

DISTRIBUTION SOLUTIONS

Medium-voltage fuses

3 kV – 40.5 kV, 0.5 A – 315 A



- Continuous protection and reliable operation
- Proven design and compliance with newest fuses standards
- Compatibility with other ABB products

ABB presents the most effective protective devices – fuses. Our MV fuses are continuously being developed and delivered for more than 80 years.

Nowadays, produced in fully automatic process and with greatest care of highest quality and reliable operation fuses are delivered to customers around the world. Millions of ABB MV fuses are now in operation protecting electrical equipment in countless applications.

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General information

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01
Limitation of short-
-circuit current

The main function of current limiting fuses is to protect electrical apparatus, such as distribution transformers, motors and capacitor banks against overload currents. Fuses can operate as sole devices or can be combined with air/SF6 insulated switch disconnectors. The choice depends on each application requirements and specific network conditions. One of the most critical factors for optimum protection is proper fuse selection. This can be done based on theoretical calculations but in many cases practical knowledge obtained from actual test results could make it easier and even more reliable. ABB, with its extensive apparatus product portfolio, has years of experience in this field. Our current limiting fuses have been designed to ensure safe operation in open air and for limited heat dissipation in installations such as gas insulated switchgears.

Fuse selection principles for the most common situations are presented in the following pages together with common definitions. Moreover we offer our support for each specific case where presented criteria are not sufficient.

Definitions

Current limiting fuses

Current limiting fuse family is generally composed of three different fuse groups:

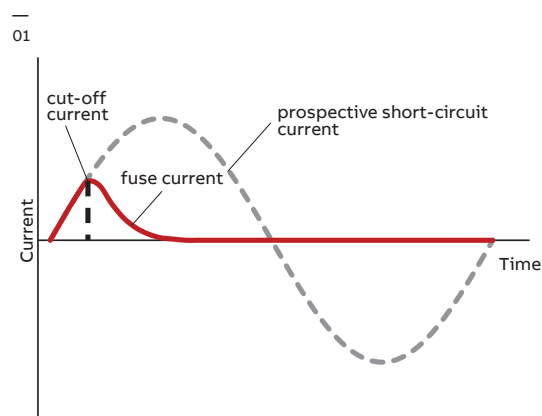
- back-up fuses
- general-purpose fuses
- full-range fuses

All of them limit the value of prospective short-circuit currents during the interruption process, thereby extending the life time of nearby installed electrical equipment. The main difference is in the minimum breaking current that characterizes the lowest fault current that the fuses are capable of interrupting. This value is generally highest for back-up fuses, slightly smaller for general-purpose fuses and smallest, with the value close to the minimum melting current, for full-range fuses. But reaction time is critical for the

protection function. That is why back-up fuses, with an interruption time for the minimum breaking current in the range of a few seconds down to a few tens of milliseconds, are the most commonly used. The total clearing time in cases of high short-circuit currents is even shorter i.e. only a few milliseconds. That is why back-up fuses can be used as typical overload protection elements. General-purpose and full-range fuses capable of interrupting even the smallest values of currents can only be considered as over current devices since the interruption time is greater than one hour. Therefore, these types are used rarely and are usually recognized as a separate element of protection, without any linkage to the opening function of load break switch. ABB current limiting fuses have low minimum breaking currents, i.e. close to three times the rated current I_r .

Current limitation

All ABB fuse-links presented are current limiting ones. A large short-circuit current will therefore not reach its full value. The cut-off characteristics show the relationship between the prospective short-circuit current and the peak value of the cut-off current. Substantial current limitation results in a considerable reduction in thermal and mechanical stress in a high-voltage installation.



Back-up fuses

All presented in catalog fuse-links are back-up class. That means the operating range in which the fuse-links are able to clear all fault currents is from the minimum breaking current I_3 to maximum breaking current I_1 .

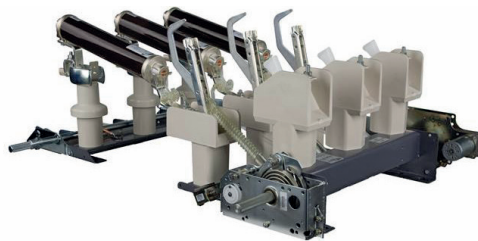
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02
NALF – switch-fuse
combination

—
03
TCU operation diagram

Switch-fuse combination

Back-up fuses are commonly used in switch-fuse combinations, both in open air and in gas insulated panels. When a switch-fuse combination operated as a protective device by tripping a system, the fuse assumes two different functions depending on the interrupted current value. When the fault current is greater than the transfer current, the fuse simply extends the breaking capability of the switch ending the interruption operation faster than the incorporated switch. This happens when the fuse clearing time is shorter than the total opening time of the Load Break Switch (LBS). By the time the striker pin pops up, the fuse has already cleared the fault current and the switch opens in almost no load conditions. If the fault currents are less than the nominal transfer current, the fuse then uses the striker pin to activate the switch, which in turn causes the system to trip. In other words, the interruption process is completed by the switch to prevent overloading of the fuses in situations where the fault current is low. Fuses used in switch-fuse combinations have to fulfill conditions specified in IEC 62271-105 (former IEC 60420 and IEC 420). Back-up fuses are specially designed for such application. The use of general-purpose or full-range fuses in switch-fuse combinations are not reasonable due to coordination principles.

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02



Temperature Control Unit – TCU

The Temperature Control Unit 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 disconnecter, 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:

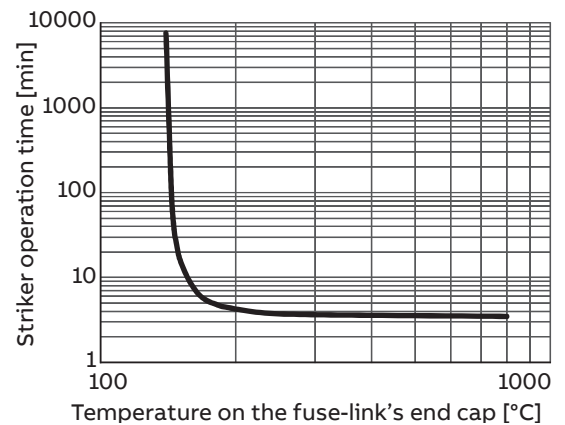
- reduced heat transfer inside the switchgear
- over-heating of degraded conducting contacts
- long-term fuse overloads

- 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. The ABB CEF, CEF-S, CMF and CEF-VT (with striker) are equipped with a TCU as standard design. Temperature Control Unit features:

- Operation according to diagram presented on Fig. 3
- Operation after approximately one hour at temperature of 150°C on the fuse end-cap
- Withstanding temperatures up to 125°C on the fuse end-cap – without operation
- Withstanding currents not exceeding 110% of fuse rated current – without operation
- Operation time tolerance is ±10% (referred to the temperature)

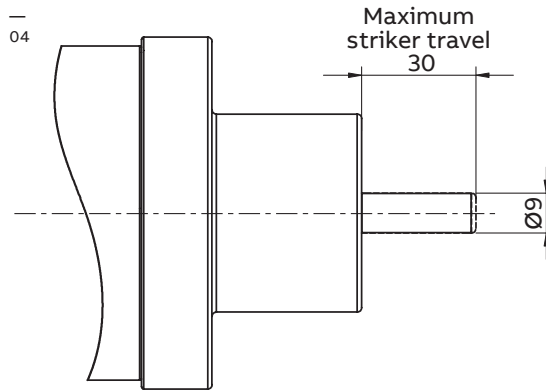
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03



Indicator and striker pin

Most of presented in the catalog fuse-links are equipped with a combined indicator and striker system which is activated immediately when the fuse element melts. Information in individual chapters indicate the striker characteristics and its presence or absence for selected type.

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04
Indicator and striker pin
combination, example
of design and travel



General principles for fuse-links selection

Choice of rated voltage U_r :

The rated voltage of the fuse-links must be equal to, or higher than the operating line voltage. By choosing the fuse-link rated voltage considerably higher than the line voltage, the maximum arc voltage must not exceed the insulation level of the network.

Choice of rated current I_r :

To obtain the best possible current limitation and thereby protection, the rated current of fuse-link must be as low as possible compared to the rated current of the object to be protected. However, the following limitations must be taking into consideration:

- the largest load current must not exceed rated current
- cooling conditions (e.g. in compact switchgear)
- inrush current of off load transformers
- starting currents of motor circuits (details in chapter: Fuse-links for motor circuits protection)

Protection of capacitor banks

ABB fuses are normally connected in series with capacitor units or banks. They are activated when these units become faulty under normal operating voltages, including the transient voltage as the capacitor are being energized. That is why the chosen fuse-link rated voltage should not be less than 1.1 times that of the rated voltage of the capacitor unit. As recommended in IEC 60549, the rated current of the fuse should be at least 1.43 times that of the capacitor's rated current. In practice it can be distinguished two general cases:

- Only one capacitor bank connected: selected rated current (I_r) for the fuses should be at least twice the rated current (I_{rc}) of the capacitor bank. The rated voltage of fuse-link (U_r) should also be at least twice the reated voltage of capacitor (U_{rc}).
 $I_r \geq 2 \times I_{rc}$
 $U_r \geq 2 \times U_{rc}$
 Example: 315 kvar capacitor bank with 10 kV U_{rc} .
 $I_{rc} = 315 / (10 * \sqrt{3}) = 18.2 \text{ A}$
 Selected fuses: $I_r = 40 \text{ A}$; $U_r = 24 \text{ kV}$
- More than one capacitor connected in parallel: when there is a possibility of reloading i.e. transmitting from a load capacitor bank to the unloaded condition, very high transient currents may occur. The rated current (I_r) of the fuses should be selected so that it is more than three times the rated current of capacitor bank (I_{rc}). Because a wide variation in transient currents may occur, ABB recommends that the calculation be discussed with the supplier of the capacitors.

Application in limited heat dissipation conditions

The setup of interaction between fuses and switch disconnectors in limited heat dissipation conditions can be obtained mainly from practical tests performed under different loading conditions. The maximum allowable power losses should be defined for the fuse so the temperature rise limits are not exceeded according to the referred standard. Therefore, the rated current of fuses with power losses above this limit are derated to a safe level. This procedure should be verified by temperature rise and breaking tests of the set.

Above procedure is valid for fuses operating in fuse compartment of switchgears or contactors.

Replacement of melted fuse-links

HV fuse-links cannot be regenerated. According to IEC Publication 60282-1, in a three phase system all three fuse-links should be replaced even if only one of them melts. Exceptions are allowed when it can be verified that the fuse-link (s) have not experienced any over current.

Fuse selection – detailed procedure

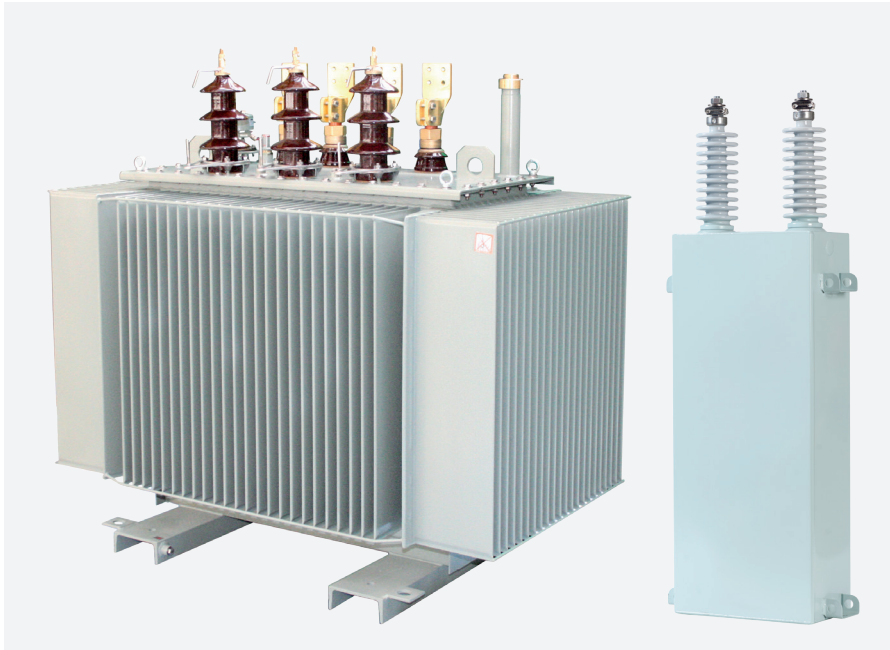
This catalog is divided into few chapters of various applications of fuse-links. Each of these chapter contains a list of suitable fuses and detailed selection procedure.

Product list

Product Group	Rated Voltage [kV]	Rated Current [A]	Class	Length "e" [mm]	Page
CEF	3/7.2	6.3-125	Back-up	192	10
CEF	3/7.2	6.3-200	Back-up	292	10
CEF	6/12	6.3-125	Back-up	292	10
CEF	6/12	6.3-200	Back-up	442	10
CEF	10/17.5	6.3-125 _{RC110*}	Back-up	367	10
CEF	10/17.5	6.3-100 _{RC87*}	Back-up	292	10
CEF	10/17.5	6.3-125	Back-up	442	10
CEF	10/24	6.3-125 _{RC105*}	Back-up	442	10
CEF	10/24	6.3-125	Back-up	537	10
CEF	10/25.8	40-63	Back-up	292	10
CEF	20/36	6.3-63	Back-up	537	10
CEF-S	6/12	10-63	Back-up „fast“	292	19
CEF-S	10/24	10-50	Back-up „fast“	442	19
CEF-S	30/40.5	6.3-63	Back-up „fast“	537	19
CMF	3.6	100-315	Back-up	292	32
CMF	7.2	63-315	Back-up	442	32
CMF	12	63-200	Back-up	442	32
CMF-BS-B	3.6	100-315	Back-up	400	40
CMF-BS-B	7.2	63-315	Back-up	553	40
CMF-BS-B	12	63-200	Back-up	553	40
CMF-BS-C	3.6	100-315	Back-up	400	40
CMF-BS-C	7.2	63-315	Back-up	553	40
CMF-BS-C	12	63-200	Back-up	553	40
CMF-BS-D	3.6	100-315	Back-up	419	40
CEF-VT	3/7.2	0.5-1	Back-up	192/292	46
CEF-VT	6/12	0.5-6.3	Back-up	192/292	46
CEF-VT	10/17.5	0.5-6.3	Back-up	192/292	46
CEF-VT	10/24	0.5-6.3	Back-up	292/442	46
WBP, WBP-6	7.2	0.5-3.15	Back-up	210	52
WBP, WBP-10	12	0.5-3.15	Back-up	250	52
WBP, WBP-20	24	0.5-3.15	Back-up	310	52
WBP, WBP-30	36	0.4-3.15	Back-up	385	52
WBP	40.5	2, 4	Back-up	440	52
CEF-OT	12/24	5-50	Back-up	359	26
CEF-OT	12/24	5-50	Back-up	359	26

* for fuses with rated current marked with RC (i.e. 125RC110A), maximum application continuous current should not exceed RC value indicated in subscript

Fuse-links for transformer and capacitor protection



- 010 – 018** **CEF** – Essential fuse-links for distribution transformers and capacitor protection
- 019 – 025** **CEF-S** – Fast-acting fuse-links for protection of distribution transformers
- 026 – 029** **CEF-OT** – Fuse-links for protection of distribution transformers, for installation inside the transformer vessel

CEF

Essential fuse-links for distribution transformers and capacitor protection

Class, type	Back-up, current limiting fuse-link
Rated voltages	3/7.2 kV – 20/36 kV
Rated currents	6.3 A – 200 A
Rated frequency	50 Hz
Applicable standard	IEC 60282-1, VDE 0670-T4 and VDE 0670-T402
Application	Indoor/outdoor
Striker	80 N (medium), with integrated TCU



Lower power losses by average level of 20 % comparing to previous design, generating additional savings during product life-cycle



Continuous protection and reliable operation guaranteed by robust design and compliance with newest IEC standards



Compatibility with other ABB products provides fast and accurate product selection



Outdoor sealing included in standard version, designed and tested for harsh conditions

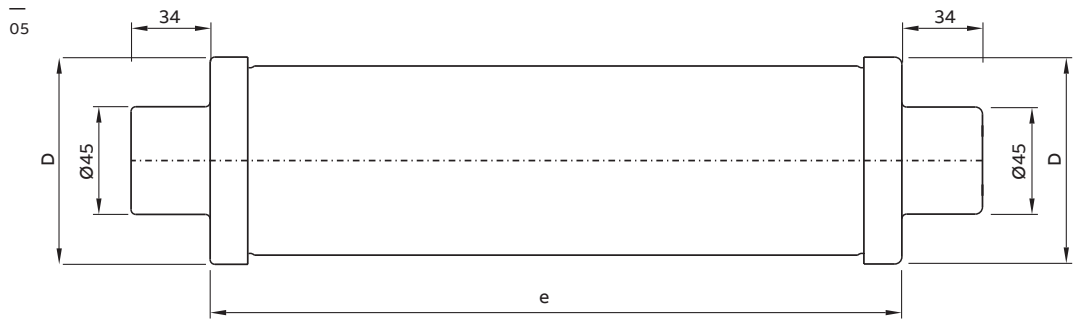
Fuse-links type CEF are designed to protect distribution transformers, cables, overhead lines and other apparatus against thermal and dynamic effects of short-circuit currents.

Key features:

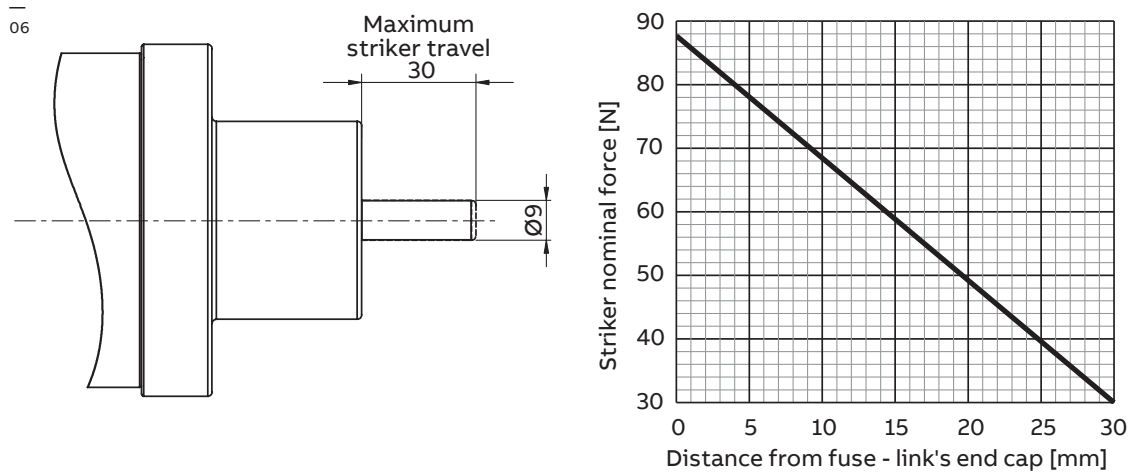
- Rated voltages 3/7.2 kV – 20/36 kV with rated currents of 6.3 A – 200 A
- For indoor and outdoor applications

- Designed and type tested acc. to IEC 602821, VDE 0670-T4 and VDE 0670-T402
- Top level fault current limitation and interruption performance up to 63kA RMS
- Striker 80 N (medium type)
- Equipped with Temperature Control Unit enabling the additional protection against thermal stresses in small enclosures

05
Dimensional drawing
of fuse-link type CEF



06
Fuse-link striker force
and dimensions



Ordering and technical table

Catalog number	Fuse name	Rated voltage U_r [kV]	Rated current I_r [A]	Rated frequency f_r [Hz]	Breaking capacity I_b [kA]	Minimal breaking current I_{b3} [A]	Diameter D [mm]	Length e [mm]	Rated power P_w [W]	Cold resistance [m Ω]	Pre-arcing integral [A 2 s]	Total interrupting integral [A 2 s]	Weight [kg]	EAN 13 Code
1YMB710713M1512	CEF	3/7.2	6.3	50	63	48	53	192	9	186.4	4.5	560	1.2	5908270806887
1YMB710716M1512	CEF	3/7.2	10	50	63	43	53	192	12	96.6	24	1 800	1.2	5908270806894
1YMB710718M1512	CEF	3/7.2	16	50	63	72	53	192	18	59.5	135	6 060	1.2	5908270806900
1YMB710719M1512	CEF	3/7.2	20	50	63	72	53	192	20	39.8	265	10 300	1.2	5908270806917
1YMB710721M1512	CEF	3/7.2	25	50	63	110	53	192	17	22.8	490	17 000	1.2	5908270806924
1YMB710724M1512	CEF	3/7.2	31.5	50	63	115	53	192	23	17.1	890	29 000	1.2	5908270806931
1YMB710725M1512	CEF	3/7.2	40	50	63	143.5	53	192	31	14.1	1600	49 000	1.2	5908270806948
1YMB710727M1512	CEF	3/7.2	50	50	63	215	53	192	32	9.4	3375	99 000	1.2	5908270806955
1YMB710729M1612	CEF	3/7.2	63	50	63	220	65	192	43	7.7	5150	106 000	1.6	5908270806962
1YMB710731M1612	CEF	3/7.2	80	50	63	320	65	192	47	5.0	7040	215 000	1.6	5908270806979
1YMB710733M1612	CEF	3/7.2	100	50	63	380	65	192	62	3.9	10300	319 000	1.6	5908270806986
1YMB710735M1812	CEF	3/7.2	125	50	63	380	87	192	81	3.3	17200	472 000	2.6	5908270806993
1YMB710713M2512	CEF	3/7.2	6.3	50	63	48	53	292	9	186.4	4.5	560	1.6	5908270807006
1YMB710716M2512	CEF	3/7.2	10	50	63	43	53	292	12	96.6	24	1 800	1.6	5908270807013
1YMB710718M2512	CEF	3/7.2	16	50	63	72	53	292	18	57.3	135	6 060	1.6	5908270807020
1YMB710719M2512	CEF	3/7.2	20	50	63	72	53	292	20	39.1	265	10 300	1.6	5908270807037
1YMB710721M2512	CEF	3/7.2	25	50	63	110	53	292	17	22.8	490	17 000	1.6	5908270807044
1YMB710724M2512	CEF	3/7.2	31.5	50	63	115	53	292	23	17.1	890	29 000	1.6	5908270807051
1YMB710725M2512	CEF	3/7.2	40	50	63	143.5	53	292	31	14.1	1600	49 000	1.6	5908270807068
1YMB710727M2512	CEF	3/7.2	50	50	63	215	53	292	32	9.4	3375	99 000	1.6	5908270807075
1YMB710729M2612	CEF	3/7.2	63	50	63	220	65	292	43	7.7	5150	106 000	2.3	5908270807082
1YMB710731M2612	CEF	3/7.2	80	50	63	320	65	292	47	5.0	7040	215 000	2.3	5908270807099
1YMB710733M2612	CEF	3/7.2	100	50	63	380	65	292	62	3.9	10300	319 000	2.3	5908270807105
1YMB710735M2812	CEF	3/7.2	125	50	63	380	87	292	81	3.3	17200	472 000	3.6	5908270807112

Catalog number	Fuse name	Rated voltage U_n [kV]	Rated current I_n [A]	Rated frequency f_r [Hz]	Breaking capacity I_{cs} [kA]	Minimal breaking current I_{cs} [A]	Diameter D [mm]	Length e [mm]	Rated power P_n [W]	Cold resistance [mΩ]	Pre-arcing integral [A ² s]	Total interrupting integral [A ² s]	Weight [kg]	EAN 13 Code
1YMB710738M2812	CEF	3/7.2	160	50	50	480	87	292	103	2.6	35000	430 000	3.6	5908270807129
1YMB710739M2812	CEF	3/7.2	200	50	50	650	87	292	109	1.7	76000	750 000	3.6	5908270807488
1YMB711213M2512	CEF	6/12	6.3	50	63	44	53	292	17	332.1	4.5	560	1.6	5908270806269
1YMB711216M2512	CEF	6/12	10	50	63	43.5	53	292	18	151.0	24	1 800	1.6	5908270806276
1YMB711218M2512	CEF	6/12	16	50	63	72.5	53	292	29	90.4	135	6 060	1.6	5908270806283
1YMB711219M2512	CEF	6/12	20	50	63	72.5	53	292	31	61.7	265	10 300	1.6	5908270806290
1YMB711221M2512	CEF	6/12	25	50	63	104	53	292	28	35.3	490	17 000	1.6	5908270806306
1YMB711224M2512	CEF	6/12	31.5	50	63	116	53	292	34	27.0	890	29 000	1.6	5908270806313
1YMB711225M2512	CEF	6/12	40	50	63	150	53	292	51	22.3	1600	49 000	1.6	5908270806320
1YMB711227M2612	CEF	6/12	50	50	63	200	65	292	48	14.8	3375	99 000	2.3	5908270806337
1YMB711229M2612	CEF	6/12	63	50	63	218	65	292	63	12.2	5150	106 000	2.3	5908270806344
1YMB711231M2612	CEF	6/12	80	50	63	330	65	292	72	8.0	7040	215 000	2.3	5908270806351
1YMB711233M2612	CEF	6/12	100	50	63	375	65	292	93	6.5	10300	319 000	2.3	5908270806368
1YMB711235M2812	CEF	6/12	125	50	63	375	87	292	124	5.3	17200	472 000	3.6	5908270806375
1YMB711213M4512	CEF	6/12	6.3	50	63	44	53	442	17	332.1	4.5	560	2.3	5908270806382
1YMB711216M4512	CEF	6/12	10	50	63	43.5	53	442	18	151.0	24	1 800	2.3	5908270806399
1YMB711218M4512	CEF	6/12	16	50	63	72.5	53	442	29	90.4	135	6 060	2.3	5908270806405
1YMB711219M4512	CEF	6/12	20	50	63	72.5	53	442	31	61.7	265	10 300	2.3	5908270806412
1YMB711221M4512	CEF	6/12	25	50	63	104	53	442	28	35.3	490	17 000	2.3	5908270806429
1YMB711224M4512	CEF	6/12	31.5	50	63	116	53	442	34	27	890	29 000	2.3	5908270806436
1YMB711225M4512	CEF	6/12	40	50	63	150	53	442	51	22.3	1600	49 000	2.3	5908270806443
1YMB711227M4612	CEF	6/12	50	50	63	200	65	442	48	14.8	3375	99 000	3.3	5908270806450
1YMB711229M4612	CEF	6/12	63	50	63	218	65	442	63	12.2	5150	106 000	3.3	5908270806467
1YMB711231M4612	CEF	6/12	80	50	63	330	65	442	72	8.0	7040	215 000	3.3	5908270806474
1YMB711233M4612	CEF	6/12	100	50	63	375	65	442	93	6.5	10300	319 000	3.3	5908270806481
1YMB711235M4612	CEF	6/12	125	50	63	375	65	442	124	5.3	17200	472 000	3.3	5908270807877
1YMB711238M4812	CEF	6/12	160	50	63	480	87	442	170	4.0	35000	430 000	5.3	5908270806504
1YMB711239M4812	CEF	6/12	200	50	63	700	87	442	166	2.7	90000	860 000	5.3	5908270806511
1YMB711713M2512	CEF	10/17.5	6.3	50	63	44	53	292	23	465.2	4.5	560	1.6	5908270807136
1YMB711716M2512	CEF	10/17.5	10	50	63	46	53	292	26	213.0	24	1 800	1.6	5908270807143
1YMB711718M2512	CEF	10/17.5	16	50	63	76.5	53	292	43	130.6	135	6 060	1.6	5908270807150
1YMB711719M2512	CEF	10/17.5	20	50	63	76.5	53	292	46	87.4	265	10 300	1.6	5908270807167
1YMB711721M2512	CEF	10/17.5	25	50	63	110	53	292	40	49.8	490	17 000	1.6	5908270807174
1YMB711724M2612	CEF	10/17.5	31.5	50	63	122	65	292	49	37.4	890	29 000	2.3	5908270807181
1YMB711725M2612	CEF	10/17.5	40	50	63	160	65	292	70	28.4	1600	49 000	2.3	5908270807198
1YMB711727M2812	CEF	10/17.5	50	50	63	205	87	292	69	20.5	3375	99 000	3.6	5908270807204
1YMB711729M2812	CEF	10/17.5	63	50	63	218	87	292	92	16.8	5150	106 000	3.6	5908270807211
1YMB711731M2812	CEF	10/17.5	80	50	63	330	87	292	110	11.0	7040	215 000	3.6	5908270807228
1YMB711733M2812	CEF	10/17.5	100 _{RC7}	50	63	380	87	292	100	8.8	10300	319 000	3.6	5908270807235
1YMB711713M3512	CEF	10/17.5	6.3	50	63	44	53	367	23	465.2	4.5	560	1.9	5908270807242
1YMB711716M3512	CEF	10/17.5	10	50	63	46	53	367	26	213.0	24	1 800	1.9	5908270807259
1YMB711718M3512	CEF	10/17.5	16	50	63	76.5	53	367	43	130.6	135	6 060	1.9	5908270807266
1YMB711719M3512	CEF	10/17.5	20	50	63	76.5	53	367	46	87.4	265	10 300	1.9	5908270807273
1YMB711721M3512	CEF	10/17.5	25	50	63	110	53	367	40	49.8	490	17 000	1.9	5908270807280
1YMB711724M3512	CEF	10/17.5	31.5	50	63	122	53	367	49	37.4	890	29 000	1.9	5908270807297
1YMB711725M3512	CEF	10/17.5	40	50	63	160	53	367	70	28.4	1600	49 000	1.9	5908270807303
1YMB711727M3612	CEF	10/17.5	50	50	63	205	65	367	69	20.5	3375	99 000	2.7	5908270807310
1YMB711729M3612	CEF	10/17.5	63	50	63	218	65	367	92	16.8	5150	106 000	2.7	5908270807327
1YMB711731M3612	CEF	10/17.5	80	50	63	330	65	367	110	11.0	7040	215 000	2.7	5908270807334
1YMB711733M3812	CEF	10/17.5	100	50	63	380	87	367	137	8.8	10300	319 000	4.4	5908270807341
1YMB711735M3812	CEF	10/17.5	125 _{RC110}	50	63	380	87	367	140	7.4	17200	472 000	4.4	5908270807358
1YMB711713M4512	CEF	10/17.5	6.3	50	63	44	53	442	23	465.2	4.5	560	2.3	5908270807365
1YMB711716M4512	CEF	10/17.5	10	50	63	46	53	442	26	213.0	24	1 800	2.3	5908270807372

