

DISTRIBUTION SOLUTIONS

Fuse-links type CEF-S

Rated voltages: 6/12 kV – 30/40.5 kV

Rated currents: 6.3 A – 63 A



Superior performance versus standard fuses ensuring up to 40% faster protection in case of low fault currents



Robust design suitable for harsh conditions, proven by tests according to the latest IEC standards, secures continuous protection and reliable operation



Compatibility with other ABB products provides fast and accurate product selection

Fuse-links type CEF-S are designed for fast acting protection of distribution transformers, increasing safety on low voltage side of the transformer

Key features:

- Designed and type tested acc. to IEC 60282-1
- Low power losses, generating additional savings during product life-cycle
- Top level fault current limitation and interruption performance up to 63kA RMS

- Outdoor sealing included in standard version, designed and tested for harsh conditions
- Welded current path
- Contacts made from silver coated copper
- Striker 80N (medium type)
- Equipped with Temperature Control Unit enabling the additional protection against thermal stresses in small enclosures
- Low switching voltages secure safe operation in wide voltage range, e.g. from 10kV to 24kV marked as 10/24kV

Ordering table of fuse-links type CEF-S:

Catalog number	Fuse name	Rated voltage U_n [kV]	Rated current I_n [A]	Length e [mm]	Diameter D [mm]	EAN 13 Code
1YMB741216M2611	CEF-S	6/12	10	292	65	5908270808034
1YMB741218M2611	CEF-S	6/12	16	292	65	5908270808041
1YMB741219M2611	CEF-S	6/12	20	292	65	5908270808058
1YMB741221M2611	CEF-S	6/12	25	292	65	5908270808065
1YMB741225M2611	CEF-S	6/12	40	292	65	5908270808072
1YMB741227M2611	CEF-S	6/12	50	292	65	5908270808089
1YMB741229M2611	CEF-S	6/12	63	292	65	5908270807495
1YMB742416M4611	CEF-S	10/24	10	442	65	5908270808096
1YMB742418M4611	CEF-S	10/24	16	442	65	5908270808102
1YMB742419M4611	CEF-S	10/24	20	442	65	5908270808119
1YMB742421M4611	CEF-S	10/24	25	442	65	5908270808126
1YMB742425M4611	CEF-S	10/24	40	442	65	5908270808133
1YMB742427M4611	CEF-S	10/24	50	442	65	5908270807501
1YMB744014M5611	CEF-S	30/40.5	6.3	537	65	5908270805682
1YMB744016M5611	CEF-S	30/40.5	10	537	65	5908270805699
1YMB744018M5611	CEF-S	30/40.5	16	537	65	5908270805705
1YMB744019M5611	CEF-S	30/40.5	20	537	65	5908270805712
1YMB744021M5611	CEF-S	30/40.5	25	537	65	5908270805729
1YMB744024M5611	CEF-S	30/40.5	31.5	537	65	5908270805736
1YMB744025M5811	CEF-S	30/40.5	40	537	87	5908270805743
1YMB744027M5811	CEF-S	30/40.5	50	537	87	5908270805750
1YMB744029M5811	CEF-S	30/40.5	63	537	87	5908270805385

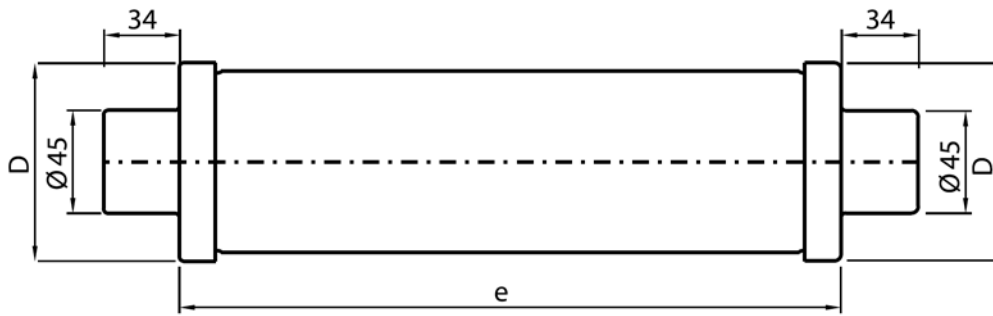
Technical data fuse-links type CEF-S:

Fuses are meeting requirements of the standards: IEC 60282-1, DIN 43625. All ratings are back-up type, equipped with 80N striker (medium type) and sealed for indoor/outdoor application.

