

Current Limiting Fuses, CEF Motor Circuits Fuses, CMF

Catalogue 1YMB631050-en



ABB

High voltage current limiting fuse links type CEF

Rated voltage:

3,6/7,2-12 kV

17,5-24 kV

27 kV

36 kV

Rated current:

6-200 A

6-125 A

6-100 A

6-40 A

Index

| | |
|--|----|
| 1. General | 3 |
| 2. Overvoltages | 3 |
| 3. Replacement of melted fuse links..... | 3 |
| 4. Nameplate | 3 |
| 5. Pre-arcing times..... | 4 |
| 6. Current limitation | 4 |
| 7. Indicator and striker pin | 4 |
| 8. Choice of fuse links | 5 |
| 9. Ordering table | 6 |
| 10. Data and dimensions CEF | 7 |
| 11. Accessories | 9 |
| 12. Data and dimensions CEF-BS | 10 |

High voltage current limiting fuse link for MOTOR circuit applications type CMF

Rated voltage:

3,6 kV

7,2 kV

12 kV

Rated current:

100-315 A

63-315 A

63-200 A

Index

| | |
|---|----|
| 1. General ... | 11 |
| 2. Nameplate..... | 11 |
| 3. Indicator and striker pin..... | 11 |
| 4. Ordering table CMF | 12 |
| 5. Ordering table UCM..... | 12 |
| 6. Ordering table type CMF-BS | 12 |
| 7. Pre-arcing times..... | 13 |
| 8. Current limitation | 13 |
| 9. Overvoltages | 13 |
| 10. Choice of fuse links | 14 |
| 11. Replacement of melted fuse links..... | 15 |
| 12. The K-factor | 15 |
| 13. Data and dimensions CMF | 15 |

High voltage current limiting fuse links type CEF

Rated voltage: 3,6/7,2-36 kV

Rated current: 6-200 A



1. General

The HRC generation of fuse link type CEF are designed and tested according to IEC Publication 60282-1 (IEC 282-1). Dimensionally the fuse links are in accordance with DIN 43625.

ABB's high voltage fuse links have the following properties:

- Low minimum breaking current
- Low power losses
- Low arc-voltage
- High breaking capacity
- High current limitation.

Low power losses permit installation of these fuse links in compact switchgear.

CEF fuses are of back-up type. They have a zone between the minimum melting current and the minimum breaking current where the fuse links may fail to interrupt. For CEF fuse links this zone is very narrow. The minimum breaking current I for any type is specified in the table on p. 8.

Other fuse types produced by ABB can be found in the following catalogues:

Fuses for Voltage Transformers WBP/BRT 1YMB6120001-en

Fuses for Railway DC Applications BWT/WBT 1YMB622001-en

M-effect

One of the structural means used for forming the time-current characteristic of medium voltage fuse links of CEF and CMF series, manufactured by ABB, is an overload spot located on fuse elements. To create this overload spot the M-effect is used. The overload spot is made by coating the silver fuse elements with a short segment of metal characterized by a low melting point.

For the first time the M-effect was described by professor Metcalf in the 1930s. It consists in taking advantage of the effect of melting by some metals characterized by a low melting point (e.g. tin, lead) and being in a liquid state, metals characterized by a higher melting point (e.g. copper, silver). Silver fuse element coated with a segment of metal a low melting point metal (solder) fuses for current values that would not fuse it if the overload spot were not present. The reason for it is as follows: During heating of the fuse element with the overload spot, the metal, which the overload spot is made of, starts melting and diffuses into the metal of the fuse element and thus reduces the active cross-section of the main silver fuse element. As a result of this silver fuse element is melted at the moment when the other parts of the fuse element still keep a relatively low temperature. With this design the overload spot enables reduction of the minimum melting current and reduction of the minimum breaking current. Consequently, the range of correct operation of the fuse link is extended. One must also emphasize that in case of short-circuit currents, when fuse elements are heating up very fast and practically no heat is dissipated into the surrounding arc-quenching medium (adiabatic heating), the fuse elements melt at the constrictions before metal, which the overload spot is made of, reaches its melting temperature. Therefore, the overload spot does not affect the fuses characteristic for short-circuit currents. Additionally, a very important advantage of using the overload spot is the fact that the arc is always initiated at the same point on the fuse element, near the geometrical center of the fuse link. This solution prevents the arc from initializing near one of the end-caps, which could result in damaging of the end-cap by the arc. To sum up, the overload spot enables increase in the useful operational range of the fuse link by extending the range of correct operation for small overload currents. Moreover, use of the overload spot prevents the arc from initializing near one of the fuse link ends and, thus, makes the fuse link safer to use.

2. Overvoltages

In order to be current limiting, the fuse link must generate an arc-voltage exceeding the instantaneous value of the operating voltage. The switching voltage generated by the CEF fuse link is below the maximum permissible value acc. to IEC 60282-1 (IEC 282-1). The CEF fuse link can safely be used if the system line voltage is 50-100% of the rated fuse link voltage.

3. Replacement of melted fuse links

CEF fuse links cannot be regenerated. According to IEC Publication 60282-1 (IEC 282-1), all 3 fuse links should be replaced, even if only 1 or 2 of the fuse links in the three phase system have operated.

Exceptions are allowed when it can be verified that the fuse link(s) have not experienced any over-current.

4. Nameplate

The symbols on the nameplate have the following meaning:

I_N = Rated current

U_N = Rated voltage

I_3 = Minimum breaking current

I_1 = Maximum short circuit current for which the fuse is tested

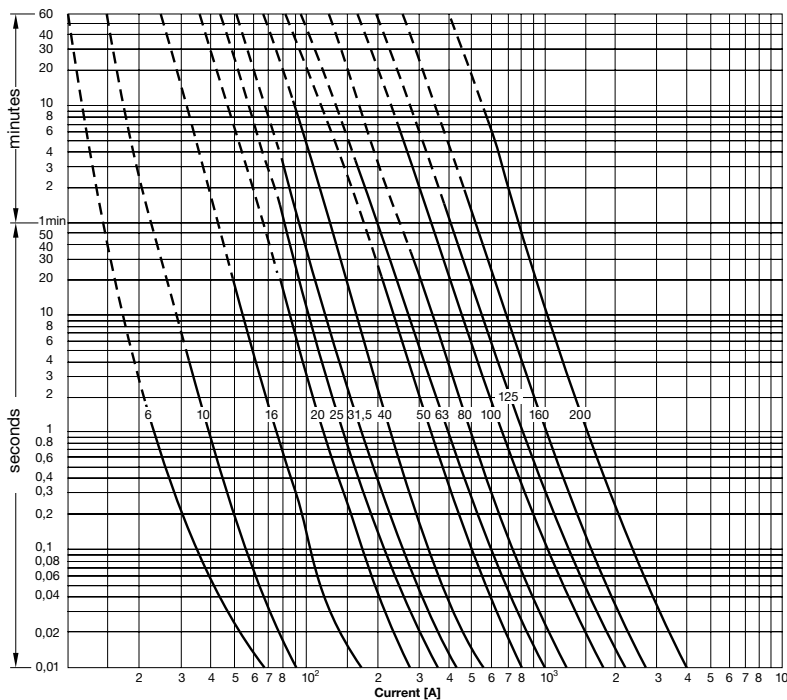
The arrowhead on the nameplate indicates in which end of the fuse link the indicator and striker pin appears. Additionally this end contact of the fuse link is specially marked.

CEF-U is outdoor type.

| | | |
|-----|--------------------|----------------------|
| | ABB | TYPE CEF |
| | $I_N = 40A$ | $I_3 < 3 \times I_N$ |
| | $U_N = 12kV$ | $I_1 = 50kA$ |
| | INDOOR - INNENRAUM | |
| ABB | | |

Fuse link type CEF

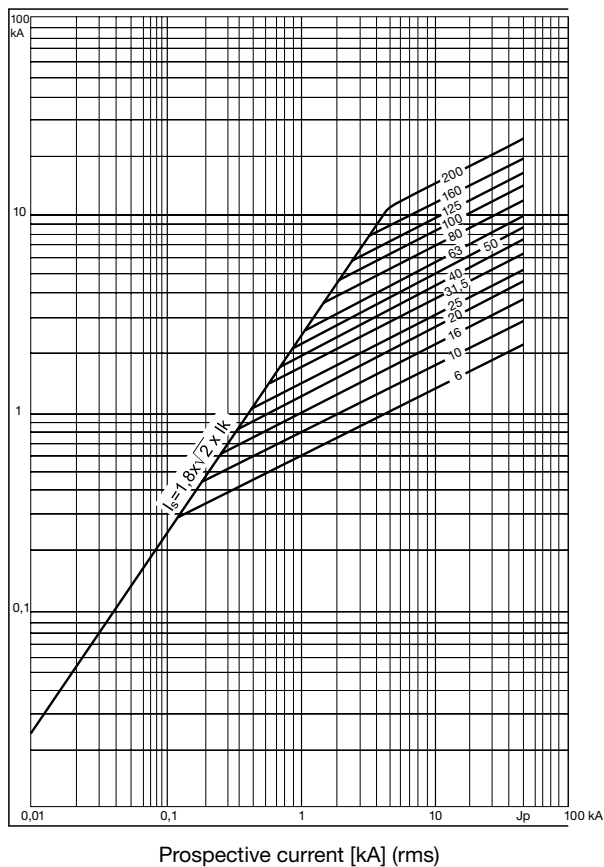
Pre-arcing time



5. Pre-arcing times

The characteristics are equal for all rated voltages and are recorded from cold condition. Dashed sections of the curves indicate the zone of uncertain interruption.

Maximum cut of current [kA] (peak)

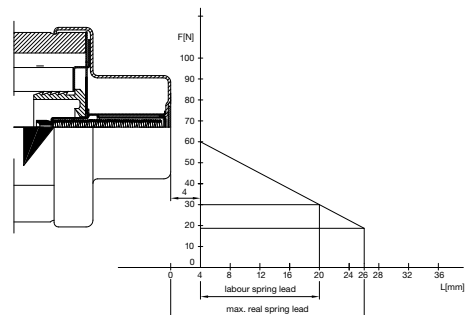


6. Current limitation

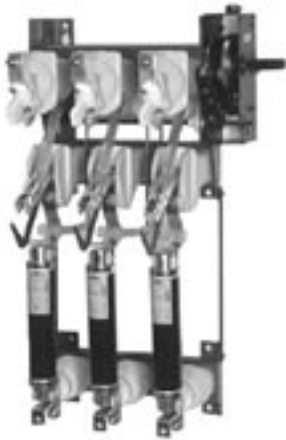
CEF fuse links are current limiting. A large short circuit current will therefore not reach its full value. The diagram shows the relation between the prospective short circuit current and the peak value of the cutoff current. Substantial current limitation results in a considerable reduction of the thermal and mechanical stress on the high voltage installation.

7. Indicator and striker pin

The CEF fuse link is equipped with a combined indicator- and striker system, which is activated immediately when the fuse element melts. The force diagram is in accordance with the requirements of IEC 60282-1 (IEC 282-1) and DIN 43625. The below presented striker pin force diagram is valid for CEF/CMF fuses as effective from May 2006. The former version of striker pin was with initial force of 50N.