Catalog number	Fuse name	Rated voltage U_n [kV]	Rated current I_n [A]	Rated frequency f_r [Hz]	Breaking capacity I_{cs} [kA]	Minimal breaking current I_{cs} [A]	Diameter D [mm]	Length e [mm]	Rated power P_w [W]	Cold resistance [mΩ]	Pre-arcing integral [A ² s]	Total interrupting integral [A ² s]	Weight [kg]	EAN 13 Code
1YMB711718M4512	CEF	10/17.5	16	50	63	76.5	53	442	43	130.6	135	6 060	2.3	5908270807389
1YMB711719M4512	CEF	10/17.5	20	50	63	76.5	53	442	46	87.4	265	10 300	2.3	5908270807396
1YMB711721M4512	CEF	10/17.5	25	50	63	110	53	442	40	49.8	490	17 000	2.3	5908270807402
1YMB711724M4512	CEF	10/17.5	31.5	50	63	122	53	442	49	37.4	890	29 000	2.3	5908270807419
1YMB711725M4512	CEF	10/17.5	40	50	63	160	53	442	70	28.4	1600	49 000	2.3	5908270807426
1YMB711727M4612	CEF	10/17.5	50	50	63	205	65	442	69	20.5	3375	99 000	3.3	5908270807433
1YMB711729M4612	CEF	10/17.5	63	50	63	218	65	442	92	16.8	5150	106 000	3.3	5908270807440
1YMB711731M4612	CEF	10/17.5	80	50	63	330	65	442	110	11.2	7040	215 000	3.3	5908270807457
1YMB711733M4612	CEF	10/17.5	100	50	63	380	65	442	136	8.5	10300	319 000	3.3	5908270807464
1YMB711735M4812	CEF	10/17.5	125	50	63	380	87	442	183	7.4	17200	472 000	5.3	5908270807471
1YMB712413M4512	CEF	10/24	6.3	50	63	43	53	442	28	572.6	4.5	560	2.3	5908270806542
1YMB712416M4512	CEF	10/24	10	50	63	46	53	442	33	272.2	24	1 800	2.3	5908270806559
1YMB712418M4512	CEF	10/24	16	50	63	76.5	53	442	55	168.9	135	6 060	2.3	5908270806566
1YMB712419M4512	CEF	10/24	20	50	63	76.5	53	442	59	112.5	265	10 300	2.3	5908270806573
1YMB712421M4512	CEF	10/24	25	50	63	110	53	442	57	64.8	490	17 000	2.3	5908270806580
1YMB712424M4512	CEF	10/24	31.5	50	63	122	53	442	65	48.9	890	29 000	2.3	5908270806597
1YMB712425M4512	CEF	10/24	40	50	63	160	53	442	89	40.2	1600	49 000	2.3	5908270806603
1YMB712427M4612	CEF	10/24	50	50	63	205	65	442	92	27.0	3375	99 000	3.3	5908270806610
1YMB712429M4612	CEF	10/24	63	50	63	215	65	442	127	21.9	5150	106 000	3.3	5908270806627
1YMB712431M4612	CEF	10/24	80	50	63	325	65	442	152	15.6	7040	215 000	3.3	5908270806634
1YMB712433M4812	CEF	10/24	100	50	63	375	87	442	200	12.9	10300	319 000	5.3	5908270806641
1YMB712435M4812	CEF	10/24	125 _{RC105}	50	40	380	87	442	173	10.5	17200	472 000	5.3	5908270807860
1YMB712413M5512	CEF	10/24	6.3	50	63	43	53	537	28	572.6	4.5	560	3.1	5908270806672
1YMB712416M5512	CEF	10/24	10	50	63	46	53	537	33	272.2	24	1 800	3.1	5908270806689
1YMB712418M5512	CEF	10/24	16	50	63	76.5	53	537	55	168.9	135	6 060	3.1	5908270806696
1YMB712419M5512	CEF	10/24	20	50	63	76.5	53	537	59	112.5	265	10 300	3.1	5908270806702
1YMB712421M5512	CEF	10/24	25	50	63	110	53	537	57	64.8	490	17 000	3.1	5908270806719
1YMB712424M5512	CEF	10/24	31.5	50	63	122	53	537	65	48.9	890	29 000	3.1	5908270806726
1YMB712425M5512	CEF	10/24	40	50	63	160	53	537	89	40.2	1600	49 000	3.1	5908270806733
1YMB712427M5612	CEF	10/24	50	50	63	205	65	537	92	27.0	3375	99 000	3.9	5908270806740
1YMB712429M5612	CEF	10/24	63	50	63	215	65	537	127	21.9	5150	106 000	3.9	5908270806757
1YMB712431M5612	CEF	10/24	80	50	63	325	65	537	152	15.6	7040	215 000	3.9	5908270806764
1YMB712433M5812	CEF	10/24	100	50	63	375	87	537	200	12.9	10300	319 000	6.4	5908270806771
1YMB712435M5812	CEF	10/24	125	50	63	375	87	537	234	10.6	17200	472 000	6.4	5908270806788
1YMB712525M2811	CEF	10/25.8	40	50	16	119	87	292	91	40.2	1446	32 538	3.6	5908270806238
1YMB712527M2811	CEF	10/25.8	50	50	16	191	87	292	93	26	4339	85 791	3.6	5908270806245
1YMB712529M2811	CEF	10/25.8	63	50	16	278	87	292	97	17.2	8099	155 020	3.6	5908270806252
1YMB713613M5512	CEF	20/36	6.3	50	40	37	53	537	47	925.0	4.5	560	3.1	5908270806795
1YMB713616M5512	CEF	20/36	10	50	40	37.5	53	537	50	413.6	24	1 800	3.1	5908270806801
1YMB713618M5512	CEF	20/36	16	50	40	59	53	537	85	254.0	135	6 060	3.1	5908270806818
1YMB713619M5512	CEF	20/36	20	50	40	62.5	53	537	88	162.3	265	10 300	3.1	5908270806825
1YMB713621M5512	CEF	20/36	25	50	40	100	53	537	87	104.0	490	17 000	3.1	5908270806832
1YMB713624M5612	CEF	20/36	31.5	50	40	158	65	537	118	84.0	1050	20 700	3.9	5908270806849
1YMB713625M5612	CEF	20/36	40	50	40	164	65	537	135	57.7	1850	39 000	3.9	5908270806856
1YMB713627M5812	CEF	20/36	50	50	40	230	87	537	157	43.5	4040	99 600	6.4	5908270806863
1YMB713629M5812	CEF	20/36	63	50	40	299	87	537	225	36.6	5800	89 500	6.4	5908270806870

for fuses with rated current marked with RC (i.e. 125RC110A), maximum application continuous current should not exceed RC value indicated in subscript

Choice of fuse-links for transformer protection:

Line voltage (kV)	Transformer rating (kVA)																			
	25	50	75	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3000	
	Fuse-link I _r (A)																			
3	10	20	25	31.5	40	50	50	63	100	125	160	160	200	250 ³	315 ³					
5	10	16	20	20	25	31.5	31.5	50	50	63	100	100	125	160	200	250 ³	315 ³			
6	6.3	10	16	20	20	25	31.5	40	50	50	63	100	100	125	160	200	250 ³	315 ³		
10	4 ²	10	10	16	16	20	20	25	31.5	31.5	50	50	63	80	100	125	160	200		
12	2.5 ²	6.3	10	10	16	16	20	20	25	31.5	40	50	50	63	80	100	125	160	200	
15	2.5 ²	6.3	10	10	10	16	16	20	20	25	31.5	40	40	50	63	80	100	125		
20	2 ^{1,2}	4 ²	6.3	10	10	10	16	16	20	20	25	31.5	31.5	40	50	63	80	100	125	
24	2 ^{1,2}	2.5 ²	6.3	6.3	10	10	10	16	16	20	20	25	25	31.5	40	50	63	80	100	
27	6.3 ¹	6.3 ¹	6.3	6.3	6.3	10	10	10	16	16	20	20	25	31.5	40	50	63			
30	6.3 ¹	6.3 ¹	6.3 ¹	6.3	6.3	6.3	10	10	10	16	20	20	20	25	31.5	40	50	63		
36	6.3 ¹	6.3 ¹	6.3 ¹	6.3	6.3	6.3	10	10	10	16	16	20	20	25	31.5	40	50	63	63	

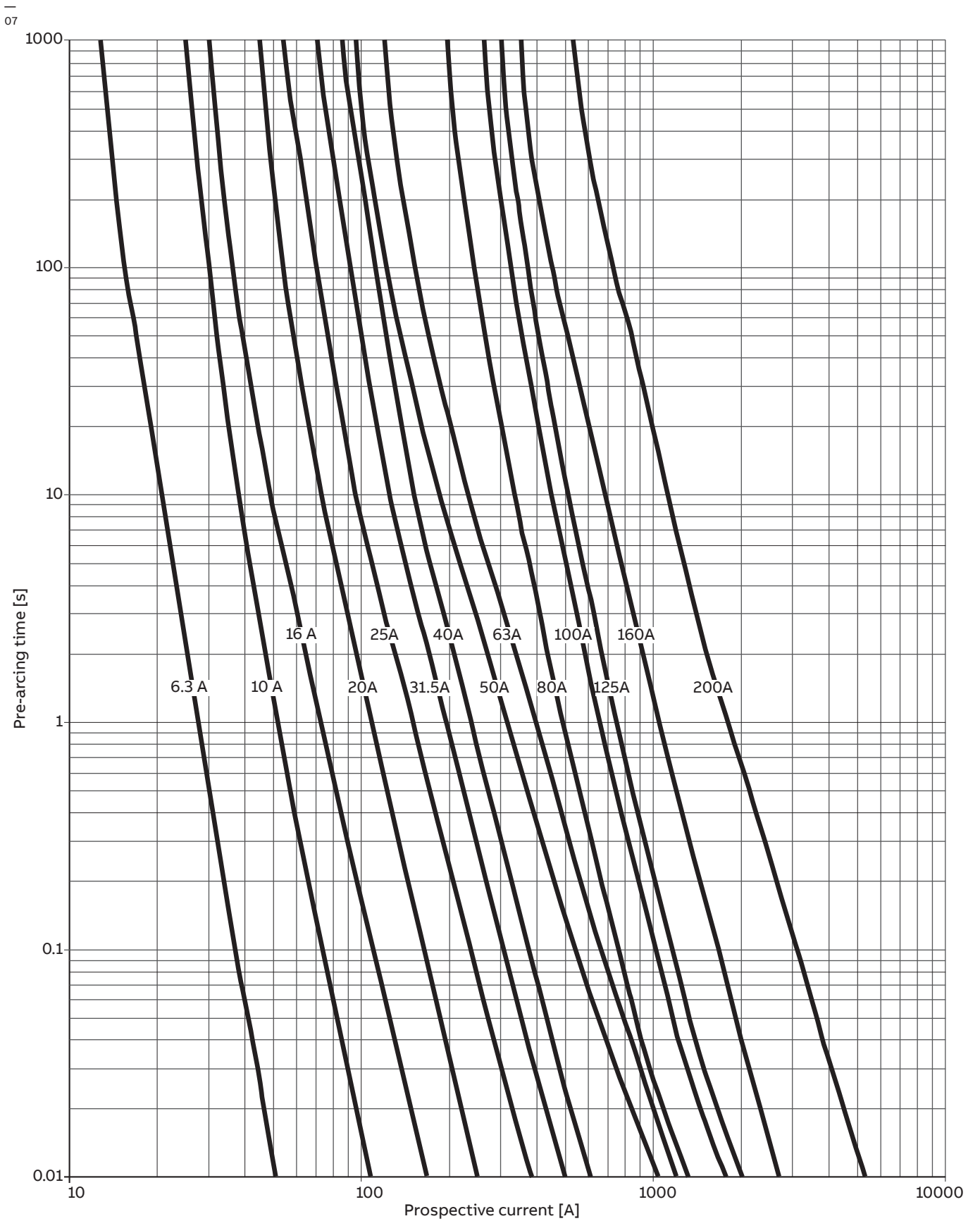
¹ – fuse is not able to clear independently transformer's secondary side terminals short-circuit current; ² – fuse type CEF-VT; ³ – fuse type CMF

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 current overload – 120%

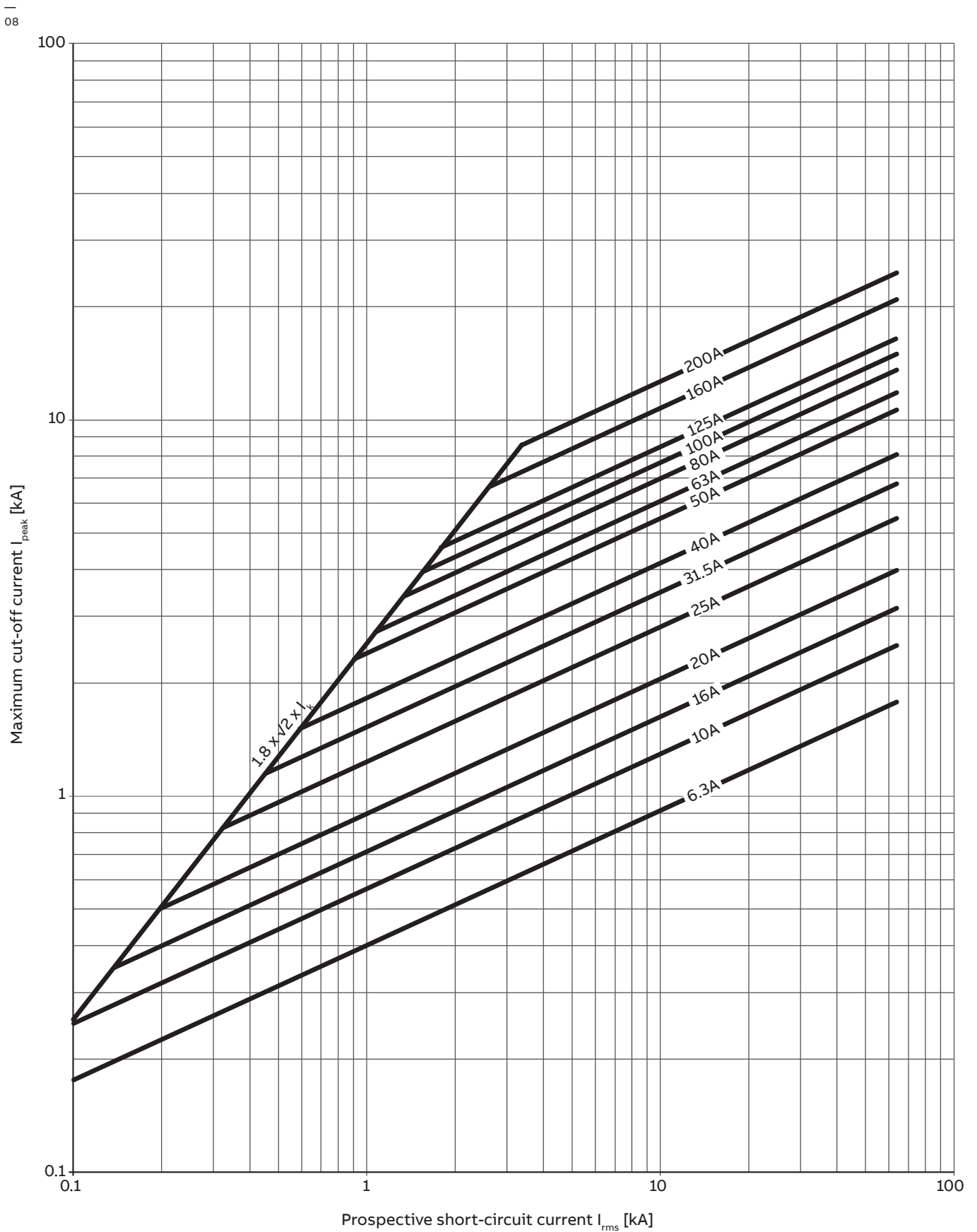
- Magnetizing transformer inrush current – $12 \times I_r$ during 100ms (up to 800 kVA) or $10 \times I_r$ during 100ms (800 kVA and above)
- Transformer short-circuit voltage according to IEC 60076-5
- No fuse derating due to small enclosures assumed

For different working conditions fuse selection has to be recalculated.



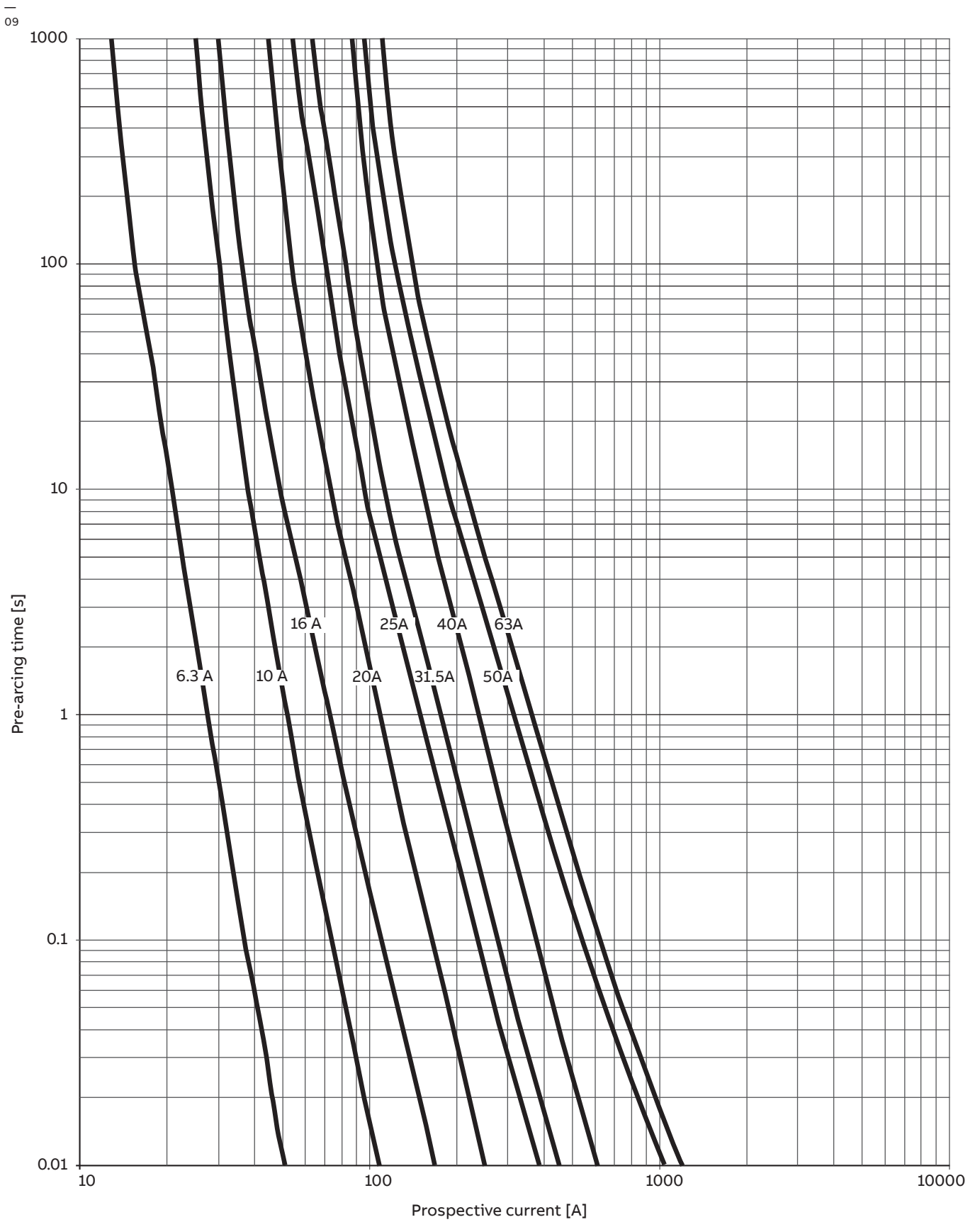
Characteristics show the average melting time as a function of the prospective current and are recorded from cold condition of fuse-link.

The tolerance is $\pm 10\%$ referred to the current. Characteristics are valid for frequency 50 Hz.



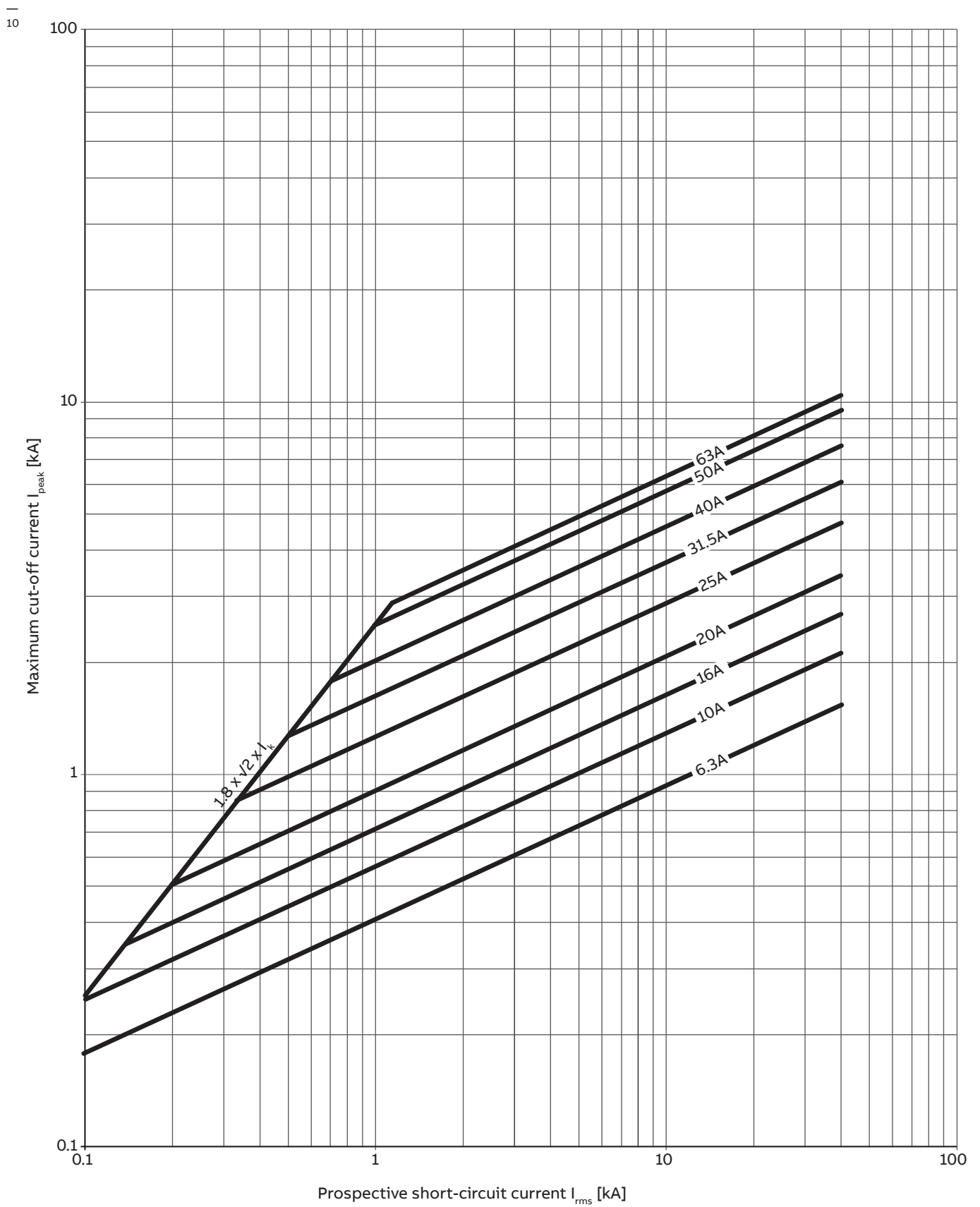
Characteristics show the cut-off current corresponding to a prospective short-circuit

current. Characteristics are valid for frequency 50Hz.



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. Characteristics are valid for frequency 50 Hz.



Characteristics show the cut-off current corresponding to a prospective short-circuit

current. Characteristics are valid for frequency 50Hz.

CEF-S

Fast-acting fuse-link for protection of distribution transformers

Class, type	Back-up, current limiting fuse-link
Rated voltages	6/12 kV – 30/40.5 kV
Rated currents	6.3 A – 63 A
Rated frequency	50 Hz
Applicable standard	IEC 60282-1
Application	Indoor/outdoor
Striker	80 N (medium), with integrated TCU



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



Continuous protection and reliable operation guaranteed by robust design and compliance with newest IEC standards



Compatibility with other ABB products provides fast and accurate product selection



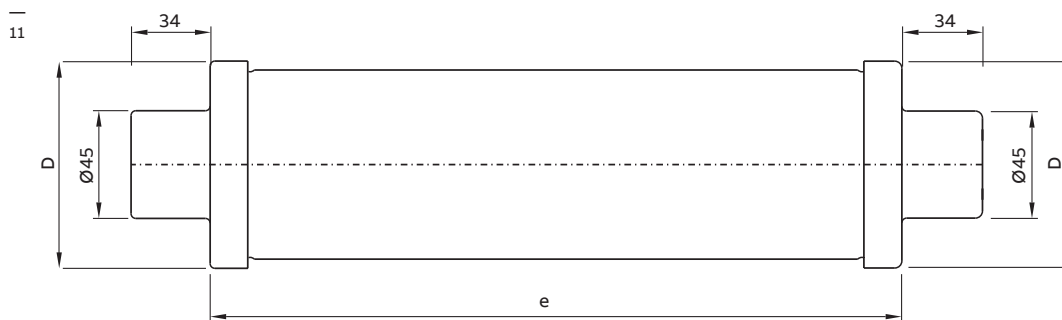
Outdoor sealing included in standard version, designed and tested for harsh conditions

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

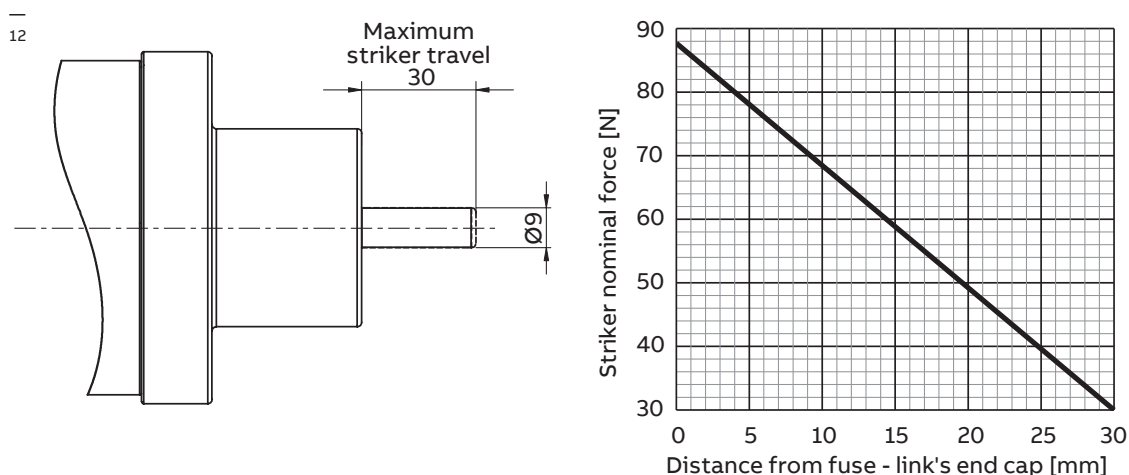
Key features:

- Rated voltages 6/12 kV – 30/40.5 kV with rated currents of 6.3 A – 63 A
- For indoor and outdoor applications
- Designed and type tested acc. to IEC 60282-1
- Top level fault current limitation and interruption performance up to 63kA RMS
- Striker 80 N (medium type)
- Equipped with Temperature Control Unit enabling the additional protection against thermal stresses in small enclosure

11 Dimensional drawing of fuse-link type CEF-S



12 Fuse-link striker force and dimensions



Ordering and technical table

Catalog number	Fuse name	Rated voltage U_n [kV]	Rated current I_n [A]	Rated frequency f_r [Hz]	Breaking capacity I_b [kA]	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]	Cold resistance [m Ω]	Pre-arcing integral [A ² s]	Total interrupting integral [A ² s]	Weight [kg]	EAN 13 Code
1YMB741216M2611	CEF-S	6/12	10	50	50	55	48	65	292	25	187	20	2520	2.3	5908270808034
1YMB741218M2611	CEF-S	6/12	16	50	50	55	80	65	292	38	108.5	80	2930	2.3	5908270808041
1YMB741219M2611	CEF-S	6/12	20	50	50	72	120	65	292	38	72.3	200	3200	2.3	5908270808058
1YMB741221M2611	CEF-S	6/12	25	50	50	72	160	65	292	36	46.5	390	7400	2.3	5908270808065
1YMB741225M2611	CEF-S	6/12	40	50	50	100	240	65	292	54	24.5	940	17600	2.3	5908270808072
1YMB741227M2611	CEF-S	6/12	50	50	50	190	330	65	292	71	18.8	2030	27000	2.3	5908270808089
1YMB741229M2611	CEF-S	6/12	63	50	63	190	440	65	292	82	14.1	4100	63500	2.3	5908270807495
1YMB742416M4611	CEF-S	10/24	10	50	25	55	48	65	442	54	373.2	20	1450	3.3	5908270808096
1YMB742418M4611	CEF-S	10/24	16	50	25	55	80	65	442	58	186.6	90	2910	3.3	5908270808102
1YMB742419M4611	CEF-S	10/24	20	50	25	72	120	65	442	66	124.4	240	3960	3.3	5908270808119
1YMB742421M4611	CEF-S	10/24	25	50	25	72	160	65	442	74	93.3	340	6140	3.3	5908270808126
1YMB742425M4611	CEF-S	10/24	40	50	25	110	240	65	442	107	48.7	930	13300	3.3	5908270808133
1YMB742427M4611	CEF-S	10/24	50	50	63	220	330	65	442	125	32.5	2360	57100	3.3	5908270807501
1YMB744014M5611	CEF-S	30/40.5	6.3	50	20	50	43	65	537	49	927	20	2350	3.9	5908270805682
1YMB744016M5611	CEF-S	30/40.5	10	50	20	66	54	65	537	51	615	30	3000	3.9	5908270805699
1YMB744018M5611	CEF-S	30/40.5	16	50	20	52	87	65	537	112	313	200	3400	3.9	5908270805705
1YMB744019M5611	CEF-S	30/40.5	20	50	20	77	122	65	537	125	207	270	4620	3.9	5908270805712
1YMB744021M5611	CEF-S	30/40.5	25	50	20	134	118	65	537	143	175	300	3880	3.9	5908270805729
1YMB744024M5611	CEF-S	30/40.5	31.5	50	20	265	202	65	537	121	89.6	1050	11900	3.9	5908270805736
1YMB744025M5811	CEF-S	30/40.5	40	50	20	172	324	87	537	130	60.3	2480	36100	6.4	5908270805743
1YMB744027M5811	CEF-S	30/40.5	50	50	20	251	500	87	537	128	39.8	6600	76800	6.4	5908270805750
1YMB744029M5811	CEF-S	30/40.5	63	50	20	334	655	87	537	165	29.7	9460	110000	6.4	5908270805385

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.