Fuse name	Rated voltage U_n [kV]	Rated current I_n [A]	Fuse breaking capacity I_1 [kA]	Fuse minimal breaking current I_3 [A]	Breaking current at 100 ms $I_{0.1s}$ [A]	Diameter D [mm]	Length e [mm]	Rated power P_w [W]	Fuse-link cold resistance [m Ω]
CEF-S	6/12	10	50	55	48	65	292	25	187
CEF-S	6/12	16	50	55	80	65	292	38	108.5
CEF-S	6/12	20	50	72	120	65	292	38	72.3
CEF-S	6/12	25	50	72	160	65	292	36	46.5
CEF-S	6/12	40	50	100	240	65	292	54	24.5
CEF-S	6/12	50	50	190	330	65	292	71	18.8
CEF-S	6/12	63	63	190	440	65	292	82	14.1
CEF-S	10/24	10	25	55	48	65	442	54	373.2
CEF-S	10/24	16	25	55	80	65	442	58	186.6
CEF-S	10/24	20	25	72	120	65	442	66	124.4
CEF-S	10/24	25	25	72	160	65	442	74	93.3
CEF-S	10/24	40	25	110	240	65	442	107	48.7
CEF-S	10/24	50	63	220	330	65	442	125	32.5
CEF-S	30/40.5	6.3	20	50	43	65	537	49	927
CEF-S	30/40.5	10	20	66	54	65	537	51	615
CEF-S	30/40.5	16	20	52	87	65	537	112	313
CEF-S	30/40.5	20	20	77	122	65	537	125	207
CEF-S	30/40.5	25	20	134	118	65	537	143	175
CEF-S	30/40.5	31.5	20	265	202	65	537	121	89.56
CEF-S	30/40.5	40	20	172	324	87	537	130	60.3
CEF-S	30/40.5	50	20	251	500	87	537	128	39.76
CEF-S	30/40.5	63	20	334	655	87	537	165	29.7

The breaking current at 100 ms $I_{0.1s}$ values refer to total clearing time. Fuse minimal breaking current I_3 data are pre-arcing values.

Dimension drawing of fuse-links type CEF-S:

