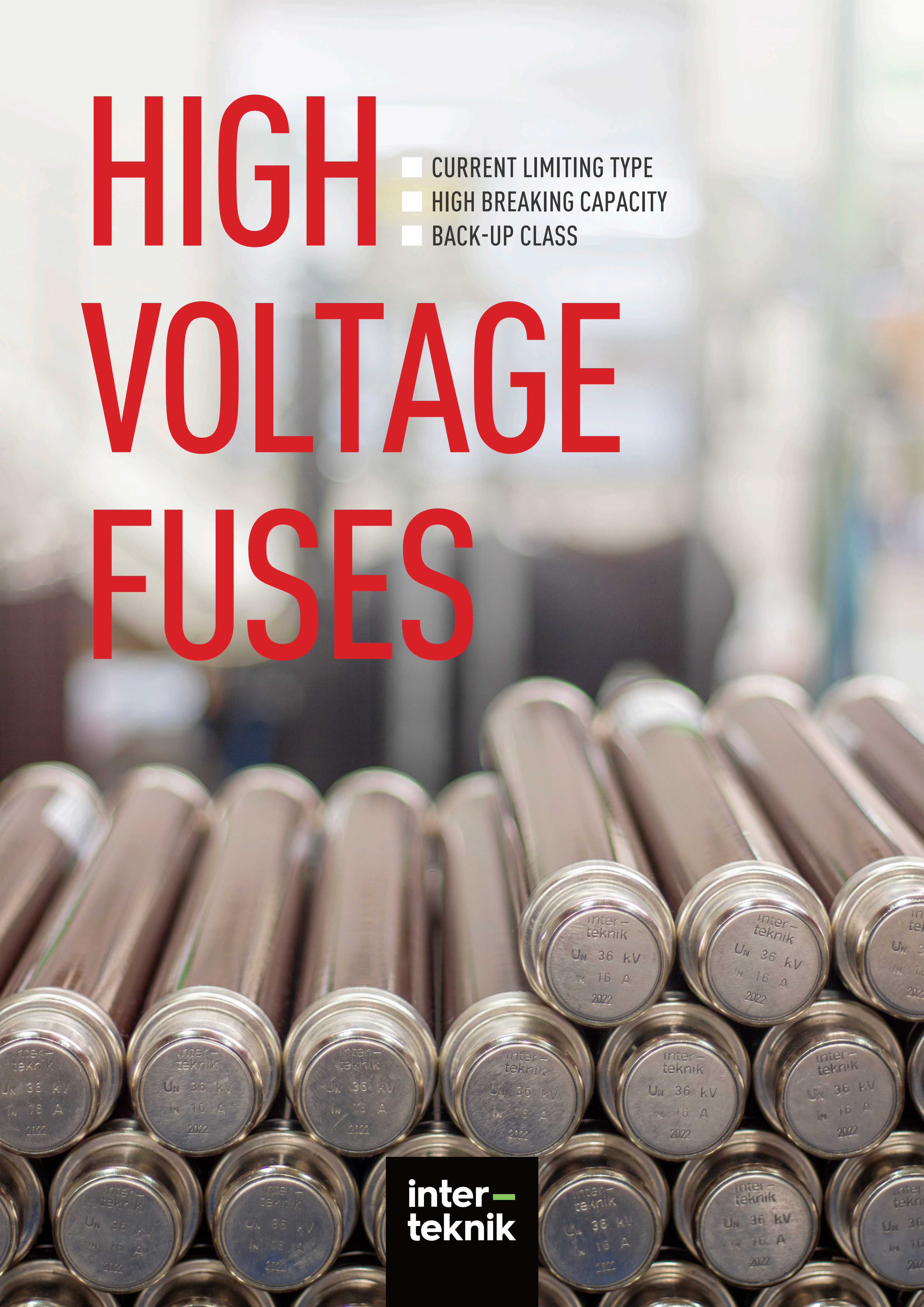
HIGH VOLTAGE FUSES

- CURRENT LIMITING TYPE
- HIGH BREAKING CAPACITY
- BACK-UP CLASS



inter-teknik

HIGH VOLTAGE FUSE-LINKS

- Current Limiting Type
- High Breaking Capacity
- Back-Up Class

Standards: IEC 60282-1, VDE 0670-4, VDE 0670-T402, DIN 43625, BS 2692-1, UTE C64-10

Inter-Teknik fuse-links are automatically and selectively acting medium voltage switching devices, which protect your transformers, motors, overhead lines, voltage transformers, capacitor banks and installations safely from the thermal and dynamic effects of short circuits within the voltage range of 6-36 kV.

Our experience from 1969 to date, extreme care in production, conscious quality control and emphasis on continuous development are the basis of the superior quality of Inter-Teknik fuse-links.

Although there are various types of HV fuse-links, the more reliable and economic CURRENT LIMITING TYPES are mostly preferred in many countries including our country. This type operates quietly in a completely hermetically sealed manner. While it functions, no flame or gas overflows outside the system. Therefore no filter, flame cell or special ventilation system is necessary.

The types of fuse-links with high breaking capacity are used for the short circuit protection of HV installations. When they are integrated with transformers, capacitors, motors, cable outlets or voltage transformers, they protect against heat or other bad effects of shortcircuit with quick circuit breaking capabilities.

Back-up fuses are the most effective and economic ways of protection against short circuits in HV installations.

Back-up fuses are not suitable devices for protection against overload. They work safely only over the Imin value. It does not operate safely within the range of In (rated current value) and Imin value, and in some cases the fuse-links may be damaged. Depending on the quality of the fuse-element used and the construction of the fuse-link, Imin by currents in such range.

Naturally the expansion of the safely operating area of a fuse-link is of great advantage. For this reason Imin should be as small as possible.

If loading between In rated current and Imin is a necessity and cannot be prevented, then it is recommended to use load break switches with thermal protective fuse-links. In that case, before the extreme heat generated in the fuselink reaches the tolerance level of the electro porcelain tube of the fuse-link, the thermal protection operates to loosen the striker pin, which in turn triggers the loadbreak switch in three phases, thus minimizing the risk.

CONSTRUCTION

The principal component of the fuse-link is a star-shaped rod. Pure silver fuseelement is wound around the star-shaped rod, thus forming completely similar small cells all along the body. The lengths and cross section of the silver strip in each cell remains the same. Many partial arcs form all along the fuse-element and the thermal heat is evenly distributed in the fuse-link body, thus attaining a higher breaking capacity. The tubes are definitely durable to extrame heat, noninflammable and insulated. The tubes are made up of non-flammable and electrically insulated material. They are highly resistant to extreme heat. Moreover, especially the outdoor type fuse-links are durable to atmospheric changes, corrosion, salts, acids and alkali gases. They do not absorb water or moisture. In case the fuse-link is blown, the body provides insulation. Therefore, it must provide the needed insulation level in rainy or sunny weather conditions. To attain these properties, the ideal material to be used is electro-porcelain.