Choice of fuse-links for transformer protection

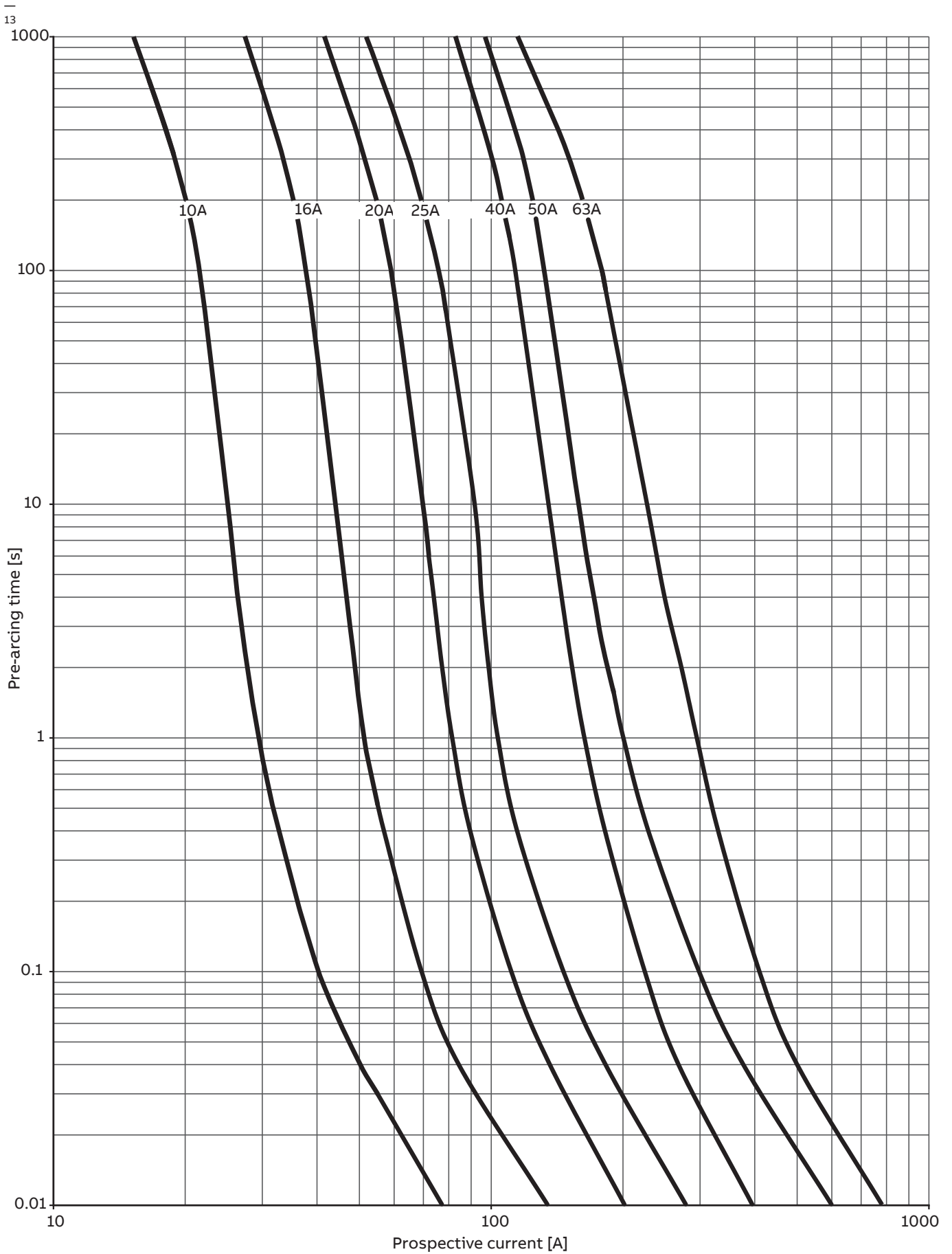
Transformer rated voltage [kV]	Transformer rating (kVA)																		Fuse rated voltage [kV]			
	25	50	75	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500		3000		
Fuse-link rating I _n (A)																						
6	10	16	20	25	40	40	50	63	63												6/12	
10	10*	10	16	20	20	25	40	40	50	63	63											
11	10*	10	16	20	20	25	40	40	40	50	63											
12	10*	10	16	16	20	20	25	40	40	50	63	63										
15	10*	10*	10	16	16	20	20	25	40	40	50										10/24	
20	10*	10*	10*	10	16	16	20	20	25	40	40	50	50									
22	10*	10*	10*	10	16	16	20	20	20	40	40	40	50	50								
24	10*	10*	10*	10	16	16	16	20	20	25	40	40	50	50								
30	6.3*	6.3*	6.3*	6.3*	6.3	10	16	16	20	40	40	40	40	40	40	50	63	63			30/40.5	
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			
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 fuse-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 current overload – 120%
- Magnetizing transformer inrush current – 12 x I_r during 100ms (up to 800 kVA) or 10 x I_r 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. The CEF-S fuse-links can be selected in reference to § 17 STEV-FS requirements that ensure very good protection and prevents many faults in low voltage switchgears. The selection table according to that is available on request.

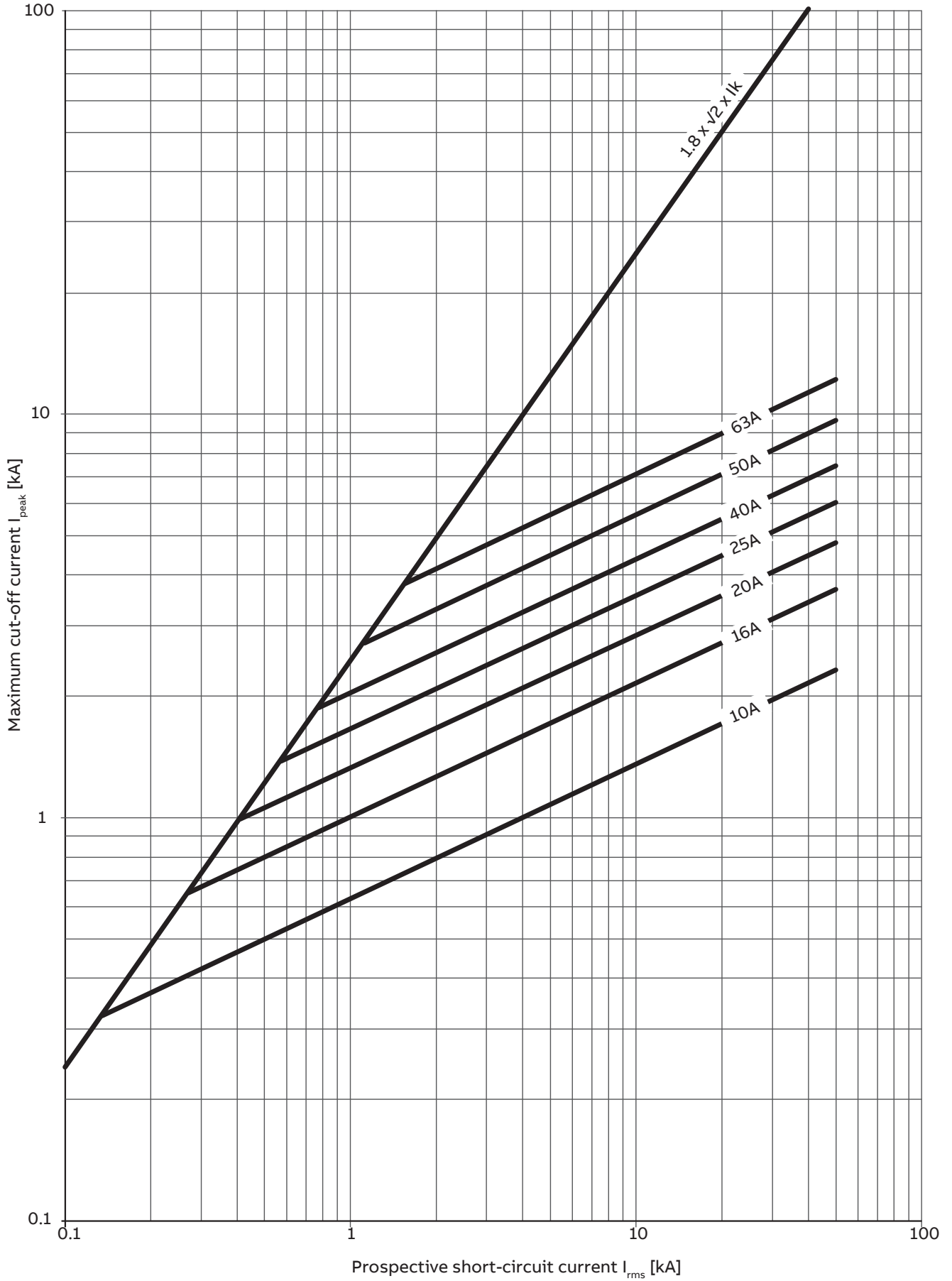


13
CEF-S 6/12, 10/24 kV
fuses time-current
characteristic

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. Characteristics are valid for frequency 50 Hz.

14

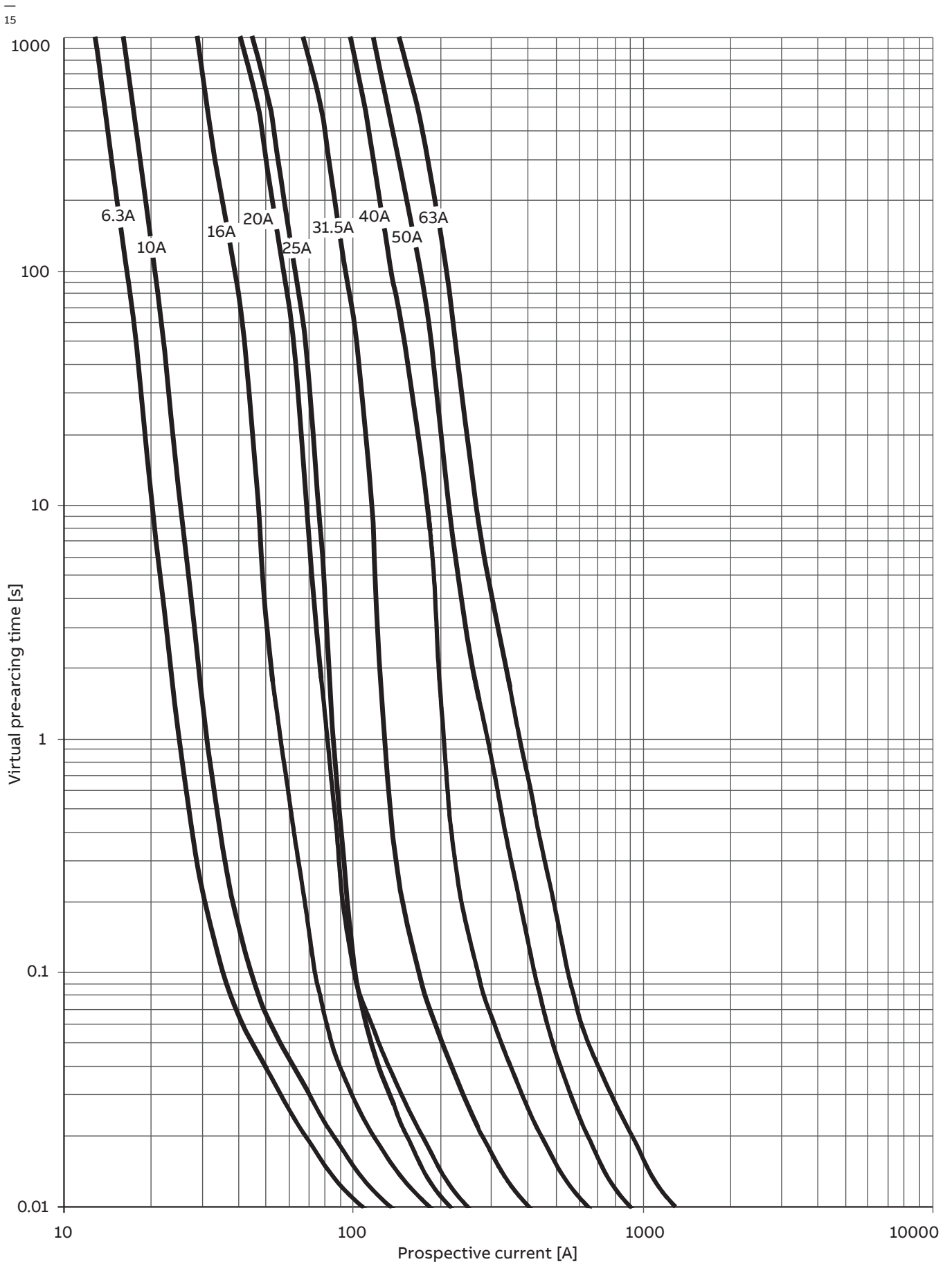


14

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.

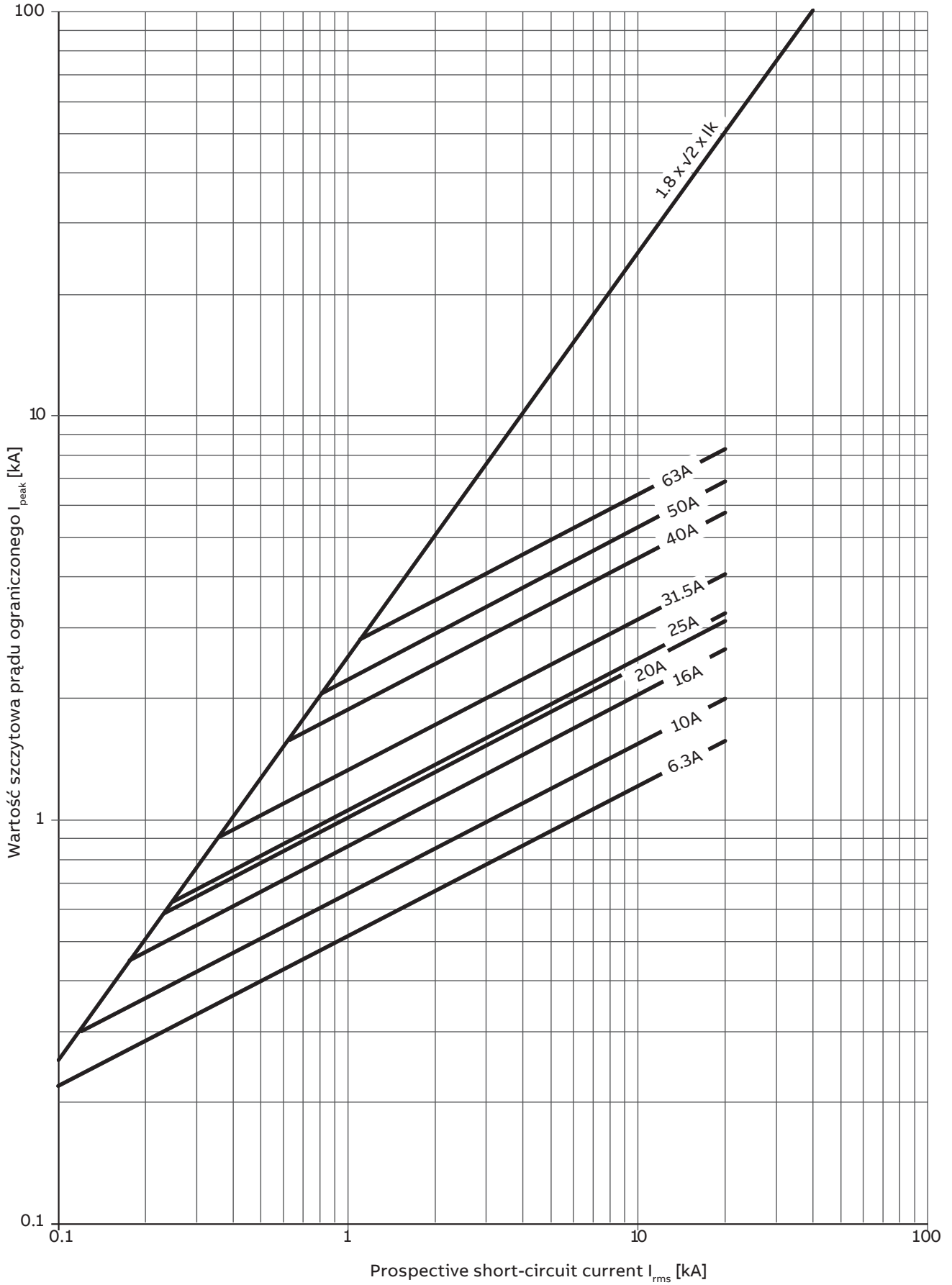


—
15
CEF-S 30/40.5 kV time-
-current characteristics

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. Characteristics are valid for frequency 50 Hz.

16



16

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

Characteristics show the cut-off current corresponding to a prospective short-circuit

current. Characteristics are valid for frequency 50Hz.

CEF-OT

Fuse-links for protection of distribution transformers, suitable for installation inside transformer tank

Class, type	Back-up, current limiting fuse-link
Rated voltages	12 kV – 24 kV
Rated currents	20 A, 31.5 A
Rated frequency	50 Hz
Applicable standard	IEC 60282-1
Application	Indoor/outdoor/oil
Striker	130 N (medium)



Wide application range for both indoor/outdoor and oil installations



Continuous protection and reliable operation guaranteed by robust design and compliance with newest IEC standards



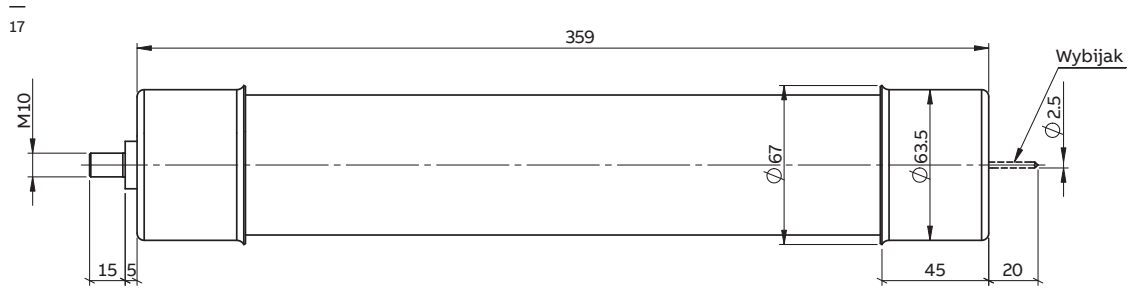
Increased life time of apparatus isolation due to significant reduction of prospective short-circuit currents

Fuse-links type CEF-OT are designed for protection of distribution transformers, they are suitable for installation inside transformer tank

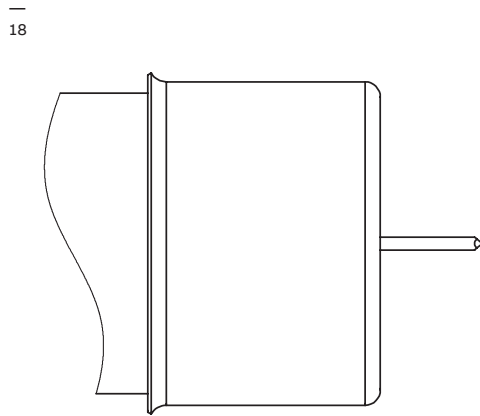
Key features:

- Rated voltage 10/24 kV
- Rated currents: 20 A, 31.5 A
- Application: indoor and outdoor, immersed in transformer oil
- Striker 130 N (medium type)

17
Dimension drawing of
CEF-OT TPC1 fuse-link



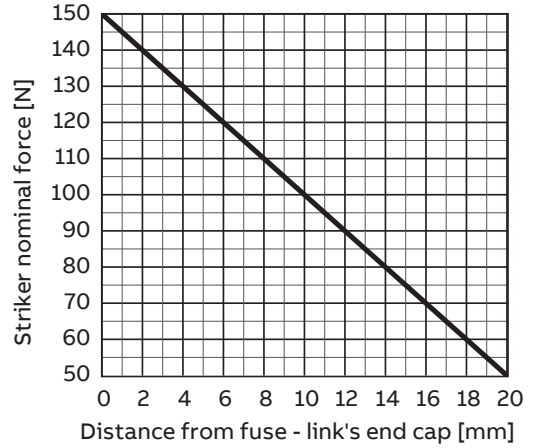
18
Fuse-link CEF-OT
TPC1 striker force
and dimensions



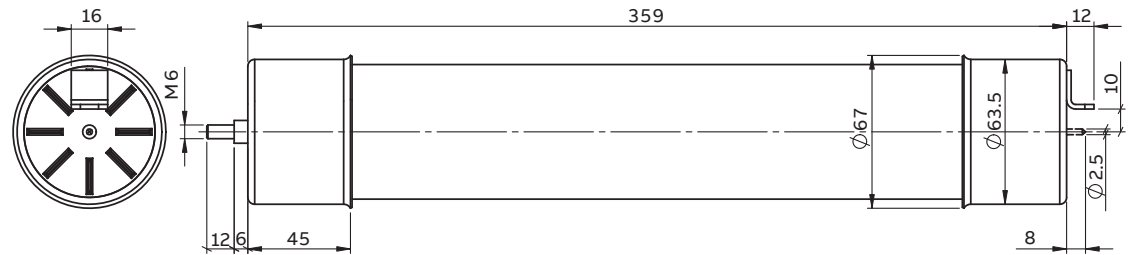
19
Dimension drawing of
CEF-OT TPC2 fuse-link

18

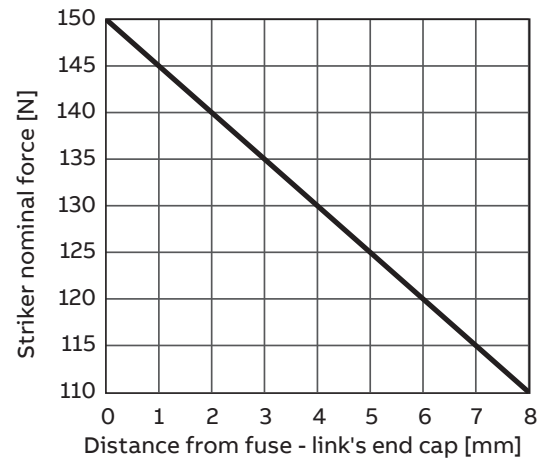
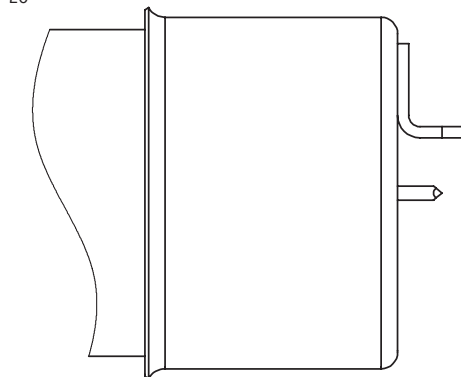
20
Fuse-link CEF-OT
TPC2 striker force
and dimensions



19

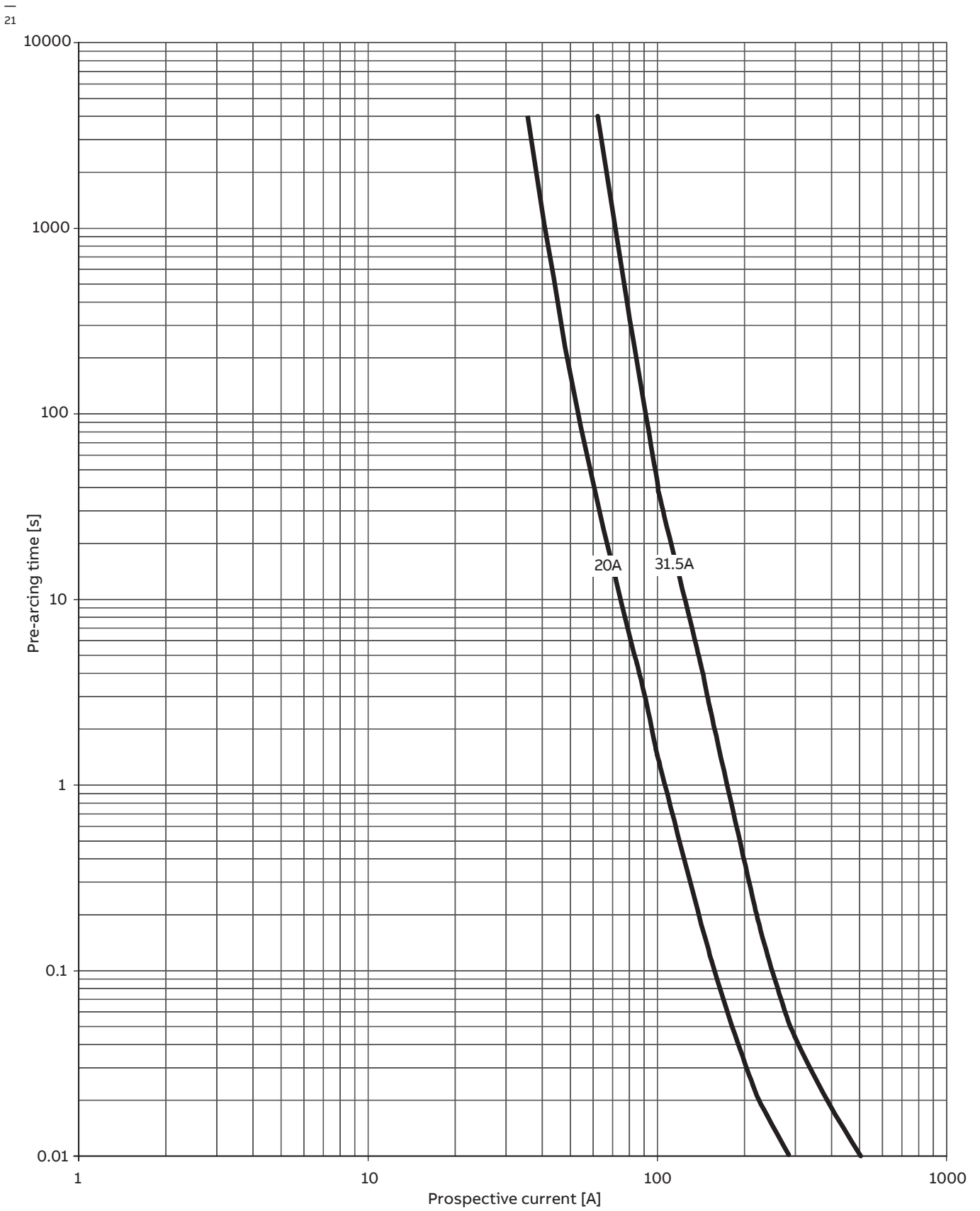


20



Ordering and technical table

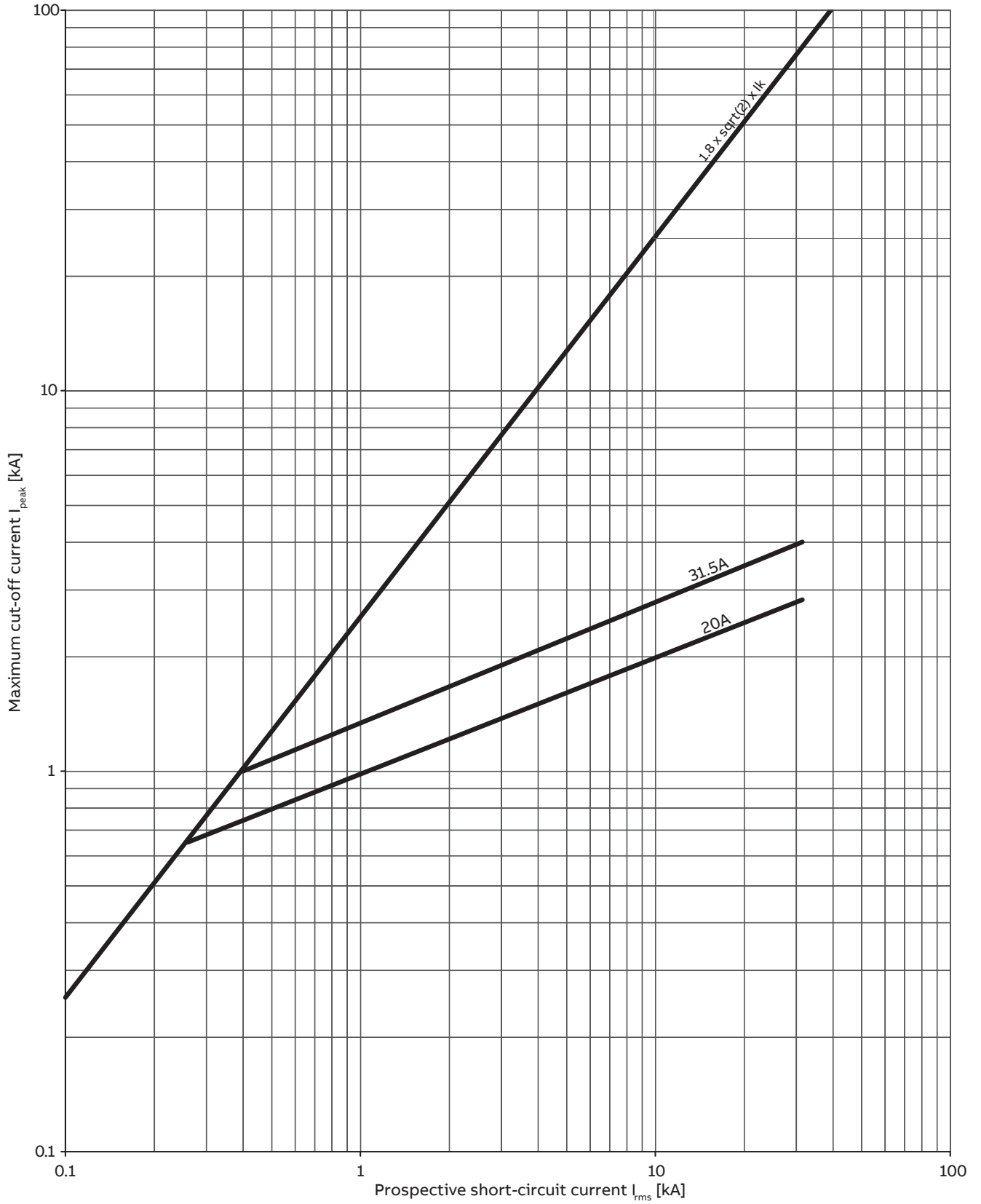
Catalog number	Fuse name	Rated voltage U, [kV]	Rated current I, [A]	Rated frequency f, [Hz]	Breaking capacity I ₁ [kA]	Minimal breaking current I ₂ [A]	Diameter D [mm]	Length e [mm]	Rated power P _w [W]	Cold resistance [mΩ]	EAN 13 Code
1YMB531041M0004	CEF-OT TPC1	12/24	20	50	31.5 (12kV), 16 (24kV)	31.5	63.5	359	70	115.5	5908270808539
1YMB531041M0006	CEF-OT TPC1	12/24	31.5	50	31.5 (12kV), 16 (24kV)	31.5	63.5	359	105	69.2	5908270808546
1YMB531041M0014	CEF-OT TPC2	12/24	20	50	31.5 (12kV), 16 (24kV)	31.5	63.5	359	70	115.5	5908270808553
1YMB531041M0016	CEF-OT TPC2	12/24	31.5	50	31.5 (12kV), 16 (24kV)	31.5	63.5	359	105	69.2	5908270808560



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. Characteristics are valid for frequency 50 Hz

—
22



Characteristics show the cut-off current corresponding to a prospective short-circuit

current. Characteristics are valid for frequency 50Hz.