Fuse link type CEF



8. Choice of fuse links

Choice of rated voltage U_N :

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_N

To obtain the best possible current limitation, and thereby also protection, I_N must be chosen as low as possible compared to the rated current of the object to be protected. However, the following limitations must be taken into consideration:

- the largest load current must not exceed I_N ;
- cooling conditions (e.g. in compact switchgear);
- inrush current of off load transformers;
- starting currents of motor circuits. (See page 14 with CMF, special motor fuses).

For the choice of rated current of fuse links for protection of transformers, the relation between the power rating of the transformers, operating voltage and rated current of the fuse link is given in the table below. The same table indicates the highest rated current of the low voltage fuse link (on the low voltage side of the transformer) which gives discrimination with the high voltage fuse link. The low voltage fuse link is of the type gL (VDE) or gG/ gM(IEC).

For choice of fuse links for transformer protection in switchgear of type Safe Plus or Safering CTC-F, see SF Insulated Compact Switchgear and Ring Main Unit catalogue.

Choice of fuse links for protection of transformers

| 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 | 3500 |
| | HIGH VOLTAGE FUSE-LINK I_N (A) | | | | | | | | | | | | | | | | | | | |
| 3 | 16 | 25 | 25 | 40 | 40 | 63 | 63 | 63 | 80 | 100 | 100 | 160 | 200 | 200 | 250* | 315* | | | | |
| 5 | 10 | 16 | 25 | 25 | 25 | 40 | 40 | 63 | 63 | 63 | 80 | 100 | 100 | 160 | 200 | 200 | 250* | 315* | 315* | |
| 6 | 10 | 16 | 16 | 25 | 25 | 25 | 40 | 40 | 63 | 63 | 63 | 80 | 100 | 100 | 160 | 200 | 200 | 250* | 315 | 315* |
| 10 | 6 | 10 | 16 | 16 | 16 | 25 | 25 | 25 | 31,5 | 40 | 63 | 63 | 63 | 80 | 100 | 100 | 160 | 200 | 250* | 250* |
| 12 | 6 | 10 | 16 | 16 | 16 | 16 | 25 | 25 | 25 | 31,5 | 40 | 63 | 63 | 63 | 80 | 100 | 160 | 160 | 200 | 250* |
| 15 | 6 | 10 | 10 | 16 | 16 | 16 | 16 | 20 | 25 | 25 | 31,5 | 40 | 63 | 63 | 63 | 100 | 100 | 125 | 200 | 200 |
| 20 | 6 | 10 | 10 | 10 | 16 | 16 | 16 | 20 | 20 | 20 | 31,5 | 31,5 | 40 | 63 | 63 | 63 | 80 | 100 | 125 | 160 |
| 24 | 6 | 10 | 10 | 10 | 10 | 16 | 16 | 20 | 20 | 20 | 31,5 | 31,5 | 40 | 40 | 63 | 63 | 63 | 80 | 125 | 125 |
| 30 | 6 | 10 | 10 | 10 | 10 | 10 | 16 | 16 | 16 | 25 | 25 | 25 | 25 | 40 | 40 | 40 | 2x40 | 2x40 | | |
| 36 | 6 | 10 | 10 | 10 | 10 | 10 | 10 | 16 | 16 | 16 | 16 | 25 | 25 | 25 | 40 | 40 | 2x40 | 2x40 | | |
| | LOW VOLTAGE FUSE-LINK I_N (A) | | | | | | | | | | | | | | | | | | | |
| 220 V | | 80 | 100 | 125 | 160 | 200 | 250 | 250 | 315 | 400 | 500 | 630 | | | | | | | | |
| 380 V | | 50 | 63 | 100 | 100 | 125 | 125 | 200 | 250 | 250 | 350 | 400 | 400 | 500 | 630 | | | | | |
| 500 V | | 40 | 50 | 80 | 80 | 100 | 100 | 160 | 160 | 200 | 250 | 350 | 350 | 400 | 500 | 630 | | | | |

*) CMF -fuse link

Fuse link type CEF

9. Ordering table

High-voltage – HRC fuse links

| Type | Rated voltage [kV] | Rated current [A] | Length e [mm] | Diameter D [mm] | Catalogue No. | Weight kg |
|------|--------------------|-------------------|---------------|-----------------|-----------------|-----------|
| CEF | 3,6/7,2 | 6 | 192 | 65 | 1YMB531001M0001 | 1,5 |
| CEF | 3,6/7,2 | 10 | 192 | 65 | 1YMB531001M0002 | 1,5 |
| CEF | 3,6/7,2 | 16 | 192 | 65 | 1YMB531001M0003 | 1,5 |
| CEF | 3,6/7,2 | 25 | 192 | 65 | 1YMB531001M0004 | 1,5 |
| CEF | 3,6/7,2 | 40 | 192 | 65 | 1YMB531001M0005 | 1,5 |
| CEF | 3,6/7,2 | 50 | 192 | 65 | 1YMB531001M0006 | 1,5 |
| CEF | 3,6/7,2 | 63 | 192 | 65 | 1YMB531001M0007 | 1,5 |
| CEF | 3,6/7,2 | 80 | 192 | 87 | 1YMB531001M0008 | 2,6 |
| CEF | 3,6/7,2 | 100 | 192 | 87 | 1YMB531001M0009 | 2,6 |
| CEF | 3,6/7,2 | 6 | 292 | 65 | 1YMB531034M0001 | 2,3 |
| CEF | 3,6/7,2 | 10 | 292 | 65 | 1YMB531034M0002 | 2,3 |
| CEF | 3,6/7,2 | 16 | 292 | 65 | 1YMB531034M0003 | 2,3 |
| CEF | 3,6/7,2 | 25 | 292 | 65 | 1YMB531034M0004 | 2,3 |
| CEF | 3,6/7,2 | 40 | 292 | 65 | 1YMB531034M0005 | 2,3 |
| CEF | 3,6/7,2 | 50 | 292 | 65 | 1YMB531034M0006 | 2,3 |
| CEF | 3,6/7,2 | 63 | 292 | 65 | 1YMB531034M0007 | 2,3 |
| CEF | 3,6/7,2 | 80 | 292 | 87 | 1YMB531034M0008 | 3,6 |
| CEF | 3,6/7,2 | 100 | 292 | 87 | 1YMB531034M0009 | 3,6 |
| CEF | 3,6/7,2 | 125 | 292 | 87 | 1YMB531001M0010 | 3,6 |
| CEF | 3,6/7,2 | 160 | 292 | 87 | 1YMB531001M0011 | 3,6 |
| CEF | 3,6/7,2 | 200 | 292 | 87 | 1YMB531001M0012 | 3,6 |
| CEF | 3,6/7,2 | 125 | 367 | 87 | 1YMB531034M0011 | 4,4 |
| CEF | 3,6/7,2 | 160 | 367 | 87 | 1YMB531034M0012 | 4,4 |
| CEF | 3,6/7,2 | 200 | 367 | 87 | 1YMB531034M0010 | 4,4 |

| | | | | | | |
|-----|----|------|-----|----|-----------------|-----|
| CEF | 12 | 6 | 292 | 53 | 1YMB531042M0001 | 1,9 |
| CEF | 12 | 6 | 292 | 65 | 1YMB531002M0001 | 2,3 |
| CEF | 12 | 10 | 292 | 53 | 1YMB531042M0002 | 1,9 |
| CEF | 12 | 10 | 292 | 65 | 1YMB531002M0002 | 2,3 |
| CEF | 12 | 16 | 292 | 53 | 1YMB531042M0003 | 1,9 |
| CEF | 12 | 16 | 292 | 65 | 1YMB531002M0003 | 2,3 |
| CEF | 12 | 20 | 292 | 53 | 1YMB531042M0004 | 1,9 |
| CEF | 12 | 25 | 292 | 65 | 1YMB531002M0004 | 2,3 |
| CEF | 12 | 31,5 | 292 | 65 | 1YMB531002M0014 | 2,3 |
| CEF | 12 | 40 | 292 | 65 | 1YMB531002M0005 | 2,3 |
| CEF | 12 | 50 | 292 | 65 | 1YMB531002M0006 | 2,3 |
| CEF | 12 | 63 | 292 | 65 | 1YMB531002M0007 | 2,3 |
| CEF | 12 | 80 | 292 | 65 | 1YMB531002M0021 | 2,3 |
| CEF | 12 | 80 | 292 | 87 | 1YMB531002M0008 | 3,6 |
| CEF | 12 | 100 | 292 | 65 | 1YMB531002M0022 | 3,6 |
| CEF | 12 | 100 | 292 | 87 | 1YMB531002M0009 | 3,6 |
| CEF | 12 | 125 | 292 | 87 | 1YMB531043M0010 | 3,6 |
| CEF | 12 | 6 | 442 | 53 | 1YMB531047M0001 | 2,5 |
| CEF | 12 | 6 | 442 | 65 | 1YMB531035M0001 | 3,0 |
| CEF | 12 | 10 | 442 | 53 | 1YMB531047M0002 | 2,5 |
| CEF | 12 | 10 | 442 | 65 | 1YMB531035M0002 | 3,0 |
| CEF | 12 | 16 | 442 | 53 | 1YMB531047M0003 | 2,5 |
| CEF | 12 | 16 | 442 | 65 | 1YMB531035M0003 | 3,0 |
| CEF | 12 | 20 | 442 | 53 | 1YMB531047M0004 | 2,5 |
| CEF | 12 | 25 | 442 | 65 | 1YMB531035M0004 | 3,0 |
| CEF | 12 | 31,5 | 442 | 65 | 1YMB531035M0014 | 3,0 |
| CEF | 12 | 40 | 442 | 65 | 1YMB531035M0005 | 3,0 |
| CEF | 12 | 50 | 442 | 65 | 1YMB531035M0006 | 3,0 |
| CEF | 12 | 63 | 442 | 65 | 1YMB531035M0007 | 3,0 |
| CEF | 12 | 80 | 442 | 65 | 1YMB531035M0021 | 3,0 |
| CEF | 12 | 80 | 442 | 87 | 1YMB531035M0008 | 5,3 |
| CEF | 12 | 100 | 442 | 65 | 1YMB531035M0022 | 3,0 |
| CEF | 12 | 100 | 442 | 87 | 1YMB531035M0009 | 5,3 |
| CEF | 12 | 125 | 442 | 65 | 1YMB531002M0023 | 3,0 |
| CEF | 12 | 125 | 442 | 87 | 1YMB531002M0010 | 5,3 |
| CEF | 12 | 160 | 442 | 87 | 1YMB531002M0011 | 5,3 |
| CEF | 12 | 200 | 442 | 87 | 1YMB531002M0012 | 5,3 |
| CEF | 12 | 125 | 537 | 65 | 1YMB531035M0023 | 4,0 |