To be durable enough to resist the high pressure and heat that may arise, the porcelain tubes should at least conform with the C120 – class as per IEC 60672-3 standards. Metal caps on both ends are made of electrolytic copper and are nickel or silver plated (4 – 6 microns) against oxidation. The caps are tightly pressed onto the porcelain tubes using silicone seal. The terminals of star-shaped core are fitted with metallic rings onto which the fuse elements are welded via pointwelding. Depending on the In value, they are either silver coated or copper striped of oil. Eventually, the fuse-link's main circuit is completed by point-welding the inner metallic rings of core with contact caps.

Against short-circuits, fuse-links provide the most effective and affordable solution

The mechanical strength and water insulation of our fuse-links are attained by mounting the metal and optical glass caps on both sides, sealing with high heat resistent insulating material and special pressing methods.

TYPES

The sizes of all our fuse-link types conform with IEC 60282-1 and are fit for indoor and outdoor use.

OPTICAL INDICATOR (TYPE: .../OPT)

The fuse-links with optical indicators, i.e. types H220 and H221, have a mechanism, which indicates that the fuse-link operates correctly. When the fuse-link is blown, a small red cap falls into the transparent capsule at the end of the tube.

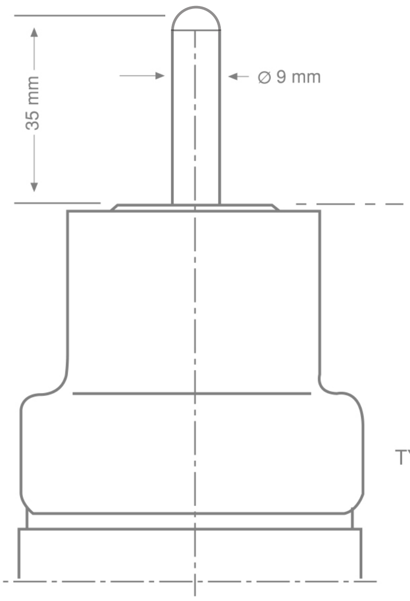
STRIKER PIN (TYPE: .../ACT)

IEC 60282-1, Table XII – (Medium)

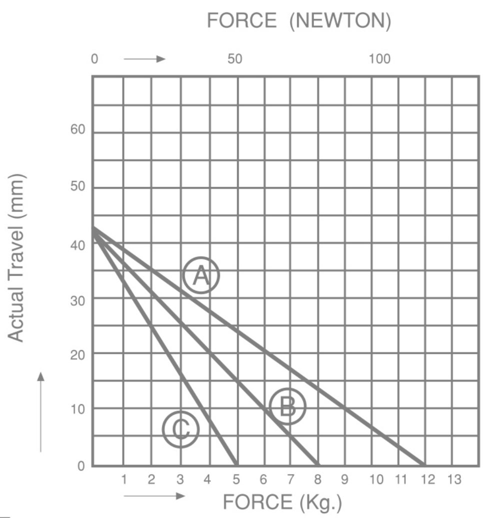
When a fuse-link trips a pin is forcedly pushed out. Hence, you can see the tripped fuse-link and also automatically initiate another system (e.g. : a switch, notification of an alarm system).

STRIKE PIN FORCE

There are three options:
A) 120 N
B) 80 N
C) 50 N
The preferred option should be specified while ordering. If it is necessary to open a switch mechanically, then the options A or B are recommended.



TYPE - ACT



STRIKING FORCE

A) 100 - 120 N
B) 80 N
C) 50 N

THERMAL PROTECTION

The operation of medium voltage fuse-links with thermal protection is determined by minimum breaking current (Imin). These fuse-links only operate safely over the Imin value. Between the values In (rated current) and Imin, a safe operation cannot be guaranteed.

The over loading of fuse-links in between these values may cause explosion and large-scale damage.

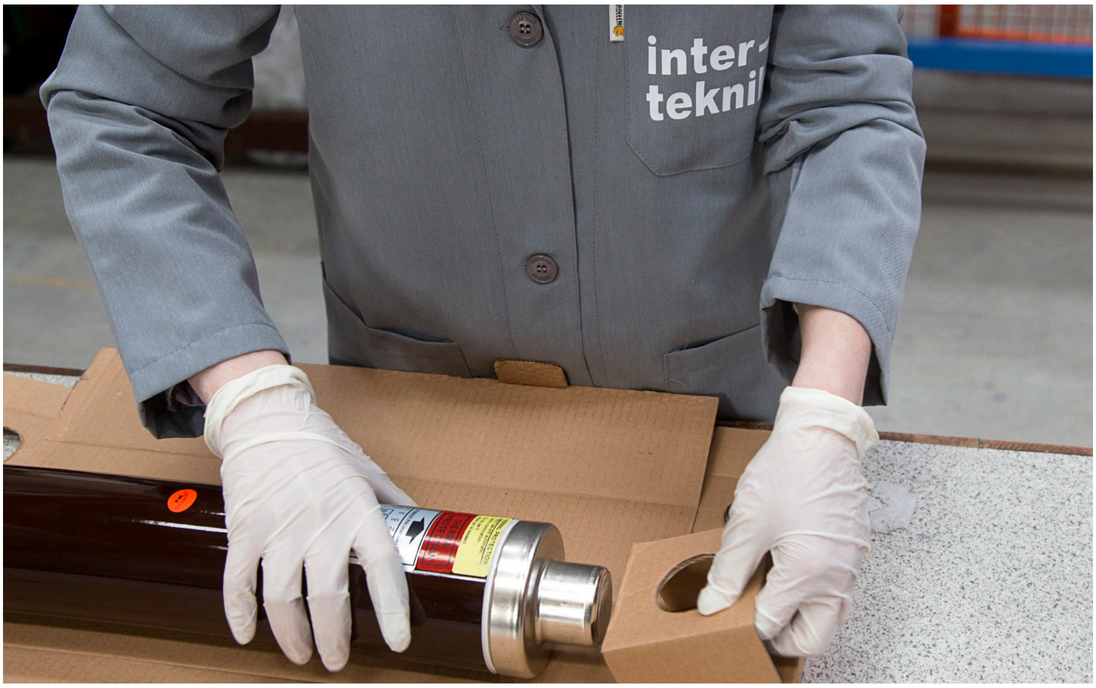
The fuse-element will melt in just one or a few small pieces and the arc produced here will continue to travel within the circuit, leading to extreme thermal stress on the fuse-link.

In order to eliminate this problem, our fuse-links have a thermal protection system. In this special design, the fuse-links have a striker device inside the fuse-link, which is released before the temperature reaches a limit endangering the thermal strength of the porcelain tube, and initiates opening of all poles by the help of a load break switch.

> The risk caused by the extreme thermal stress may be avoided with the use of thermal protection feature.

Fuse-links with the thermal protection system should be used in combination with a switch. When used in combination with automatic breaking switch or especially with SF6 gas insulated "Ring Main Unit" panels, fuse-links with thermal protection system should be preferred.

