



37A/168/CD

COMMITTEE DRAFT (CD)

IEC/TC or SC: SC 37A	Project number IEC 61643-11 Ed.1.0	
Title of TC/SC: Low-voltage Surge Protective Devices	Date of circulation 2004-10-15	Closing date for comments 2005-01-21
Also of interest to the following committees TC 37, ITU	Supersedes document 37A/167/MCR	
Functions concerned: <input type="checkbox"/> Safety	<input type="checkbox"/> EMC	<input type="checkbox"/> Environment <input type="checkbox"/> Quality assurance
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Title:

IEC 61643-11 Ed.1.0: Surge Protective Devices Connected To Low-Voltage Power Distribution Systems - Part 11: Performance Requirements And Testing Methods

(Titre) :

Introductory note

This CD is based on the decision to revise IEC61643-1: Ed.1.0: 1998.

Due to the agreement to renumber the 61643 series of standards, the number for the revised standard will be IEC 61643-11 Ed.1.0.

This CD and the FDIS for the Amendment 2 to IEC61643-1: Ed.1.0:1998 are both out to NCs. Because Amendment 2 is greater than 25% of the base standard, it has been merged into the standard and the consolidated version will be IEC61643-1 Ed.2.0. National committees are kindly advised not to confuse Ed.2.0 with this revision project.

The Working Group will be meeting in February 2005 and wish to consider NC comments on the CD. In order to meet this schedule a three months comments deadline has been set.

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7.1.1 Class I impulse current

The impulse discharge current passing through the device under test (SPD) is defined by the crest value I_{imp} , the charge Q and the specific energy W/R . The unipolar impulse current shall reach I_{imp} within 50 μ s, the transfer of the charge Q shall occur within 3 ms and the specific energy W/R shall be dissipated within 3 ms.

Note: The 3 ms has been chosen to allow the full charge Q to be deposited when testing using a 10/350 generator.

Table 4 gives values of Q (As) and W/R (kJ/ Ω) for example values of I_{imp} (kA).

The relationships between I_{imp} , Q and W/R in Table 4 is as follows:

$$Q = I_{imp} \cdot a \quad \text{where} \quad a = 5 \cdot 10^{-4} \text{ s}$$

$$W/R = I_{imp}^2 \cdot b \quad \text{where} \quad b = 2,5 \cdot 10^{-4} \text{ s}$$

I_{imp} within 50 μ s kA	Q within 3 ms As	W/R within 3 ms kJ/ Ω
20	10	100
12.5	6.25	39
10	5	25
5	2,5	6,25
2	1	1
1	0,5	0,25

NOTE One of the possible test impulses which meets the above parameters is the 10/350 waveshape proposed in IEC 61312-1.

Table 4: Parameters for class I test

The following tolerances shall apply:

- I_{imp} ± 10 %;
- Q ± 20 %;
- W/R ± 35 %.

7.1.2 Class I and class II discharge current

The standard waveshape is 8/20. The tolerances on the current waveshape passing through the device under test are as follows:

- crest value ± 10 %
- front time ± 10 %
- time to half value ± 10 %

A small overshoot or oscillation is tolerated provided that the amplitude of any oscillation is not more than 5 % of the crest value. Any polarity reversal after the current has fallen to zero shall not be more than 20 % of the crest value.

In the case of two port devices, the magnitude of the reversal shall be less than 5 %, so that it does not affect the measured limiting voltage.

7.1.3 Class I and II voltage impulse

The standard voltage waveshape is 1,2/50. The tolerances of the voltage waveshape of the open circuit voltage at the points where the device under test (SPD) will be connected are the following:

- crest value $\pm 5 \%$
- front time $\pm 30 \%$
- time to half value $\pm 20 \%$

Oscillations or overshoot may occur at the crest of the impulse. If the frequency of such oscillations is more than 500 kHz or the duration of the overshoot is less than 1 μs , a mean curve shall be drawn and, for the purpose of the measurement, the maximum amplitude of this mean curve defines the measured crest value of the test voltage.

Oscillations exceeding 3 % of the crest value are not allowed on the rising portion of the voltage impulse between 0 % and 80 % of the crest value.

The measuring devices shall have an overall bandwidth of at least 25 MHz and the overshoot shall be less than 3 %.

The short-circuit current of the test generator shall be less than 20 % of the nominal discharge current I_n , but sufficient to ensure that the SPD's voltage switching component(s) conduct during the test.

7.1.4 Class III combination wave

The standard impulse of a combination waveform generator is characterized by the output voltage under open-circuit conditions and the output current under short-circuit conditions. The open-circuit voltage shall have a front time of 1,2 μs and a time to half value of 50 μs . The short-circuit current shall have a front time of 8 μs and a time to half value of 20 μs .

NOTE: For further guidance on this subject, see IEEE C62.45.

a) The tolerances of the open circuit voltage U_{oc} at the points where the device under test (SPD) will be connected are as follows:

- crest value $\pm 5 \%$
- front time $\pm 30 \%$
- time to half value $\pm 20 \%$

These generator tolerances are for the generator alone, without any SPD or power supply circuit being connected.

Oscillations or overshoot may occur at the crest of the impulse. If the frequency of such oscillations is more than 500 kHz or the duration of the overshoot is less than 1 μs , a mean curve shall be drawn and, for the purpose of the measurement, the maximum amplitude of this mean curve defines the measured crest value of the test voltage.

Oscillations exceeding 3 % of the crest value are not allowed on the rising portion of the voltage impulse between 0 % and 80 % of the crest value.