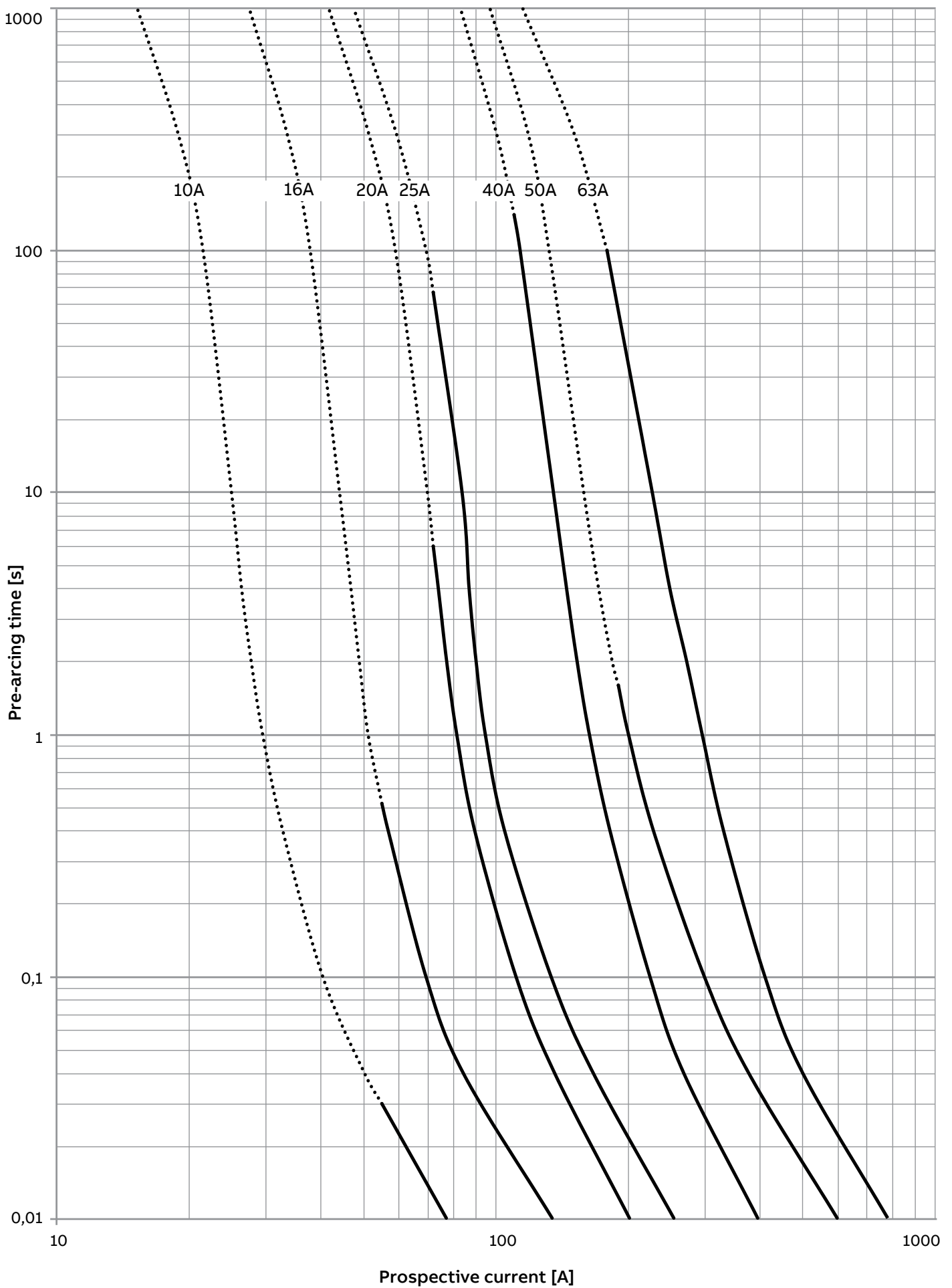


Choice of fuse-links for transformer protection:

Transformer rated voltage [kV]	Transformer rating (kVA)																		Fuse rated voltage [kV]	
	25	50	75	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500		3000
Fuse-link rating I_n (A)																				
6	10	16	20	25	40	40	50													6/12
10	10'	10	16	20	20	25	40	40	50											
11	10'	10	16	20	20	25	40	40	40	50										
12	10'	10	16	16	20	20	25	40	40	50										
15	10'	10'	10	16	16	20	20	25	40	40										
20	10'	10'	10*	10	16	16	20	20	25	40	40									10/24
22	10'	10'	10*	10	16	16	20	20	20	40	40	40								
24	10'	10'	10'	10	16	16	16	20	20	25	40	40								
30	6.3'	6.3'	6.3'	6.3*	6.3	10	16	16	20	40	40	40	40	40	40	50	63	63		
36	6.3'	6.3'	6.3'	6.3*	6.3	6.3	10	16	16	20	40	40	40	40	40	50	50	63	63	30/40.5
38.5	6.3'	6.3'	6.3'	6.3*	6.3*	6.3	10	16	16	20	20	40	40	40	40	50	50	63		
40.5	6.3'	6.3'	6.3'	6.3*	6.3*	6.3	10	16	16	20	20	40	40	40	40	50	50	63		
Max. gG use-link at LV side (A)	40	80	125	160	160	200	250	250	300	400	400	800	1000	1000	1000	1000	1250	1250	1250	