Please do not hesitate to contact us for more information about thermal protection.



SHORT CIRCUIT CURRENT LIMITATIONS

Our HV HRC fuse-links clear the fault current before the short-circuit current reaches its peak value during the first half-cycle. They are thus current-limiting.

The figure below shows the progress of a short-circuit operation. Without a fuselink in the circuit, the short-circuit current would rise as the prospective current Ik shown as a dashed value below.

However, the current-limiting action of the fuse-link permits the melting current IS to rise only to the cut-off value ID (full line). The current decreases during the arcing time tL with increasing arc length and is finally broken in the area of a voltage zero passage.

The current-limiting action of the fuse-links relieves the protected object and parts of the system of thermal and dynamic stresses. It is clear that the application of current-limiting fuse-links is particulary advantageous in older installations which have not been designed for the increasing short-circuit levels of the system.

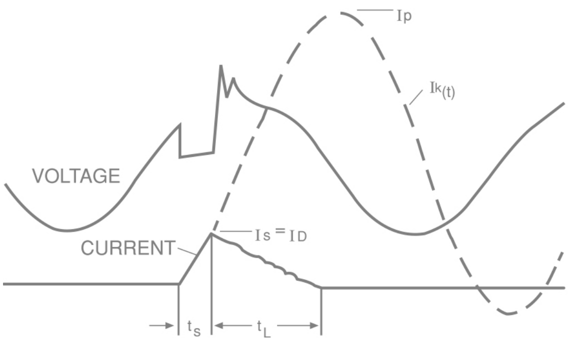
The value of the cut-off current is influenced by the design of the fuse-link. It further depends on the rated current and the instant on the voltage wave, at which the short-circuit occurs.

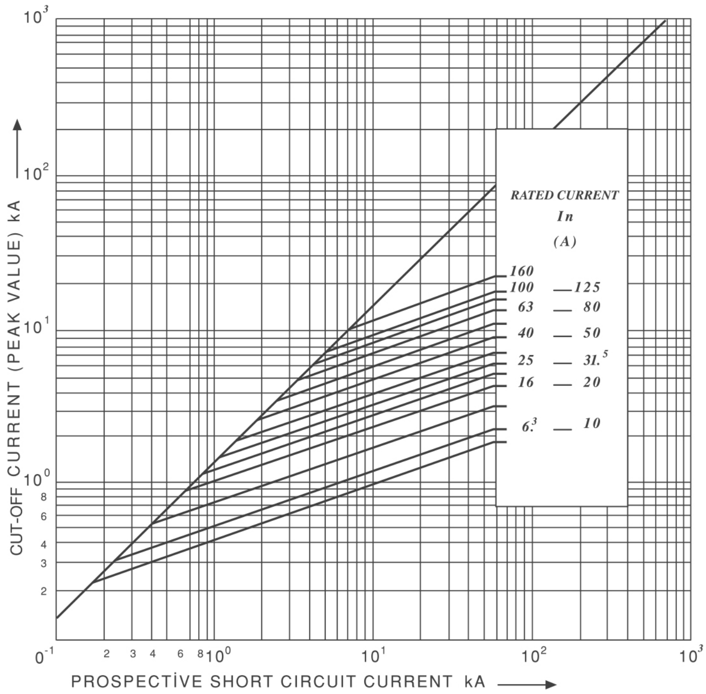
The cut-off current of our HV HRC fuse-links, which can be taken from the diagram, are a function of the prospective short-circuit current (r.m.s. value of the symmetrical component) and of the rated current.

The prospective short-circuit current is expressed by the r.m.s. value of the symmetrical component of the current, which would flow at the location of installation if the fuse-link were replaced by a solid link.

The cut-off currents determined from the diagram are the maximum values that may occur for a given RMS value of the symmetrical component of the prospective short-circuit current with any degree of asymmetry and the highes rate of current rise. Actual values are thus, as a rule, less than the values defined here.

- I_S Melting current
- I_D Cut-off current
- $I_{k(t)}$ Prospective short-circuit current (fuse replaced by metallic link)
- I_P Impulse short-circuit current
- t_S Pre-arcing time
- t_L Arcing time





RATED BREAKING CURRENT CAPACITY

The rated breaking current capacity depends on the inner structure of the fuselink. The special construction of the fuse-link ensures that short pre-arcing and arcing times are obtained on operation and that multiple partial arcs are generated. Accordingly, the amount of heat generated in the fuse-link is relatively low and uniformly divided over the whole length of the fuse-link elements. These factors provide the increase in the rated current breaking capacity of a fuse-link. Inter-Teknik HV fuse-links have the highest breaking capacity (up to 63kA, verified at KEMA) in the global market.

SWITCHING VOLTAGE

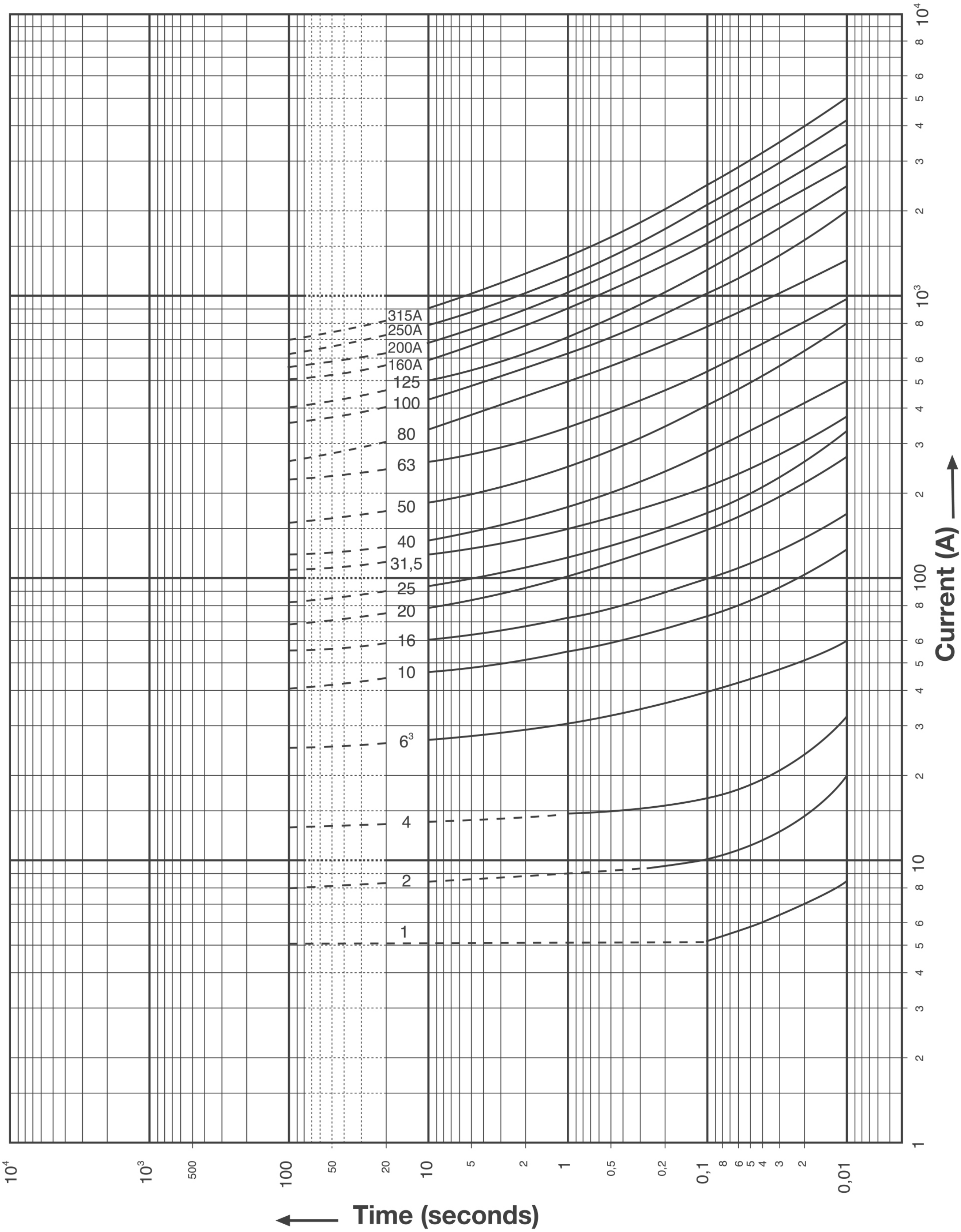
When the short circuit current is interrupted, the voltage spikes up. In order to avert any possible damage to the installation due to these unvaoidable voltage spikes, the voltage peak value, also known as switching voltage, is limited as 2.UN.(√2) in the IEC and VDE standards. The advantage of using these fuse-links to protect your transformers, cable outlets and voltage transformers is clear.