| | | | | | | |
|-----|------|------|-----|----|-----------------|-----|
| CEF | 17,5 | 6 | 292 | 65 | 1YMB531003M0001 | 2,3 |
| CEF | 17,5 | 10 | 292 | 65 | 1YMB531003M0002 | 2,3 |
| CEF | 17,5 | 16 | 292 | 65 | 1YMB531003M0003 | 2,3 |
| CEF | 17,5 | 20 | 292 | 65 | 1YMB531003M0013 | 2,3 |
| CEF | 17,5 | 25 | 292 | 65 | 1YMB531003M0004 | 2,3 |
| CEF | 17,5 | 31,5 | 292 | 65 | 1YMB531003M0014 | 2,3 |
| CEF | 17,5 | 40 | 292 | 65 | 1YMB531003M0021 | 2,3 |
| CEF | 17,5 | 40 | 292 | 87 | 1YMB531003M0005 | 3,6 |
| CEF | 17,5 | 50 | 292 | 65 | 1YMB531003M0022 | 2,3 |
| CEF | 17,5 | 50 | 292 | 87 | 1YMB531003M0006 | 3,6 |
| CEF | 17,5 | 63 | 292 | 87 | 1YMB531003M0007 | 3,6 |
| CEF | 17,5 | 6 | 367 | 65 | 1YMB531036M0001 | 2,7 |
| CEF | 17,5 | 10 | 367 | 65 | 1YMB531036M0002 | 2,7 |
| CEF | 17,5 | 16 | 367 | 65 | 1YMB531036M0003 | 2,7 |
| CEF | 17,5 | 20 | 367 | 65 | 1YMB531036M0013 | 2,7 |

| Type | Rated voltage [kV] | Rated current [A] | Length e [mm] | Diameter D [mm] | Catalogue No. | Weight kg |
|------|--------------------|-------------------|---------------|-----------------|-----------------|-----------|
| CEF | 17,5 | 25 | 367 | 65 | 1YMB531036M0004 | 2,7 |
| CEF | 17,5 | 31,5 | 367 | 65 | 1YMB531036M0014 | 2,7 |
| CEF | 17,5 | 40 | 367 | 65 | 1YMB531036M0021 | 2,7 |
| CEF | 17,5 | 40 | 367 | 87 | 1YMB531036M0005 | 4,4 |
| CEF | 17,5 | 50 | 367 | 65 | 1YMB531036M0022 | 4,4 |
| CEF | 17,5 | 50 | 367 | 87 | 1YMB531036M0006 | 4,4 |
| CEF | 17,5 | 63 | 367 | 87 | 1YMB531036M0007 | 4,4 |
| CEF | 17,5 | 100 | 367 | 87 | 1YMB531038M0001 | 4,4 |
| CEF | 17,5 | 6 | 442 | 65 | 1YMB531037M0001 | 3,0 |
| CEF | 17,5 | 10 | 442 | 65 | 1YMB531037M0002 | 3,0 |
| CEF | 17,5 | 16 | 442 | 65 | 1YMB531037M0003 | 3,0 |
| CEF | 17,5 | 20 | 442 | 65 | 1YMB531037M0013 | 3,0 |
| CEF | 17,5 | 25 | 442 | 65 | 1YMB531037M0004 | 3,0 |
| CEF | 17,5 | 31,5 | 442 | 65 | 1YMB531037M0014 | 3,0 |
| CEF | 17,5 | 40 | 442 | 65 | 1YMB531037M0021 | 3,0 |
| CEF | 17,5 | 40 | 442 | 87 | 1YMB531037M0005 | 5,3 |
| CEF | 17,5 | 50 | 442 | 65 | 1YMB531037M0022 | 3,0 |
| CEF | 17,5 | 50 | 442 | 87 | 1YMB531037M0006 | 5,3 |
| CEF | 17,5 | 63 | 442 | 87 | 1YMB531037M0007 | 5,3 |
| CEF | 17,5 | 80 | 442 | 87 | 1YMB531037M0008 | 5,3 |
| CEF | 17,5 | 100 | 442 | 87 | 1YMB531037M0009 | 5,3 |
| CEF | 17,5 | 125 | 442 | 87 | 1YMB531037M0010 | 5,3 |

| | | | | | | |
|-----|----|------|-----|----|-----------------|-----|
| CEF | 24 | 6 | 442 | 53 | 1YMB531044M0001 | 2,5 |
| CEF | 24 | 6 | 442 | 65 | 1YMB531004M0001 | 3,0 |
| CEF | 24 | 10 | 442 | 53 | 1YMB531044M0002 | 2,5 |
| CEF | 24 | 10 | 442 | 65 | 1YMB531004M0002 | 3,0 |
| CEF | 24 | 16 | 442 | 53 | 1YMB531044M0003 | 2,5 |
| CEF | 24 | 16 | 442 | 65 | 1YMB531004M0003 | 3,0 |
| CEF | 24 | 20 | 442 | 53 | 1YMB531044M0004 | 2,5 |
| CEF | 24 | 20 | 442 | 65 | 1YMB531004M0011 | 3,0 |
| CEF | 24 | 25 | 442 | 65 | 1YMB531004M0004 | 3,0 |
| CEF | 24 | 31,5 | 442 | 65 | 1YMB531004M0012 | 3,0 |
| CEF | 24 | 40 | 442 | 65 | 1YMB531004M0005 | 3,0 |
| CEF | 24 | 50 | 442 | 65 | 1YMB531004M0021 | 3,0 |
| CEF | 24 | 50 | 442 | 87 | 1YMB531004M0006 | 5,3 |
| CEF | 24 | 63 | 442 | 65 | 1YMB531004M0022 | 3,0 |
| CEF | 24 | 63 | 442 | 87 | 1YMB531004M0007 | 5,3 |
| CEF | 24 | 80 | 442 | 87 | 1YMB531022M0001 | 5,3 |
| CEF | 24 | 100 | 442 | 87 | 1YMB531022M0002 | 5,3 |
| CEF | 24 | 125 | 442 | 87 | 1YMB531022M0003 | 5,3 |
| CEF | 24 | 80 | 537 | 65 | 1YMB531004M0023 | 4,0 |
| CEF | 24 | 80 | 537 | 87 | 1YMB531004M0008 | 6,2 |
| CEF | 24 | 100 | 537 | 87 | 1YMB531004M0009 | 6,2 |
| CEF | 24 | 125 | 537 | 87 | 1YMB531004M0010 | 6,2 |

| | | | | | | |
|-----|----|-----|-----|----|-----------------|-----|
| CEF | 27 | 6 | 442 | 65 | 1YMB531005M0001 | 3,0 |
| CEF | 27 | 10 | 442 | 65 | 1YMB531005M0002 | 3,0 |
| CEF | 27 | 16 | 442 | 65 | 1YMB531005M0003 | 3,0 |
| CEF | 27 | 25 | 442 | 87 | 1YMB531005M0004 | 5,3 |
| CEF | 27 | 40 | 442 | 87 | 1YMB531005M0005 | 5,3 |
| CEF | 27 | 50 | 442 | 87 | 1YMB531005M0006 | 5,3 |
| CEF | 27 | 63 | 442 | 87 | 1YMB531005M0007 | 5,3 |
| CEF | 27 | 80 | 537 | 87 | 1YMB531005M0008 | 6,2 |
| CEF | 27 | 100 | 537 | 87 | 1YMB531005M0009 | 6,2 |

| | | | | | | |
|-----|----|----|-----|----|-----------------|-----|
| CEF | 36 | 6 | 537 | 65 | 1YMB531006M0001 | 4,0 |
| CEF | 36 | 10 | 537 | 65 | 1YMB531006M0002 | 4,0 |
| CEF | 36 | 16 | 537 | 65 | 1YMB531006M0003 | 4,0 |
| CEF | 36 | 25 | 537 | 87 | 1YMB531006M0004 | 6,2 |
| CEF | 36 | 40 | 537 | 87 | 1YMB531006M0005 | 6,2 |

Other ratings and dimensions on request. When ordering outdoor version pls. indicate CEF -U.

Fuse link type CEF

10. Data and dimensions CEF

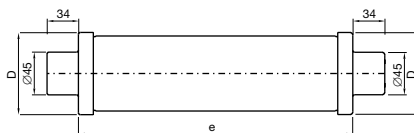
| Type | Rated voltage U_n [kV] | Rated current I_n [kV] | Length e [mm] | Diameter D [mm] | Short Circuit current I_s [kA] | Minimum breaking current I_b [A] | Rated Power P_n [W] | Resistance R_o [mΩ] |
|------|-----------------------------|-----------------------------|--------------------|----------------------|--|--|--------------------------|--------------------------|
| CEF | 3,6/7/2 | 6 | 192 | 65 | 50 | 35 | 26 | 489,0 |
| CEF | 3,6/7/2 | 10 | 192 | 65 | 50 | 55 | 16 | 120,0 |
| CEF | 3,6/7/2 | 16 | 192 | 65 | 50 | 55 | 26 | 60,2 |
| CEF | 3,6/7/2 | 25 | 192 | 65 | 50 | 72 | 24 | 30,1 |
| CEF | 3,6/7/2 | 40 | 192 | 65 | 50 | 100 | 30 | 15,3 |
| CEF | 3,6/7/2 | 50 | 192 | 65 | 50 | 190 | 35 | 10,4 |
| CEF | 3,6/7/2 | 63 | 192 | 65 | 50 | 190 | 40 | 7,8 |
| CEF | 3,6/7/2 | 80 | 192 | 87 | 50 | 250 | 52 | 6,2 |
| CEF | 3,6/7/2 | 100 | 192 | 87 | 50 | 275 | 57 | 4,4 |
| CEF | 3,6/7/2 | 6 | 292 | 65 | 50 | 35 | 26 | 489,0 |
| CEF | 3,6/7/2 | 10 | 292 | 65 | 50 | 55 | 16 | 120,0 |
| CEF | 3,6/7/2 | 16 | 292 | 65 | 50 | 55 | 26 | 60,2 |
| CEF | 3,6/7/2 | 25 | 292 | 65 | 50 | 72 | 24 | 30,1 |
| CEF | 3,6/7/2 | 40 | 292 | 65 | 50 | 100 | 30 | 15,3 |
| CEF | 3,6/7/2 | 50 | 292 | 65 | 50 | 190 | 35 | 10,4 |
| CEF | 3,6/7/2 | 63 | 292 | 65 | 50 | 190 | 40 | 7,8 |
| CEF | 3,6/7/2 | 80 | 292 | 87 | 50 | 250 | 52 | 6,2 |
| CEF | 3,6/7/2 | 100 | 292 | 87 | 50 | 275 | 57 | 4,4 |
| CEF | 3,6/7/2 | 125 | 292 | 87 | 50 | 375 | 76 | 3,5 |
| CEF | 3,6/7/2 | 160 | 292 | 87 | 50 | 480 | 101 | 2,6 |
| CEF | 3,6/7/2 | 200 | 292 | 87 | 50 | 650 | 107 | 1,7 |
| CEF | 3,6/7/2 | 125 | 367 | 87 | 50 | 375 | 76 | 3,5 |
| CEF | 3,6/7/2 | 160 | 367 | 87 | 50 | 480 | 101 | 2,6 |
| CEF | 3,6/7/2 | 200 | 367 | 87 | 50 | 650 | 107 | 1,7 |