—
22

Fuse-links for motor circuits protection



032 – 039 **CMF** – Essential fuse-links for motor circuit protection

040 – 043 **CMF-BS** – Fuse-links with tags for motor circuit protection

CMF

Essential fuse-links for motor circuit protection

Class, type	Back-up, current limiting fuse-link
Rated voltages	3.6 kV, 7.2 kV, 12 kV
Rated currents	63 A – 315 A
Rated frequency	50 Hz
Applicable standard	IEC 60282-1
Application	Indoor/outdoor
Striker	80 N (medium), with integrated TCU



Special design of fuse-links resistant to cyclical load typical for motor applications



Continuous protection and reliable operation guaranteed by robust design and compliance with newest IEC standards



Compatibility with other ABB products provides fast and accurate product selection



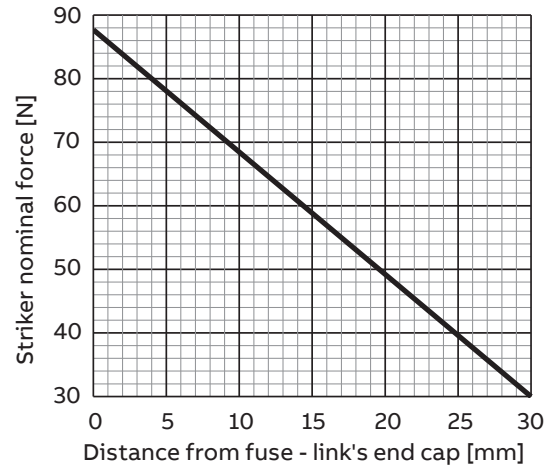
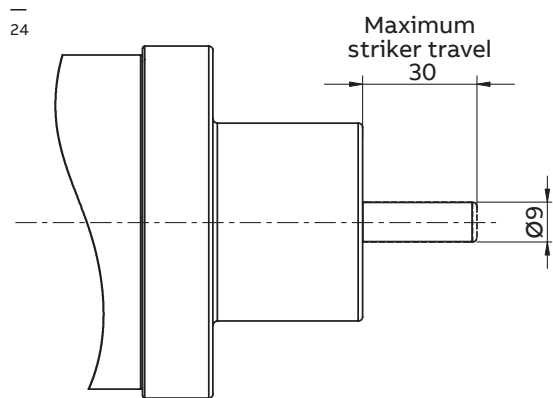
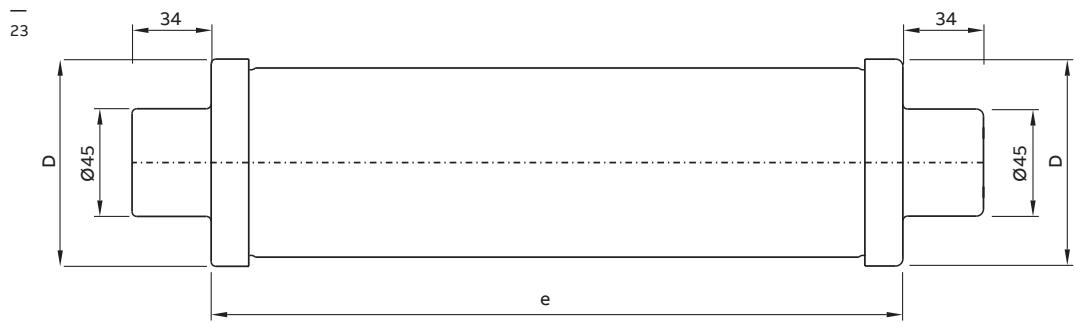
Outdoor sealing included in standard version, designed and tested for harsh conditions

Fuse-links type CMF are designed to protect motor circuits against thermal and dynamic effects of short-circuit currents

Key features:

- Rated voltages up to 12 kV with rated currents of 63 A – 315 A

- For indoor and outdoor applications
- Designed and type tested acc. to IEC 60282-1
- Striker 80 N (medium type)
- Equipped with Temperature Control Unit enabling the additional protection against thermal stresses in small enclosures



23
Dimensional drawing of fuse-link type CMF

24
Fuse-link striker force and dimensions

Ordering and technical table

Catalog number	Fuse name	Rated voltage U_r [kV]	Rated current I_r [A]	Rated frequency f_r [Hz]	Breaking capacity I_b [kA]	Minimal breaking current I_3 [A]	K factor	Diameter D [mm]	Length e [mm]	Rated power P_w [W]	Cold resistance [mΩ]	Pre-arcing integral [A ² s]	Total interrupting integral [A ² s]	Weight [kg]	EAN 13 Code
1YMB760333M2611	CMF	3.6	100	50	63	275	0.75	65	292	41	3.2	14000	170000	2.3	5908270807884
1YMB760338M2611	CMF	3.6	160	50	63	400	0.7	65	292	70	1.9	38000	500000	2.3	5908270807891
1YMB760339M2811	CMF	3.6	200	50	63	500	0.7	87	292	78	1.4	76000	710000	3.6	5908270807907
1YMB760341M2811	CMF	3.6	250	50	63	760	0.6	87	292	90	1	140000	1150000	3.6	5908270807914
1YMB760342M2811	CMF	3.6	315	50	63	900	0.6	87	292	121	0.8	210000	1800000	3.6	5908270807921
1YMB760729M4611	CMF	7.2	63	50	63	195	0.75	65	442	43	8.5	4800	65000	3.3	5908270807938
1YMB760733M4611	CMF	7.2	100	50	63	275	0.75	65	442	64	4.9	14000	180000	3.3	5908270807945
1YMB760738M4611	CMF	7.2	160	50	63	400	0.7	65	442	109	2.9	38000	540000	3.3	5908270807952
1YMB760739M4811	CMF	7.2	200	50	63	500	0.7	87	442	122	2.1	76000	750000	5.3	5908270807969
1YMB760741M4811	CMF	7.2	250	50	63	800	0.6	87	442	133	1.5	140000	1200000	5.3	5908270807976
1YMB760742M4811	CMF	7.2	315	50	63	950	0.6	87	442	186	1.2	210000	2200000	5.3	5908270807983
1YMB761229M4611	CMF	12	63	50	63	210	0.75	65	442	71	13.5	4800	110000	3.3	5908270807990
1YMB761233M4811	CMF	12	100	50	63	275	0.75	87	442	88	6.6	14000	200000	5.3	5908270808003
1YMB761238M4811	CMF	12	160	50	63	480	0.7	87	442	139	3.9	38000	700000	5.3	5908270808010
1YMB761239M4811	CMF	12	200	50	63	700	0.7	87	442	166	2.7	93000	910000	5.3	5908270808027

Choice of fuse-links for motor protection:

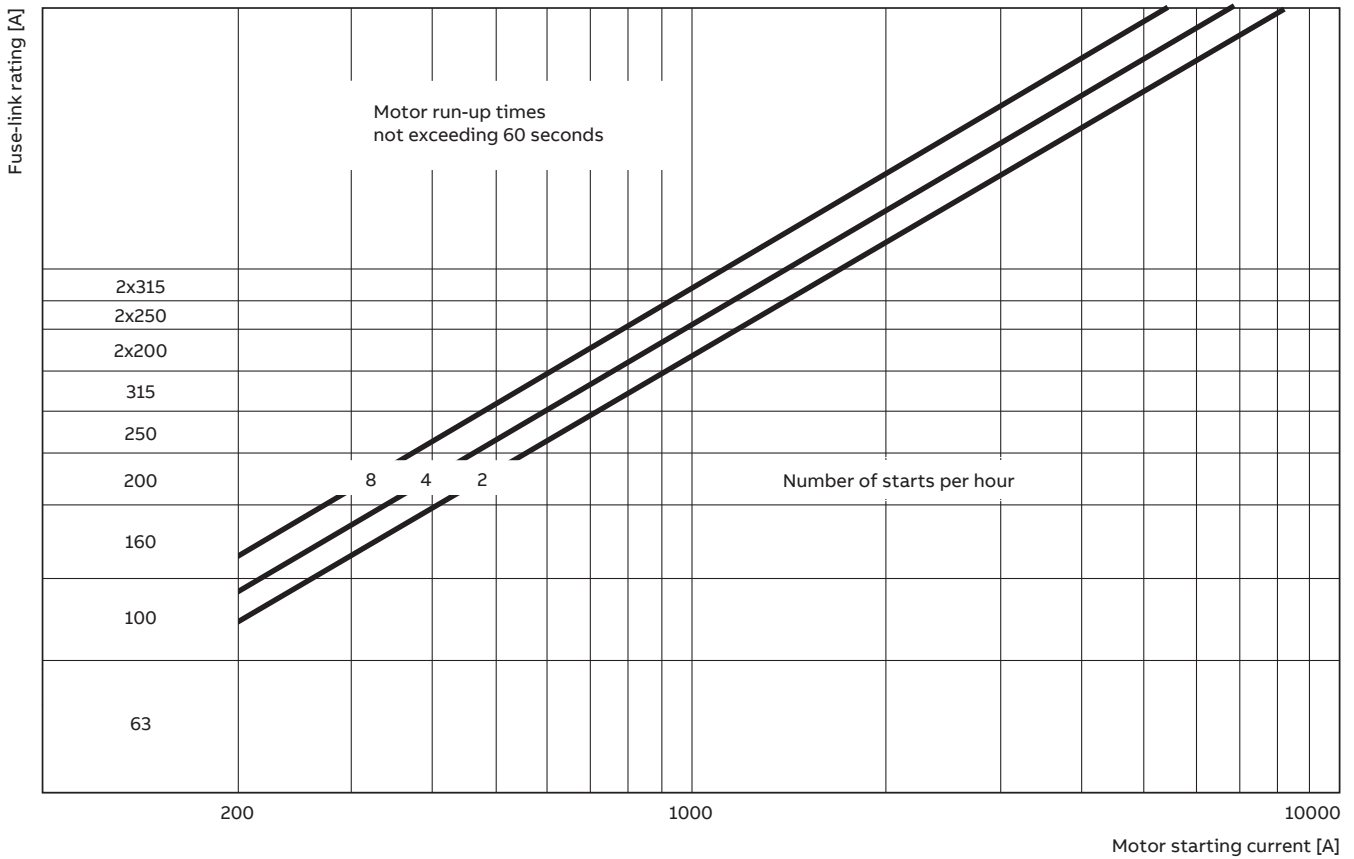
The minimum permissible current rating of the fuse-links for motor protection may be determined from the selection charts. These three charts are for run-up times of 6, 15 and 60 seconds respectively. Each chart contains different characteristics, depending on the number of starts per hour. With reference to the number of starts per hour, the first two are in immediate succession while the rest are evenly spaced at intervals of one hour. The number of starts per hour indicates the time interval between separated starts. For example, four starts in 15 minutes are represented by 16 starts per hour. The horizontal axis of the selection chart indicates the motor starting current, while the current rating of the fuse-link is found along the vertical axis.

Selection procedure:

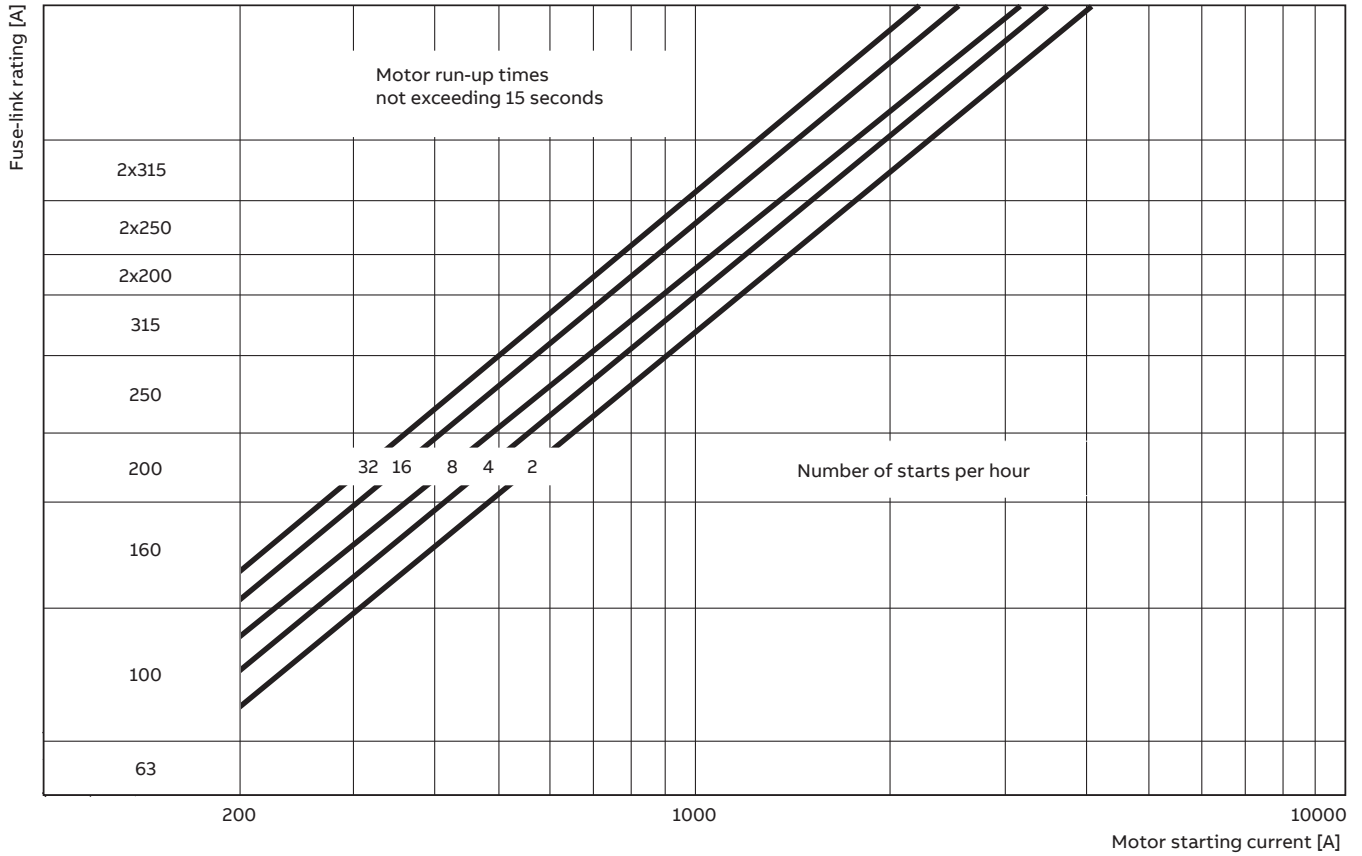
- Select the chart which is appropriate for the run-up time of the motor
- Select the starting current along the horizontal axis
- Depending on the number of starts per hour, select the correct characteristic (2, 4, 8, 16, 32)
- Read the correct fuse-link rating on the vertical axis.

Example	A	B
Starting current of the motor	850 A	250 A
Run-up time	6 seconds	15 seconds
Number of starts per hour	2	16
Chart number	3	2
Rated current of fuse link	250 A	160 A

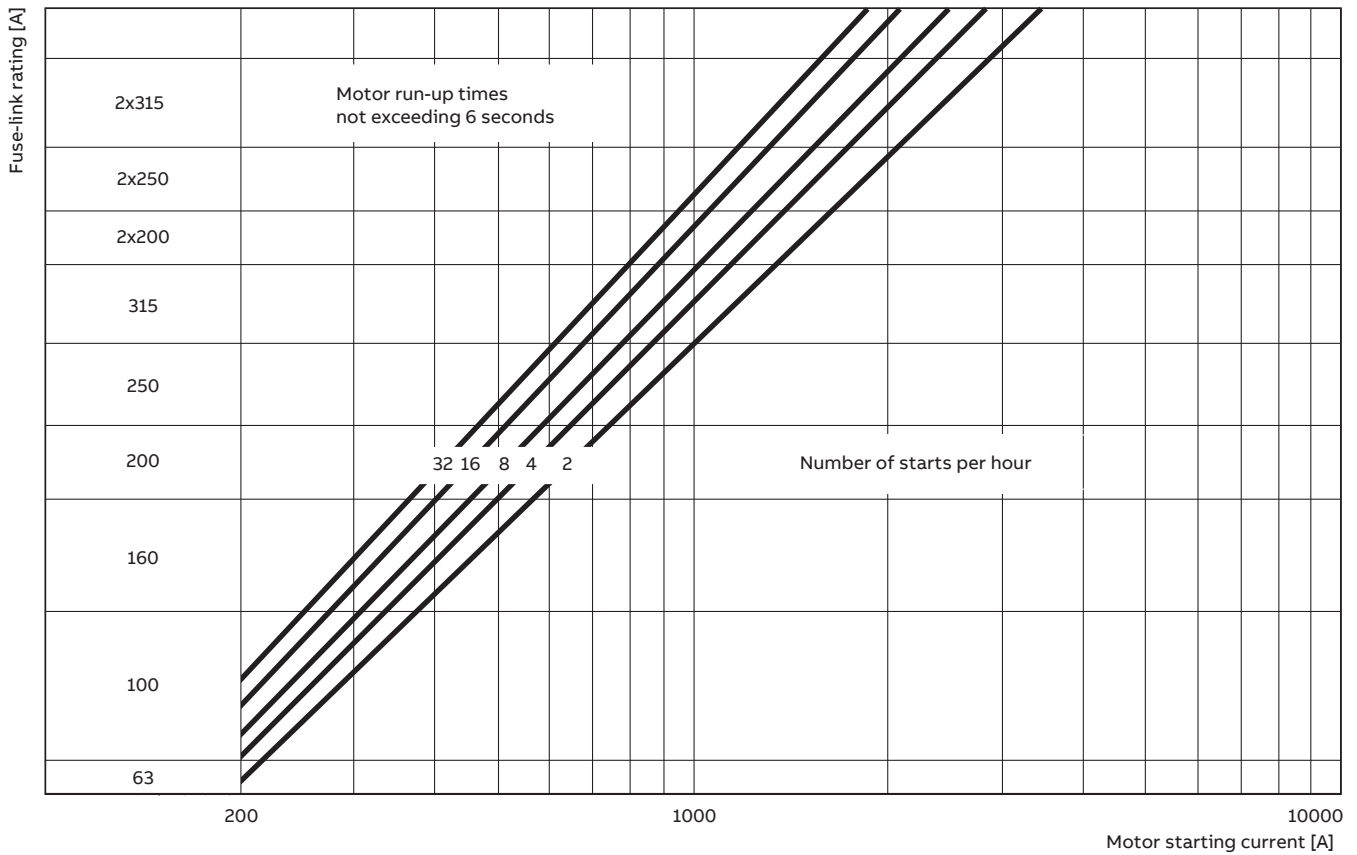
Selection chart No. 1:



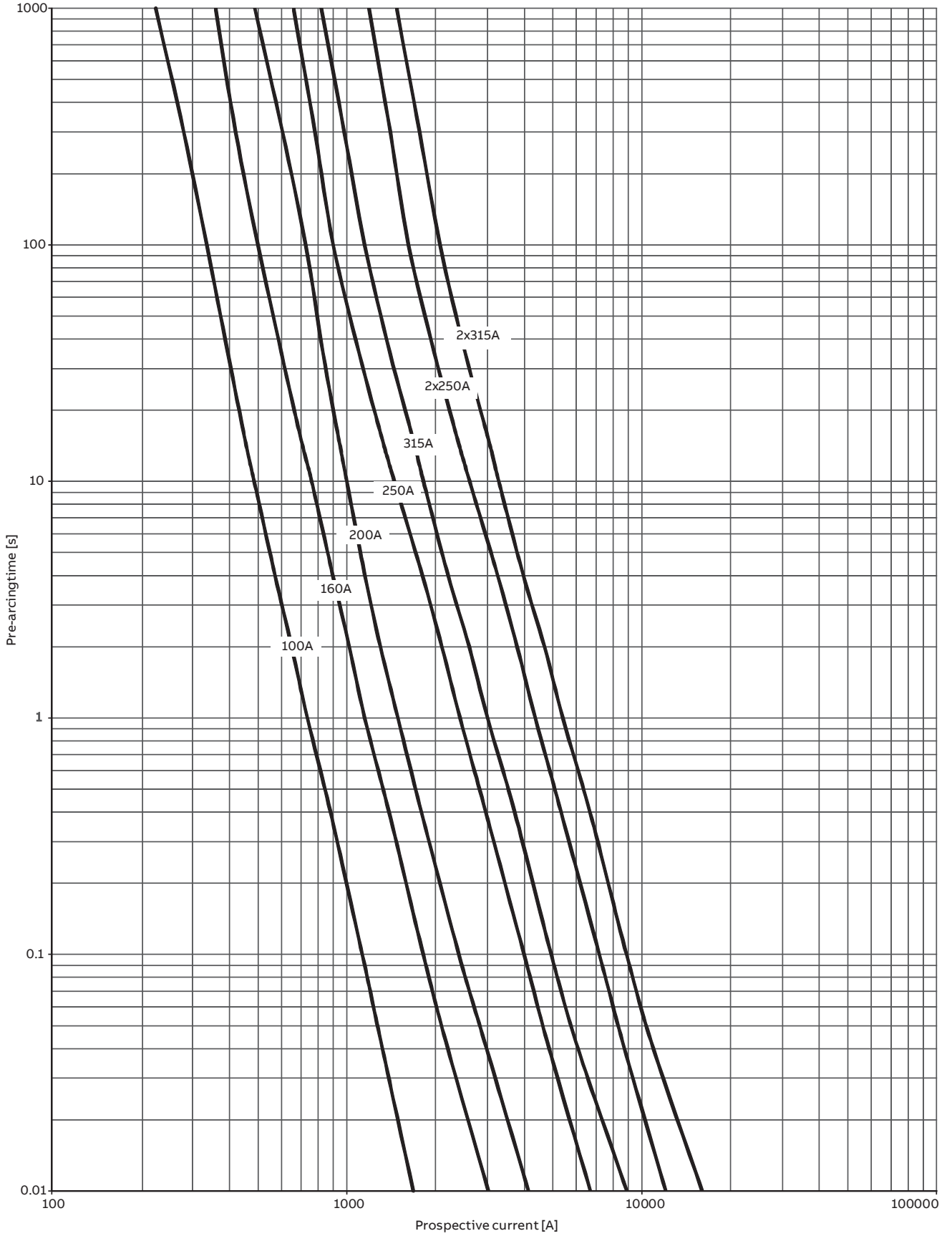
Selection chart No. 2:



Selection chart No. 3:



—
25

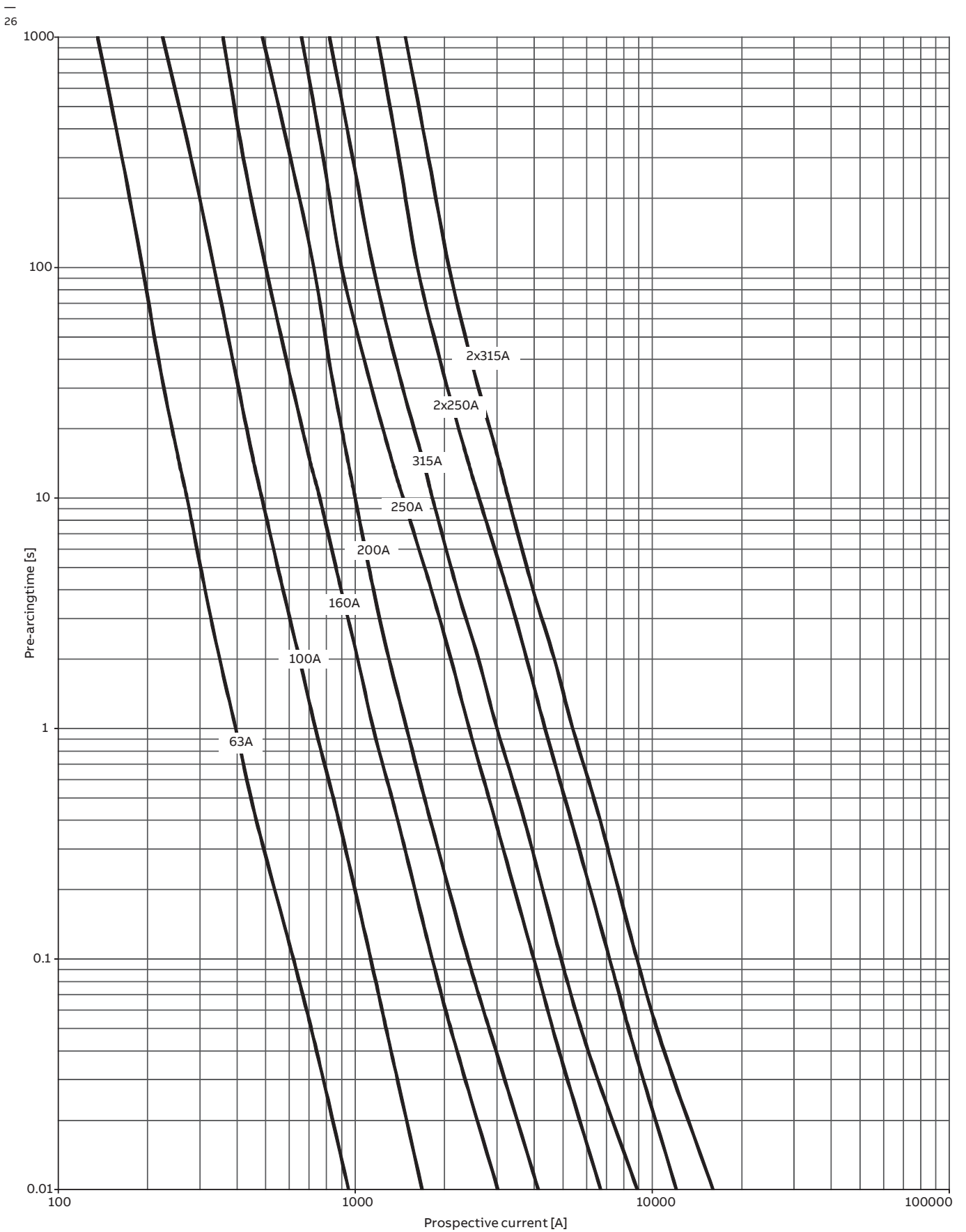


—
25

CMF 3.6 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

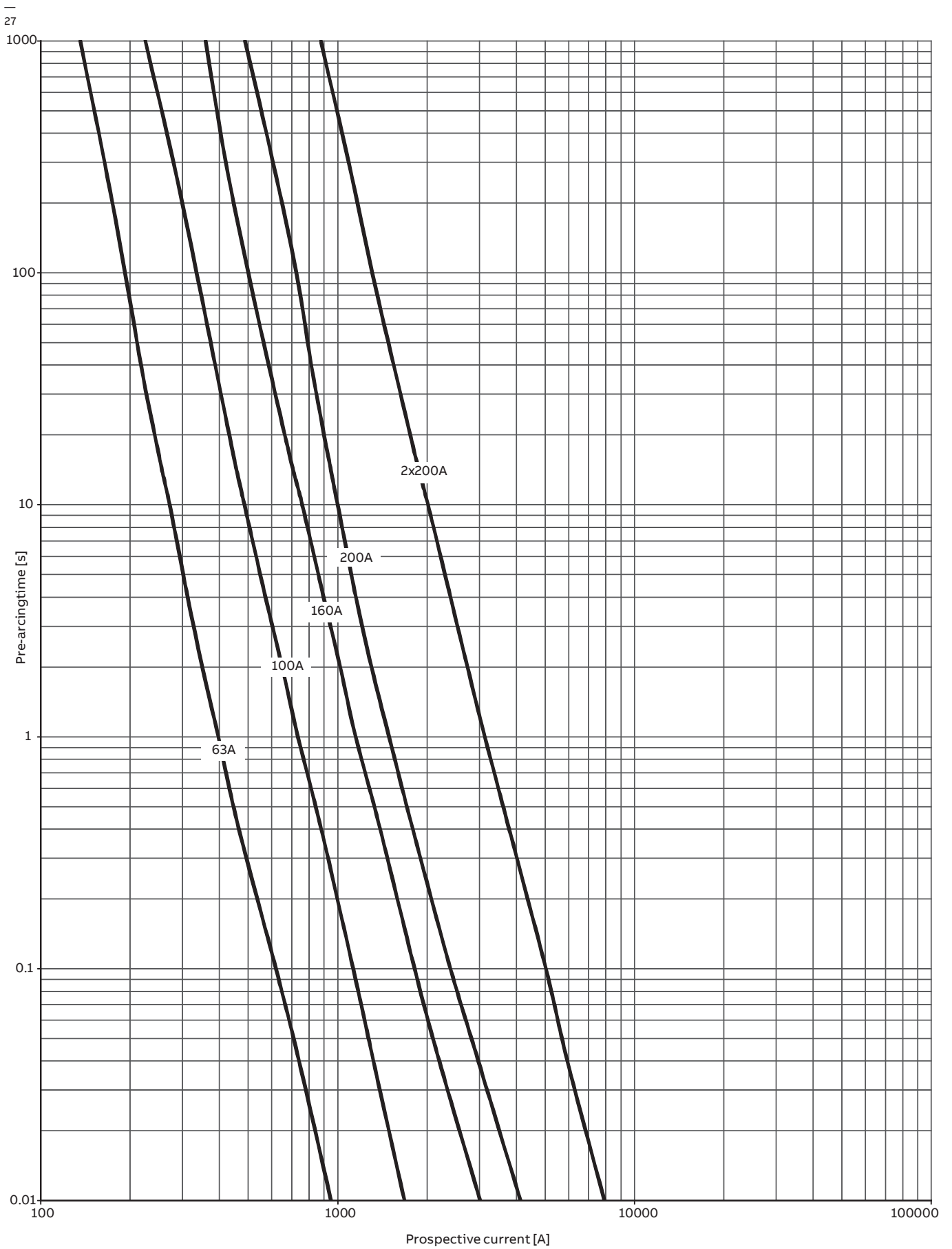
tolerance is $\pm 10\%$ referred to the current for single fuses; $\pm 20\%$ referred to the current for double fuses. Characteristics are valid for frequency 50Hz.