POWER DISSIPATION

The heat generated in the fuse-link should be released to the atmosphere. In indoor areas and air insulated switchgears, heat is a vital factor affecting the nominal values of the devices.

Lower power dissipation of HV fuse-links leads to less electrical losses in the grid and occupies less heat dissipation capacity of the surrounding area.

Time Current Characteristics of Medium Voltage High Breaking Capacity Fuses



SELECTIONS

Rated Voltage

Must be properly selected in accordance with the operational voltage.

Rated Breaking Current

Proper fuse-link selection according to the short circuit load of the network is important. In some special occasions, if necessary, a fuse-link of a higher voltage group may be selected.

Rated Current

This value denotes the naming of the fuse-link. Essentially, the selection of the fuse-link according to the purpose and the place of use is very important. Heat is one of the most important factors. For example, for protection of a transformer, a fuse-link of In=16 A is suitable for use outdoors. In extreme cases where higher current values are necessary, two fuse-links with the same value connected parallel can be used. But as the two fuse-links standing side by side will give heat to each other, a specific tolerance level should be set.

Derating Factor

The rated current is the current that a fuse-link link can carry continuously without altering the time/ current characteristic curve. At higher ambient temperatures as well as higher power losses generated by fuse-links of very high rated currents, it is necessary to pay special attention to derating factors.

Depending on conditions of use and due to the overheating of the fuse-link body, it is advisable to reconsider the choice of fuse-link rating and use a fuse-link with a higher In value.

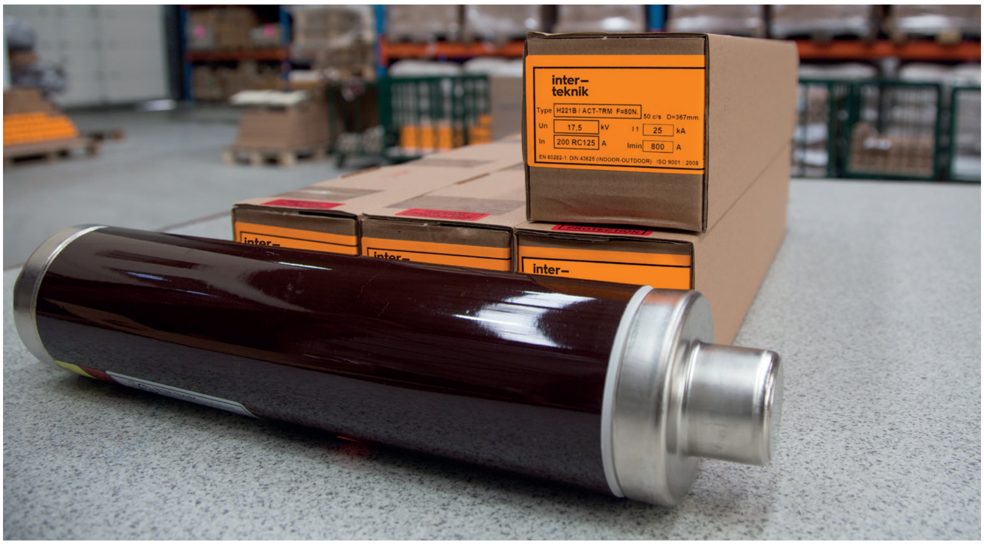
In fuse-links that operate with melting fuse-link elements, the heat of the fuse-link body is the main factor that affects the functioning of the fuse-link. As it functions, the heat generated in the fuse-link should be transferred to the atmosphere in an effective way.

As the plants of our day are huge and growing in size, they require fuse-links with very high In values for their protection. Meanwhile, as the In value of fuse-links increase, due to physical limitations of material and production methods, it becomes very difficult to keep the heat of the fuse-link at normal temperatures. Therefore, especially under these circumstances special attention should be given to the DERATING FACTOR.

Due to their high starting currents, for protection of electrical equipment such as motors, transformers or capacitors, fuse-links with in In values should be selected. In other words, under normal operating conditions the current passing through the fuse-link will be approximately half; under 25% overload, it will be about 75% of the In value of the fuse-link. Generally, the nominal current of the fuse-link should be 2 or 3 times higher then that of the normal circuit current. It is important to keep this fact in mind.

This means that the fuse-links will warm less. During the evaluation process, special attention should be given to this point. For this reason, on the labels of these fuse-links, both current values are indicated. For example "250 RC 160" means:

- the nominal current of the fuse-link In=250 A. (the starting current is taken into consideration)
- the current value of the continuous current through the circuit RC (rated current) is 160 A.