| | | | | | | | | |
|-----|----|------|-----|----|----|-----|-----|-------|
| CEF | 12 | 6 | 292 | 53 | 63 | 36 | 46 | 735,0 |
| CEF | 12 | 6 | 292 | 65 | 63 | 35 | 41 | 735,0 |
| CEF | 12 | 10 | 292 | 53 | 63 | 65 | 25 | 180,0 |
| CEF | 12 | 10 | 292 | 65 | 63 | 55 | 33 | 180,0 |
| CEF | 12 | 16 | 292 | 53 | 63 | 65 | 34 | 105,2 |
| CEF | 12 | 16 | 292 | 65 | 63 | 55 | 32 | 105,2 |
| CEF | 12 | 20 | 292 | 53 | 63 | 83 | 38 | 70,1 |
| CEF | 12 | 25 | 292 | 65 | 63 | 77 | 47 | 52,6 |
| CEF | 12 | 31,5 | 292 | 65 | 63 | 100 | 41 | 30,7 |
| CEF | 12 | 40 | 292 | 65 | 63 | 105 | 52 | 23,0 |
| CEF | 12 | 50 | 292 | 65 | 63 | 190 | 70 | 17,9 |
| CEF | 12 | 63 | 292 | 65 | 63 | 190 | 78 | 13,4 |
| CEF | 12 | 80 | 292 | 65 | 63 | 250 | 82 | 9,2 |
| CEF | 12 | 80 | 292 | 87 | 63 | 250 | 82 | 9,2 |
| CEF | 12 | 100 | 292 | 65 | 63 | 375 | 101 | 6,4 |
| CEF | 12 | 100 | 292 | 87 | 63 | 275 | 84 | 6,6 |
| CEF | 12 | 125 | 292 | 87 | 63 | 375 | 125 | 5,1 |
| CEF | 12 | 6 | 442 | 53 | 63 | 36 | 46 | 735,0 |
| CEF | 12 | 6 | 442 | 65 | 63 | 35 | 41 | 735,0 |
| CEF | 12 | 10 | 442 | 53 | 63 | 65 | 25 | 180,0 |
| CEF | 12 | 10 | 442 | 65 | 63 | 55 | 33 | 180,0 |
| CEF | 12 | 16 | 442 | 53 | 63 | 65 | 34 | 105,2 |
| CEF | 12 | 16 | 442 | 65 | 63 | 55 | 32 | 105,2 |
| CEF | 12 | 20 | 442 | 53 | 63 | 83 | 38 | 70,1 |
| CEF | 12 | 25 | 442 | 65 | 63 | 77 | 47 | 52,6 |
| CEF | 12 | 31,5 | 442 | 65 | 63 | 100 | 41 | 30,7 |
| CEF | 12 | 40 | 442 | 65 | 63 | 105 | 52 | 23,0 |
| CEF | 12 | 50 | 442 | 65 | 63 | 190 | 70 | 17,9 |
| CEF | 12 | 63 | 442 | 65 | 63 | 190 | 78 | 13,4 |
| CEF | 12 | 80 | 442 | 65 | 63 | 250 | 82 | 9,2 |
| CEF | 12 | 80 | 442 | 87 | 63 | 250 | 82 | 9,2 |
| CEF | 12 | 100 | 442 | 65 | 63 | 375 | 103 | 6,4 |
| CEF | 12 | 100 | 442 | 87 | 63 | 275 | 84 | 6,6 |
| CEF | 12 | 125 | 442 | 65 | 63 | 375 | 125 | 5,3 |
| CEF | 12 | 125 | 442 | 87 | 63 | 375 | 125 | 5,3 |
| CEF | 12 | 160 | 442 | 87 | 50 | 480 | 170 | 3,9 |
| CEF | 12 | 200 | 442 | 87 | 50 | 650 | 174 | 2,7 |
| CEF | 12 | 125 | 537 | 65 | 50 | 375 | 125 | 5,3 |

| | | | | | | | | |
|-----|------|------|-----|----|----|-----|------|-------|
| CEF | 17,5 | 6 | 292 | 65 | 20 | 35 | 54 | 880,0 |
| CEF | 17,5 | 10 | 292 | 65 | 20 | 55 | 41 | 270,7 |
| CEF | 17,5 | 16 | 292 | 65 | 20 | 55 | 67 | 135,4 |
| CEF | 17,5 | 20 | 292 | 65 | 25 | 83 | 52,6 | 90,3 |
| CEF | 17,5 | 25 | 292 | 65 | 25 | 72 | 64 | 67,7 |
| CEF | 17,5 | 31,5 | 292 | 65 | 25 | 100 | 56,7 | 46,0 |
| CEF | 17,5 | 40 | 292 | 65 | 25 | 210 | 80 | 34,5 |
| CEF | 17,5 | 40 | 292 | 87 | 25 | 100 | 80 | 34,5 |
| CEF | 17,5 | 50 | 292 | 65 | 25 | 210 | 90 | 23,1 |
| CEF | 17,5 | 50 | 292 | 87 | 25 | 210 | 90 | 23,1 |
| CEF | 17,5 | 63 | 292 | 87 | 25 | 210 | 100 | 17,3 |
| CEF | 17,5 | 6 | 367 | 65 | 20 | 35 | 54 | 880,0 |
| CEF | 17,5 | 10 | 367 | 65 | 20 | 55 | 41 | 270,7 |
| CEF | 17,5 | 16 | 367 | 65 | 20 | 55 | 67 | 135,4 |

Fuse link type CEF

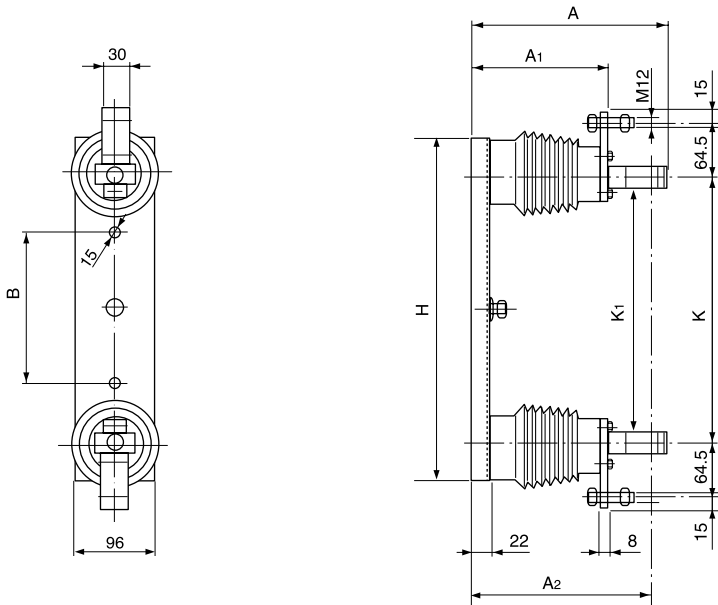
| Type | Rated voltage U_n [kV] | Rated current I_n [kV] | Length e [mm] | Diameter D [mm] | Short Circuit current I_1 [kA] | Minimum breaking current I_3 [A] | Rated Power P_N [W] | Resistance R_0 [mΩ] |
|------|-----------------------------|-----------------------------|--------------------|----------------------|--|--|--------------------------|--------------------------|
| CEF | 17,5 | 20 | 367 | 65 | 25 | 83 | 52,6 | 90,3 |
| CEF | 17,5 | 25 | 367 | 65 | 25 | 72 | 64 | 67,7 |
| CEF | 17,5 | 31,5 | 367 | 65 | 25 | 100 | 56,7 | 46,0 |
| CEF | 17,5 | 40 | 367 | 65 | 25 | 210 | 80 | 34,7 |
| CEF | 17,5 | 40 | 367 | 87 | 25 | 100 | 80 | 34,5 |
| CEF | 17,5 | 50 | 367 | 65 | 25 | 210 | 90 | 23,1 |
| CEF | 17,5 | 50 | 367 | 87 | 25 | 210 | 90 | 23,1 |
| CEF | 17,5 | 63 | 367 | 87 | 25 | 210 | 100 | 17,3 |
| CEF | 17,5 | 100 | 367 | 87 | 25 | 375 | 134 | 9,5 |
| CEF | 17,5 | 6 | 442 | 65 | 20 | 35 | 54 | 880,0 |
| CEF | 17,5 | 10 | 442 | 65 | 20 | 55 | 41 | 271,0 |
| CEF | 17,5 | 16 | 442 | 65 | 20 | 55 | 67 | 135,0 |
| CEF | 17,5 | 20 | 442 | 65 | 25 | 83 | 52,6 | 101,6 |
| CEF | 17,5 | 25 | 442 | 65 | 25 | 72 | 64 | 67,7 |
| CEF | 17,5 | 31,5 | 442 | 65 | 25 | 100 | 56,7 | 43,1 |
| CEF | 17,5 | 40 | 442 | 65 | 25 | 210 | 80 | 34,5 |
| CEF | 17,5 | 40 | 442 | 87 | 25 | 100 | 80 | 34,5 |
| CEF | 17,5 | 50 | 442 | 65 | 25 | 210 | 90 | 23,1 |
| CEF | 17,5 | 50 | 442 | 87 | 25 | 210 | 90 | 23,1 |
| CEF | 17,5 | 63 | 442 | 87 | 25 | 210 | 100 | 17,3 |
| CEF | 17,5 | 80 | 442 | 87 | 25 | 250 | 124 | 13,8 |
| CEF | 17,5 | 100 | 442 | 87 | 25 | 275 | 136 | 9,9 |
| CEF | 17,5 | 125 | 442 | 87 | 25 | 375 | 175 | 7,9 |
| CEF | 24 | 6 | 442 | 53 | 63 | 25 | 82 | 1370,0 |
| CEF | 24 | 6 | 442 | 65 | 63 | 35 | 91 | 1370,0 |
| CEF | 24 | 10 | 442 | 53 | 63 | 65 | 48 | 360,9 |
| CEF | 24 | 10 | 442 | 65 | 63 | 55 | 62 | 360,9 |
| CEF | 24 | 16 | 442 | 53 | 63 | 65 | 63 | 180,5 |
| CEF | 24 | 16 | 442 | 65 | 63 | 55 | 72 | 180,5 |
| CEF | 24 | 20 | 442 | 53 | 63 | 83 | 46 | 120,3 |
| CEF | 24 | 20 | 442 | 65 | 63 | 82 | 61 | 130,3 |
| CEF | 24 | 25 | 442 | 65 | 63 | 72 | 79 | 90,2 |
| CEF | 24 | 31,5 | 442 | 65 | 63 | 82 | 98 | 72,2 |
| CEF | 24 | 40 | 442 | 65 | 63 | 110 | 106 | 46,0 |
| CEF | 24 | 50 | 442 | 65 | 63 | 210 | 130 | 30,7 |
| CEF | 24 | 50 | 442 | 87 | 63 | 210 | 130 | 30,7 |
| CEF | 24 | 63 | 442 | 65 | 63 | 250 | 147 | 23,0 |
| CEF | 24 | 63 | 442 | 87 | 63 | 210 | 147 | 23,0 |
| CEF | 24 | 80 | 442 | 87 | 63 | 250 | 165 | 18,4 |
| CEF | 24 | 100 | 442 | 87 | 63 | 300 | 186 | 13,2 |
| CEF | 24 | 125 | 442 | 87 | 63 | 375 | 234 | 10,5 |
| CEF | 24 | 80 | 537 | 65 | 63 | 250 | 165 | 18,4 |
| CEF | 24 | 80 | 537 | 87 | 63 | 250 | 165 | 18,4 |
| CEF | 24 | 100 | 537 | 87 | 63 | 300 | 186 | 13,2 |
| CEF | 24 | 125 | 537 | 87 | 63 | 375 | 234 | 10,5 |
| CEF | 27 | 6 | 442 | 65 | 20 | 35 | 91 | 1340,0 |
| CEF | 27 | 10 | 442 | 65 | 20 | 55 | 80 | 451,2 |
| CEF | 27 | 16 | 442 | 65 | 20 | 55 | 90 | 225,6 |
| CEF | 27 | 25 | 442 | 87 | 20 | 72 | 100 | 112,8 |
| CEF | 27 | 40 | 442 | 87 | 20 | 110 | 130 | 55,6 |
| CEF | 27 | 50 | 442 | 87 | 20 | 210 | 130 | 30,7 |
| CEF | 27 | 63 | 442 | 87 | 20 | 210 | 147 | 23,0 |
| CEF | 27 | 80 | 537 | 87 | 20 | 250 | 210 | 18,4 |
| CEF | 27 | 100 | 537 | 87 | 20 | 300 | 235 | 15,8 |
| CEF | 36 | 6 | 537 | 65 | 20 | 35 | 137 | 2055,0 |
| CEF | 36 | 10 | 537 | 65 | 20 | 55 | 93 | 571,5 |
| CEF | 36 | 16 | 537 | 65 | 20 | 55 | 109 | 285,8 |
| CEF | 36 | 25 | 537 | 87 | 20 | 72 | 144 | 142,9 |
| CEF | 36 | 40 | 537 | 87 | 20 | 100 | 176 | 69,1 |