26
CMF 7.2 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 for single fuses; $\pm 20\%$ referred to the current for double fuses. Characteristics are valid for frequency 50 Hz.

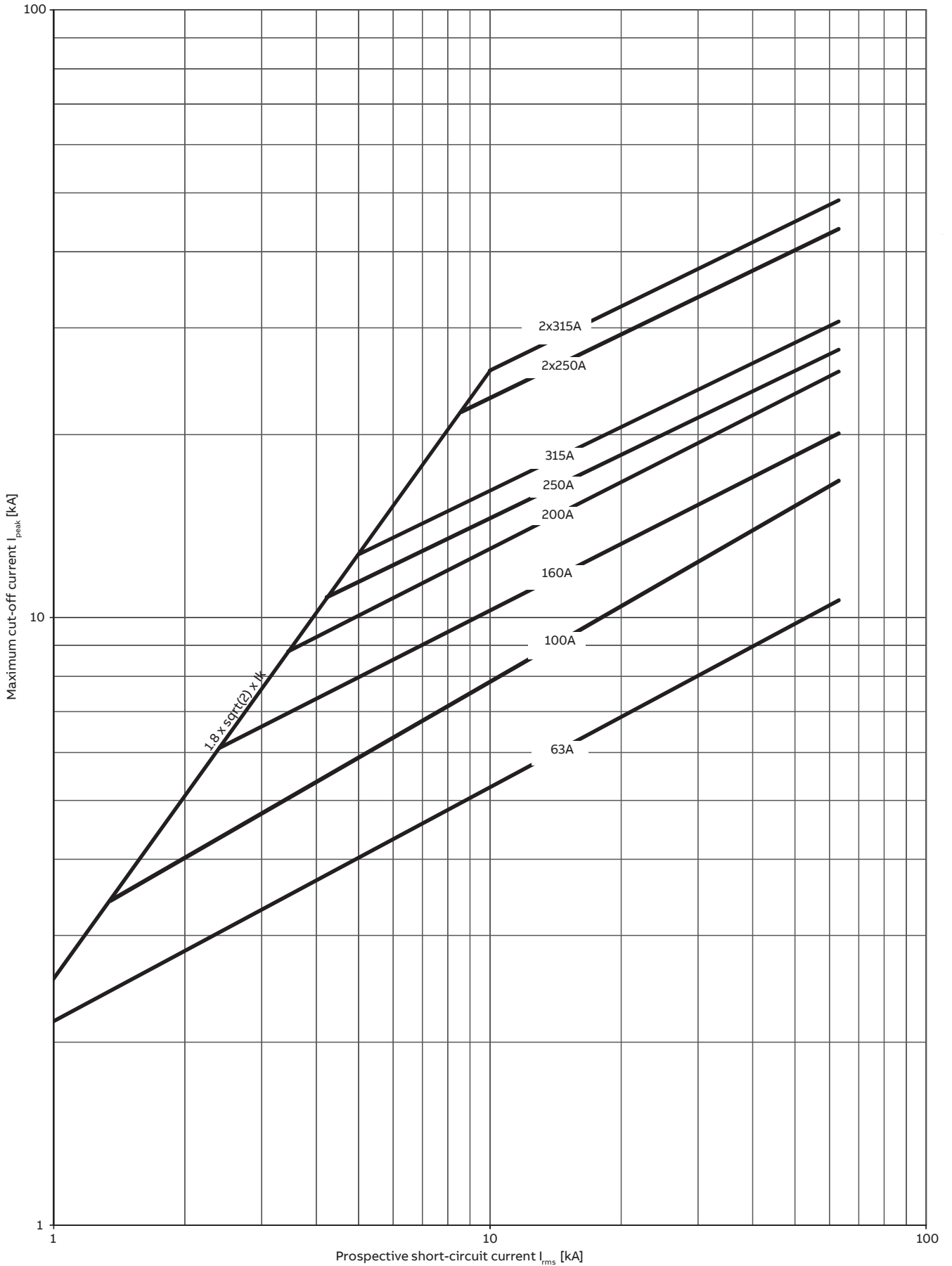


27
CMF 12 kV fuses
time-current
characteristics

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 for single fuses; $\pm 20\%$ referred to the current for double fuses. Characteristics are valid for frequency 50 Hz.

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28



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28
CMF 3.6 kV, 7.2 kV,
12 kV cut-off current
characteristics

Characteristics show the cut-off current corresponding to a prospective short-circuit

current. Characteristics are valid for frequency 50Hz.

CMF-BS

Fuse-links with tags for motor circuit protection

Class, type	Back-up, current limiting fuse-link
Rated voltages	3.6 kV, 7.2 kV, 12 kV
Rated currents	63 A – 315 A
Rated frequency	50 Hz
Applicable standard	IEC 60282-1
Application	Indoor/outdoor
Striker	80 N (medium), with integrated TCU



Special design of fuse-links resistant to cyclical load typical for motor applications



Continuous protection and reliable operation guaranteed by robust design and compliance with newest IEC standards



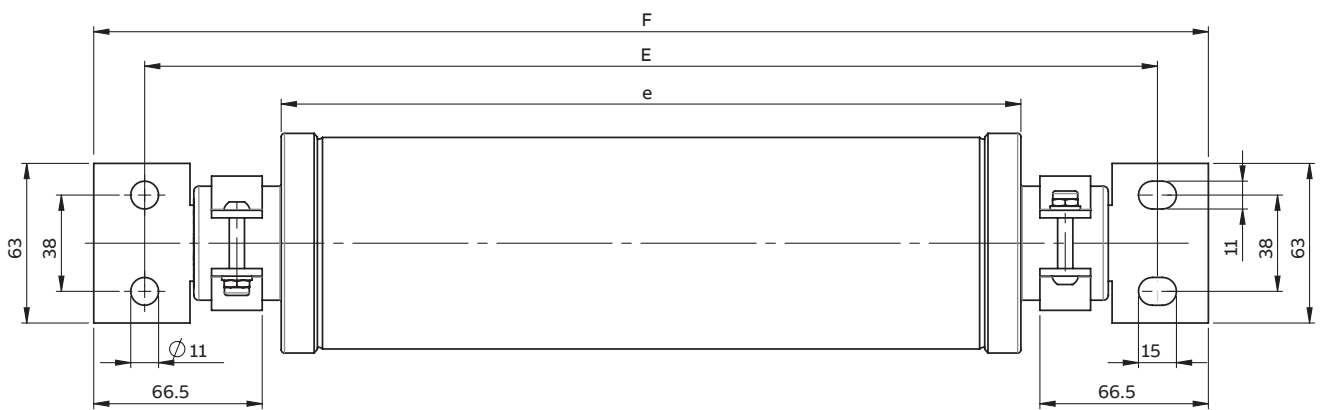
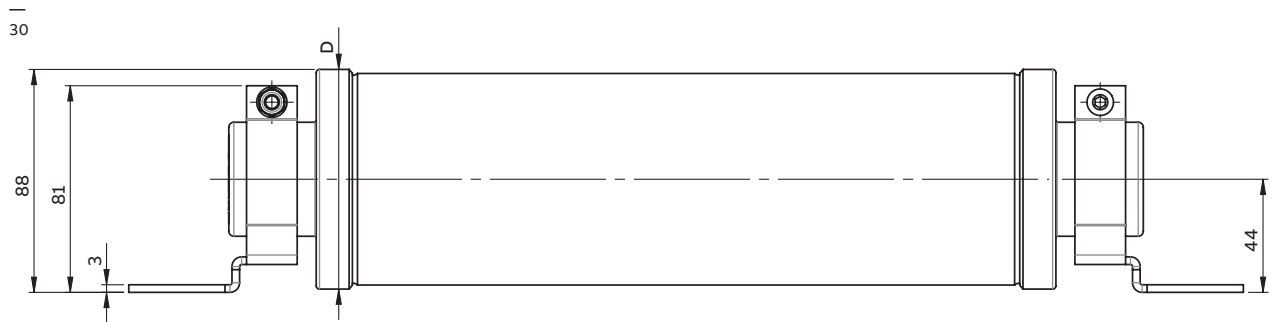
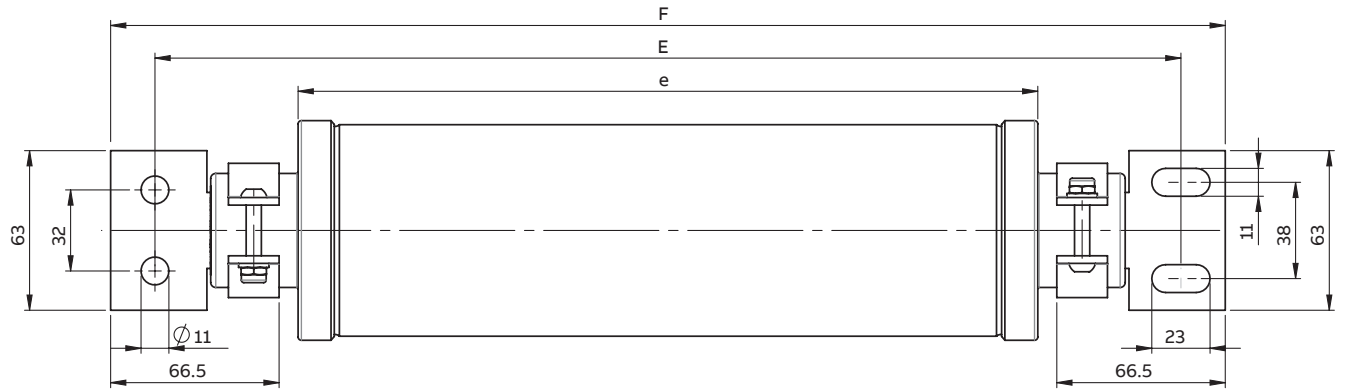
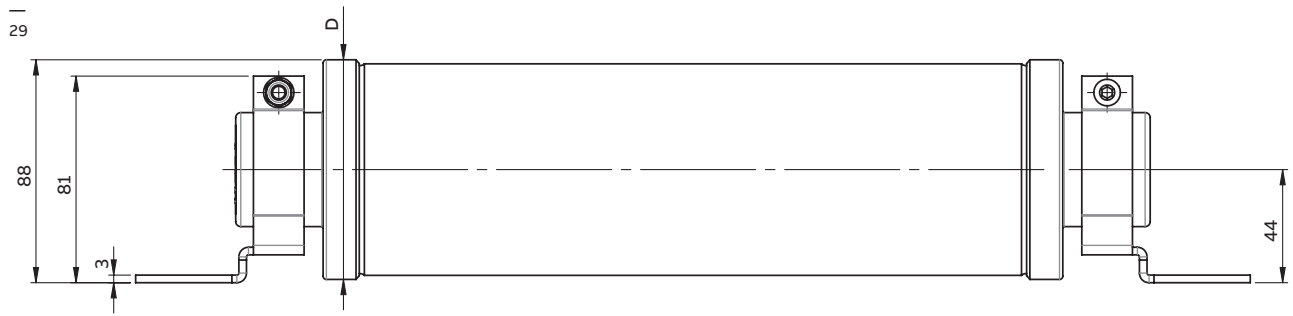
Outdoor sealing included in standard version, designed and tested for harsh conditions

Fuse-links type CMF-BS are designed to protect motor circuits against thermal and dynamic effects of short-circuit currents

Key features:

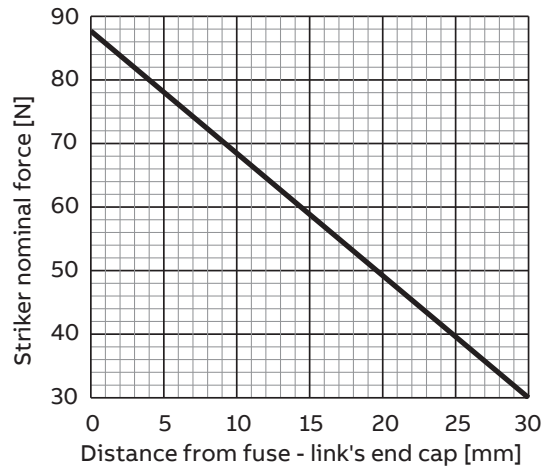
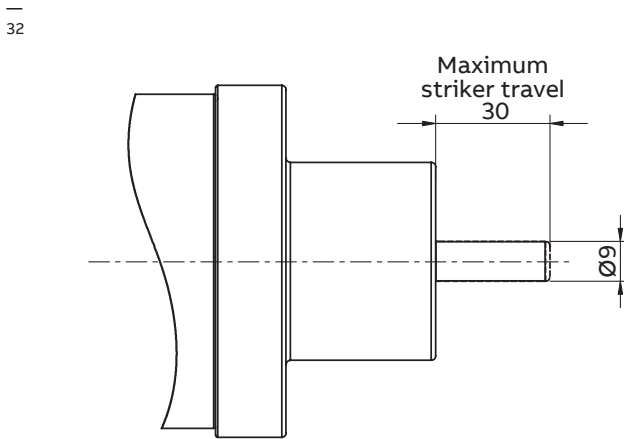
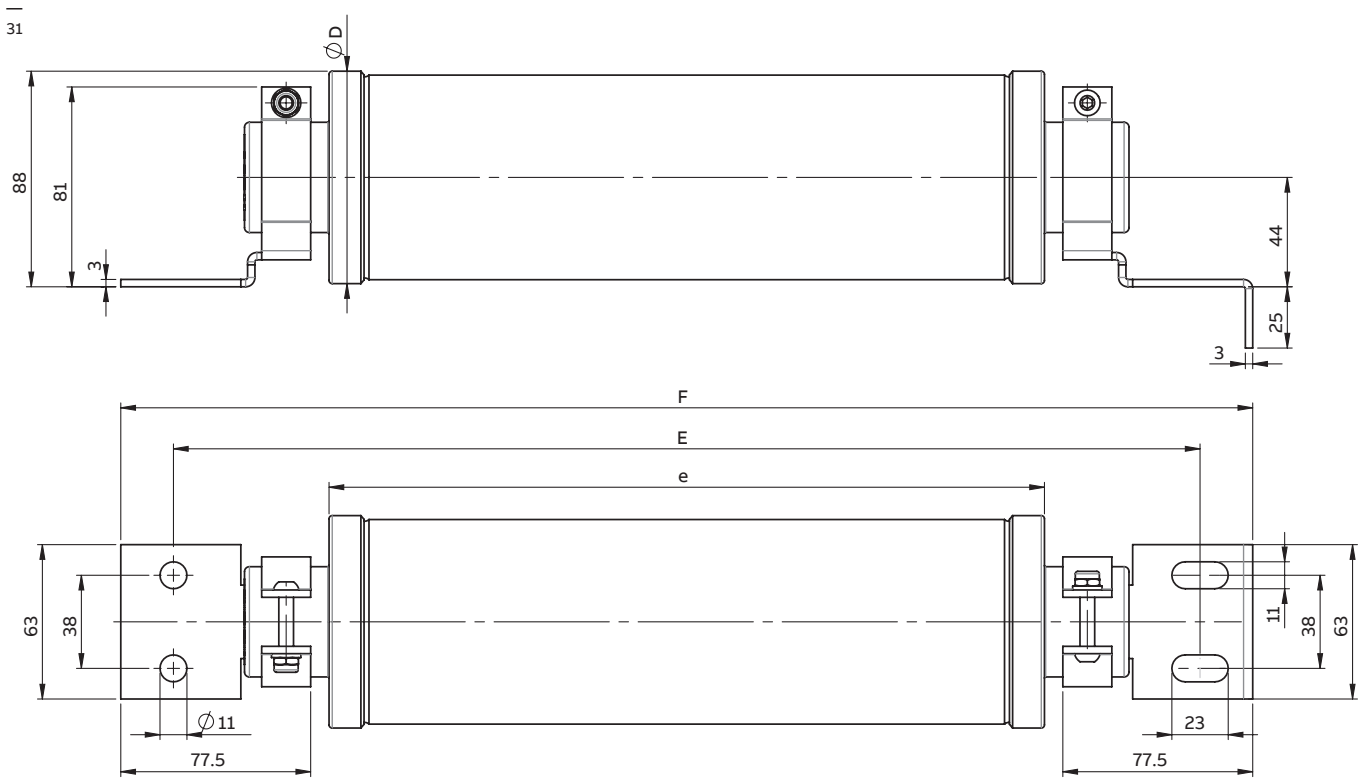
- Rated voltages up to 12 kV with rated currents of 63 A – 315 A

- Equipped with tags with mounting holes
- For indoor and outdoor applications
- Designed and type tested acc. to IEC 60282-1
- Striker 80 N (medium type)
- Equipped with Temperature Control Unit enabling the additional protection against thermal stresses in small enclosures



29
Dimensional drawing of
fuse-link type CMF-BS-B

30
Dimensional drawing of
fuse-link type CMF-BS-C



31
Dimensional drawing of
fuse-link type CMF-BS-D

32
Fuse-link striker force
and dimensions

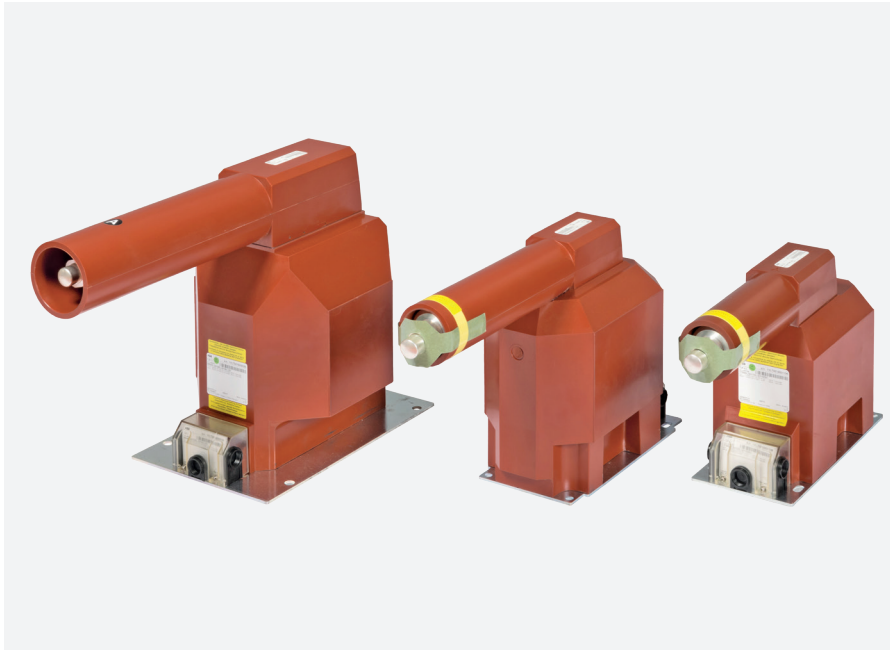
Ordering and technical table

Catalog number	Fuse name	Rated voltage U_r [kV]	Rated current I_r [A]	Rated frequency f_r [Hz]	Breaking capacity I_b [kA]	Minimal breaking current I_3 [A]	Diameter D [mm]	Length e [mm]	Length E [mm]	Length F [mm]	Rated power P_w [W]	Cold resistance [mΩ]	Pre-arcing integral [A ² s]	Total interrupting integral [A ² s]	Weight [kg]	EAN 13 Code
1YMB770333M2612	CMF-BS-B	3.6	100	50	63	275	65	292	400	435	41	3.2	14000	170000	2.5	5908270807518
1YMB770338M2612	CMF-BS-B	3.6	160	50	63	400	65	292	400	435	70	1.9	38000	500000	2.5	5908270807525
1YMB770339M2812	CMF-BS-B	3.6	200	50	63	500	87	292	400	435	78	1.4	76000	710000	3.8	5908270807532
1YMB770341M2812	CMF-BS-B	3.6	250	50	63	760	87	292	400	435	90	1	140000	1150000	3.8	5908270807549
1YMB770342M2812	CMF-BS-B	3.6	315	50	63	900	87	292	400	435	121	0.8	210000	1800000	3.8	5908270807556
1YMB770729M4612	CMF-BS-B	7.2	63	50	63	195	65	442	553	588	43	8.5	4800	65000	3.5	5908270807563
1YMB770733M4612	CMF-BS-B	7.2	100	50	63	275	65	442	553	588	64	4.9	14000	180000	3.5	5908270807570
1YMB770738M4612	CMF-BS-B	7.2	160	50	63	400	65	442	553	588	109	2.9	38000	540000	3.5	5908270807587
1YMB770739M4812	CMF-BS-B	7.2	200	50	63	500	87	442	553	588	122	2.1	76000	750000	5.5	5908270807594
1YMB770741M4812	CMF-BS-B	7.2	250	50	63	800	87	442	553	588	133	1.5	140000	1200000	5.5	5908270807600
1YMB770742M4812	CMF-BS-B	7.2	315	50	63	950	87	442	553	588	186	1.2	210000	2200000	5.5	5908270807617
1YMB771229M4612	CMF-BS-B	12	63	50	63	210	65	442	553	588	71	13.5	4800	110000	3.5	5908270807624
1YMB771233M4812	CMF-BS-B	12	100	50	63	275	87	442	553	588	88	6.6	14000	200000	5.5	5908270807631
1YMB771238M4812	CMF-BS-B	12	160	50	63	480	87	442	553	588	139	3.9	38000	700000	5.5	5908270807648
1YMB771239M4812	CMF-BS-B	12	200	50	63	700	87	442	553	588	166	2.7	93000	910000	5.5	5908270807655
1YMB780333M2612	CMF-BS-C	3.6	100	50	63	275	65	292	400	440	41	3.2	14000	170000	2.5	5908270807662
1YMB780338M2612	CMF-BS-C	3.6	160	50	63	400	65	292	400	440	70	1.9	38000	500000	2.5	5908270807679
1YMB780339M2812	CMF-BS-C	3.6	200	50	63	500	87	292	400	440	78	1.4	76000	710000	3.8	5908270807686
1YMB780341M2812	CMF-BS-C	3.6	250	50	63	760	87	292	400	440	90	1	140000	1150000	3.8	5908270807693
1YMB780342M2812	CMF-BS-C	3.6	315	50	63	900	87	292	400	440	121	0.8	210000	1800000	3.8	5908270807709
1YMB780729M4612	CMF-BS-C	7.2	63	50	63	195	65	442	553	593	43	8.5	4800	65000	3.5	5908270807716
1YMB780733M4612	CMF-BS-C	7.2	100	50	63	275	65	442	553	593	64	4.9	14000	180000	3.5	5908270807723
1YMB780738M4612	CMF-BS-C	7.2	160	50	63	400	65	442	553	593	109	2.9	38000	540000	3.5	5908270807730
1YMB780739M4812	CMF-BS-C	7.2	200	50	63	500	87	442	553	593	122	2.1	76000	750000	5.5	5908270807747
1YMB780741M4812	CMF-BS-C	7.2	250	50	63	800	87	442	553	593	133	1.5	140000	1200000	5.5	5908270807754
1YMB780742M4812	CMF-BS-C	7.2	315	50	63	950	87	442	553	593	186	1.2	210000	2200000	5.5	5908270807761
1YMB781229M4612	CMF-BS-C	12	63	50	63	210	65	442	553	593	71	13.5	4800	110000	3.5	5908270807778
1YMB781233M4812	CMF-BS-C	12	100	50	63	275	87	442	553	593	88	6.6	14000	200000	5.5	5908270807785
1YMB781238M4812	CMF-BS-C	12	160	50	63	480	87	442	553	593	139	3.9	38000	700000	5.5	5908270807792
1YMB781239M4812	CMF-BS-C	12	200	50	63	700	87	442	553	593	166	2.7	93000	910000	5.5	5908270807808
1YMB790333M2612	CMF-BS-D	3.6	100	50	63	275	65	292	419	462	41	3.2	14000	170000	2.5	5908270807815
1YMB790338M2612	CMF-BS-D	3.6	160	50	63	400	65	292	419	462	70	1.9	38000	500000	2.5	5908270807822
1YMB790339M2812	CMF-BS-D	3.6	200	50	63	500	87	292	419	462	78	1.4	76000	710000	3.8	5908270807839
1YMB790341M2812	CMF-BS-D	3.6	250	50	63	760	87	292	419	462	90	1	140000	1150000	3.8	5908270807846
1YMB790342M2812	CMF-BS-D	3.6	315	50	63	900	87	292	419	462	121	0.8	210000	1800000	3.8	5908270807853

Choice of fuse-links for motor protection – the same selection procedure applies as for CMF fuse-links, see page 34.

Time-current and cut-off current characteristic – the same characteristics apply as for the CMF fuse-links, presented on pages 36-39.

Fuse-links for voltage transformer protection



046 – 051 **CEF-VT** – Essential fuse-links for voltage transformer protection

052 – 058 **WBP** – Compact fuse-links for voltage transformer protection

CEF-VT

Essential fuse-links for voltage transformer protection

Class, type	Back-up, current limiting fuse-link
Rated voltages	3/7.2 kV - 10/24 kV
Rated currents	0.5 A – 6.3 A
Rated frequency	50 Hz
Applicable standard	IEC 60282-1
Application	Indoor/outdoor
Striker	Without / 80 N (medium), with integrated TCU



Efficient protection of voltage transformer circuits



Extending the lifetime of installed electrical equipment thanks to the limitation of the short-circuit current



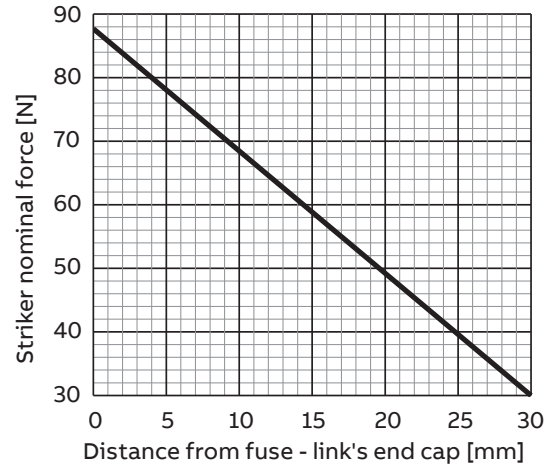
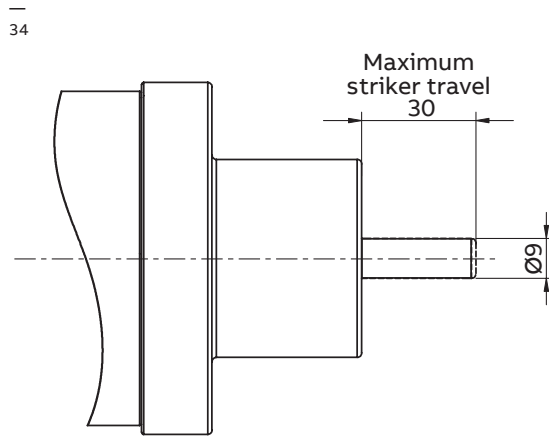
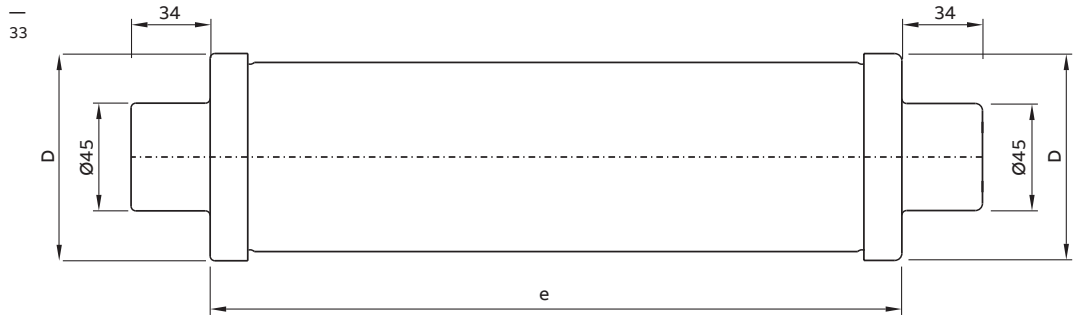
Outdoor sealing included in standard version, designed and tested for harsh conditions

CEF-VT fuses are designed for protection against faults in voltage transformer installation

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) / without striker
- Equipped with Temperature Control Unit enabling the additional protection against thermal stresses in small enclosures



33 Dimensional drawing of fuse-link type CEF-VT

34 Fuse-link striker force and dimensions (applies only for types with a striker)

Ordering and technical table

Catalog number	Fuse name	Striker force [N]	Rated voltage U_r [kV]	Rated current I_r [A]	Rated frequency f_r [Hz]	Breaking capacity I_b [kA]	Minimal breaking current I_3 [A]	Diameter D [mm]	Length e [mm]	Rated power P_w [W]	Cold resistance [mΩ]	Pre-arcing integral [A ² s]	Total interrupting integral [A ² s]	Weight [kg]	EAN 13 Code
1YMB750705M1502	CEF-VT	-	3/7.2	0.5	50	63	5	53	192	2	5957	0.05	1.4	1.2	5908270808577
1YMB750708M1502	CEF-VT	-	3/7.2	1	50	63	8	53	192	3	2149	0.09	2.4	1.2	5908270808584
1YMB750705M2502	CEF-VT	-	3/7.2	0.5	50	63	5	53	292	2	5957	0.05	1.4	1.6	5908270808591
1YMB750708M2502	CEF-VT	-	3/7.2	1	50	63	8	53	292	3	2149	0.09	2.4	1.6	5908270808607
1YMB751205M1502	CEF-VT	-	6/12	0.5	50	63	5	53	192	3	9660	0.02	0.3	1.2	5908270808614
1YMB751208M1502	CEF-VT	-	6/12	1	50	63	5	53	192	4.5	3485	0.01	0.9	1.2	5908270808621
1YMB751209M1512	CEF-VT	80	6/12	2	50	63	21	53	192	6.5	1311	1.8	377	1.2	5908270808638
1YMB751209M1502	CEF-VT	-	6/12	2	50	63	21	53	192	6.5	1607	1.8	377	1.2	5908270808645
1YMB751244M1512	CEF-VT	80	6/12	2.5	50	63	26	53	192	9.5	1100	0.67	149	1.2	5908270808652
1YMB751244M1502	CEF-VT	-	6/12	2.5	50	63	26	53	192	9.5	1317	0.67	149	1.2	5908270808669
1YMB751245M1512	CEF-VT	80	6/12	3.15	50	63	34	53	192	10.5	827	0.84	186	1.2	5908270808676
1YMB751245M1502	CEF-VT	-	6/12	3.15	50	63	34	53	192	10.5	951	0.84	186	1.2	5908270808683
1YMB751211M1512	CEF-VT	80	6/12	4	50	63	34	53	192	16	736	1.03	221	1.2	5908270808690
1YMB751211M1502	CEF-VT	-	6/12	4	50	63	34	53	192	16	835	1.03	221	1.2	5908270808706
1YMB751246M1512	CEF-VT	80	6/12	5	50	63	34	53	192	25.5	592	1.14	214	1.2	5908270808713
1YMB751246M1502	CEF-VT	-	6/12	5	50	63	34	53	192	25.5	659	1.14	214	1.2	5908270808720
1YMB751214M1512	CEF-VT	80	6/12	6.3	50	63	37	53	192	26	421	1.44	270	1.2	5908270808737
1YMB751214M1502	CEF-VT	-	6/12	6.3	50	63	37	53	192	26	458	1.44	270	1.2	5908270808744
1YMB751205M2502	CEF-VT	-	6/12	0.5	50	63	5	53	292	3	9660	0.02	0.3	1.6	5908270808751
1YMB751208M2502	CEF-VT	-	6/12	1	50	63	5	53	292	4.5	3485	0.01	0.9	1.6	5908270808768
1YMB751209M2512	CEF-VT	80	6/12	2	50	63	21	53	292	6.5	1311	1.8	377	1.6	5908270808775
1YMB751209M2502	CEF-VT	-	6/12	2	50	63	21	53	292	6.5	1607	1.8	377	1.6	5908270808782