MOTOR PROTECTION IEC 60644

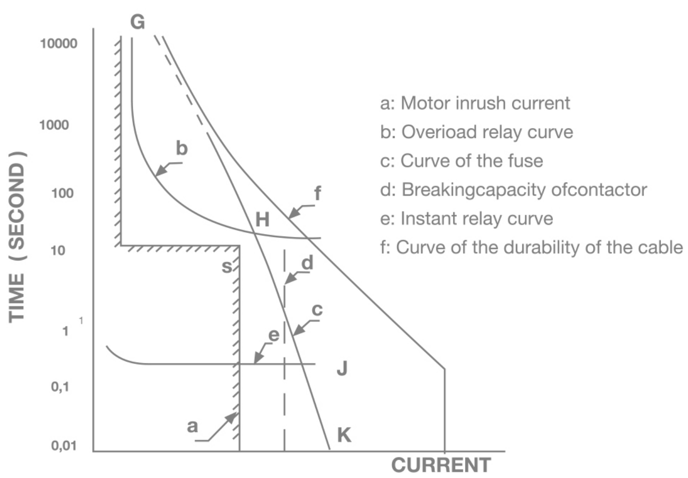
The first important criteria in fuse-link selection is the value and the duration of the INRUSH current of the motor. The fuse-link should stand this inrush current. In selecting the fuse-link from the time-current curves, the tolerance on current rates given in the standards should not be neglected (± 20% on current value). The second criteria is the frequency of starting the motor that can lead to the aging of the fuse-link, which in turn might result in changes in the characteristics of the fuse-link. Depending on the frequency of the starting time, the In value of the fuse link may be uprated. In selecting your fuse-link, please keep in mind following: Usually fuse-link+switch combinations are used for motor protection. If one of the fuse-links blow due to a fault, the striker pin starts the switch to break the current in three phases.

- The breaking capacity of the fuse-link should be higher than the short circuit load of the installation.

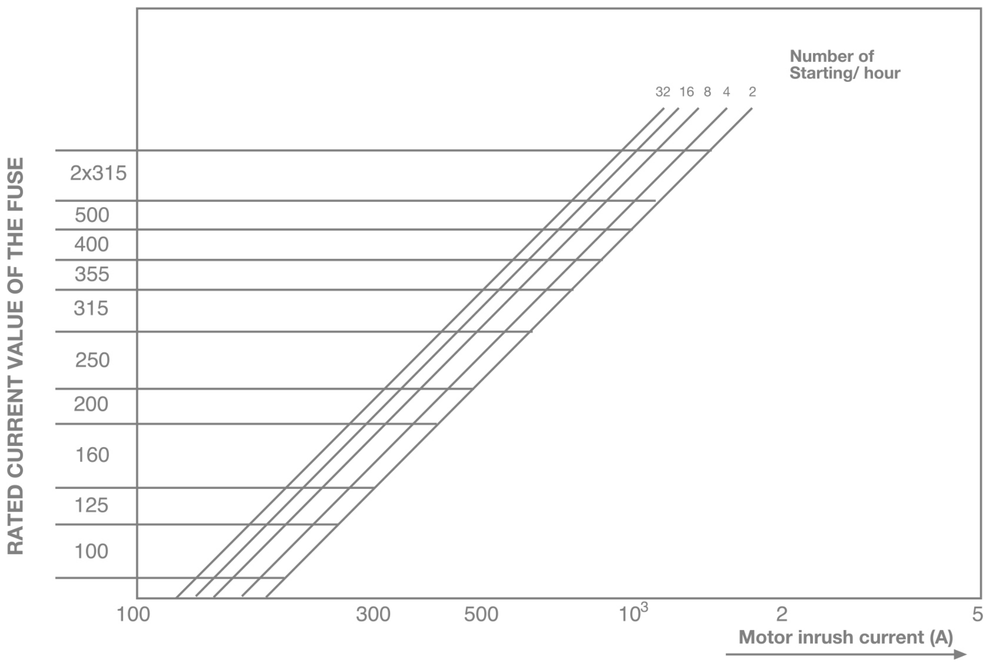
- The In value of the fuse-link should be higher than the rated and overload current of the motor. Derating should be made according to the medium in, which the fuse-link will be used, which means the In value of the fuse-link should be increased accordingly.
- The In value should be decided upon with an acceptable margin so that the fuse-link does not blow during starting current period.
- Depending on the number of starting/shutting of the motor, there will be material fatigue. In value should be increased accordingly.
- The minimum breaking current (Imin) value of the fuse-link should be lower than the value of point H.

For the coordination between the fuse-link and the protection relay of the switch, and for all the above listed points, please use the following diagram.

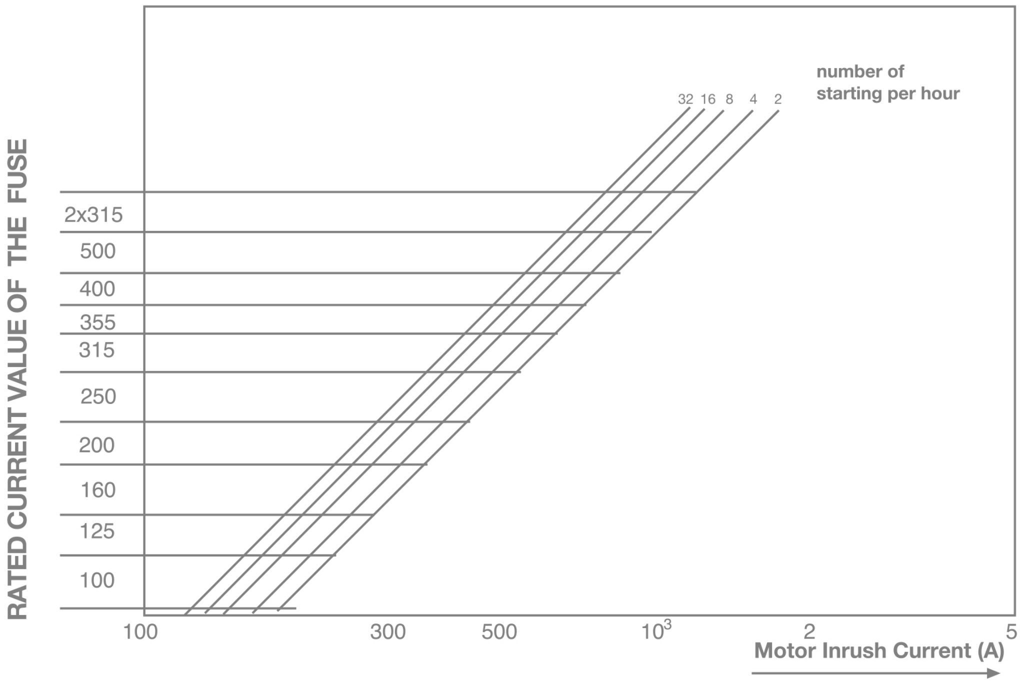
MOTOR PROTECTION OF M.V. FUSE-AN EXAMPLE



