

**SLOVENSKI
STANDARD**

**SIST EN 62271-
100:2002/A1:2003**

julij 2003

High-voltage switchgear and controlgear - Part 100: High-voltage alternating-current circuit-breakers

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ICS 29.130.10

Referenčna številka
SIST EN 62271-100:2002/A1:2003(en)

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EUROPEAN STANDARD

EN 62271-100/A1

NORME EUROPÉENNE

EUROPÄISCHE NORM

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English version

High-voltage switchgear and controlgear
Part 100: High-voltage alternating-current circuit-breakers
(IEC 62271-100:2001/A1:2002)

Appareillage à haute tension
Partie 100: Disjoncteurs à courant
alternatif à haute tension
(CEI 62271-100:2001/A1:2002)

Hochspannungs-Schaltgeräte
Teil 100: Hochspannungs-Wechselstrom-
Leistungsschalter
(IEC 62271-100:2001/A1:2002)

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This amendment A1 modifies the European Standard EN 62271-100:2001; it was approved by CENELEC on 2002-11-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.
<https://standards.iteh.ai/en/standards/sist-en-62271-100-2002-a1-2003>

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 17A/625/FDIS, future amendment 1 to IEC 62271-100:2001, prepared by SC 17A, High-voltage switchgear and controlgear, of IEC TC 17, Switchgear and controlgear, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 62271-100:2001 on 2002-11-01.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2003-08-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2005-11-01

Endorsement notice

The text of amendment 1:2002 to the International Standard IEC 62271-100:2001 was approved by CENELEC as an amendment to the European Standard without any modification.

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NORME
INTERNATIONALE
INTERNATIONAL
STANDARD

CEI
IEC

62271-100

2001

AMENDEMENT 1
AMENDMENT 1
2002-05

Amendement 1

Appareillage à haute tension –

Partie 100:

Disjoncteurs à courant alternatif à haute tension

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Amendment 1

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Part 100:

High-voltage alternating-current circuit-breakers

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FOREWORD

This amendment has been prepared by subcommittee 17A: High-voltage switchgear and controlgear, of IEC technical committee 17: Switchgear and controlgear.

The text of this amendment is based on the following documents:

FDIS	Report on voting
17A/625/FDIS	17A/635/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

The committee has decided that the contents of the base publication and its amendments will remain unchanged until 2013. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

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4.102.2 Representation of TRV

Replace the existing item a) by the following:

- a) Four-parameter reference line (see figure 10):

u_1 = first reference voltage, in kilovolts;

t_1 = time to reach u_1 , in microseconds;

u_c = second reference voltage (TRV peak value), in kilovolts;

t_2 = time to reach u_c , in microseconds.

TRV parameters are defined as a function of the rated voltage (U_r), the first-pole-to-clear factor (k_{pp}) and the amplitude factor (k_{af}) as follows:

$$u_1 = 0,75 \times k_{pp} U_r \sqrt{\frac{2}{3}}$$

t_1 is derived from u_1 and the specified value of the rate of rise $u_1/t_1 = RRRV$;

$$u_c = k_{af} \times k_{pp} U_r \sqrt{\frac{2}{3}}, \text{ where } k_{af} \text{ is equal to:}$$

- 1,4 for terminal fault and short-line fault,
- 1,25 for out-of-phase.

$$t_2 = 4t_1$$

Replace the existing item b) by the following:

b) Two-parameter reference line (see figure 11):

u_c = reference voltage (TRV peak value), in kilovolts;

t_3 = time to reach u_c , in microseconds.

TRV parameters are defined as a function of the rated voltage (U_r), the first-pole-to-clear factor (k_{pp}) and the amplitude factor (k_{af}) as follows:

$u_c = k_{pp} \times k_{af} \times U_r \times \sqrt{2/3}$, where k_{af} is equal to

- 1,4 for terminal fault and short-line fault,
- 1,25 for out-of-phase.

t_3 is derived from u_c and the specified value of the rate of rise $u_c/t_3 = \text{RRRV}$.

Replace the existing item c) by the following:

c) Delay line of TRV (see figures 10 and 11):

t_d = time delay, in microseconds;

u' = reference voltage, in kilovolts;

t' = time to reach u' , in microseconds.

The delay line starts on the time axis at the rated time delay and runs parallel to the first section of the reference line of rated TRV and terminates at the voltage u' (time coordinate t').

For rated voltages lower than 52 kV:

$t_d = 0,15 \times t_3$, (this formula applies except for 48,3 kV, where $t_d = 0,05 \times t_3$);

$u' = u_c/3$ and

t' is derived from u' , u_c/t_3 (RRRV) and t_d according to figure 11, $t' = t_d + u'/\text{RRRV}$.

For rated voltages 52 kV and 72,5 kV:

$t_d = 0,05 \times t_3$, for terminal fault and short-line fault;

$u' = u_c/3$ and

t' is derived from u' , u_c/t_3 (RRRV) and t_d according to figure 11, $t' = t_d + u'/\text{RRRV}$.

For rated voltages higher than 72,5 kV:

$t_d = 0,21 \times t_1$ or 2 μs for terminal fault and short-line fault;

$t_d = 0,1 \times t_1$ for out-of-phase;

$u' = u_1/2$ and

t' is derived from u' , u_c/t_3 (RRRV) and t_d according to figure 11, $t' = t_d + u'/\text{RRRV}$.

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4.102.3 Standard values of TRV related to the rated short-circuit breaking current

Replace the second paragraph by the following:

For rated voltages of 100 kV and above, four parameters are used. Table 1b gives values for rated voltages of 100 kV up to 170 kV for solidly earthed systems. Table 1c gives values for rated voltages of 100 kV up to 170 kV for non-solidly earthed systems. Table 1d gives values for rated voltages of 245 kV and above.