Catalog number	Fuse name	Striker force [N]	Rated voltage U_r [kV]	Rated current I_r [A]	Rated frequency f_r [Hz]	Breaking capacity I_b [kA]	Minimal breaking current I_3 [A]	Diameter D [mm]	Length e [mm]	Rated power P_w [W]	Cold resistance [mΩ]	Pre-arcing integral [A ² s]	Total interrupting integral [A ² s]	Weight [kg]	EAN 13 Code
1YMB751244M2512	CEF-VT	80	6/12	2.5	50	63	26	53	292	9.5	1100	0.67	149	1.6	5908270808799
1YMB751244M2502	CEF-VT	-	6/12	2.5	50	63	26	53	292	9.5	1317	0.67	149	1.6	5908270808805
1YMB751245M2512	CEF-VT	80	6/12	3.15	50	63	34	53	292	10.5	827	0.84	186	1.6	5908270808812
1YMB751245M2502	CEF-VT	-	6/12	3.15	50	63	34	53	292	10.5	951	0.84	186	1.6	5908270808829
1YMB751211M2512	CEF-VT	80	6/12	4	50	63	34	53	292	16	736	1.03	221	1.6	5908270808836
1YMB751211M2502	CEF-VT	-	6/12	4	50	63	34	53	292	16	835	1.03	221	1.6	5908270808843
1YMB751246M2512	CEF-VT	80	6/12	5	50	63	34	53	292	25.5	592	1.14	214	1.6	5908270808850
1YMB751246M2502	CEF-VT	-	6/12	5	50	63	34	53	292	25.5	659	1.14	214	1.6	5908270808867
1YMB751214M2512	CEF-VT	80	6/12	6.3	50	63	37	53	292	26	421	1.44	270	1.6	5908270808874
1YMB751214M2502	CEF-VT	-	6/12	6.3	50	63	37	53	292	26	458	1.44	270	1.6	5908270808881
1YMB751705M1502	CEF-VT	-	10/17.5	0.5	50	63	5	53	192	4	12880	0.01	0.7	1.2	5908270808898
1YMB751708M1502	CEF-VT	-	10/17.5	1	50	63	8	53	192	5.5	4716	0.02	1.3	1.2	5908270808904
1YMB751709M1512	CEF-VT	80	10/17.5	2	50	63	24	53	192	9.5	1994	0.75	5.0	1.2	5908270808911
1YMB751709M1502	CEF-VT	-	10/17.5	2	50	63	24	53	192	9.5	2410	0.75	5.0	1.2	5908270808928
1YMB751744M1512	CEF-VT	80	10/17.5	2.5	50	63	24	53	192	13.5	1618	0.16	174	1.2	5908270808935
1YMB751744M1502	CEF-VT	-	10/17.5	2.5	50	63	24	53	192	13.5	1882	0.16	174	1.2	5908270808942
1YMB751745M1512	CEF-VT	80	10/17.5	3.15	50	63	31	53	192	15.5	1174	0.2	218	1.2	5908270808959
1YMB751745M1502	CEF-VT	-	10/17.5	3.15	50	63	31	53	192	15.5	1307	0.2	218	1.2	5908270808966
1YMB751711M1512	CEF-VT	80	10/17.5	4	50	63	31	53	192	23	1063	0.16	170	1.2	5908270808973
1YMB751711M1502	CEF-VT	-	10/17.5	4	50	63	31	53	192	23	1171	0.16	170	1.2	5908270808980
1YMB751746M1512	CEF-VT	80	10/17.5	5	50	63	31	53	192	31.5	870	0.05	457	1.2	5908270808997
1YMB751746M1502	CEF-VT	-	10/17.5	5	50	63	31	53	192	31.5	941	0.05	457	1.2	5908270809000
1YMB751714M1512	CEF-VT	80	10/17.5	6.3	50	63	37	53	192	38	619	0.06	571	1.2	5908270809017
1YMB751714M1502	CEF-VT	-	10/17.5	6.3	50	63	37	53	192	38	654	0.06	571	1.2	5908270809024
1YMB751705M2502	CEF-VT	-	10/17.5	0.5	50	63	5	53	292	4	12880	0.01	0.7	1.6	5908270809031
1YMB751708M2502	CEF-VT	-	10/17.5	1	50	63	8	53	292	5.5	4716	0.02	1.3	1.6	5908270809048
1YMB751709M2512	CEF-VT	80	10/17.5	2	50	63	24	53	292	9.5	1994	0.75	5.0	1.6	5908270809055
1YMB751709M2502	CEF-VT	-	10/17.5	2	50	63	24	53	292	9.5	2410	0.75	5.0	1.6	5908270809062
1YMB751744M2512	CEF-VT	80	10/17.5	2.5	50	63	24	53	292	13.5	1618	0.16	174	1.6	5908270809079
1YMB751744M2502	CEF-VT	-	10/17.5	2.5	50	63	24	53	292	13.5	1882	0.16	174	1.6	5908270809086
1YMB751745M2512	CEF-VT	80	10/17.5	3.15	50	63	31	53	292	15.5	1174	0.2	218	1.6	5908270809093
1YMB751745M2502	CEF-VT	-	10/17.5	3.15	50	63	31	53	292	15.5	1307	0.2	218	1.6	5908270809109
1YMB751711M2512	CEF-VT	80	10/17.5	4	50	63	31	53	292	23	1063	0.16	170	1.6	5908270809116
1YMB751711M2502	CEF-VT	-	10/17.5	4	50	63	31	53	292	23	1171	0.16	170	1.6	5908270809123
1YMB751746M2512	CEF-VT	80	10/17.5	5	50	63	31	53	292	31.5	870	0.05	457	1.6	5908270809130
1YMB751746M2502	CEF-VT	-	10/17.5	5	50	63	31	53	292	31.5	941	0.05	457	1.6	5908270809147
1YMB751714M2512	CEF-VT	80	10/17.5	6.3	50	63	37	53	292	38	619	0.06	571	1.6	5908270809154
1YMB751714M2502	CEF-VT	-	10/17.5	6.3	50	63	37	53	292	38	654	0.06	571	1.6	5908270809161
1YMB752405M2502	CEF-VT	-	10/24	0.5	50	63	5	53	292	5	17709	0.01	0.3	1.6	5908270809178
1YMB752408M2502	CEF-VT	-	10/24	1	50	63	8	53	292	8	6389	0.01	0.9	1.6	5908270809185
1YMB752409M2512	CEF-VT	80	10/24	2	50	63	25	53	292	12	2568	1.23	139	1.6	5908270809192
1YMB752409M2502	CEF-VT	-	10/24	2	50	63	25	53	292	12	2962	1.23	139	1.6	5908270809208
1YMB752444M2512	CEF-VT	80	10/24	2.5	50	63	25	53	292	16.5	2138	3.44	98	1.6	5908270809215
1YMB752444M2502	CEF-VT	-	10/24	2.5	50	63	25	53	292	16.5	2404	3.44	98	1.6	5908270809222
1YMB752445M2512	CEF-VT	80	10/24	3.15	50	63	30	53	292	19	1537	4.3	123	1.6	5908270809239
1YMB752445M2502	CEF-VT	-	10/24	3.15	50	63	30	53	292	19	1670	4.3	123	1.6	5908270809246

Catalog number	Fuse name	Striker force [N]	Rated voltage U_r [kV]	Rated current I_r [A]	Rated frequency f_r [Hz]	Breaking capacity I_b [kA]	Minimal breaking current I_3 [A]	Diameter D [mm]	Length e [mm]	Rated power P_w [W]	Cold resistance [mΩ]	Pre-arcing integral [A ² s]	Total interrupting integral [A ² s]	Weight [kg]	EAN 13 Code
1YMB752411M2512	CEF-VT	80	10/24	4	50	63	31	53	292	29.5	1375	2	140	1.6	5908270809253
1YMB752411M2502	CEF-VT	-	10/24	4	50	63	31	53	292	29.5	1481	2	140	1.6	5908270809260
1YMB752446M2512	CEF-VT	80	10/24	5	50	63	31	53	292	39	1132	1.54	221	1.6	5908270809277
1YMB752446M2502	CEF-VT	-	10/24	5	50	63	31	53	292	39	1202	1.54	221	1.6	5908270809284
1YMB752414M2512	CEF-VT	80	10/24	6.3	50	63	36	53	292	46	801	1.92	276	1.6	5908270809291
1YMB752414M2502	CEF-VT	-	10/24	6.3	50	63	36	53	292	46	835	1.92	276	1.6	5908270809307
1YMB752405M4502	CEF-VT	-	10/24	0.5	50	63	5	53	442	5	17709	0.01	0.3	2.3	5908270809314
1YMB752408M4502	CEF-VT	-	10/24	1	50	63	8	53	442	8	6389	0.01	0.9	2.3	5908270809321
1YMB752409M4512	CEF-VT	80	10/24	2	50	63	25	53	442	12	2568	1.23	139	2.3	5908270806528
1YMB752409M4502	CEF-VT	-	10/24	2	50	63	25	53	442	12	2962	1.23	139	2.3	5908270809338
1YMB752444M4512	CEF-VT	80	10/24	2.5	50	63	25	53	442	16.5	2138	3.44	98	2.3	5908270809345
1YMB752444M4502	CEF-VT	-	10/24	2.5	50	63	25	53	442	16.5	2404	3.44	98	2.3	5908270809352
1YMB752445M4512	CEF-VT	80	10/24	3.15	50	63	30	53	442	19	1537	4.3	123	2.3	5908270809369
1YMB752445M4502	CEF-VT	-	10/24	3.15	50	63	30	53	442	19	1670	4.3	123	2.3	5908270809376
1YMB752411M4512	CEF-VT	80	10/24	4	50	63	31	53	442	29.5	1375	2	140	2.3	5908270806535
1YMB752411M4502	CEF-VT	-	10/24	4	50	63	31	53	442	29.5	1481	2	140	2.3	5908270809383
1YMB752446M4512	CEF-VT	80	10/24	5	50	63	31	53	442	39	1132	1.54	221	2.3	5908270809390
1YMB752446M4502	CEF-VT	-	10/24	5	50	63	31	53	442	39	1202	1.54	221	2.3	5908270809406
1YMB752414M4512	CEF-VT	80	10/24	6.3	50	63	36	53	442	46	801	1.92	276	2.3	5908270809413
1YMB752414M4502	CEF-VT	-	10/24	6.3	50	63	36	53	442	46	835	1.92	276	2.3	5908270809420

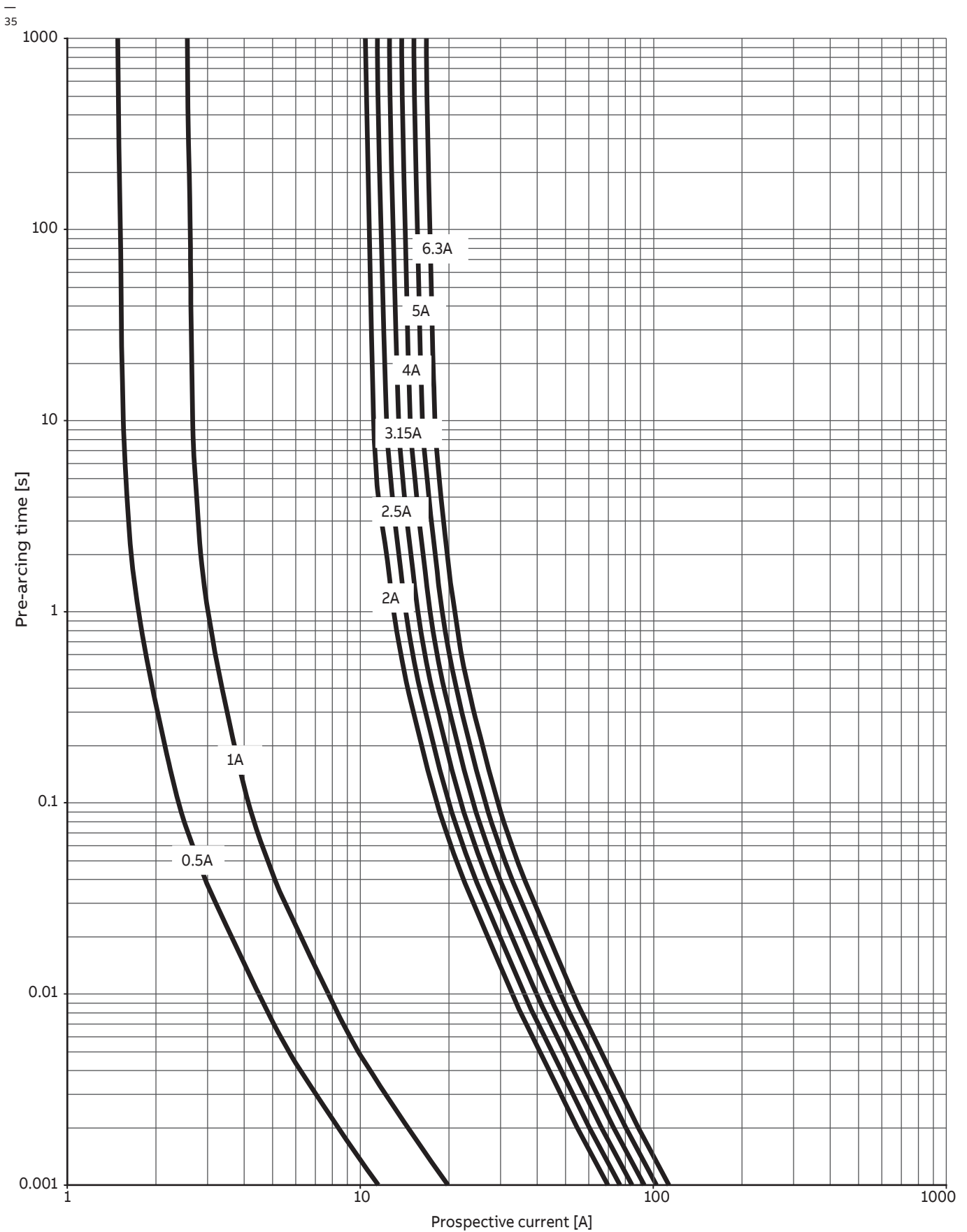
Choice of fuse-links for voltage transformer protection:

Rated voltage U_r – should be equal to or higher than the maximum operating system voltage.

Rated current I_r – should be higher than the maximum continuous current of the voltage transformer.

The following points should be observed:

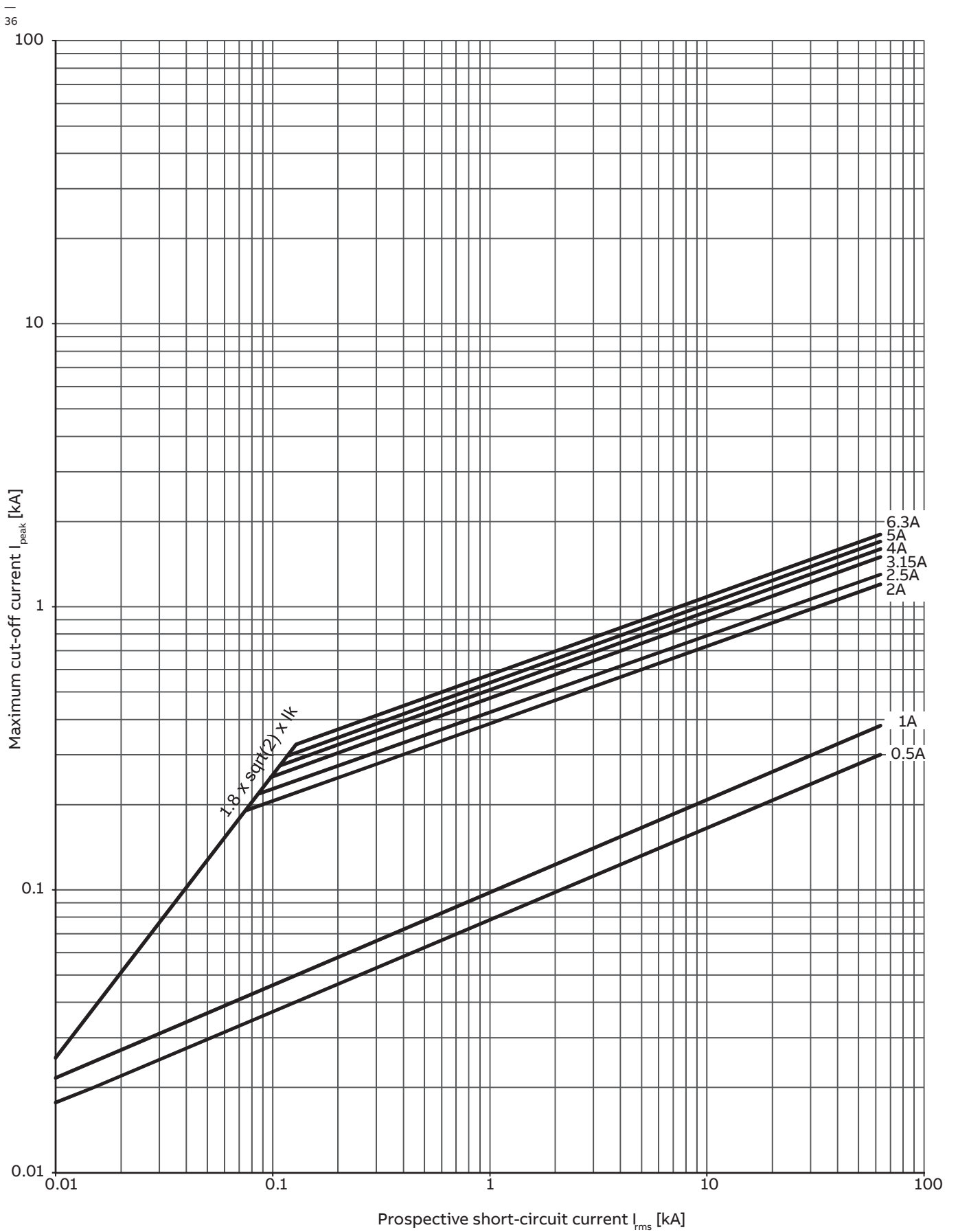
- Initial starting current of voltage transformer, energizing and operations of installed switching apparatus should not cause fuse tripping under normal working conditions
- Rated breaking capacity of the fuse-links should be higher than the prospective value of the short-circuit in its place of installation
- The ability of the electrical system (switchgear) to withstand impulses should exceed the switching overvoltages generated by the fuse-links



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35
CEF-VT 3/7.2 kV;
6/12 kV; 10/17.5 kV;
10/24 kV time-current
characteristics

Characteristic show the average melting time as a function of the prospective current and are recorded from cold condition of fuse-link. The

tolerance is ± 20% referred to the current for single fuses. Characteristics are valid for frequency 50 Hz



36
 CEF-VT 3/7.2 kV;
 6/12kV; 10/17.5 kV;
 10/24 kV cut-off current characteristics

Characteristics show the upper limit of the cut-off current corresponding to a prospective short-circuit current.

Characteristics are valid for frequency 50Hz.

WBP

Compact fuse-links for voltage transformer protection

Class, type	Back-up, current limiting fuse-link
Rated voltages	3 kV - 40.5 kV
Rated currents	0.4 A - 4 A
Rated frequency	50 Hz
Applicable standard	IEC 60282-1
Application	Indoor
Striker	Without



Safe operation of electrical circuit with voltage transformers



Reduce cost of service due to extended lifetime of related electrical equipment by effective limitation of short-circuit currents



Easier handling thanks to a more durable design comparing to previous generation

Fuse-links type WBP are designed for efficient protection of the circuit from faults in voltage transformers (potential transformers)

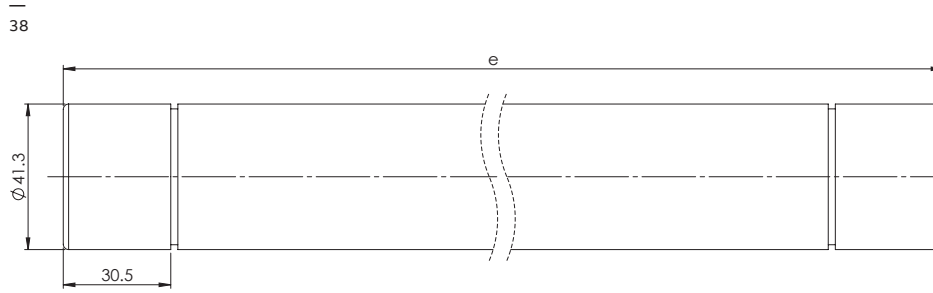
Key features:

- Designed and type tested acc. to IEC 60282-1
- Low power losses, generating additional savings during product life-cycle
- Designed for indoor applications
- Compact dimensions
- More durable design comparing to previous generation, with the use of porcelain tube
- Top level fault current limitation and interruption performance up to 63kA RMS
- Welded current path
- Contacts made from silver coated copper
- Compatible with ABB voltage transformers type TJC, TDC and other types with suitable fuse holders

37
Dimensional drawing of fuse-link type WBP 7.2 kV – 36 kV



38
Dimensional drawing of fuse-link type WBP 40.5 kV



Ordering and technical table

Catalog number	Fuse name	Rated voltage U_r [kV]	Rated current I_r [A]	Rated frequency f_r [Hz]	Breaking capacity I_b [kA]	Minimal breaking current I_3 [A]	Diameter D [mm]	Length e [mm]	Rated power P_w [W]	Cold resistance [mΩ]	Pre-arcing integral [A ² s]	Total interrupting integral [A ² s]	Weight [kg]	EAN 13 Code
1YMB750705M2202	WBP	7.2	0.5	50	63	5	23	210	2	6057	0.05	1.36	0.2	5908270809451
1YMB750708M2202	WBP	7.2	1	50	63	8	23	210	3.3	2185	0.09	2.42	0.2	5908270809468
1YMB750709M2202	WBP	7.2	2	50	63	16	23	210	5.2	969	0.325	8.35	0.2	5908270809475
1YMB750745M2202	WBP	7.2	3.15	50	63	16	23	210	7.6	546	1.23	16.3	0.2	5908270809482
1YMB751205M2202	WBP	12	0.5	50	63	5	23	250	3.3	9564	0.05	1.36	0.3	5908270809499
1YMB751208M2202	WBP	12	1	50	63	8	23	250	4.4	3451	0.09	2.42	0.3	5908270809505
1YMB751209M2202	WBP	12	2	50	63	16	23	250	8.3	1530	0.325	8.35	0.3	5908270809512
1YMB751245M2202	WBP	12	3.15	50	63	16	23	250	9.5	863	1.23	16.3	0.3	5908270809529
1YMB752405M3202	WBP	24	0.5	50	63	5	23	310	5.9	17534	0.05	1.36	0.3	5908270809536
1YMB752408M3202	WBP	24	1	50	63	8	23	310	8.4	6614	0.09	2.42	0.3	5908270809543
1YMB752409M3202	WBP	24	2	50	63	16	23	310	11.5	2933	0.325	8.35	0.3	5908270809550
1YMB752445M3202	WBP	24	3.15	50	63	24	23	310	21.2	1654	1.23	16.3	0.3	5908270809567
1YMB753605M3202	WBP	36	0.5	50	40	10	23	385	1.9	6074	0.02	1.85	0.4	5908270809574
1YMB753608M3202	WBP	36	1	50	40	10	23	385	6	4727	0.1	2.82	0.4	5908270809581
1YMB753609M3202	WBP	36	2	50	40	24	23	385	26.6	4208	0.325	8.35	0.4	5908270809598
1YMB753645M3202	WBP	36	3.15	50	40	24	23	385	39	2373	1.23	16.3	0.4	5908270809604
1YMB754009M4402	WBP	40.5	2	50	40	14	41.3	440	26.8	4845	0.325	8.35	1.3	5908270809611
1YMB754011M4402	WBP	40.5	4	50	40	30	41.3	440	38.4	2423	0.65	16.7	1.3	5908270809628
1YMB750747M2201	WBP-6	7.2	0.7	50	63	8	23	210	2.2	2185	0.09	2.42	0.2	5908270809635
1YMB751206M2201	WBP-10	12	0.6	50	63	8	23	250	3.1	3451	0.09	2.42	0.3	5908270809642
1YMB752405M3201	WBP-20	24	0.5	50	63	5	23	310	5.9	17534	0.05	1.36	0.3	5908270809659
1YMB753604M3201	WBP-30	36	0.4	50	40	10	23	385	1.7	6074	0.02	1.85	0.4	5908270809666

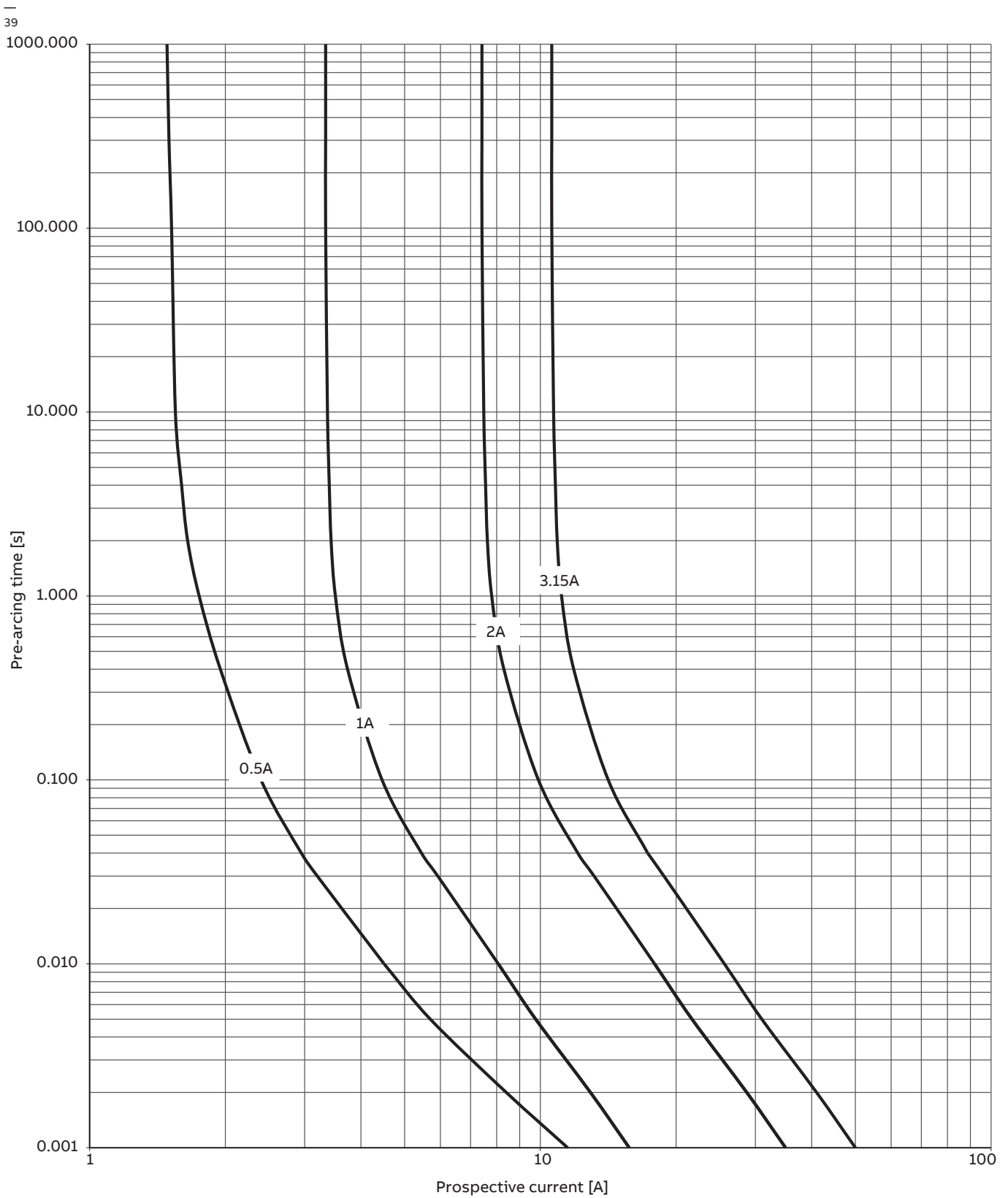
Choice of fuse-links for voltage transformer protection:

Rated voltage U_r - should be equal to or higher than the maximum operating system voltage

Rated current I_r - should be higher than the maximum continuous current of the voltage transformer