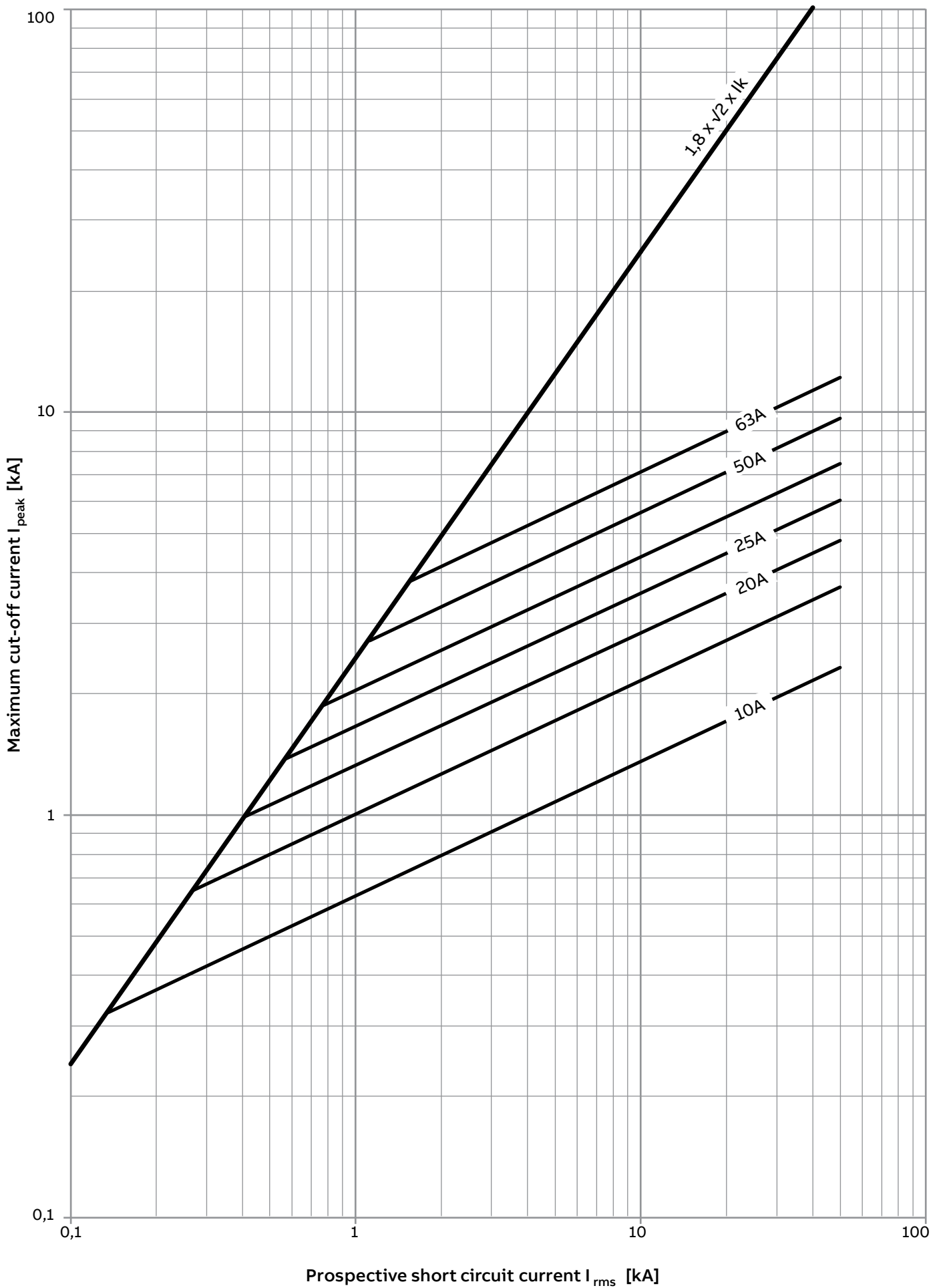
Recommended fuse rating is on the crossing of transformer rating and line voltage. For different line voltage level, please use closest smaller value from the table. The table was calculated according to standards IEC 60787 and IEC 62271-105 with following assumptions:

- Maximum long lasting transformer overload – 120%
 - Magnetizing transformer inrush current – $12 \times I_n$ during 100ms (up to 800 kVA) or $10 \times I_n$ during 100ms (800 kVA and above)
 - Transformer short-circuit voltage according to IEC 60076-5
 - No fuse derating due to small enclosures assumed
 - For ratings marked with “*” fuse is not able to clear independently transformer’s secondary side terminals short-circuit current
- For different working conditions fuse selection has to be recalculated.