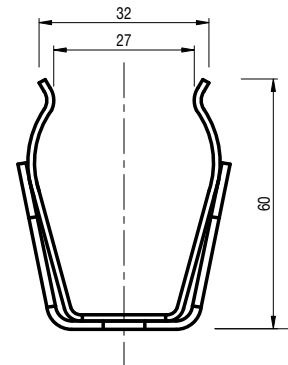
I_1 = maximum short-circuit current tested
 I_3 = minimum breaking current
 P_N = power loss at rated current
 R_0 = resistance at room temp.

Fuse link type CEF

Accessories Fuse base type UCE



Fuse clips



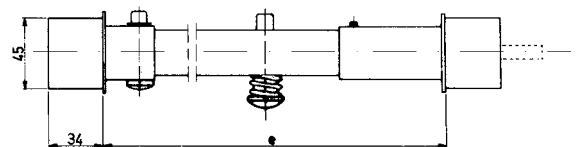
Catalogue No. 1YMX000128M0001

11. Ordering table

| Type | Rated voltage [kV] | Current ratings [A] | Fuse length mm | Dimensions in mm | | | | | | | Weight [kg] | Catalogue No. |
|----------|-----------------------|------------------------|-------------------|------------------|----------------|----------------|-----|-----|----------------|-----|----------------|------------------------------------|
| | | | | A | A ₁ | A ₂ | H | K | K ₁ | B | | |
| UCE 7,2 | 3,6/7,2 | 6-100 | 192 | 242 | 160 | 221 | 310 | 218 | 193 | 55 | 3,4 | 1YMX052501M0001 |
| UCE12 | 3,6/7,2 12 | 6-200 6-125 | 292 | 242 | 160 | 221 | 410 | 318 | 293 | 180 | 3,7 | 1YMX052503M0001 1YMX052503M0001 |
| UCE 12L | 12 | 125-200 | 442 | 242 | 160 | 221 | 570 | 468 | 443 | 300 | 4,2 | 1YMX052505M0001 |
| UCE 17,5 | 17,5 | 6-63 | 292 | 327 | 245 | 306 | 410 | 318 | 293 | 180 | 3,7 | 1YMX052507M0001 |
| UCE 24 | 17,5 24 | 6-125 6-125 | 442 | 327 | 245 | 306 | 570 | 468 | 443 | 300 | 6,9 | 1YMX052509M0001 1YMX052509M0001 |
| UCE 24L | 24 | 80-125 | 537 | 327 | 245 | 306 | 675 | 563 | 538 | 380 | 7,4 | 1YMX052511M0001 |
| UCE 36 | 36 | 6-40 | 537 | 422 | 340 | 401 | 675 | 563 | 538 | 380 | 7,6 | 1YMX052513M0001 |

CEF test fuse-link 3,6/7,2-36 kV for test of striker system.

| Catalogue No. | Weight [kg] | Dimension in mm | |
|-----------------|----------------|-----------------|--------------|
| | | e* | Total length |
| 1YMX300062M0001 | 1,4 | 192 | 605 |
| | | 292 | |
| | | 442 | |
| | | 537 | |



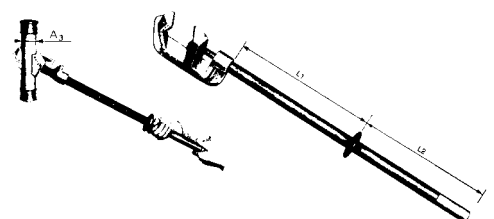
*) Adjustable

The striker has a force-travel characteristic as shown in the figure on page 4.

Operating tong for fuse links CEF 3,6/7,2 - 36 kV

| Catalogue No. | Test voltage [kV] | Weight [kg] |
|----------------|----------------------|----------------|
| 1YMX053006M001 | 100 | 2,2 |

| Dimensions in mm | | |
|------------------|-----|-------|
| L1 | L2 | A3(Ø) |
| 700 | 600 | 30-90 |

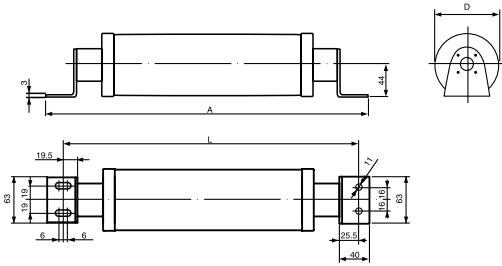


Fuse link type CEF

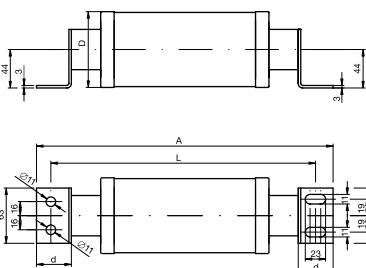
12. Data and dimension CEF-BS

| Type | Rated voltage [kV] | Rated current [A] | L/D [mm] | A [mm] | Catalogue No. |
|--------|--------------------|-------------------|----------|--------|-----------------|
| CEF-BS | 3,6/7,2 | 6 | 307/65 | 342 | 1YMB531007M0001 |
| CEF-BS | 3,6/7,2 | 10 | 307/65 | 342 | 1YMB531007M0002 |
| CEF-BS | 3,6/7,2 | 16 | 307/65 | 342 | 1YMB531007M0003 |
| CEF-BS | 3,6/7,2 | 25 | 307/65 | 342 | 1YMB531007M0004 |
| CEF-BS | 3,6/7,2 | 40 | 307/65 | 342 | 1YMB531007M0005 |
| CEF-BS | 3,6/7,2 | 50 | 307/65 | 342 | 1YMB531007M0006 |
| CEF-BS | 3,6/7,2 | 63 | 307/65 | 342 | 1YMB531007M0007 |
| CEF-BS | 3,6/7,2 | 80 | 307/65 | 342 | 1YMB531007M0008 |
| CEF-BS | 3,6/7,2 | 100 | 307/65 | 342 | 1YMB531007M0009 |
| CEF-BS | 3,6/7,2 | 125 | 407/87 | 442 | 1YMB531007M0010 |
| CEF-BS | 3,6/7,2 | 160 | 407/87 | 442 | 1YMB531007M0011 |
| CEF-BS | 3,6/7,2 | 200 | 407/87 | 442 | 1YMB531007M0012 |
| CEF-BS | 12 | 6 | 407/65 | 442 | 1YMB531008M0001 |
| CEF-BS | 12 | 10 | 407/65 | 442 | 1YMB531008M0002 |
| CEF-BS | 12 | 16 | 407/65 | 442 | 1YMB531008M0003 |
| CEF-BS | 12 | 25 | 407/65 | 442 | 1YMB531008M0004 |
| CEF-BS | 12 | 40 | 407/65 | 442 | 1YMB531008M0005 |
| CEF-BS | 12 | 50 | 407/65 | 442 | 1YMB531008M0006 |
| CEF-BS | 12 | 63 | 407/65 | 442 | 1YMB531008M0007 |
| CEF-BS | 12 | 80 | 407/87 | 442 | 1YMB531008M0008 |
| CEF-BS | 12 | 100 | 407/87 | 442 | 1YMB531008M0009 |
| CEF-BS | 12 | 125 | 557/87 | 592 | 1YMB531008M0010 |
| CEF-BS | 12 | 160 | 557/87 | 592 | 1YMB531008M0011 |
| CEF-BS | 12 | 200 | 557/87 | 592 | 1YMB531008M0012 |
| CEF-BS | 17,5 | 6 | 407/65 | 442 | 1YMB531009M0001 |
| CEF-BS | 17,5 | 10 | 407/65 | 442 | 1YMB531009M0002 |
| CEF-BS | 17,5 | 16 | 407/65 | 442 | 1YMB531009M0003 |
| CEF-BS | 17,5 | 25 | 407/65 | 442 | 1YMB531009M0004 |
| CEF-BS | 17,5 | 40 | 407/87 | 442 | 1YMB531009M0005 |
| CEF-BS | 17,5 | 50 | 407/87 | 442 | 1YMB531009M0006 |
| CEF-BS | 17,5 | 63 | 407/87 | 442 | 1YMB531009M0007 |
| CEF-BS | 17,5 | 80 | 557/87 | 592 | 1YMB531009M0008 |
| CEF-BS | 17,5 | 100 | 557/87 | 592 | 1YMB531009M0009 |
| CEF-BS | 17,5 | 125 | 557/87 | 592 | 1YMB531009M0010 |
| CEF-BS | 24 | 6 | 557/65 | 592 | 1YMB531010M0001 |
| CEF-BS | 24 | 10 | 557/65 | 592 | 1YMB531010M0002 |
| CEF-BS | 24 | 16 | 557/65 | 592 | 1YMB531010M0003 |
| CEF-BS | 24 | 25 | 557/65 | 592 | 1YMB531010M0004 |
| CEF-BS | 24 | 40 | 557/65 | 592 | 1YMB531010M0005 |
| CEF-BS | 24 | 50 | 557/87 | 592 | 1YMB531010M0006 |
| CEF-BS | 24 | 63 | 557/87 | 592 | 1YMB531010M0007 |
| CEF-BS | 24 | 80 | 652/87 | | |
| CEF-BS | 24 | 100 | 652/87 | | |
| CEF-BS | 24 | 125 | 652/87 | | |