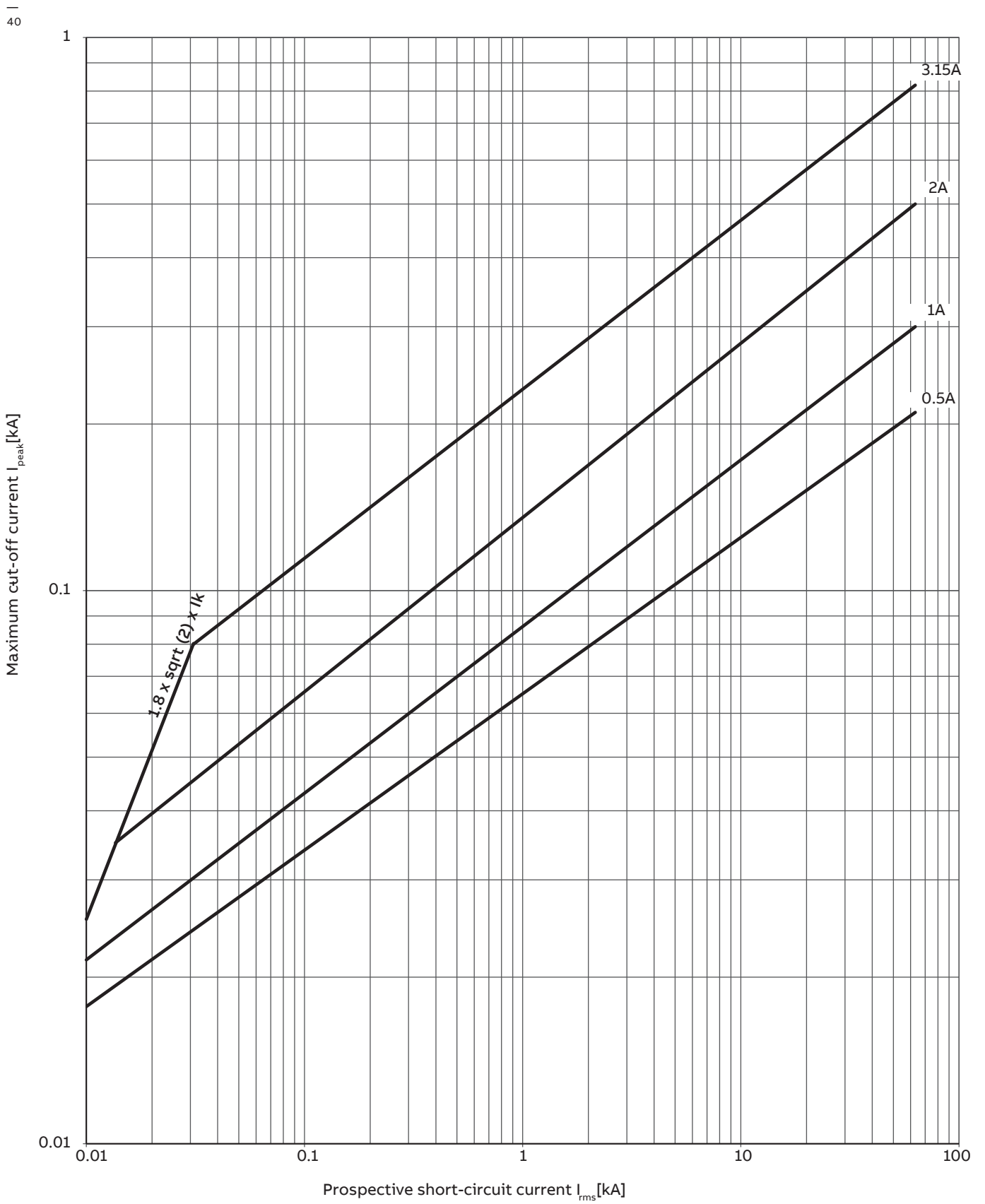
The following points should be observed:

- Initial starting current of voltage transformer, energizing and operations of installed switching apparatus should not cause fuse tripping under normal working conditions
- Rated breaking capacity of the fuse-links should be higher than the prospective value of the short-circuit in its place of installation
- The ability of the electrical system (switchgear) to withstand impulses should exceed the switching overvoltages generated by the fuse-links



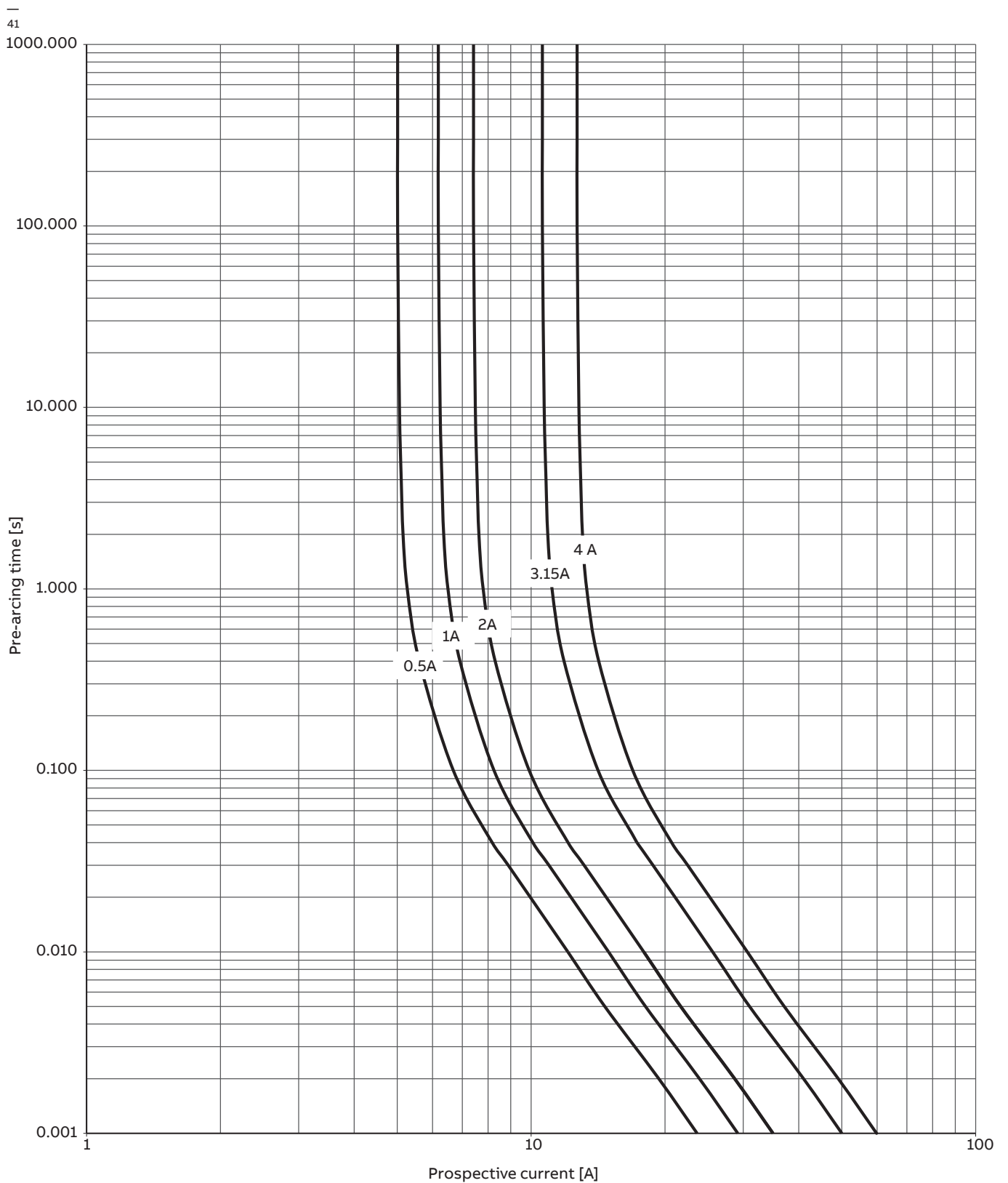
Characteristic show the average melting time as a function of the prospective current and are recorded from cold condition of fuse-link.

The tolerance is $\pm 20\%$ referred to the current for single fuses. Characteristics are valid for frequency 50 Hz



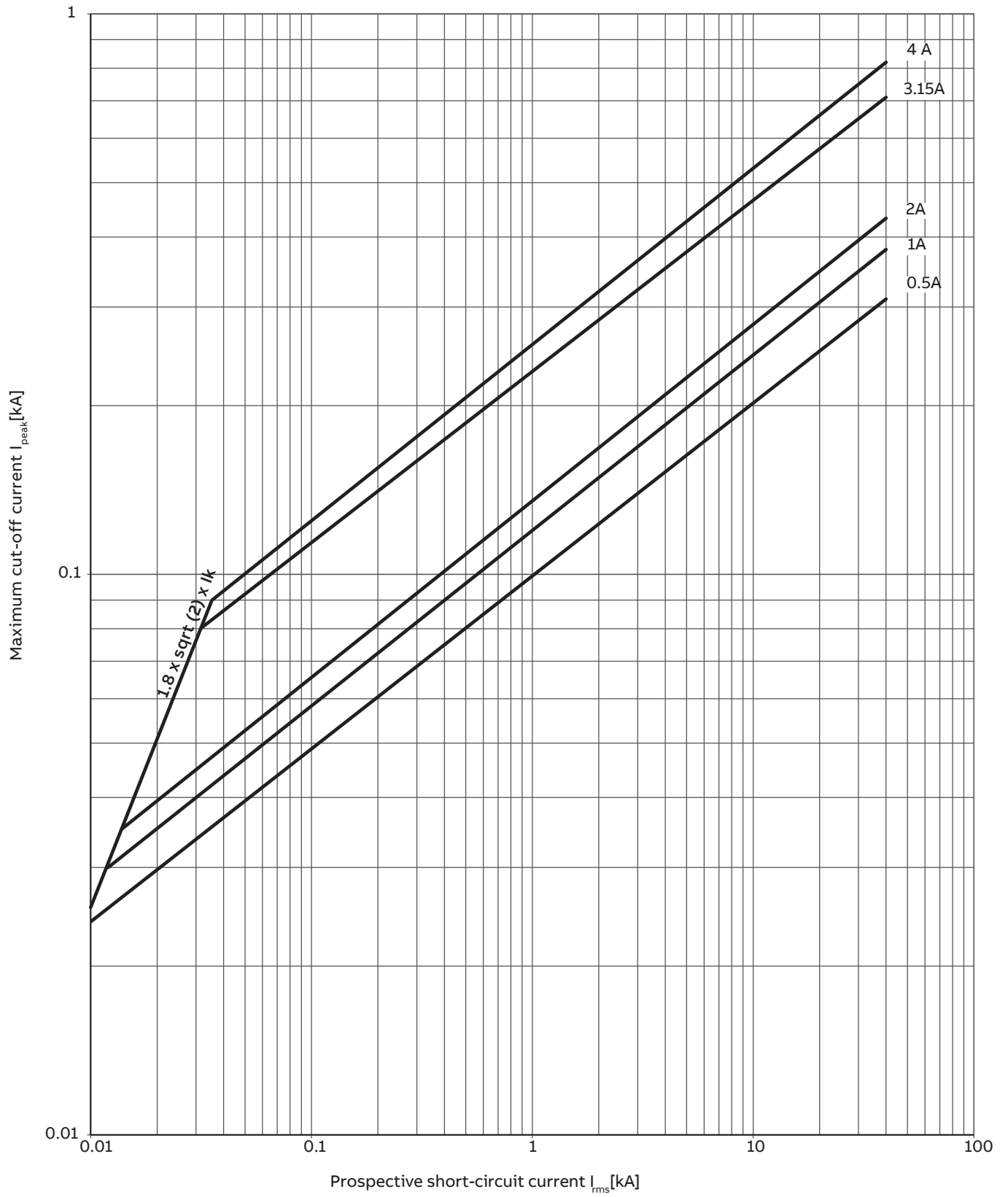
Characteristics show the cut-off current corresponding to a prospective short-circuit current.

Characteristics are valid for frequency 50Hz.



Characteristic show the average melting time as a function of the prospective current and are recorded from cold condition of fuse-link.

The tolerance is $\pm 20\%$ referred to the current for single fuses. Characteristics are valid for frequency 50 HZ



Characteristics show the cut-off current corresponding to a prospective short-circuit current.

Characteristics are valid for frequency 50Hz.

Fuse-bases and accessories



- 062 – 063** **UCE-NI** – Indoor fuse-bases for CEF, CEF-S, CEF-VT, CMF fuse-links
- 064 – 066** **BWMPNS** and **BWMPNW** – Outdoor fuse-bases for CEF, CEF-S, CEF-VT, CMF fuse-links
- 067 – 069** **PBPM** – Indoor fuse-bases for WBP fuse-links
- 070 – 074** **Accessories** – Accessories for fuse-links and fuse-bases

UCE-NI

Indoor fuse-bases for CEF, CEF-S, CEF-VT, CMF fuse-links

Application	Indoor fuse-base
Rated voltages	12 kV – 36 kV
Rated currents	200 A, 315 A
Rated frequency	50 Hz – 60 Hz
Compatible fuse-links	CEF, CEF-S, CEF-VT, CMF



Suitable for all types of DIN-size fuse-links



Reliable operation guaranteed by proven design



Firm connection with fuse-link secured by locks, allowing any mounting position

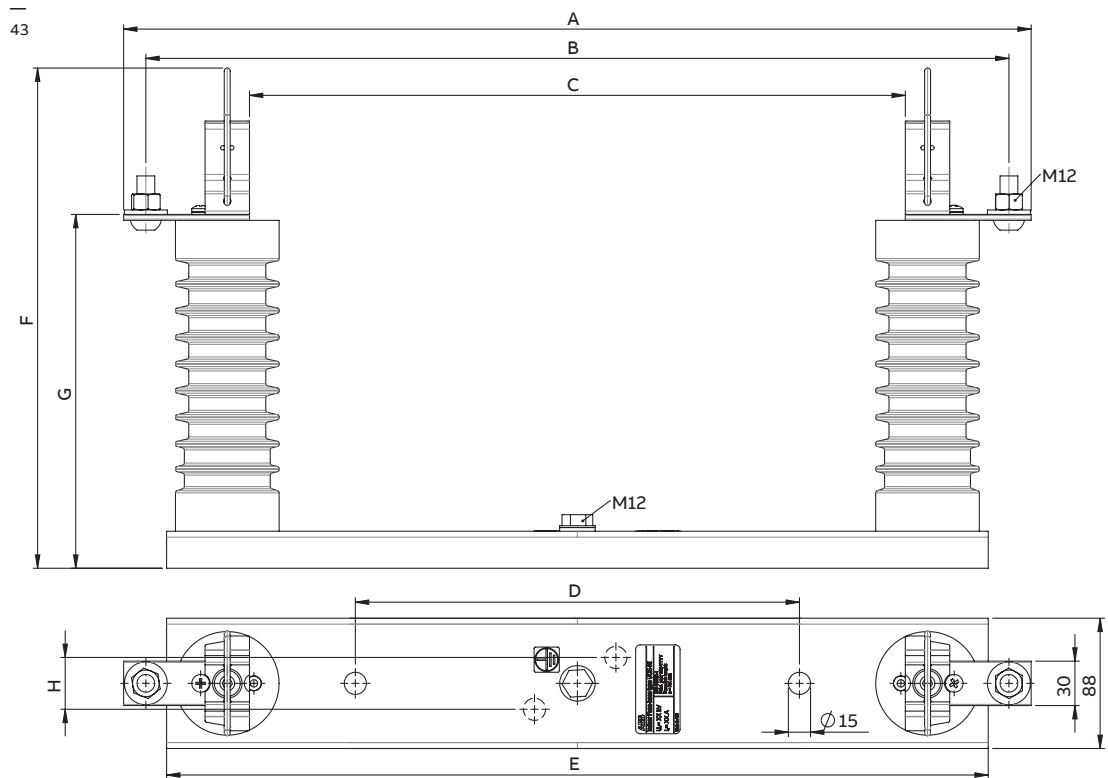
Fuse-bases type UCE-NI are designed for securing fuse-links in indoor application

Key features:

- Rated voltage 12 kV – 36 kV
- Rated current up to 315 A
- Type tested acc. to IEC 60282-1
- Silver coated contacts

Ordering table of fuse-bases UCE-NI

Catalog number	Type	Rated voltage [kV]	Rated current [A]	Fuse length e [mm]	Lightning impulse withstand voltage [kV]		Power-frequency withstand voltage [kV]		Weight [kg]	EAN 13 Code
					To earth and between poles	Across the isolating distance	To earth and between poles	Across the isolating distance		
1YMB333101M0001	UCE-NI	12	250	192	75	85	28	32	3	5908270808249
1YMB333101M0002	UCE-NI	12	250	292	75	85	28	32	3.3	5908270808256
1YMB333101M0003	UCE-NI	12	250	367	75	85	28	32	3.5	5908270808263
1YMB333101M0004	UCE-NI	12	250	442	75	85	28	32	3.7	5908270808270
1YMB333101M0005	UCE-NI	12	250	537	75	85	28	32	4	5908270808287
1YMB333101M0014	UCE-NI	12	315	292	75	85	28	32	3.4	5908270808379
1YMB333101M0015	UCE-NI	12	315	442	75	85	28	32	3.8	5908270808386
1YMB333101M0006	UCE-NI	17.5	250	192	95	110	38	45	4.2	5908270808294
1YMB333101M0007	UCE-NI	24	250	292	125	145	50	60	4.5	5908270808300
1YMB333101M0008	UCE-NI	24	250	367	125	145	50	60	4.7	5908270808317
1YMB333101M0009	UCE-NI	24	250	442	125	145	50	60	4.9	5908270808324
1YMB333101M0010	UCE-NI	24	250	537	125	145	50	60	5.2	5908270808331
1YMB333101M0011	UCE-NI	25.8	250	292	170	195	70	80	6.3	5908270808348
1YMB333101M0012	UCE-NI	36	250	442	170	195	70	80	6.7	5908270808355
1YMB333101M0013	UCE-NI	36	250	537	170	195	70	80	7	5908270808362



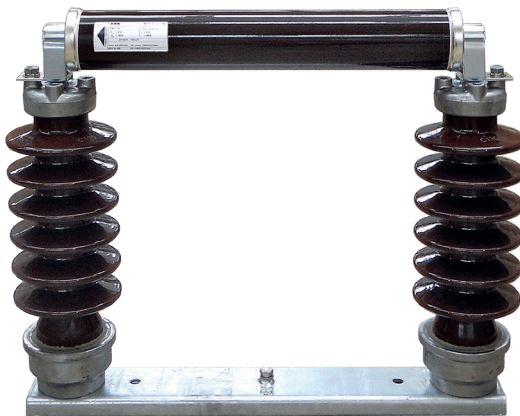
Dimensions of indoor fuse-base type UCE-NI.

Type	U _r [kV]	e [mm]	Dimensions in mm ± 3%							
			A	B	C	D	E	F	G	H
UCE-NI	12	192	363	333	193	55	305	258	159	35
UCE-NI	12	292	463	433	293	180	405	258	159	-
UCE-NI	12	367	538	508	368	180	480	258	159	-
UCE-NI	12	442	613	583	443	300	555	258	159	-
UCE-NI	12	537	708	678	538	380	650	258	159	-
UCE-NI	17.5	192	363	333	193	55	305	338	239	35
UCE-NI	24	292	463	433	293	180	405	338	239	-
UCE-NI	24	367	538	508	368	180	480	338	239	-
UCE-NI	24	442	613	583	443	300	555	338	239	-
UCE-NI	24	537	708	678	538	380	650	338	239	-
UCE-NI	25.8	292	463	433	293	180	405	428	329	-
UCE-NI	36	442	613	583	443	300	555	428	329	-
UCE-NI	36	537	708	678	538	380	650	428	329	-

BWMPNS and BWMPNW

Outdoor fuse-bases for CEF, CEF-S, CEF-VT, CMF fuse-links

Application	Outdoor fuse-base
Rated voltages	12 kV – 36 kV
Rated currents	200 A
Rated frequency	50 Hz – 60 Hz
Compatible fuse-links	CEF, CEF-S, CEF-VT, CMF



Suitable for all types of DIN-size fuse-links



Reliable operation guaranteed by proven design



Flexibility in mounting position

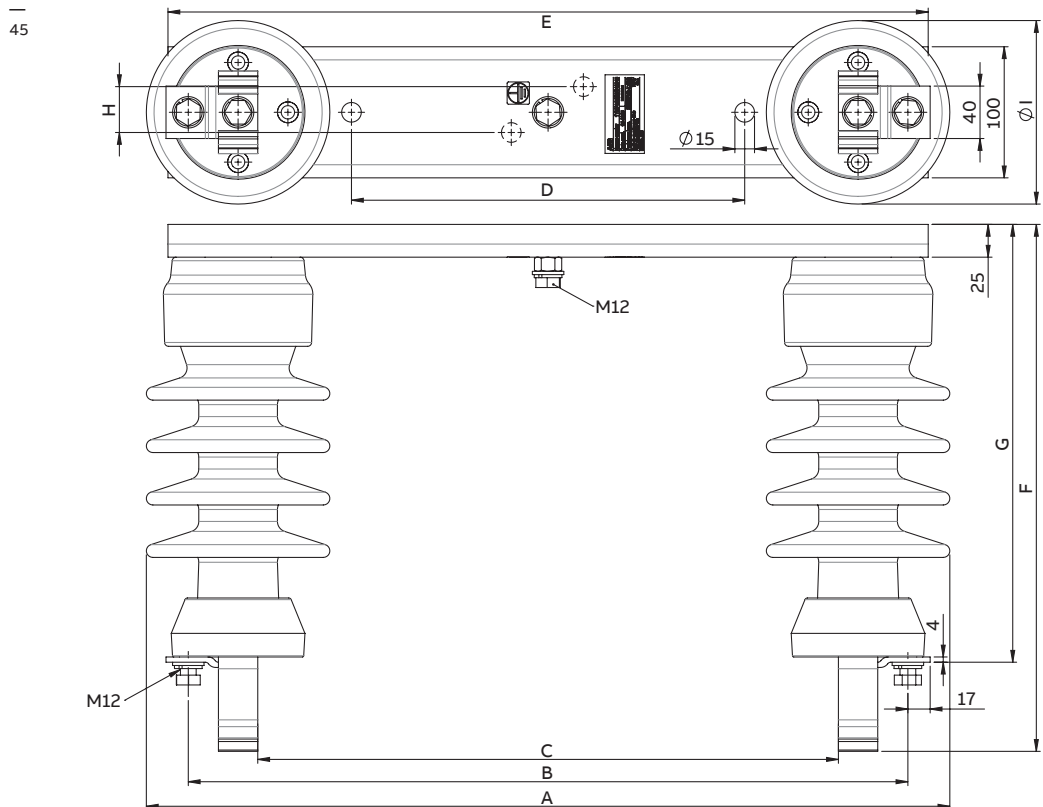
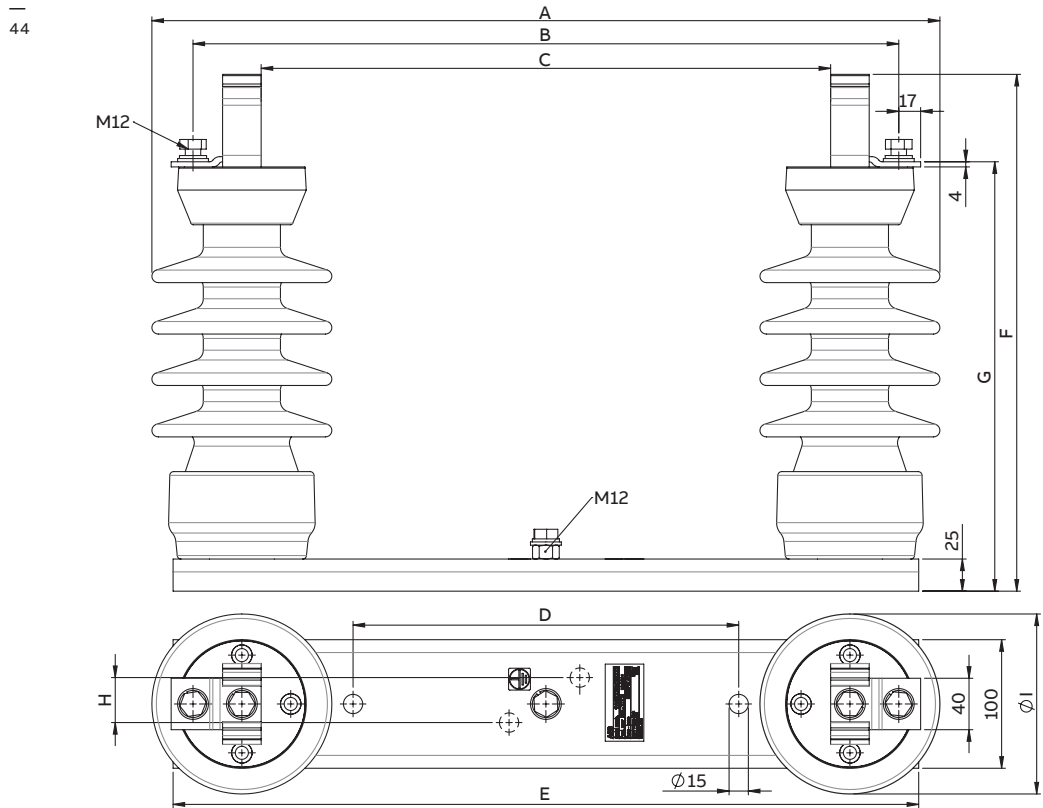
Fuse-bases type BWMPNS and BWMPNW are designed for securing fuse-links in outdoor application

Key features:

- Rated voltage 12 – 36 kV
- Rated current 200 A
- Type tested acc. to IEC 60282-1
- Silver coated contacts

Ordering table of fuse-bases BWMPNS and BWMPNW

Catalog number	Type	Fixing position	Rated voltage [kV]	Rated current [A]	Fuse length e [mm]	Lightning impulse withstand voltage [kV]		Power-frequency withstand voltage [kV]		Weight [kg]	EAN 13 Code
						To earth and between poles	Across the isolating distance	To earth and between poles	Across the isolating distance		
1YMB220101M0001	BWMPNS	Horizontal/ Vertical	7.2	200	192	60	70	23	28	10	5908270801820
1YMB220101M0003	BWMPNS	Horizontal/ Vertical	7.2	200	442	60	70	23	28	10.8	5908270801837
1YMB220102M0002	BWMPNS	Horizontal/ Vertical	12	200	292	75	85	42	48	10.3	5908270801882
1YMB220101M0004	BWMPNS	Horizontal/ Vertical	12	200	537	75	85	42	48	11.3	5908270801844
1YMB220101M0005	BWMPNS	Horizontal/ Vertical	24	200	442	125	145	50	60	17.6	5908270801851
1YMB220101M0006	BWMPNS	Horizontal/ Vertical	24	200	537	125	145	50	60	18.1	5908270801868
1YMB220101M0007	BWMPNS	Horizontal/ Vertical	36	200	537	170	195	70	80	27.4	5908270801875
1YMB211101M0001	BWMPNW	Horizontal upside down/Vertical	7.2	200	192	60	70	23	28	10	5908270805101
1YMB211101M0003	BWMPNW	Horizontal upside down/Vertical	7.2	200	442	60	70	23	28	10.8	5908270805125
1YMB211101M0002	BWMPNW	Horizontal upside down/Vertical	12	200	292	75	85	42	48	10.3	5908270805118
1YMB211101M0004	BWMPNW	Horizontal upside down/Vertical	12	200	537	75	85	42	48	11.3	5908270801783
1YMB211101M0005	BWMPNW	Horizontal upside down/Vertical	24	200	442	125	145	50	60	17.6	5908270801790
1YMB211101M0006	BWMPNW	Horizontal upside down/Vertical	24	200	537	125	145	50	60	18.1	5908270801806
1YMB211101M0007	BWMPNW	Horizontal upside down/Vertical	36	200	537	170	195	70	80	27.4	5908270801813



Type	U _r [kV]	e [mm]	Dimensions in mm ± 3%								
			A	B	C	D	E	F	G	H	I
BWMPNS/BWMPNW	7.2	192	363	299	193	55	330	312	244	35	140
BWMPNS/BWMPNW	7.2	442	613	549	443	300	580	312	244	-	140
BWMPNS/BWMPNW	12	292	463	399	293	180	430	312	244	-	140
BWMPNS/BWMPNW	12	537	708	644	538	380	675	312	244	-	140
BWMPNS/BWMPNW	24	442	613	549	443	300	580	402	334	-	140
BWMPNS/BWMPNW	24	537	708	644	538	380	675	402	334	-	140
BWMPNS/BWMPNW	36	537	723	644	538	380	675	542	474	-	155

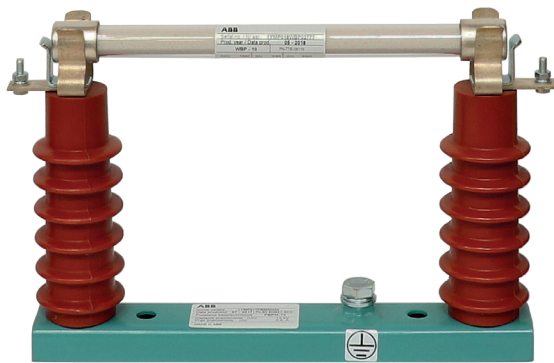
—
44
Dimensional drawing
of fuse-bases
type BWMPNS

—
45
Dimensional drawing
of fuse-bases
type BWMPNW

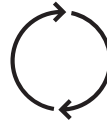
PBPM

Indoor fuse-bases for WBP fuse-links

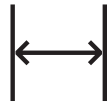
Application	Indoor fuse-base
Rated voltages	7.2 kV – 36 kV
Rated currents	3.15 A
Rated frequency	50 Hz – 60 Hz
Compatible fuse-links	WBP



Reliable operation guaranteed by proven design



Flexibility in mounting position



Small dimensions support both application and storage

Fuse-bases type PBPM are designed for securing WBP fuse-links in indoor application