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Page 81 and 83

Replace tables 1b and 1c by the following:

**Table 1b – Standard values of transient recovery voltage^a –
Rated voltages of 100 kV to 170 kV for solidly earthed systems –
Representation by four parameters**

Rated voltage	Test-duty	First-pole-to-clear factor	Amplitude factor	First reference voltage	Time	TRV peak value	Time	Time delay	Voltage	Time	RRRV
U_r kV		k_{pp} p.u.	k_{af} p.u.	u_1 kV	t_1 μ s	u_c kV	t_2 μ s	t_d μ s	u' kV	t' μ s	u_1/t_1 kV/ μ s
100	Terminal fault	1,3	1,40	80	40	149	159	2	40	22	2
	Short-line fault	1	1,40	61	31	114	122	2	31	17	2
	Out-of-phase	2	1,25	122	80	204	159	8	61	48	1,54
123	Terminal fault	1,3	1,40	98	49	183	196	2	49	26	2
	Short-line fault	1	1,40	75	38	141	151	2	38	21	2
	Out-of-phase	2	1,25	151	98	251	196	10	75	59	1,54
145	Terminal fault	1,3	1,40	115	58	215	231	2	58	31	2
	Short-line fault	1	1,40	89	44	166	178	2	44	24	2
	Out-of-phase	2	1,25	178	115	296	231	12	89	70	1,54
170	Terminal fault	1,3	1,40	135	68	253	270	2	68	36	2
	Short-line fault	1	1,40	104	52	194	208	2	52	28	2
	Out-of-phase	2	1,25	208	135	347	270	14	104	81	1,54

^a In case of short-line faults, transient recovery voltage and time quantities are those of the supply circuit.

^b RRRV = rate of rise of recovery voltage.

Table 1c – Standard values of transient recovery voltage^a –
Rated voltages of 100 kV to 170 kV for non-solidly earthed systems –
Representation by four parameters

Rated voltage	Test-duty	First-pole-to-clear factor	Amplitude factor	First reference voltage	Time	TRV peak value	Time	Time delay	Voltage	Time	RRRV
U_r kV		k_{pp} p.u.	k_{af} p.u.	u_1 kV	t_1 μ s	u_c kV	t_2 μ s	t_d μ s	u' kV	t' μ s	u_1/t_1 kV/ μ s)
100	Terminal fault	1,5	1,40	92	46	171	184	2	46	25	2
	Short-line fault	1	1,40	61	31	114	122	2	31	17	2
	Out-of-phase	2,5	1,25	153	92	255	184	9	77	55	1,67
123	Terminal fault	1,5	1,40	113	56	211	226	2	56	30	2
	Short-line fault	1	1,40	75	38	141	151	2	38	21	2
	Out-of-phase	2,5	1,25	188	113	314	226	11	94	67	1,67
145	Terminal fault	1,5	1,40	133	67	249	266	2	67	35	2
	Short-line fault	1	1,40	89	44	166	178	2	44	24	2
	Out-of-phase	2,5	1,25	222	133	370	266	13	111	79	1,67
170	Terminal fault	1,5	1,40	156	78	291	312	2	78	41	2
	Short-line fault	1	1,40	104	52	194	208	2	52	28	2
	Out-of-phase	2,5	1,25	260	156	434	312	16	130	94	1,67

^a In case of short-line faults, transient recovery voltage and time quantities are those of the supply circuit.

^b RRRV = rate of rise of recovery voltage.

Add, after table 1c and the two paragraphs that follow, a new table 1d as follows:

**Table 1d – Standard values of transient recovery voltage^a –
Rated voltages 245 kV and above for solidly earthed systems –
Representation by four parameters**

Rated voltage	Test-duty	First-pole-to-clear factor	Amplitude factor	First reference voltage	Time	TRV peak value	Time	Time delay	Voltage	Time	RRRV
U_r kV		k_{pp} p.u.	k_{af} p.u.	u_1 kV	t_1 μ s	u_c KV	t_2 μ s	t_d μ s	u' kV	t' μ s	u_1/t_1 kV/ μ s
245	Terminal fault	1,3	1,40	195	98	364	390	2	98	51	2
	Short-line fault	1	1,40	150	75	280	300	2	75	40	2
	Out-of-phase	2	1,25	300	195	500	390	20	150	117	1,54
300	Terminal fault	1,3	1,40	239	119	446	478	2	119	62	2
	Short-line fault	1	1,40	184	92	343	367	2	92	48	2
	Out-of-phase	2	1,25	367	239	612	478	24	184	143	1,54
362	Terminal fault	1,3	1,40	288	144	538	576	2	144	74	2
	Short-line fault	1	1,40	222	111	414	443	2	111	57	2
	Out-of-phase	2	1,25	443	288	739	576	29	222	173	1,54
420	Terminal fault	1,3	1,40	334	167	624	669	2	167	86	2
	Short-line fault	1	1,40	257	129	480	514	2	129	66	2
	Out-of-phase	2	1,25	514	334	857	669	33	257	202	1,54
550	Terminal fault	1,3	1,40	438	219	817	876	2	219	111	2
	Short-line fault	1	1,40	337	168	629	674	2	168	86	2
	Out-of-phase	2	1,25	674	437	1 123	876	44	337	263	1,54
800	Terminal fault	1,3	1,40	637	318	1 189	1 274	2	318	161	2
	Short-line fault	1	1,40	490	245	914	980	2	245	124	2
	Out-of-phase	2	1,25	980	636	1 633	1 274	64	490	382	1,54

^a In case of short-line faults, transient recovery voltage and time quantities are those of the supply circuit.

^b RRRV = rate of rise of recovery voltage.