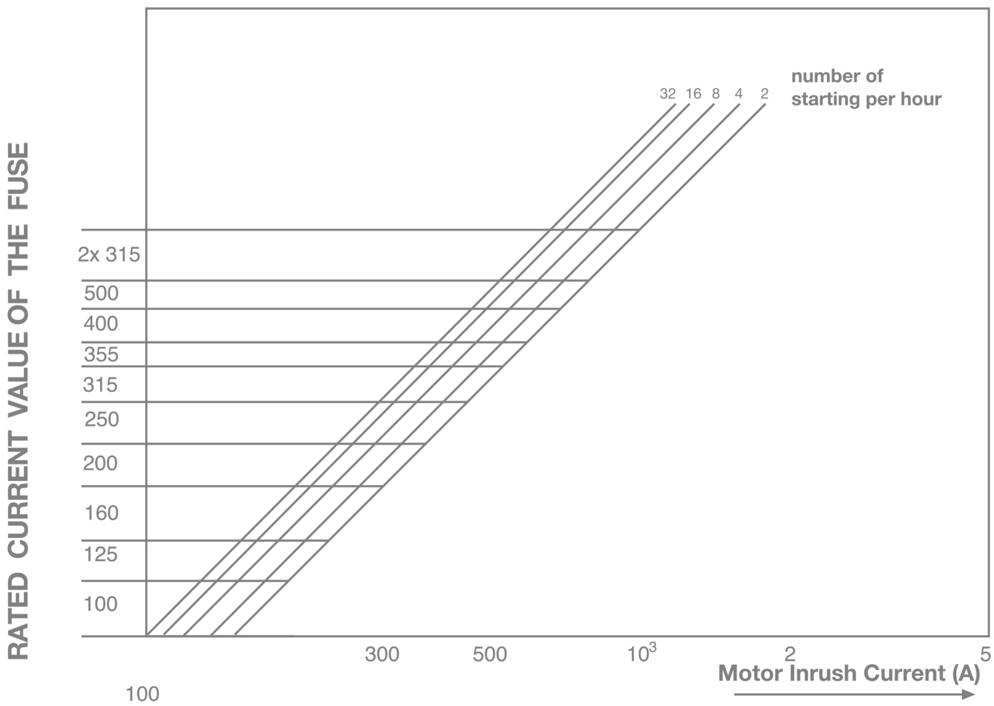
M.V. FUSE PROTECTION FOR MOTORS WITH INRUSH PERIOD NOT EXCEEDING 6 SECONDS



MV FUSE PROTECTION FOR MOTORS WITH INRUSH PERIOD NOT EXCEEDING 15 SECONDS



MV FUSE PROTECTION FOR MOTORS WITH INRUSH PERIOD NOT EXCEEDING 30 SECONDS



FUSE-LINK PROTECTION OF TRANSFORMERS IEC 60787

All tests and applications indicate that, when chosen correctly, current limiting HV fuse-links effectively protect transformers by breaking fault currents.

Various criteria have to be observed in selecting HV HRC fuse-links for the short circuit protection of transformers. Here are some of them:

1- The rated current of the HV HRC fuse-link must not be less than a certain value in order not to cause operation of the fuse-link from the transformer inrush current after switching on.

2- The rated current of the fuse-link must be low enough so that the value of the current that may occur during a short-circuit on the low voltage side of the transformer (secondary bolted short circuit current) will not be less than Imin value of the fuse-link. This means that the fuse-link will perform its breaking function safely.

3- The rated current of the medium-voltage fuse-link must be sufficiently high to allow the overloading of the transformer and assure selectivity between the fuselinks on the low voltage side.

4- The rated current of the HV HRC fuse-link must be as low as possible so that the fuse-link can break the current quickly when a fault occurs in the transformer windings and assure the selectivity between the fuse-link and relay upstream.

Taking the above mentioned points into account, it is recommended to select the HV HRC fuse-links in accordance with the tables below.

Note: The following tables are only for reference. For proper fuse selection please contact us.

Rated Voltage			U_{1N}= 6/7,2 kV			U_{2N}= 400V
Trans. Rated Power	Transformer Rated Current		M.V. Fuse Rated Current		L.V. Fuse Rated Current	
(kVA)	prim. (A)	sec. (A)	min. (A)	max. (A)	min. (A)	max. (A)
25	2,4	36	6,3	6,3	31,5	40
50	4,8	72	10	16	63	80
75	7,2	108	16	25	100	125
100	9,6	144	20	31,5	125	160
125	12,0	180	25	40	160	200
160	15,4	231	31,5	50	200	250
200	19,2	290	40	63	250	315
250	24,0	360	50	80	315	400
315	30,3	455	63	100	400	500
400	38,5	576	80	125	500	630
500	48,1	720	100	160	630	720
630	60,6	910	125	200	800	900
800	77,0	1160	160	200	1000	1200
1000	96,2	1440	200	200	1200	-

Rated Voltage			U_{1N}= 10/12 kV			U_{2N}= 400V
Trans. Rated Power	Transformer Rated Current		M.V. Fuse Rated Current		L.V. Fuse Rated Current	
(kVA)	prim. (A)	sec. (A)	min. (A)	max. (A)	min. (A)	max. (A)
25	1,45	36	4	6,3	31,5	40
50	2,9	72	6,3	16	63	80
75	4,3	108	10	16	100	125
100	5,8	144	16	25	125	160
125	7,2	180	16	25	160	200
160	9,2	231	20	31,5	200	250
200	11,5	290	25	31,5	250	315
250	14,4	360	31,5	50	315	400
315	18,2	455	40	63	400	500
400	23,1	576	50	80	500	630
500	28,9	720	63	100	630	720
630	36,4	910	80	125	800	900
800	46,2	1160	100	125	1000	1200
1000	57,7	1440	125	160	1200	-

Trans. Rated Power (kVA)	Rated Voltage		U_{1N}= 15/17,5 kV		U_{2N}= 400V		Rated Voltage		U_{1N}= 20/24 kV		U_{2N}= 400V		Rated Voltage		U_{1N}= 30/36 kV		U_{2N}= 400V	
	Transformer Rated Current		M.V. Fuse Rated Current		L.V. Fuse Rated Current		Transformer Rated Current		M.V. Fuse Rated Current		L.V. Fuse Rated Current		Transformer Rated Current		M.V. Fuse Rated Current		L.V. Fuse Rated Current	
	prim. (A)	sec. (A)	min. (A)	max. (A)	min. (A)	max. (A)	prim. (A)	sec. (A)	min. (A)	max. (A)	min. (A)	max. (A)	prim. (A)	sec. (A)	min. (A)	max. (A)	min. (A)	max. (A)
25	0,95	36	4	6,3	31,5	40	0,7	36	4	6,3	31,5	40	0,5	36	2	6,3	31,5	40
50	1,9	72	6,3	10	63	80	1,4	72	6,3	6,3	63	80	1,0	72	4	6,3	63	80
75	3	108	10	10	100	125	2,2	108	6,3	6,3	100	125	1,5	108	6,3	6,3	100	125
100	4	144	10	16	125	160	2,9	144	10	10	125	160	1,9	144	6,3	6,3	125	160
125	4,8	180	16	20	160	200	3,6	180	10	16	160	200	2,4	180	6,3	10	160	200
160	6,1	231	16	25	200	250	4,6	231	16	20	200	250	3,1	231	10	16	200	250
200	7,7	290	20	25	250	315	5,8	290	16	20	250	315	3,8	290	10	16	250	315
250	9,6	360	25	25	315	400	7,2	360	20	25	315	400	4,8	360	16	20	315	400
315	12,1	455	25	31,5	400	500	9,1	455	20	25	400	500	6,1	455	16	25	400	500
400	15,3	576	25	31,5	500	630	11,5	576	25	40	500	630	7,7	576	16	25	500	630
500	19,7	720	31,5	40	630	720	14,4	720	31,5	50	630	720	9,6	720	25	31,5	630	720
630	24,9	910	40	50	800	900	18,2	910	40	63	800	900	12,1	910	31,5	40	800	900
800	30,8	1160	63	63	1000	1200	23,1	1160	50	63	1000	1200	15,4	1160	40	50	1000	1200
1000	38,6	1440	80	80	1200	-	28,9	1440	63	80	1200	-	19,2	1440	40	50	1200	-
1250	48,1	1800	100	100	-	-	36,1	1800	80	80	-	-	24	1800	50	63	-	-
1600	61,6	2304	125	125	-	-	46,2	2304	100	100	-	-	30,7	2304	63	80	-	-
2000	77,0	2880	160	160	-	-	57,8	2880	125	125	-	-	38,5	2880	2 x 50		-	-