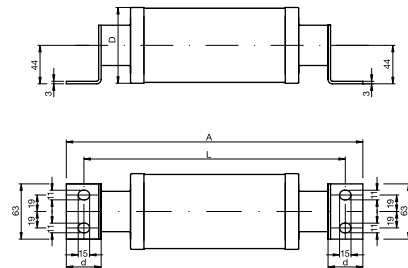
Dimension CEF-BS



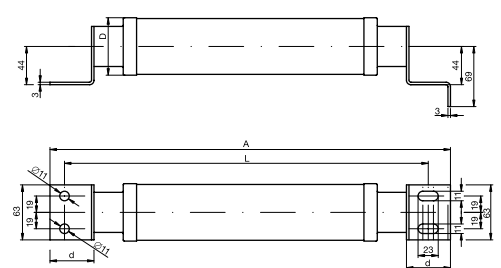
Dimension CEF-BS-B



Dimension CEF-BS-C



Dimension CEF-BS-D



Data and dimension CEF-BS acc. to EN 60282-1:1996

| Type | Rated voltage [kV] | Rated current [A] | L/D [mm] | A/d [mm] | Catalogue No. |
|----------|--------------------|-------------------|----------|----------|-----------------|
| CEF-BS-B | 3,6/7,2 | 6 | 305/65 | 340/40 | 1YMB531007M0021 |
| CEF-BS-B | 3,6/7,2 | 10 | 305/65 | 340/40 | 1YMB531007M0022 |
| CEF-BS-B | 3,6/7,2 | 16 | 305/65 | 340/40 | 1YMB531007M0023 |
| CEF-BS-B | 3,6/7,2 | 25 | 305/65 | 340/40 | 1YMB531007M0024 |
| CEF-BS-B | 3,6/7,2 | 40 | 305/65 | 340/40 | 1YMB531007M0025 |
| CEF-BS-B | 3,6/7,2 | 50 | 305/65 | 340/40 | 1YMB531007M0026 |
| CEF-BS-B | 3,6/7,2 | 63 | 305/65 | 340/40 | 1YMB531007M0027 |
| CEF-BS-B | 3,6/7,2 | 80 | 305/87 | 340/40 | 1YMB531007M0028 |
| CEF-BS-B | 3,6/7,2 | 100 | 305/87 | 340/40 | 1YMB531007M0029 |
| CEF-BS-B | 3,6/7,2 | 125 | 419/87 | 340/40 | 1YMB531007M0030 |
| CEF-BS-B | 3,6/7,2 | 160 | 419/87 | 461/50,5 | 1YMB531007M0031 |
| CEF-BS-B | 3,6/7,2 | 200 | 419/87 | 461/50,5 | 1YMB531007M0032 |
| CEF-BS-D | 12 | 6 | 419/65 | 461/50,5 | 1YMB531008M0021 |
| CEF-BS-D | 12 | 10 | 419/65 | 461/50,5 | 1YMB531008M0022 |
| CEF-BS-D | 12 | 16 | 419/65 | 461/50,5 | 1YMB531008M0023 |
| CEF-BS-D | 12 | 25 | 419/65 | 461/50,5 | 1YMB531008M0024 |
| CEF-BS-D | 12 | 40 | 419/65 | 461/50,5 | 1YMB531008M0025 |
| CEF-BS-D | 12 | 50 | 419/65 | 461/50,5 | 1YMB531008M0026 |
| CEF-BS-D | 12 | 63 | 419/65 | 461/50,5 | 1YMB531008M0027 |
| CEF-BS-D | 12 | 80 | 419/87 | 461/50,5 | 1YMB531008M0028 |
| CEF-BS-D | 12 | 100 | 419/87 | 461/50,5 | 1YMB531008M0029 |
| CEF-BS-B | 12 | 125 | 553/87 | 590/40 | 1YMB531008M0030 |
| CEF-BS-B | 12 | 160 | 553/87 | 590/40 | 1YMB531008M0031 |
| CEF-BS-B | 12 | 200 | 553/87 | 590/40 | 1YMB531008M0032 |
| CEF-BS-D | 17,5 | 6 | 419/65 | 461/50,5 | 1YMB531009M0021 |
| CEF-BS-D | 17,5 | 10 | 419/65 | 461/50,5 | 1YMB531009M0022 |
| CEF-BS-D | 17,5 | 16 | 419/65 | 461/50,5 | 1YMB531009M0023 |
| CEF-BS-D | 17,5 | 25 | 419/65 | 461/50,5 | 1YMB531009M0024 |
| CEF-BS-D | 17,5 | 40 | 419/87 | 461/50,5 | 1YMB531009M0025 |
| CEF-BS-D | 17,5 | 50 | 419/87 | 461/50,5 | 1YMB531009M0026 |
| CEF-BS-D | 17,5 | 63 | 419/87 | 461/50,5 | 1YMB531009M0027 |
| CEF-BS-B | 17,5 | 80 | 553/87 | 590/40 | 1YMB531009M0028 |
| CEF-BS-B | 17,5 | 100 | 553/87 | 590/40 | 1YMB531009M0029 |
| CEF-BS-B | 17,5 | 125 | 553/87 | 590/40 | 1YMB531009M0030 |
| CEF-BS-B | 24 | 6 | 553/65 | 590/40 | 1YMB531010M0021 |
| CEF-BS-B | 24 | 10 | 553/65 | 590/40 | 1YMB531010M0022 |
| CEF-BS-B | 24 | 16 | 553/65 | 590/40 | 1YMB531010M0023 |
| CEF-BS-B | 24 | 25 | 553/65 | 590/40 | 1YMB531010M0024 |
| CEF-BS-B | 24 | 40 | 553/65 | 590/40 | 1YMB531010M0025 |
| CEF-BS-B | 24 | 50 | 553/87 | 590/40 | 1YMB531010M0026 |
| CEF-BS-B | 24 | 63 | 553/87 | 590/40 | 1YMB531010M0027 |
| CEF-BS-C | 3,6/7,2 | 6 | 305/65 | 340/40 | 1YMB531007M0041 |
| CEF-BS-C | 3,6/7,2 | 10 | 305/65 | 340/40 | 1YMB531007M0042 |
| CEF-BS-C | 3,6/7,2 | 16 | 305/65 | 340/40 | 1YMB531007M0043 |
| CEF-BS-C | 3,6/7,2 | 25 | 305/65 | 340/40 | 1YMB531007M0044 |
| CEF-BS-C | 3,6/7,2 | 40 | 305/65 | 340/40 | 1YMB531007M0045 |
| CEF-BS-C | 3,6/7,2 | 50 | 305/65 | 340/40 | 1YMB531007M0046 |
| CEF-BS-C | 3,6/7,2 | 63 | 305/65 | 340/40 | 1YMB531007M0047 |
| CEF-BS-C | 3,6/7,2 | 80 | 305/87 | 340/40 | 1YMB531007M0048 |
| CEF-BS-C | 3,6/7,2 | 100 | 305/87 | 340/40 | 1YMB531007M0049 |
| CEF-BS-C | 3,6/7,2 | 6 | 320/65 | 361/50,5 | 1YMB531007M0061 |
| CEF-BS-C | 3,6/7,2 | 10 | 320/65 | 361/50,5 | 1YMB531007M0062 |
| CEF-BS-C | 3,6/7,2 | 16 | 320/65 | 361/50,5 | 1YMB531007M0063 |
| CEF-BS-C | 3,6/7,2 | 25 | 320/65 | 361/50,5 | 1YMB531007M0064 |
| CEF-BS-C | 3,6/7,2 | 40 | 320/65 | 361/50,5 | 1YMB531007M0065 |
| CEF-BS-C | 3,6/7,2 | 50 | 320/65 | 361/50,5 | 1YMB531007M0066 |
| CEF-BS-C | 3,6/7,2 | 63 | 320/65 | 361/50,5 | 1YMB531007M0067 |
| CEF-BS-C | 3,6/7,2 | 80 | 320/87 | 361/50,5 | 1YMB531007M0068 |
| CEF-BS-C | 3,6/7,2 | 100 | 320/87 | 361/50,5 | 1YMB531007M0069 |
| CEF-BS-C | 3,6/7,2 | 125 | 320/87 | 400/40 | 1YMB531007M0050 |
| CEF-BS-C | 3,6/7,2 | 160 | 320/87 | 400/40 | 1YMB531007M0051 |
| CEF-BS-C | 3,6/7,2 | 200 | 320/87 | 400/40 | 1YMB531007M0052 |
| CEF-BS-C | 12 | 6 | 400/65 | 400/40 | 1YMB531008M0041 |
| CEF-BS-C | 12 | 10 | 400/65 | 400/40 | 1YMB531008M0042 |
| CEF-BS-C | 12 | 16 | 400/65 | 400/40 | 1YMB531008M0043 |
| CEF-BS-C | 12 | 25 | 400/65 | 400/40 | 1YMB531008M0044 |
| CEF-BS-C | 12 | 40 | 400/65 | 400/40 | 1YMB531008M0045 |
| CEF-BS-C | 12 | 50 | 400/65 | 400/40 | 1YMB531008M0046 |
| CEF-BS-C | 12 | 63 | 400/65 | 400/40 | 1YMB531008M0047 |
| CEF-BS-C | 12 | 80 | 400/87 | 400/40 | 1YMB531008M0048 |
| CEF-BS-C | 12 | 100 | 400/87 | 400/40 | 1YMB531008M0049 |
| CEF-BS-C | 17,5 | 6 | 400/65 | 400/40 | 1YMB531009M0041 |
| CEF-BS-C | 17,5 | 10 | 400/65 | 400/40 | 1YMB531009M0042 |
| CEF-BS-C | 17,5 | 16 | 400/65 | 400/40 | 1YMB531009M0043 |
| CEF-BS-C | 17,5 | 25 | 400/65 | 400/40 | 1YMB531009M0044 |
| CEF-BS-C | 17,5 | 40 | 400/87 | 400/40 | 1YMB531009M0045 |
| CEF-BS-C | 17,5 | 50 | 400/87 | 400/40 | 1YMB531009M0046 |
| CEF-BS-C | 17,5 | 63 | 400/87 | 400/40 | 1YMB531009M0047 |

High voltage current limiting fuse link for MOTOR circuit applications type CMF

Rated voltage:
3,6 kV
7,2 kV
12 kV

Rated current:
100-315 A
63-315 A
63-200 A



1. General

The fuse links type CMF are specially designed for motor circuit applications. They are tested according to the IEC Publication 60282-1 (IEC 282-1) and Publication 644. The IEC 644 applies to fuse links used with motors started direct-on-line on alternating current systems. High voltage fuses used in motor circuits must have the ability to withstand, without deterioration, the repeated surges associated with motor starting.

The dimensions are in accordance with DIN 43625, i.e. the 3,6 kV rating is realized in the normal 12 kV length (e = 292 mm). The 7,2 kV and 12 kV rating in the 24 kV length (e = 442 mm). Special connection elements can be delivered in cases where fuses have to be paralleled.