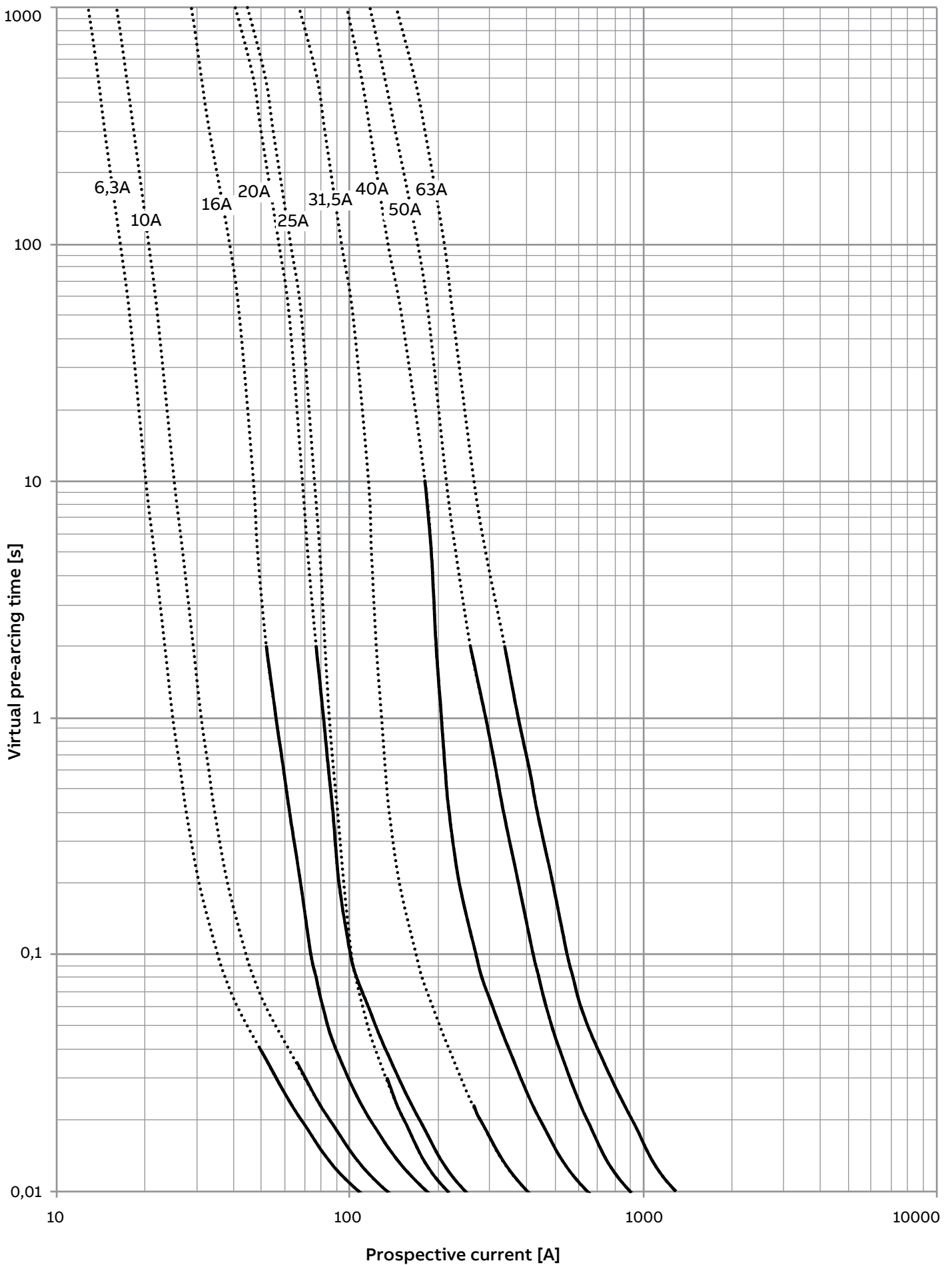
CEF-S 6/12 kV, 10/24 kV fuses time-current characteristics:

Characteristics show the average melting time as a function of the prospective current and are recorded from cold condition of fuse-link. The tolerance is $\pm 10\%$ referred to the current.