FUSE PROTECTION OF CAPACITOR BANKS

The existence of numerous types of electrical facilities and unknown circuit parameters usually complicates fuse-link selection. When selecting, keep in mind the following criteria:

- The In value of the fuse-link should be high enough to withstand the continuous maximum load current and the allowable harmonic content.
- The In value of the fuse-link should be able to tolerate the inrush value of the capacitor bank.
- Transient voltages should not be neglected and for security purposes, fuses of higher voltage level should be selected.
- As for practical information, the In value of the fuse-link should not be lower than 2-2,5 times that of the capacitor bank full load current value.

CABLE AND OVERHEAD LINE PROTECTION

It should be noted that cables and overhead lines will be exposed to overloading from time to time. This situation may cause overloads between the In value and Imin value of the fuse-link, eventually causing extreme heating and damage. For this reason the fuse-link should be selected according to the maximum load that the cable or line can carry.

VOLTAGE TRANSFORMER PROTECTION

Because of the low capacity of voltage transformers, HV fuse-links cannot protect the voltage transformer from internal faults (inter turn) of PTs effectively. More often, they are used to isolate the defected voltage transformer from the system. The principle in selecting the fuse-link is to use a fuse-link that is big enough to withstand the inrush voltage of the transformer. This means that the fuse-link should be at the most In=1-2 A. The very thin fuse-element used in the fuse-links with low In values may lead to a "corona" effect. Therefore, the fuse-link should definitely be used as far away from earthed metal parts as possible.

OPERATIONAL RECOMMENDATIONS

- It is dangerous to use a fuse-link that has been dropped or exposed to any sort of impact without testing it.
- In a three – phase installation, unless you are definitely sure that only the blown fuse-link has been exposed to a faulty current, all three must be replaced, because the fuse-links that are not blown also might have reached a point very close to functioning and their characteristics might have changed.
- As a precaution, the blown fuse-link should be changed 5 – 10 minutes after it is blown.

INFORMATION NEEDED WHILE ORDERING

Type	: H220 – H221 (to be determined by Inter-Teknik as per criteria below)
Indicator	: OPT (Optical) or ACT (striker pin)
If ACT, the force of the striker pin	: F=50 N, F=80 N, F=120 N
Thermal protection	: TRM
Rated voltage (Un) kV	: from the table at pages
Length (D) mm	: from the table at pages
Rated current (In) A	: from the table at pages

Example 1:

H220/ACT	F= 80 N
Un= 36 kV	D= 537 mm
In= 40 A	I_1= 40 kA

Example 2:

H221/OPT	
Un=12 kV	D=442 mm
In= 160 A	I1=63 kA

Overview of Standard and Non-standard Dimensions of HV Back-up Fuse-links - Voltage Transformer Protection

Rated Voltage (kV)	Rated Current (In)(A)	Breaking Capacity (I1) (kA)	ØA (mm)	B (mm)	L (mm)
5,5	0,3	63	20	15	127
	0,5				
	1				
	2				
	3,15				
	4				
7,2/8,25	0,3	63	20	15	190
	0,5				
	1				
	2				
	3,15				
	4				
	0,3	63	20	15	254
	0,5				
	1				
	2				
	3,15				
	4				
	0,3	63	25,4	31	142
	0,5				
	1				
	2				
	3,15				
	4				
12/15,5	0,3	63	25,4	31	195
	0,5				
	1				
	2				
	3,15				
	4				
	0,3	63	25,4	15	254
	0,5				
	1				
	2				
	3,15				
	4				
	0,3	63	20	15	275
	0,5				
	1				
	2				
	3,15				
	4				
17,5	0,3	63	20	32	220
	0,5				
	1				
	2				
	3,15				
	4				

Rated Voltage (kV)	Rated Current (In)(A)	Breaking Capacity (I1) (kA)	ØA (mm)	B (mm)	L (mm)
24/25,5	0,3	63	41	15	280
	0,5				
	1				
	2				
	3,15				
	4				
	0,3	63	22	15	340
	0,5				
	1				
	2				
	3,15				
	4				
	0,3	63	20	15	276
	0,5				
	1				
	2				
	3,15				
	4				
36	0,3	40	36	27	400
	0,5				
	1				
	2				
	3,15				
	4				
	0,3	40	41	32	439
	0,5				
	1				
	2				
	3,15				
	4				

Electrical characteristics as per IEC 60282-1

Please contact us for non-standard FUSE-LINKS with special technical specification

Overview of Standard and Non-standard Dimensions of HV Back-up Fuse-links - DIN Type

