SPECIFICATION FOR OVERCURRENT RELAYS

with auxiliary supply

1 Procedure

A manufacturer willing to classify an overcurrent 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 the order has been received from the manufacturer.

2 Identification Form Overcurrent Protection

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

3 Additional Information Overcurrent Protection

Comments :

4 Technical Characteristics

4.1 Main characteristics

Type	*Function*	*Requirements*	*Remarks*	*OK?*
Interface	Rating analog input	1 and 5 A available (not necessarily in the same version)		
	number	At least 4 (3 phase currents + zero sequence)		
	Tripping contacts	≥ 2 (at least 1 user defined)		
	Signalling contacts	≥ 2 + watchdog		
	Signalling contacts	User defined contacts		
	Signalable informations	Programmable + watchdog		
	Indicator lights or panel display	Trip functions, started functions, service		
		Possibility of local reset		
		Leds indication memorized		
	Input contacts	≥ 2 (user defined)		
	Input contact voltage	Same as supply voltage		
Supply	Power supply	At least, possibility to feed with DC supply		
	Consumption	≤ 35W		
MM-Interface	Software compatibility	At least windows XP, 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		
	Frequent settings	numerical input (no potentiometers or DIP-switches)		
	Sealing of the settings	At software level (password)		
Autosurpervision	Watchdog	supply, memories, processor, software		
General	Stability of working	Normal operation of the relay while in communication		
	Local display	Presence of a local display required		
		Visualization of primary currents required		

	Local port	Presence of a local port for communication with relay (USB, Ethernet or local conversion mean provided with relay by manufacturer : USB or Ethernet)		
Date and time	setting	Possibility to program date and time		
	precision	Possibility to set : year, month, day, hour, minutes, seconds		
Event registers	Available informations	Trip + start of the functions		
		Fault currents (primary values)		
	Numbers of records	≥ 20		
		FIFO buffer overwrite principle		
	Time stamp	Each event must have an absolute time stamp (precision : ms)		
Disturbance recorder	Number of records	≥ 3		
	Memory principle	FIFO buffer overwrite principle		
	start	Possibility to start on pick-up		
	Length of records	≥ 2 s user defined		
	prefault	User defined (at least 500 ms)		
	Sampling frequency	≥ 400 Hz		
	Available information	Analog channels : currents (phase + ground) Digital channels : all starts of prot functions + trip		
	File format	COMTRADE		

4.2 Technical characteristics

Type	***Function***	***Requirements***	***Remarks***	***OK?***
Electric strength	50Hz-1minute	2kV		
	Surge-1,2/50μs, 0.5J	5kV		
Mechanical endurance	Working	10000 workings of trip contact		
	Insert/Remove	200 times		
	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		
Currents inputs	Permissible continuous current	≥ 2*IN		
	Thermal overload	≥ 100*IN RMS during 1s		
	Dynamic overload	≥ 250*IN peak during ½ period		
	consumption	< 3 VA for I<IN		
Tripping contacts	Voltage	≥230V AC/DC		
	Permissible continuous current	≥5A AC/DC		
	Permissible current during short time	≥15A 0.2sec AC/DC		
	Making capacity	≥10A AC/DC		
	Breaking capacity (in DC with L/R<40ms)	≥0.2A at 110V DC ≥0.5A at 48V DC		
Signaling contacts	Voltage	≥230V AC/DC		
	Permissible continuous current	≥1A AC/DC		
	Permissible current during short time	≥10A 0.2sec AC/DC		
	Making capacity	≥1A AC/DC		
	Breaking capacity (in DC with L/R<40ms)	≥0.2A at 110V DC ≥0.5A at 48V DC		

5 EMC requirements

Standard	*Concerned*	*Requirements*	*Remarks*	*OK?*
IEC 60255-25 emission	this test applies to the auxiliary power supply inputs only	**Conducted emission limits** 0,15 MHz - 0,5 MHz : 79 dB (µV) Quasi peak, 66 dB (µV) Average 0,5 MHz - 30 MHz : 73 dB (µV) Quasi peak, 60 dB (µV) Average		
		Radiated emission limits 30 MHz - 230 MHz : 40 dB (µV/m) quasi peak, measured at 10 m distance 230 MHz -1000 MHz : 47 dB (µV/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 ± 10% / repetition rate 5 kHz 4 kV ± 10% /repetition rate 5 kHz 4 kV ± 10% / repetition rate 5 kHz 4 kV ± 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 ± 10% Line to earth:4 kV ± 10% ; Line to line: 2 kV ± 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 immunity 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 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 ± 10% / DM 1 kV ± 10% / Oscillation frequency 1 MHz CM: 2,5 kV ± 10% / DM 1 kV ± 10% / Oscillation frequency 1 MHz CM: 1 kV ± 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		

6 Protection functions

Type	*Function*	*Requirements*	*Remarks*	*OK?*
Currents	General	Possibility to disable each function		
	I>	At least DT characteristics		
		Settable time delay : 0 to 60 s (maximal step 0.1 s)		
		Settable threshold : 0.3 to 2.5 IN		
	I>>	At least DT characteristics		
		Settable time delay : 0 to 2 s (maximal step 0.1 s)		
		Settable threshold : 1 to 30 IN		
	I0>	At least DT characteristics		
		Possibility to use dedicated input for CT torus		
		Settable time delay : 0 to 2 s (maximal step 0.1 s)		
		Settable threshold : 0,05 to 5 I0N		
Signal filtration	harmonics	< 10 % threshold for $H_N \geq 20\ \% H_1$		
	Influence of ripple control signal	< 10 % threshold	Used frequencies : 175, 180, 216, 273, 283, 317, 1350 Hz	
Accuracy	current	0.05 A sec		
	Time	≤ 30 ms		
	Instantaneous trip time	≤ 50 ms		
	Drop-off value	≤ 10 % of threshold		

7 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)		

8 Documents

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