CEF-S 6/12 kV, 10/24 kV cut-off current characteristics:

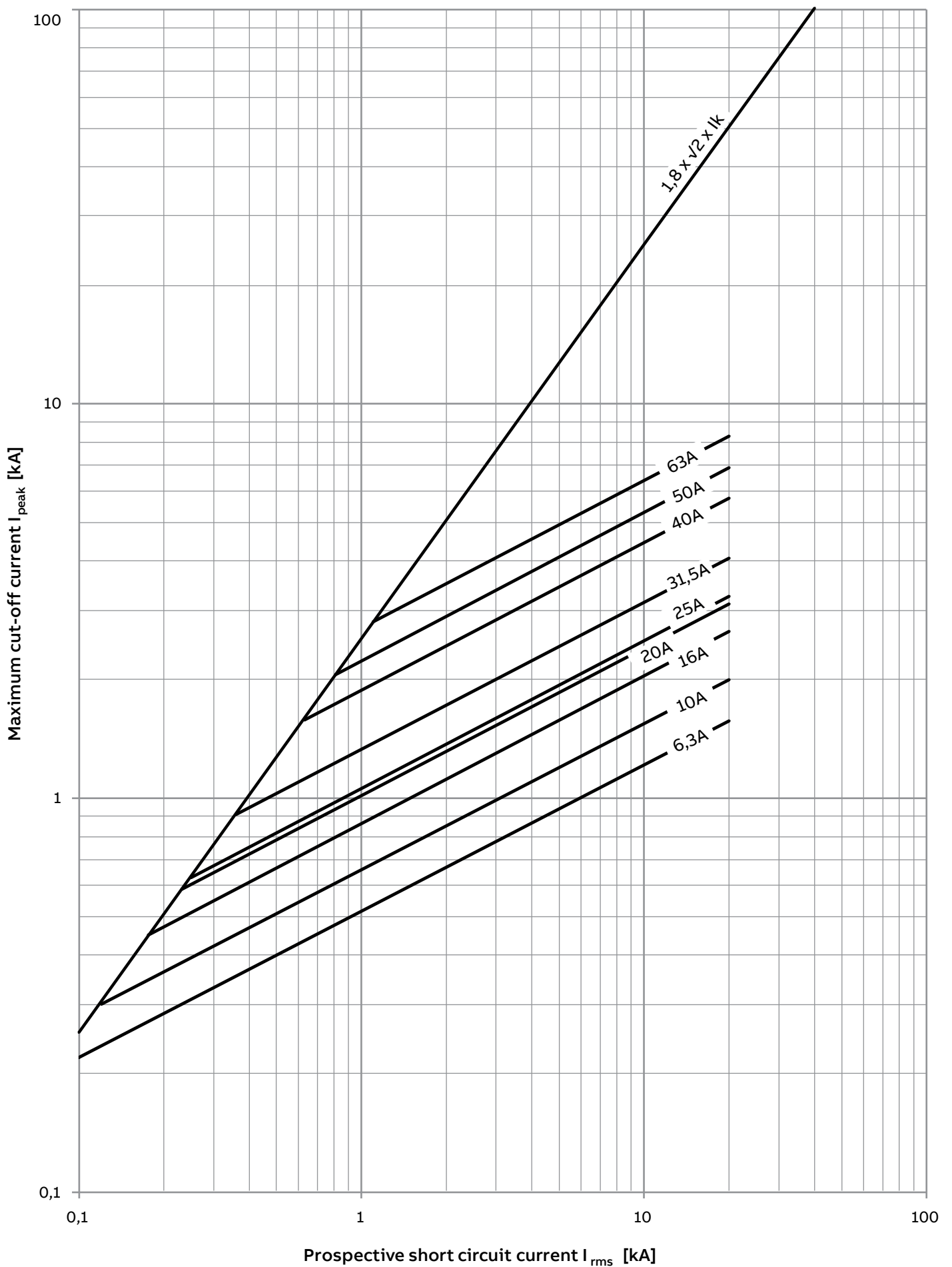


Characteristics show the cut-off current corresponding to a prospective short circuit current. Characteristics are valid for frequency 50Hz.

CEF-S 30/40.5 kV time-current characteristics:

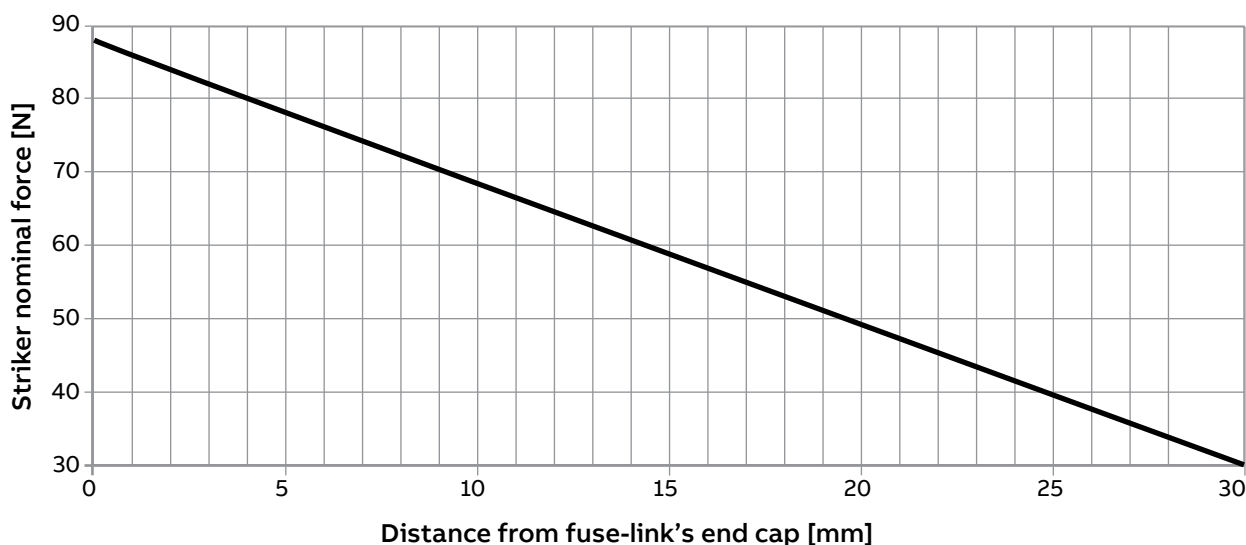
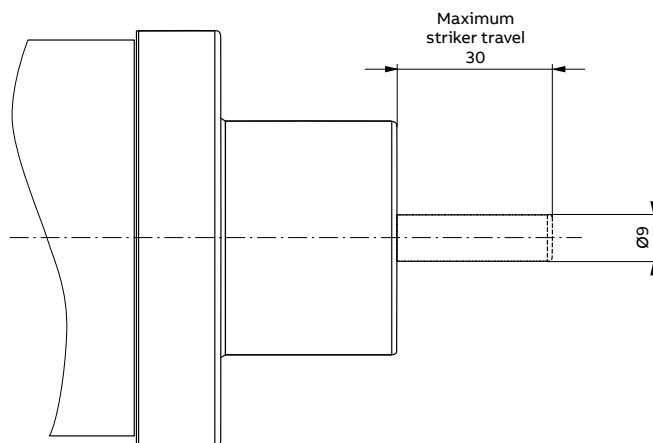
Characteristics show the average melting time as a function of the prospective current and are recorded from cold condition of fuse-link. The tolerance is $\pm 10\%$ referred to the current.

CEF-S 30/40.5kV cut-off characteristics:



Characteristics show the cut-off current corresponding to a prospective short circuit current. Characteristics are valid for frequency 50Hz.

Fuse-link striker force and dimensions:



Temperature Control Unit:

The Temperature Control Unit (TCU) is tripping device which is integrated with the striker of high-voltage (HV) fuses. It is activated when the allowable temperature in the switchgear is exceeded. When the temperature is too high the TCU activates the striker by releasing the switch disconnector, which in turn opens the electric circuit and avoids further temperature increases. The high temperatures inside the switchgear interior may be caused by external conditions or by a high current passing through the fuse link. List of possible reasons of too high temperatures inside fuse compartment:

- reduced heat transfer inside the switchgear
- over-heating of degraded conducting contacts
- long-term fuse overloads
- improper selection of the fuse rating

- local melting of fuse elements caused by transformer inrush currents, starting currents of motors etc
- Safety is significantly increased when fuses are equipped with a TCU. This is especially true in devices where fuses are located inside closed fuse compartments, as is the case of SF6 switchgear. In gas insulated switchgear fuse canisters or in narrow panels of air switchgear the risk of overheating is high because cooling is limited. High temperatures in switchgears cause degradation and oxidation of the metal contacts, degradation of switchgear equipment or enclosures, and insulator ageing. Unfavorable effects, i.e. temperature rise inside the switchgear, leads to internal short-circuit and further temperature increases. In case of reaching too high temperature, TCU will be activated, releasing a striker and opening associated switch, thus eliminating the threat.

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