



## **SPECIFICATION FOR REVERSE AND ZERO POWER RELAYS**

according to the Synergrid prescription C10/11- revision 06.2012



## 1. Procedure

A manufacturer willing to classify a reverse and / or zero power 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 fully equipped 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.



**IDENTIFICATION FORM reverse and zero power PROTECTION**

<b>Manufacturer :</b>			
<b>Type :</b>			
<b>Version:</b>			
<b>Date start approval</b>			
<b>Type of approval :</b>	New relay	New version of approved relay	New version of existing file
<b>Approved :</b>	YES / NO	<b>Date of approval :</b>	

**ADDITIONAL INFORMATION reverse and zero power PROTECTION**

**Comments :**

## 1. Main characteristics

Type	Function	Requirements	Remarks	OK?
Interface	Rating analogue input : current	1 and 5 A available (not necessarily in the same version)		
	Number of current inputs	3 phases currents for reverse power; At least 1 phase current for zero power;		
	Rating analogue input : voltage	110 V AC or 400 V AC (phase to phase values)		
	Contacts	≥ 2 for reverse power ≥ 1 for zero power		
	Signalable informations	Programmable + watchdog (if digital relay)		
	Indicator lights or panel display	Trip functions, started functions, service		
		Possibility of local reset (LEDs)		
Supply	Power supply	At least, possibility to feed with DC supply		
	Consumption	≤ 20 W		
MM-Interface	Software compatibility	At least windows XP, Windows 7, and more recent windows versions		
	User software	standardised (common for one family of relays)		
	Use language	At least English		
	Use compatibility	With all previous versions of the relay		
	Settings	User friendly interface		
	Sealing of the settings	possibility to seal the front panel		
Self-supervision	Watchdog	supply, memories, processor, software (if applicable)		
General	Stability of working	Normal operation of the relay while in communication (if applicable)		
	Local display	visualization of settings should be possible on front panel or via display		
	memory	Settings must remain after a loss of supply		

## 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 of trip contact		
	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% U auxiliary		
	Relative humidity	According to CEI 68-2-30 or DIN 40040		
Currents inputs	Permissible continuous current	$\geq 2 \cdot I_N$		
	Thermal overload	$\geq 80 \cdot I_N$ RMS during 1s		
	Dynamic overload consumption	$\geq 250 \cdot I_N$ peak during $\frac{1}{2}$ period < 3 VA for $I < I_N$		
Voltage inputs	Permissible continuous voltage	$\geq 1.2 \cdot U_N$		
	Thermal overload	$\geq 2 \cdot U_N$ RMS during 1s		
	Consumption	< 3 VA for $U = U_N$		
Contacts	Voltage	$\geq 230V$ AC/ 110 V DC		
	Permissible continuous current	$\geq 5A$ AC/DC		
	Permissible current during short time	$\geq 15A$ 0.2sec AC/DC		
	Making capacity	$\geq 10A$ AC/DC		
	Breaking capacity (in DC with L/R<40ms)	$\geq 0.2A$ at 110V DC $\geq 0.5A$ at 48V DC		
	logic	Fail safe logic should be possible		

### 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 ( $\mu$ V) Quasi peak, 66 dB ( $\mu$ V) Average 0,5 MHz - 30 MHz : 73 dB ( $\mu$ V) Quasi peak, 60 dB ( $\mu$ V) Average		
		<b>Radiated emission limits</b> 30 MHz - 230 MHz : 40 dB ( $\mu$ V/m) quasi peak, measured at 10 m distance 230 MHz -1000 MHz : 47 dB ( $\mu$ 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 61000-4-8 Power frequency magnetic 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% / Oscillation frequency 1 MHz CM: 2,5 kV $\pm$ 10% / DM 1 kV $\pm$ 10% / Oscillation frequency 1 MHz CM: 1 kV $\pm$ 10% / DM 0 kV / Oscillation frequency 1 MHz		
IEC60255-11 DC voltage interruption	Auxiliary power supply ports	100% reduction 5,10,20,50,100,200 ms interruption time (if applicable)		

#### 4. Protection functions

##### a. reverse power

Type	Function	Requirements	Remarks	OK?
reverse power	General	Possibility to disable the function		
	Thresholds	$\geq 2$		
		Possibility of non-delayed tripping for one of them		
		Max reaction time for low threshold : < 5s		
	Rev P>	Min threshold $\leq 20\%$		
	Hysteresis	> 0.8 % of Pn		
	Loss of U	In case of loss of meas. voltage, a trip is recommended		
Accuracy	power	< 3%		
	Instantaneous trip time	$\leq 1000$ ms		
	Drop-off value	$\leq 10\%$ of threshold		

##### b. zero power

Type	Function	Requirements	Remarks	OK?
zero power	General	Possibility to disable the function		
	Thresholds	$\geq 1$		
		Possibility of non-delayed tripping		
	Rev P>	Min threshold $\leq 5\%$		
Accuracy	Power	< 3%		
	Instantaneous trip time	$\leq 1000$ ms		



## 5. Marking

Marking	Remarks	OK?
Marking in English		
Constructor name or fabrication brand (front panel)		
Designation of type (front panel) and serial number		
Software version (digital relays) (or available via display)		
Nominal values of supply voltages		
Rated values		
CE marking		
Indication of the execution of the factory acceptance tests (stamp of conformity tests)		

## 6. Documents

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