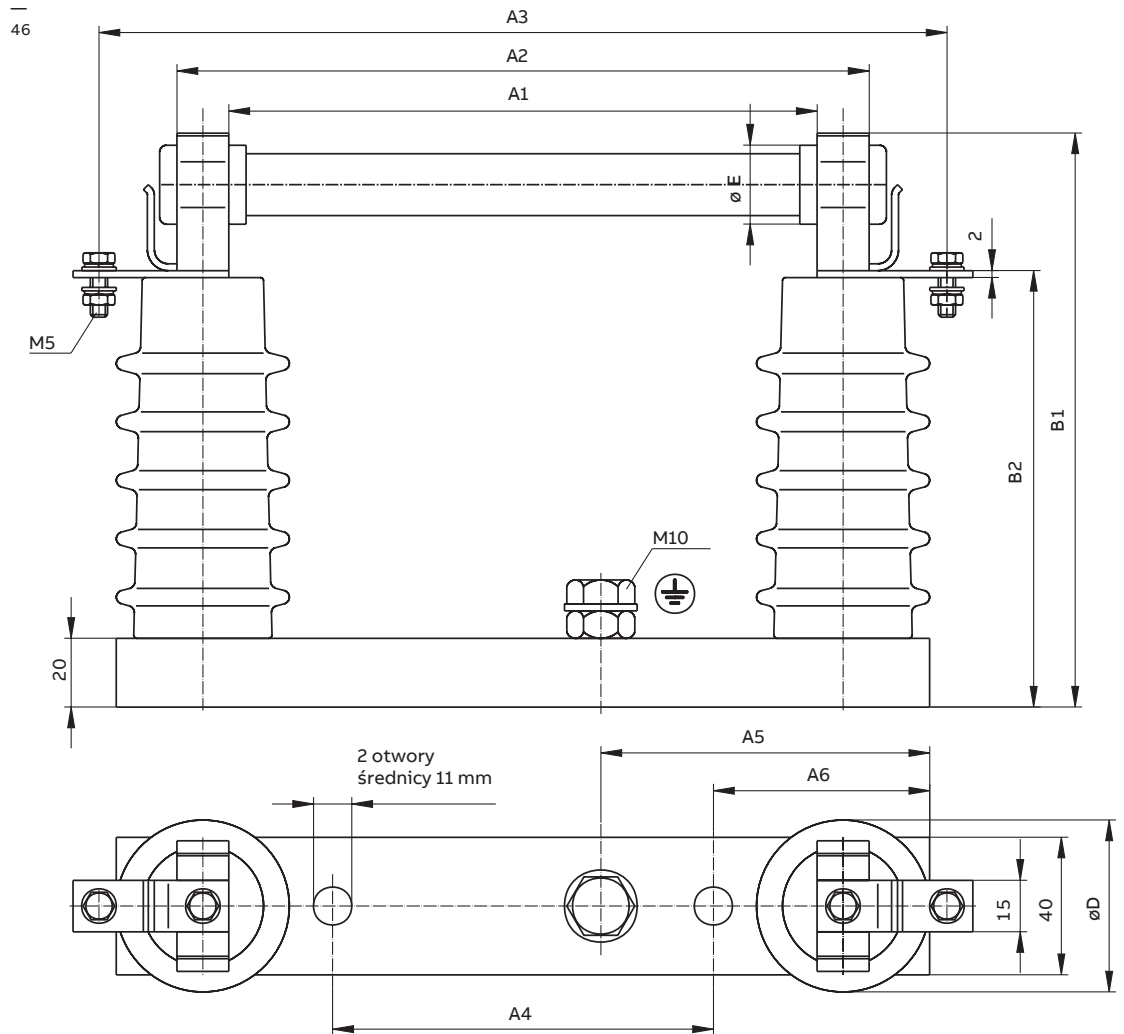
Key features:

- Rated voltage 7.2 kV – 36 kV
- Rated current 0.4 A – 3.15 A
- Designed for indoor conditions

Ordering table of fuse-bases PBPM

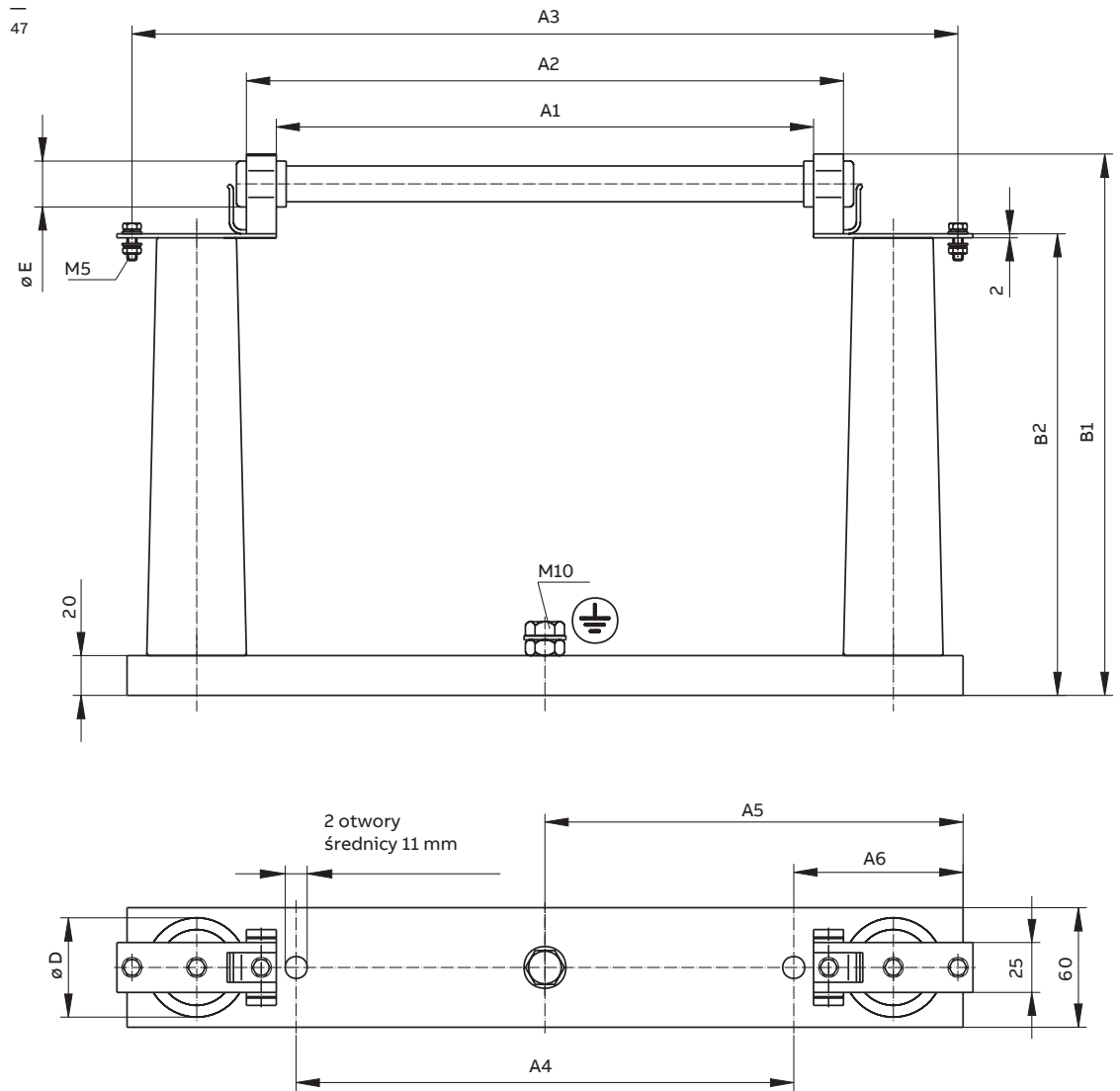
Catalog number	Type	Rated voltage [kV]	Rated current [A]	Fuse length e [mm]	Lightning impulse withstand voltage [kV]		Power-frequency withstand voltage [kV]		Weight [kg]	EAN 13 Code
					To earth and between poles	Across the isolating distance	To earth and between poles	Across the isolating distance		
					1YMB311101M0001	PBPM-6	7.2	3.15		
1YMB311101M0002	PBPM-10	12	3.15	250	75	85	28	32	1.3	5908270801936
1YMB311101M0007	PBPM-20	24	3.15	310	125	145	50	60	3.0	5908270801950
1YMB311101M0004	PBPM-30	36	3.15	385	170	195	70	80	4.6	5908270801943

46 Dimensional drawings of fuse-bases type PBPM-6, PBPM-10



Fuse-base type	Dimensions [mm]									
	A1	A2	A3	A4	A5	A6	B1	B2	ØD	ØE
PBPM-6	170±2	200±2	245	110	95	62.5	165	128	50	23
PBPM-10	210±2	240±2	285	150	95	62.5	190	153	50	23

—
47
Dimensional drawings
of fuse-bases type
PBPM-20, PBPM-30



Fuse-base type	Dimensions [mm]									
	A1	A2	A3	A4	A5	A6	B1	B2	ØD	ØE
PBPM-20	270±2	300±2	415	250	210	85	272	232	50	23
PBPM-30	345±2	375±2	490	325	247.5	85	362	322	70	23

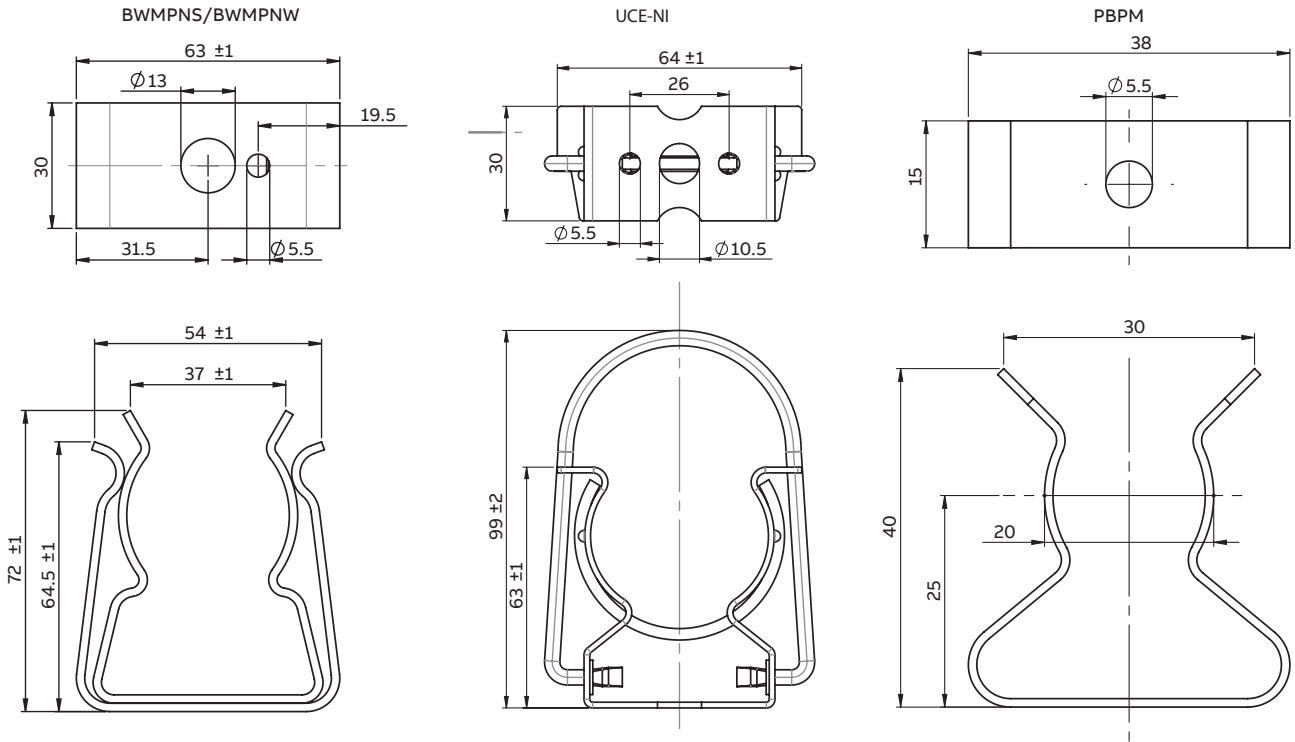
Accessories

List of available accessories

Catalog number	Accessories	Remarks	Drawing
1YMB333102M0001	Fuse-clip UCE-NI	Suitable for CEF/CEF-S/CEF-VT/CMF	48
1YMB420001M0001	Fuse-clip BWMPNS/BWMPNW	Suitable for CEF/CEF-S/CEF-VT/CMF	48
1YMB411002M0001	Fuse clip PBPM	Suitable for WBP	48
1YMX300062M0001	Test fuse-link	Device to test switch-disconnector fuse triggering system	49
1YMX053006M0001	Operating tong	Suitable for CEF/CEF-S/CEF-VT/CMF	50
1YMX304513M0001	Fuse extension adapter +150mm	Extension to increase the length of CEF/CEF-S/CEF-VT/CMF fuse-links	51
1YMX304513M0002	Fuse extension adapter +100mm	Extension to increase the length of CEF/CEF-S/CEF-VT/CMF fuse-links	51
1YMX304513M0003	Fuse extension adapter +250mm	Extension to increase the length of CEF/CEF-S/CEF-VT/CMF fuse-links	51
1YMX304513M0004	Fuse extension adapter +95mm	Extension to increase the length of CEF/CEF-S/CEF-VT/CMF fuse-links	51
1YMX304513M0011	Fuse ext. adapter +150mm with band clip	Extension to increase the length of CEF/CEF-S/CEF-VT/CMF fuse-links	51
1YMX304513M0012	Fuse ext. adapter +100mm with band clip	Extension to increase the length of CEF/CEF-S/CEF-VT/CMF fuse-links	51
1YMX304513M0013	Fuse ext. adapter +250mm with band clip	Extension to increase the length of CEF/CEF-S/CEF-VT/CMF fuse-links	51
1YMX304513M0014	Fuse ext. adapter +95mm with band clip	Extension to increase the length of CEF/CEF-S/CEF-VT/CMF fuse-links	51
1YMX304514M0001	Dummy fuse 192mm	Solid link for other equipment testing purposes	52
1YMX304514M0002	Dummy fuse 292mm	Solid link for other equipment testing purposes	52
1YMX304514M0003	Dummy fuse 367mm	Solid link for other equipment testing purposes	52
1YMX304514M0004	Dummy fuse 442mm	Solid link for other equipment testing purposes	52
1YMX304514M0005	Dummy fuse 537mm	Solid link for other equipment testing purposes	52
1YMB333103M0001	Adapter set BS-B	Adapter set for one fuse-link CEF/CMF/CEF-VT/CEF-S	53
1YMB333103M0003	Adapter set BS-C	Adapter set for one fuse-link CEF/CMF/CEF-VT/CEF-S	54
1YMB333103M0002	Adapter set BS-D	Adapter set for one fuse-link CEF/CMF/CEF-VT/CEF-S	55

Fuse-clips – equipment of indoor/outdoor fuse-bases used for fuse-link fixing

48

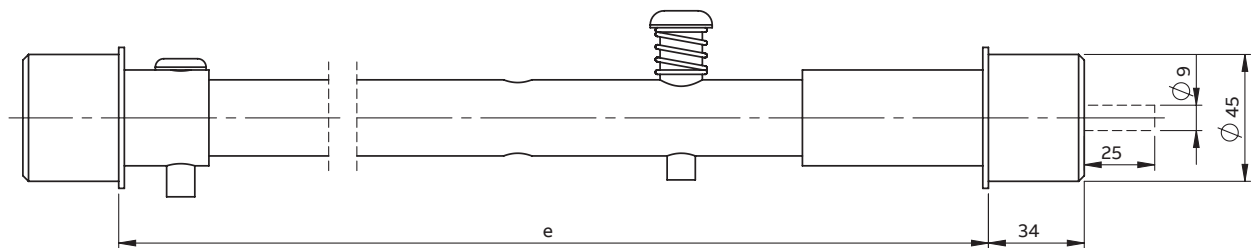


48
Fuse-clips

Catalog number	Type	Rated current [A]	Weight [kg]	Application	Compatible fuse-links	EAN 13 Code
1YMB333102M0001	Fuse-clip UCE-NI	315	0.1	Indoor	CEF/CEFS/CEFVT/CMF	5908270808393
1YMB420001M0001	Fuse-clip BWMPNS/BWMPNW	315	0.1	Indoor/Outdoor	CEF/CEFS/CEF-VT/CMF	5908270808409
1YMB411002M0001	Fuse-clip PBPM	3.15	0.1	Indoor	WBP	5908270802353

Test fuse link – device to test switch-disconnector fuse triggering system

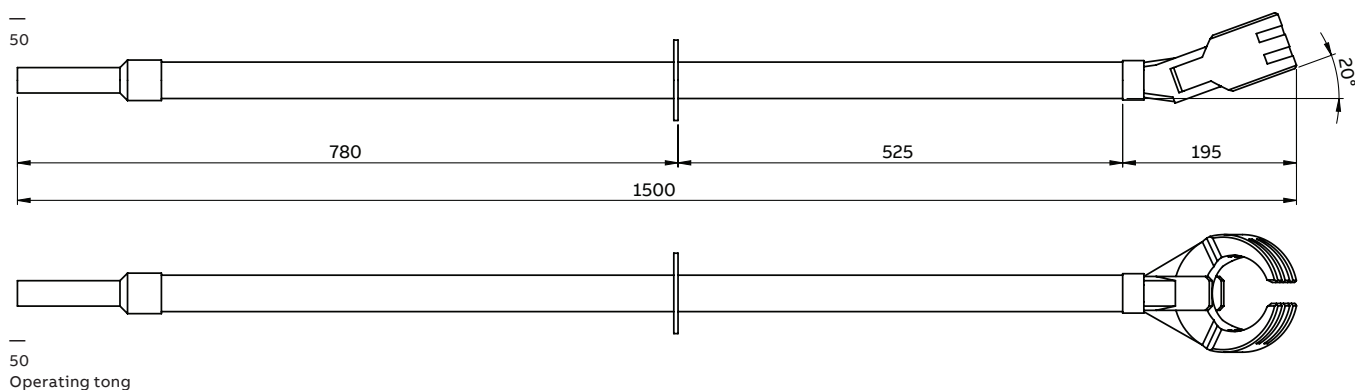
49



49
Test fuse-link

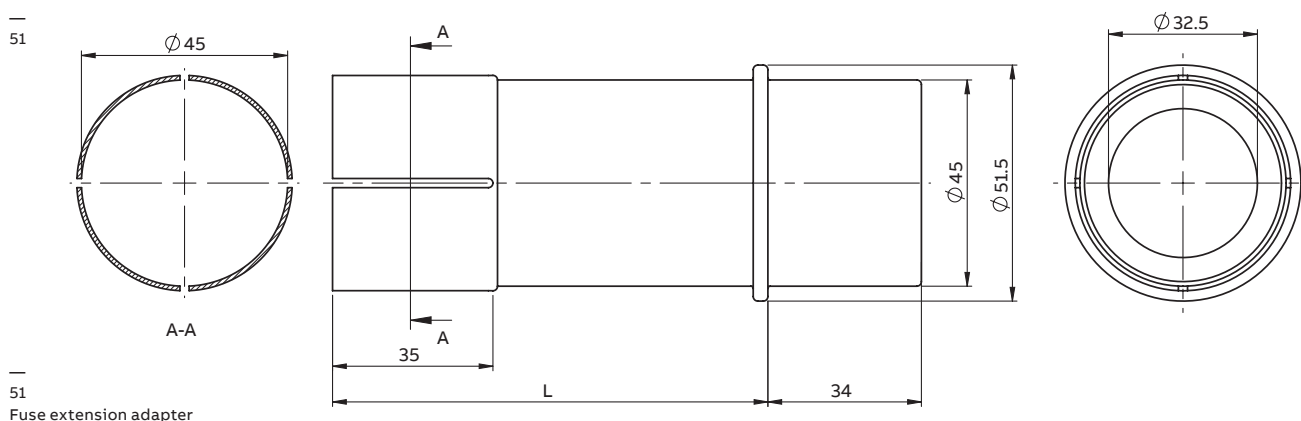
Catalog number	Type	Weight [kg]	e [mm]	Total length [mm]	EAN 13 Code
1YMX300062M0001	Test fuse-link	1.4	Adjustable: 192, 292, 442, 537	605	5908270802957

Operating tong – Insulated device for fuse-link insertion/removal



Catalog number	Type	Weight [kg]	Max. operating voltage [kV]	Dimensions [mm]	EAN 13 Code
1YMX053006M0001	Operating tong for fuse-links	2.59	36	Clamping range: 30-90	5908270802957
				Total length: 1500	
				Insulating clearance: 525	
				Length (handle): 780	
				Insertion depth: 195	

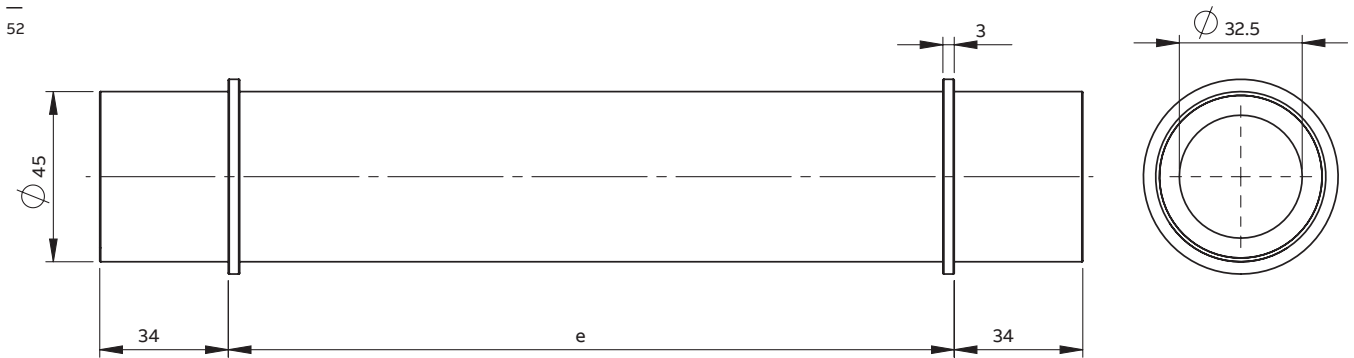
Fuse extension adapter – Extension to increase the length of CEF/ CEF-S/CEF-VT/CMF fuse-links



Catalog number	Type	Extension length L [mm]	Weight [kg]	Compatible fuse-links	EAN 13 Code
1YMX304513M0001	Fuse extension adapter +150mm	150	0.3	CEF, CEF-S, CEF-VT, CMF	5908270802995
1YMX304513M0002	Fuse extension adapter +100mm	100	0.2		5908270803008
1YMX304513M0003	Fuse extension adapter +250mm	250	0.4		5908270803015
1YMX304513M0004	Fuse extension adapter +95mm	95	0.2		5908270803022
1YMX304513M0011	Fuse ext. adapter +150mm with band clip*	150	0.3		5908270808416
1YMX304513M0012	Fuse ext. adapter +100mm with band clip*	100	0.2		5908270808423
1YMX304513M0013	Fuse ext. adapter +250mm with band clip*	250	0.4		5908270808430
1YMX304513M0014	Fuse ext. adapter +95mm with band clip*	95	0.2		5908270808447

*steel band clip for diameter 43-53 mm, width 8mm

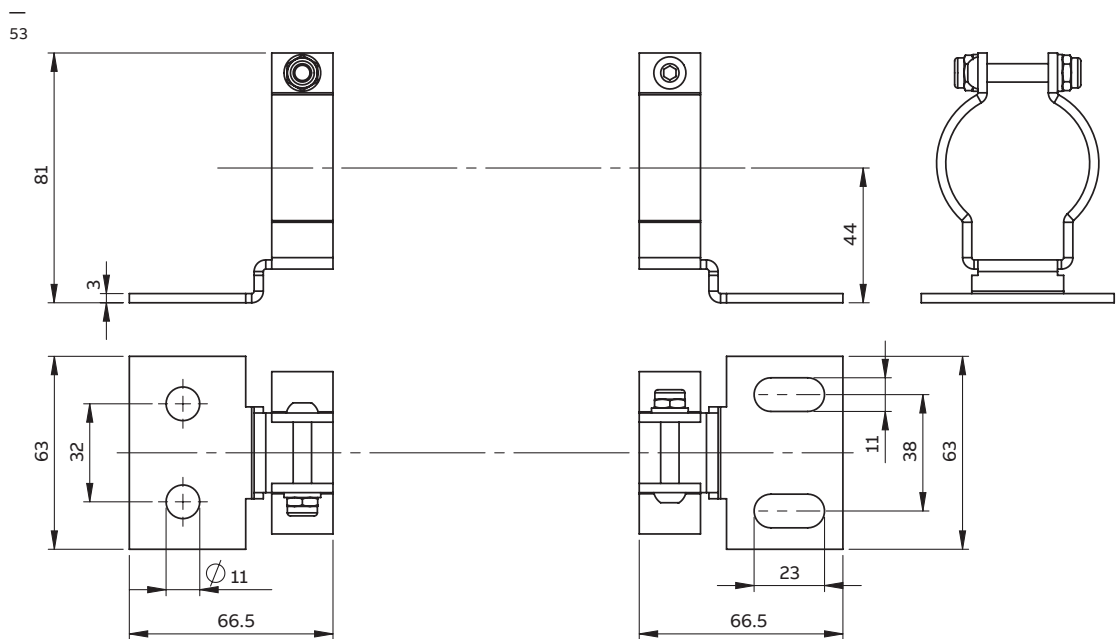
Dummy fuse – solid link for other equipment testing purposes



52
Dummy fuse

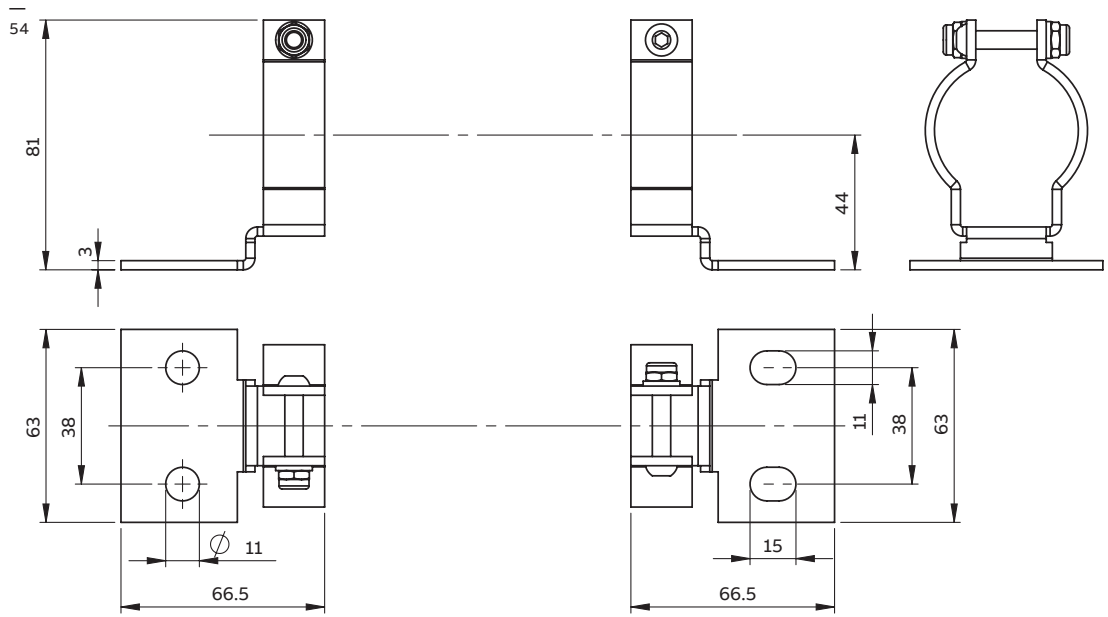
Catalog number	Type	Length e [mm]	Weight [kg]	Max. current [A]	Max. voltage [kV]	Material	EAN 13 Code
1YMX304514M0001	Dummy fuse 192 mm	192	0.4	315	36	Cu-ETP, contacts silver plated	5908270808454
1YMX304514M0002	Dummy fuse 292 mm	292	0.5	315	36		5908270808461
1YMX304514M0003	Dummy fuse 367 mm	367	0.6	315	36		5908270808478
1YMX304514M0004	Dummy fuse 442 mm	442	0.7	315	36		5908270808485
1YMX304514M0005	Dummy fuse 537 mm	537	0.9	315	36		5908270808492

Adapter sets – connectable tags for fuse-link for fixing adaptation

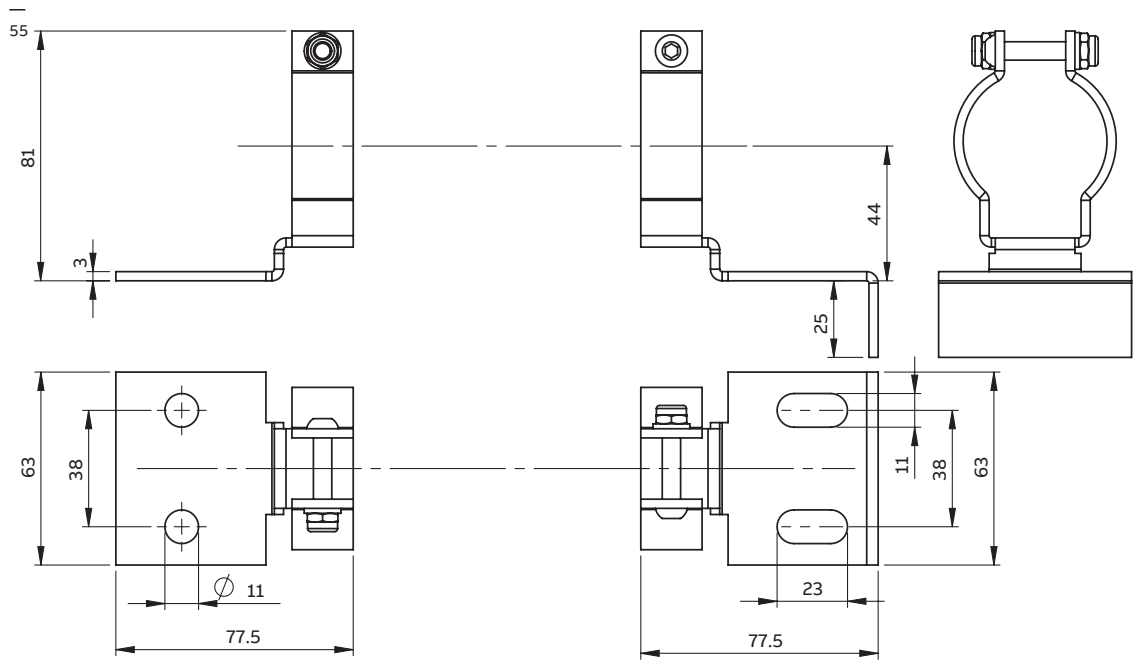


Catalog number	Type	Weight [kg]	Compatible fuse-links	EAN 13 Code
1YMB333103M0001	Adapter set BS-B	0.4	CEF, CEF-S, CEF-VT, CMF	5908270808508

53
Adapter sets BS-B



Catalog number	Type	Weight [kg]	Compatible fuse-links	EAN 13 Code
1YMB333103M0003	Adapter set BS-C	0.4	CEF, CEF-S, CEF-VT, CMF	5908270808515



Catalog number	Type	Weight [kg]	Compatible fuse-links	EAN 13 Code
1YMB333103M0002	Adapter set BS-D	0.4	CEF, CEF-S, CEF-VT, CMF	5908270808522

—
54
Adapter sets BS-C

—
55
Adapter sets BS-D

—
ABB Contact Center
tel.: +48 22 22 37 777
e-mail: contact.center@pl.abb.com

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