ABB's motor fuses have the following properties:

- higher current rating within single body dimensions
- tested according to IEC 644 which guarantees excellent ability to withstand repeated motor starting conditions
- low power losses
- low minimum breaking current
- high breaking capacity and excellent short circuit current limitation.

Although a motor fuse is normally run at a stationary current which is much lower than the fuse rated current, the low-loss characteristics of the CMF fuses make them especially suitable in compact contactor compartments.

| | | |
|---------------------------|--|----------|
| STRIKER - SCHLAGSTIFT | ABB | TYPE CMF |
| | $I_N = 100A$ $U_N = 7.2kV \quad I_1 = 50kA$ | |
| | ABB | |

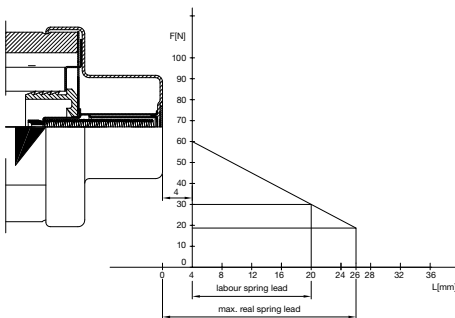
2. Nameplate

The symbols on the nameplate have the following meaning:

I_N = Rated current

U_N = Rated voltage

I_1 = Maximum short circuit current for which the fuse is tested



3. Indicator and striker pin

The CMF fuse links are equipped with a combined indicator and striker system, which is activated immediately when the fuse element melts. The force diagram is in accordance with the requirements of IEC 60282-1 (IEC 282-1) and DIN 43625. The below presented striker pin force diagram is valid for CEF/CMF fuses as effective from 05.2006. The former version of striker pin was with initial force of 50N.

Fuse link type CMF



4. Ordering table type CMF

High voltage – fuse links

| Type | Rated voltage [kV] | Rated Current [A] | e | Catalogue No. | Weight [kg] |
|------|--------------------|-------------------|-----|-----------------|-------------|
| CMF | 3,6 | 100 | 292 | 1YMB531028M0001 | 2,3 |
| CMF | 3,6 | 160 | 292 | 1YMB531028M0002 | 2,3 |
| CMF | 3,6 | 200 | 292 | 1YMB531028M0003 | 2,3 |
| CMF | 3,6 | 250 | 292 | 1YMB531028M0004 | 3,8 |
| CMF | 3,6 | 315 | 292 | 1YMB531028M0005 | 3,8 |
| CMF | 7,2 | 63 | 442 | 1YMB531029M0001 | 3,0 |
| CMF | 7,2 | 100 | 442 | 1YMB531029M0002 | 3,0 |
| CMF | 7,2 | 160 | 442 | 1YMB531029M0003 | 3,0 |
| CMF | 7,2 | 200 | 442 | 1YMB531029M0004 | 5,3 |
| CMF | 7,2 | 250 | 442 | 1YMB531029M0005 | 5,3 |
| CMF | 7,2 | 315 | 442 | 1YMB531029M0006 | 5,3 |
| CMF | 12 | 63 | 442 | 1YMB531030M0001 | 3,0 |
| CMF | 12 | 100 | 442 | 1YMB531030M0002 | 5,3 |
| CMF | 12 | 160 | 442 | 1YMB531030M0003 | 5,3 |
| CMF | 12 | 200 | 442 | 1YMB531030M0004 | 5,3 |

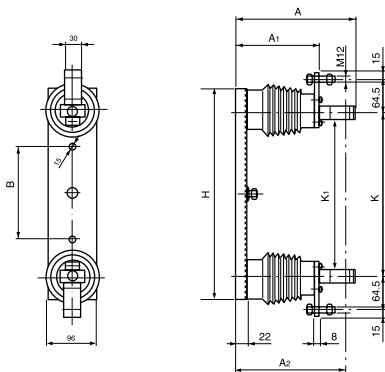
FUSE BASE TYPE UCM

5. Ordering table UCM

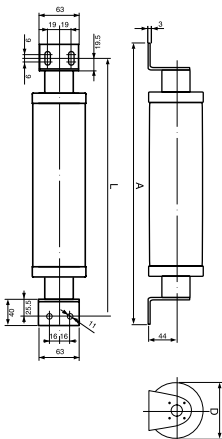
| Type | Rated voltage [kV] | Dimensions [mm] | | | | | | | Weight [kg] | Catalogue No. |
|------|--------------------|-----------------|----------------|----------------|-----|-----|----------------|-----|-------------|----------------|
| | | A | A ₁ | A ₂ | H | K | K ₁ | B | | |
| UCM | 3,6 | 232 | 160 | 220 | 410 | 318 | 293 | 180 | 3,7 | 1YMX139037R001 |
| UCM | 7,2/12 | 232 | 160 | 220 | 570 | 468 | 443 | 300 | 4,2 | 1YMX139037R002 |

6. Ordering table type CMF-BS

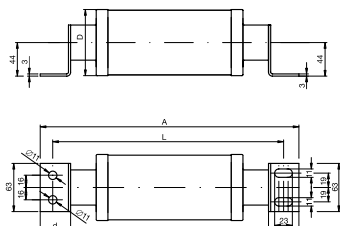
| Type | Rated voltage [kV] | Rated Current [A] | L/D [mm] | A/d [mm] | Catalogue No. | Weight [kg] |
|----------|--------------------|-------------------|----------|----------|-----------------|-------------|
| CMF-BS-C | 3,6 | 100 | 400/65 | 440/40 | 1YMB531031M0021 | 2,3 |
| CMF-BS-C | 3,6 | 160 | 400/65 | 440/40 | 1YMB531031M0022 | 2,3 |
| CMF-BS-C | 3,6 | 200 | 400/87 | 440/40 | 1YMB531031M0023 | 2,3 |
| CMF-BS-C | 3,6 | 250 | 400/87 | 440/40 | 1YMB531031M0024 | 3,8 |
| CMF-BS-C | 3,6 | 315 | 400/87 | 440/40 | 1YMB531031M0025 | 3,8 |
| CMF-BS-D | 3,6 | 100 | 419/65 | 461/50,5 | 1YMB531031M0011 | 2,3 |
| CMF-BS-D | 3,6 | 160 | 419/65 | 461/50,5 | 1YMB531031M0012 | 2,3 |
| CMF-BS-D | 3,6 | 20 | 419/87 | 461/50,5 | 1YMB531031M0013 | 2,3 |
| CMF-BS-D | 3,6 | 250 | 419/87 | 461/50,5 | 1YMB531031M0014 | 3,8 |
| CMF-BS-D | 3,6 | 315 | 419/87 | 461/50,5 | 1YMB531031M0015 | 3,8 |
| CMF-BS-B | 7,2 | 63 | 555/65 | 590/40 | 1YMB531032M0021 | 3,0 |
| CMF-BS-B | 7,2 | 100 | 555/65 | 590/40 | 1YMB531032M0022 | 3,0 |
| CMF-BS-B | 7,2 | 160 | 555/65 | 590/40 | 1YMB531032M0023 | 3,0 |
| CMF-BS-B | 7,2 | 200 | 555/87 | 590/40 | 1YMB531032M0024 | 5,3 |
| CMF-BS-B | 7,2 | 250 | 555/87 | 590/40 | 1YMB531032M0025 | 5,3 |
| CMF-BS-B | 7,2 | 315 | 555/87 | 590/40 | 1YMB531032M0026 | 5,3 |
| CMF-BS-B | 12 | 63 | 555/65 | 590/40 | 1YMB531033M0021 | 3,0 |
| CMF-BS-B | 12 | 100 | 555/87 | 590/40 | 1YMB531033M0022 | 5,3 |
| CMF-BS-B | 12 | 160 | 555/87 | 590/40 | 1YMB531033M0023 | 5,3 |
| CMF-BS-B | 12 | 200 | 555/87 | 590/40 | 1YMB531033M0024 | 5,3 |
| CMF-BS | 3,6 | 100 | 405/65 | 440/40 | 1YMB531031M0001 | 2,3 |
| CMF-BS | 3,6 | 160 | 405/65 | 440/40 | 1YMB531031M0002 | 2,3 |
| CMF-BS | 3,6 | 200 | 405/87 | 440/40 | 1YMB531031M0003 | 2,3 |
| CMF-BS | 3,6 | 250 | 405/87 | 440/40 | 1YMB531031M0004 | 3,8 |
| CMF-BS | 3,6 | 315 | 405/87 | 440/40 | 1YMB531031M0005 | 3,8 |
| CMF-BS | 7,2 | 63 | 555/65 | 590/40 | 1YMB531032M0001 | 3,0 |
| CMF-BS | 7,2 | 100 | 555/65 | 590/40 | 1YMB531032M0002 | 3,0 |
| CMF-BS | 7,2 | 160 | 555/65 | 590/40 | 1YMB531032M0003 | 3,0 |
| CMF-BS | 7,2 | 200 | 555/87 | 590/40 | 1YMB531032M0004 | 5,3 |
| CMF-BS | 7,2 | 250 | 555/87 | 590/40 | 1YMB531032M0005 | 5,3 |
| CMF-BS | 7,2 | 315 | 555/87 | 590/40 | 1YMB531032M0006 | 5,3 |
| CMF-BS | 12 | 63 | 555/65 | 590/40 | 1YMB531033M0001 | 3,0 |
| CMF-BS | 12 | 100 | 555/87 | 590/40 | 1YMB531033M0002 | 5,3 |
| CMF-BS | 12 | 160 | 555/87 | 590/40 | 1YMB531033M0003 | 5,3 |
| CMF-BS | 12 | 200 | 555/87 | 590/40 | 1YMB531033M0004 | 5,3 |



