

##### 4.1 Main characteristics

Type	Function	Requirements	Remarks	OK?
Interface	Voltage	110 or 230 or 400 V		
	Synchronizing pulse	Length of pulse : as long as sync conditions are fulfilled		
	Synchronizing contacts	$\geq 1$		
Display	Local display	Visualization of phase difference		
		activation of the synchronization pulse (output relay)		
		$U_{GEN}$ too high		
		$U_{GEN}$ too low		
	Frequency	45 to 55 Hz		
Software version	Each Evolution of firmware must be communicated to Synergrid			
	Each evolution that have an impact on the user interface (menus, buttons functions, ...) will lead to a new approval request			
General	Extended functions	<b>instrument may not have extended functions that can perform an active synchronizing control</b>		

##### 4.2 Technical characteristics

Type	Function	Requirements	Remarks	OK?
Electric strength	50Hz-1minute	2kV		
	Surge-1,2/50 $\mu$ s, 0.5J	5kV		
Mechanical endurance	Working	10000 workings		
	Vibrations	Class 1 according to CEI 255-21-1		
Limits of quantities and influencing factors	Ambient air temperature	-5°C to 55°C		

	Storage temperature	-20°C to 55°C		
	Power supply	80% to 115% UDC or UAC		
	Relative humidity	According to CEI 68-2-30		
Voltage inputs	Permissible continuous voltage	$\geq 1.2 \cdot UN$		
	Thermal overload	$\geq 2 \cdot UN$ RMS during 1s		
	Consumption	$< 3 \text{ VA}$ for $U = UN$		
Contacts	Voltage	$\geq 230\text{V AC/DC}$		
	Permissible continuous current	$\geq 5\text{A AC/DC}$		
	Permissible current during short time	$\geq 15\text{A } 0.2\text{sec AC/DC}$		
	Making capacity	$\geq 10\text{A AC/DC}$		
	Breaking capacity (in DC with $L/R < 40\text{ms}$ )	$\geq 0.2\text{A at } 110\text{V DC}$ $\geq 0.5\text{A at } 48\text{V DC}$		

### 4.3 EMC Requirements

Standard	Concerned	Requirements	Remarks	OK?
IEC 60255-25 emission	this test applies to the auxiliary power supply inputs only	<b>Conducted emission limits</b> 0,15 MHz - 0,5 MHz : 79 dB ( $\mu\text{V}$ ) Quasi peak, 66 dB ( $\mu\text{V}$ ) Average 0,5 MHz - 30 MHz : 73 dB ( $\mu\text{V}$ ) Quasi peak, 60 dB ( $\mu\text{V}$ ) Average		
		<b>Radiated emission limits</b> 30 MHz - 230 MHz : 40 dB ( $\mu\text{V/m}$ ) quasi peak, measured at 10 m distance 230 MHz -1000 MHz : 47 dB ( $\mu\text{V/m}$ ) quasi peak, measured at 10 m distance		
IEC 60255-22-2 Electrostatic discharge tests	Enclosure port	Class 3 of severity test : 6 kV for contact discharge to conductive surfaces 8 kV air discharge at insulating surfaces		
IEC 60255-22-3 Radiated electromagnetic field disturbance test	Enclosure port Antenna facing the front and the rear of the relay 80 – 1000 MHz 1400 – 2700 MHz 80 % AM (1 kHz)	10 V/m r.m.s. within the swept frequency range 80 MHz to 1000 MHz and 1400 to 2700 MHz		

IEC 60255-22-4 electrical fast transient/burst immunity test	Communication Ports AC, DC low voltage Input and Output power ports Auxiliary power supply inputs Functional earth port	Test severity level: Class A 2 kV $\pm$ 10% / repetition rate 5 kHz  4 kV $\pm$ 10% /repetition rate 5 kHz 4 kV $\pm$ 10% / repetition rate 5 kHz 4 kV $\pm$ 10% / repetition rate 5 kHz		
IEC 60255-22-5 Surge immunity test	Communication Ports  AC, DC low voltage Input and Output power ports, auxiliary power supply ports	Test severity level: Class A Line to earth:2 kV $\pm$ 10%  Line to earth:4 kV $\pm$ 10% ; Line to line: 2 kV $\pm$ 10%		
IEC 60255-22-6 conducted disturbances induced by radio frequency fields	Communication Ports AC, DC low voltage Input and Output power ports, auxiliary power supply ports	10 V R.M.S. 10 V R.M.S. 10 V R.M.S. 10 V R.M.S.		
IEC 60255-22-7 Power frequency im- munity test	DC status input port	Test level class A Differential Mode (DM) tests 150 V r.m.s. Common mode (CM) tests 300 V r.m.s		
IEC 61000-4-8 Power frequency mag- netic field	Enclosure port	30 A/m continuous 300 A/m for 1 to 3 s		
IEC 60255-22-1 1 MHz oscillatory waves	Auxiliary power supply ports  AC, DC low voltage Input and Output power ports Communication Ports	CM: 2,5 kV $\pm$ 10% / DM 1 kV $\pm$ 10% / Oscilla- tion frequency 1 MHz CM: 2,5 kV $\pm$ 10% / DM 1 kV $\pm$ 10% / Oscilla- tion frequency 1 MHz CM: 1 kV $\pm$ 10% / DM 0 kV / Oscillation fre- quency 1 MHz		
IEC60255-11 DC voltage interruption	Auxiliary power supply ports	100% reduction 5,10,20,50,100,200 ms interruption time		

#### 4.4 Synchronizing functions

Type	Function	Requirements	Real values
Setting limits	$\Delta U$	0 to 10% $U_N$	
	$\Delta \varphi$	0 to 10°	
	$\Delta t$	0 to 1 sec (step of 0.1s)	
	$\Delta f$	0 to 0.5 Hz (step of 0.05)	
		Directly measured or set by t : the phase difference must be inside the preset synchronizing window during time t	
Dead bus	Dead bus function	Possibility to disable the function	
Performances	Precision	$\Delta U : \leq 2 \%$	
		$\Delta \varphi : \leq 2^\circ$	
		$\Delta f : \leq 0.02 \text{ Hz}$	

#### 4.5 Marking

	Remarks	OK?
Marking in English		
Constructor name or fabrication brand		
Designation of type and serial number		
Nominal values of voltage		
Nominal values or control area of the thresholds		
CE marking		
Indication of the execution of the factory tests (stamp of conformity tests)		



#### 4.6 Main characteristics

	Remarks	
User manual with connection plans		
Report of dielectric tests and EMC tests		
Description of factory acceptance test		