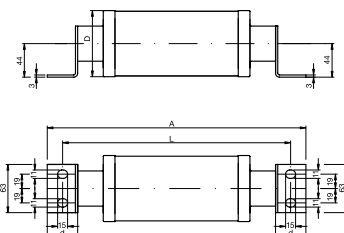
Dimension CMF-BF



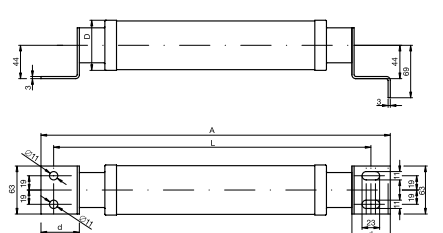
Dimension CMF-BS-B



Dimension CMF-BS-C

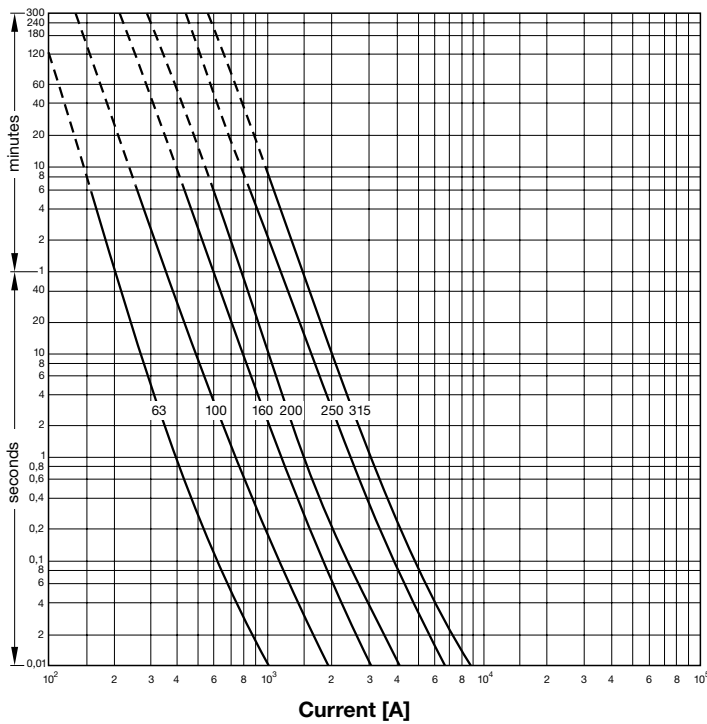


Dimension CMF-BS-D



Fuse link type CMF

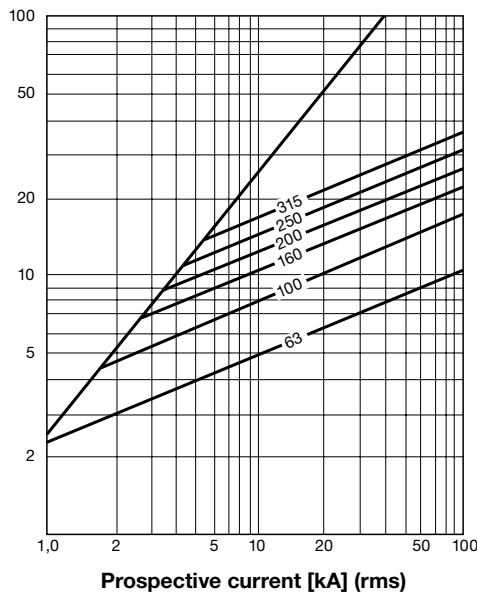
Pre-arcing time



7. Pre-arcing times

The characteristics are equal for all rated voltages and are recorded from cold condition. Dashed sections of the curves indicate the zone of uncertain interruption.

Maximum cut off current [kA] (peak)



8. Current limitation

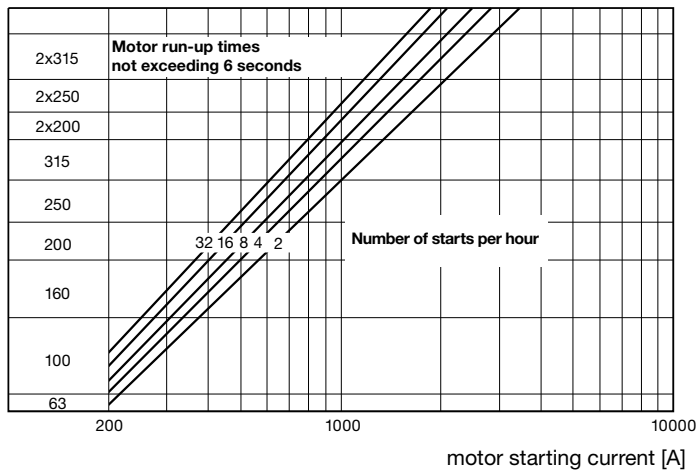
CMF fuse links are current limiting. A large short circuit current will therefore not reach its full value. The diagram shows the relation between the prospective short circuit current and the peak value of the cut off current.

9. Overvoltages

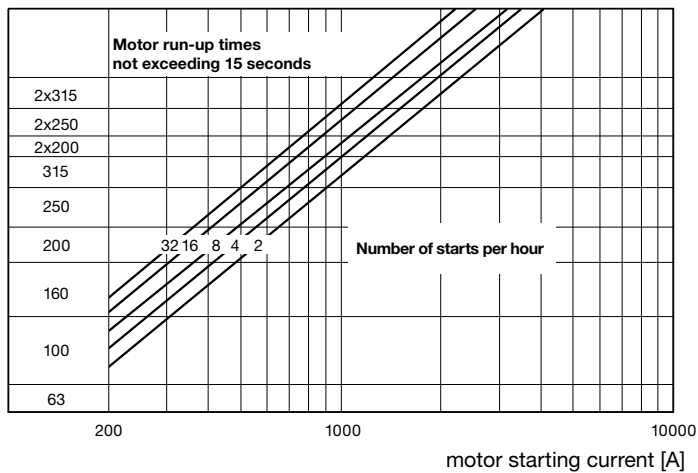
In order to be current limiting, the fuse links must generate an arc voltage exceeding the instantaneous value of the operating voltage. The overvoltage generated by the CMF fuse link is below the maximum permissible value according to IEC 60282-1 (IEC 282-1) CMF fuse links can safely be used if the system line voltage is 50-100% of the rated fuse link voltage.

Fuse link type CMF

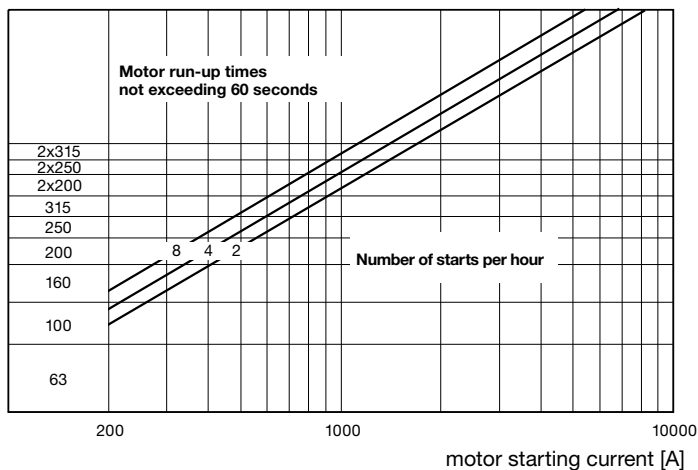
Fuselink rating [A]



Fuselink rating [A]



Fuselink rating [A]



10. Choice of fuse links

Choice of rated voltage U_N

The rated voltage of the fuse links must be equal to, or higher than the operating line voltage. By choosing 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_N

The minimum permissible current rating of the fuse link for motor protection may be determined from the selection charts I, II and III.

The three different 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. Of this specific number of starts per hour, the first two are in immediate succession, the rest being evenly spaced in the 1 hour period.

The number of starts per hour indicates the time interval between separate starts.

For example, 4 starts in 15 minutes are represented by 16 starts per hour.

On the horizontal axis of the selection chart, the motor starting current is given, and along the vertical axis the current rating of the fuse link is found.

Selection procedure:

- Select the charts which are 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 of the correct rating of the fuse link on the vertical axis.

| Example: | A | B |
|-------------------------------|--------|---------|
| Starting current of the motor | 820A | 250A |
| Run-up time | 6 sec. | 15 sec. |
| Number of starts per hour | 2 | 16 |
| Chart number | 1 | 2 |
| Rated current of fuse link | 250A | 160A |

Fuse link type CMF

11. Replacement of melted fuse links

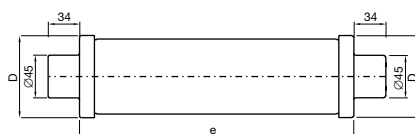
CMF fuse link cannot be regenerated. According to IEC Publication 60282-1 (IEC 282-1), all 3 fuse links should be replaced, even if only 1 or 2 of the fuse links in the three-phase system have operated. Exceptions are allowed when it can be verified that the fuse link(s) have not experienced any overcurrent.

12. The K-factor

According to the IEC 644, the K-factor is a factor (less than unity) defining an overload characteristic to which the fuse link may be repeatedly subjected under specified motor starting conditions without deterioration. The overload characteristic is obtained by multiplying the current on the prearcing characteristic (melting time characteristics) by K. The Value of K given in the data table is chosen at 10 seconds melting time, and is valid for melting times between 5 and 60 seconds.

13. Data and dimensions CMF

| U_N | I_N | e | D | K^* | I_1 | I_3 | R_0 | P_N | Minimum $I^2 \times t$ | Maximum $I^2 \times t$ |
|-------|-------|------|------|-------|-------|-------|-------|-------|-----------------------------|----------------------------------|
| [kV] | [A] | [mm] | [mm] | - | [kA] | [A] | [mΩ] | [W] | Pre-arc A ² s | Interruption A ² s |
| 3,6 | 100 | 292 | 65 | 0,75 | 50 | 275 | 3,20 | 49 | $1,4 \times 10^4$ | 17×10^4 |
| | 160 | 292 | 65 | 0,7 | 50 | 400 | 1,92 | 75 | $3,8 \times 10^4$ | 50×10^4 |
| | 200 | 292 | 87 | 0,7 | 50 | 500 | 1,40 | 75 | $7,6 \times 10^4$ | 71×10^4 |
| | 250 | 292 | 87 | 0,6 | 50 | 760 | 0,97 | 90 | 14×10^4 | 115×10^4 |
| | 315 | 292 | 87 | 0,6 | 50 | 900 | 0,81 | 122 | 21×10^4 | 180×10^4 |
| 7,2 | 63 | 442 | 65 | 0,75 | 50 | 175 | 8,50 | 45 | $0,48 \times 10^4$ | $6,5 \times 10^4$ |
| | 100 | 442 | 65 | 0,75 | 50 | 275 | 4,86 | 67 | $1,40 \times 10^4$ | 18×10^4 |
| | 160 | 442 | 65 | 0,7 | 50 | 400 | 2,92 | 119 | $3,8 \times 10^4$ | 54×10^4 |
| | 200 | 442 | 87 | 0,7 | 50 | 500 | 2,12 | 118 | $7,6 \times 10^4$ | 75×10^4 |
| | 250 | 442 | 87 | 0,6 | 50 | 800 | 1,48 | 142 | 14×10^4 | 120×10^4 |
| 12 | 315 | 442 | 87 | 0,6 | 50 | 950 | 1,23 | 193 | 21×10^4 | 220×10^4 |
| | 63 | 442 | 65 | 0,75 | 50 | 190 | 13,52 | 77 | $0,48 \times 10^4$ | 11×10^4 |
| | 100 | 442 | 87 | 0,75 | 50 | 275 | 6,62 | 103 | $1,4 \times 10^4$ | 20×10^4 |
| | 160 | 442 | 87 | 0,7 | 50 | 480 | 3,98 | 155 | $3,8 \times 10^4$ | 70×10^4 |
| | 200 | 442 | 87 | 0,7 | 50 | 560 | 2,73 | 173 | $9,3 \times 10^4$ | 91×10^4 |



*) The K-factor is referred to the average value of current.

Legends:

e = see figure

D = see figure

K = K-factor acc. to IEC 644

I_1 = max. short circuit current tested

I_3 = minimum breaking current

R_0 = resistance at room temperature

P_N = power loss at rated current

ABB is working to continuous improve the products. Therefore we reserve the right to change design, dimension and data without prior notice.



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