<table>
<tr><th></th><th></th><th colspan="19">Rated Current (A)</th></tr>
<tr><th>Rated Voltage</th><th>Body Length "D" (mm)</th><th>1</th><th>2</th><th>4</th><th>6.3</th><th>10</th><th>16</th><th>20</th><th>25</th><th>31,5</th><th>40</th><th>50</th><th>63</th><th>80</th><th>100</th><th>125</th><th>160</th><th>200</th><th>250</th><th>315</th></tr>
<tr><td>36kV</td><td>537</td><td colspan="10">537 x Ø53</td><td>537 x Ø68</td><td colspan="6">537 x Ø68</td><td colspan="2"></td></tr>
<tr><td>36kV</td><td>442</td><td colspan="6">442 x Ø53</td><td colspan="3">442 x Ø68</td><td colspan="4">442 x Ø68</td><td colspan="6"></td></tr>
<tr><td>36kV</td><td>367</td><td colspan="6">367 x Ø53</td><td colspan="6">367 x Ø86</td><td colspan="7"></td></tr>
<tr><td>36kV</td><td>292</td><td colspan="3">292 x Ø53</td><td colspan="3">292 x Ø68</td><td colspan="3">292 x Ø68</td><td colspan="10"></td></tr>
<tr><td>24kV</td><td>442</td><td colspan="10">442 x Ø53</td><td colspan="2">442 x Ø68</td><td colspan="5">442 x Ø68</td><td colspan="2"></td></tr>
<tr><td>24kV</td><td>537</td><td colspan="10">537 x Ø53</td><td colspan="4">537 x Ø86</td><td colspan="3">537 x Ø86</td><td colspan="2"></td></tr>
<tr><td>24kV</td><td>367</td><td colspan="6">367 x Ø53</td><td colspan="5">367 x Ø68</td><td colspan="3">367 x Ø68</td><td colspan="5"></td></tr>
<tr><td>24kV</td><td>292</td><td colspan="6">292 x Ø53</td><td colspan="3">292 x Ø53</td><td colspan="3">292 x Ø68</td><td colspan="7"></td></tr>
<tr><td>24kV</td><td>192</td><td colspan="3">192 x Ø53</td><td colspan="6">192 x Ø68</td><td colspan="10"></td></tr>
<tr><td>17.5kV</td><td>367</td><td colspan="10">367 x Ø53</td><td colspan="3">367 x Ø68</td><td colspan="4">367 x Ø68</td><td colspan="2"></td></tr>
<tr><td>17.5kV</td><td>537</td><td colspan="10">537 x Ø53</td><td colspan="3">537 x Ø68</td><td colspan="4">537 x Ø86</td><td colspan="2"></td></tr>
<tr><td>17.5kV</td><td>442</td><td colspan="10">442 x Ø53</td><td colspan="3">442 x Ø68</td><td colspan="4">442 x Ø86</td><td colspan="2"></td></tr>
<tr><td>17.5kV</td><td>292</td><td colspan="9">292 x Ø53</td><td colspan="3">292 x Ø68</td><td colspan="2">292 x Ø86</td><td colspan="3"></td><td colspan="2"></td></tr>
<tr><td>17.5kV</td><td>192</td><td colspan="5">192 x Ø53</td><td colspan="3">192 x Ø68</td><td colspan="2">192 x Ø86</td><td colspan="9"></td></tr>
<tr><td>12kV</td><td>292</td><td colspan="10">292 x Ø53</td><td colspan="3">292 x Ø68</td><td colspan="4">292 x Ø86</td><td colspan="2"></td></tr>
<tr><td>12kV</td><td>537</td><td colspan="11">537 x Ø53</td><td colspan="3">537 x Ø68</td><td colspan="5">537 x Ø86</td></tr>
<tr><td>12kV</td><td>442</td><td colspan="10">442 x Ø53</td><td colspan="3">442 x Ø68</td><td colspan="6">442 x Ø86</td></tr>
<tr><td>12kV</td><td>367</td><td colspan="11">367 x Ø53</td><td colspan="2">367 x Ø68</td><td colspan="4">367 x Ø86</td><td colspan="2"></td></tr>
<tr><td>12kV</td><td>192</td><td colspan="8">192 x Ø53</td><td colspan="4">192 x Ø68</td><td colspan="2">192 x Ø86</td><td colspan="5"></td></tr>
<tr><td>7.2kV</td><td>192</td><td colspan="11">192 x Ø53</td><td colspan="3">192 x Ø68</td><td colspan="3">192 x Ø68</td><td colspan="2"></td></tr>
<tr><td>7.2kV</td><td>537</td><td colspan="11">537 x Ø53</td><td colspan="4">537 x Ø68</td><td colspan="4">537 x Ø86</td></tr>
<tr><td>7.2kV</td><td>442</td><td colspan="11">442 x Ø53</td><td colspan="4">442 x Ø68</td><td colspan="4">442 x Ø86</td></tr>
<tr><td>7.2kV</td><td>367</td><td colspan="11">367 x Ø53</td><td colspan="4">367 x Ø68</td><td colspan="4">367 x Ø86</td></tr>
<tr><td>7.2kV</td><td>292</td><td colspan="11">292 x Ø53</td><td colspan="4">292 x Ø68</td><td colspan="2">292 x Ø86</td><td colspan="2"></td></tr>
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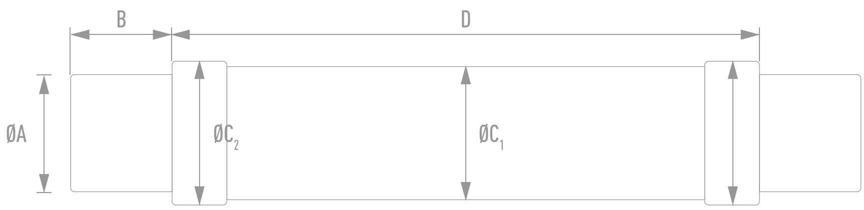
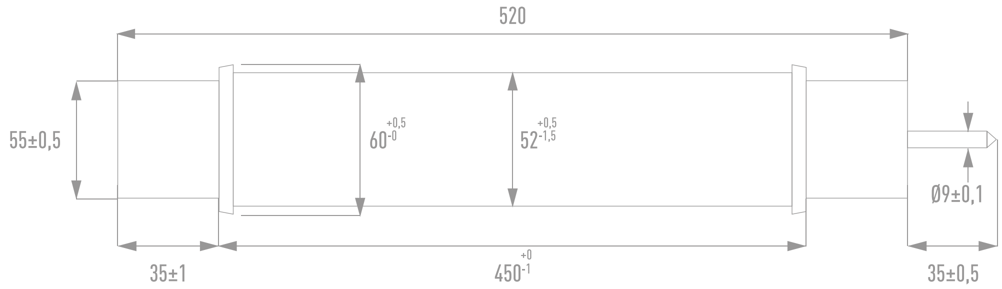
IEC 60282-1
DIN 43625
VDE 0670-4
VDE 0670-T402



Overview of Standard Dimensions of HV Back-up Fuse-links - UTE Type

<table>
<tr><th></th><th></th><th colspan="13">Rated Current (A)</th></tr>
<tr><th>Rated Voltage</th><th>Body Length "D" (mm)</th><th>1</th><th>2</th><th>4</th><th>6.3</th><th>10</th><th>16</th><th>20</th><th>25</th><th>31,5</th><th>40</th><th>50</th><th>63</th><th>80</th></tr>
<tr><td>36kV</td><td>520</td><td colspan="11">520 x Ø52</td><td colspan="2"></td></tr>
<tr><td>24kV</td><td>520</td><td colspan="12">520 x Ø52</td><td></td></tr>
<tr><td>17.5kV</td><td>520</td><td colspan="13">520 x Ø52</td></tr>
<tr><td>12kV</td><td>520</td><td colspan="13">520 x Ø52</td></tr>
<tr><td>7.2kV</td><td>520</td><td colspan="13">520 x Ø52</td></tr>
</table>

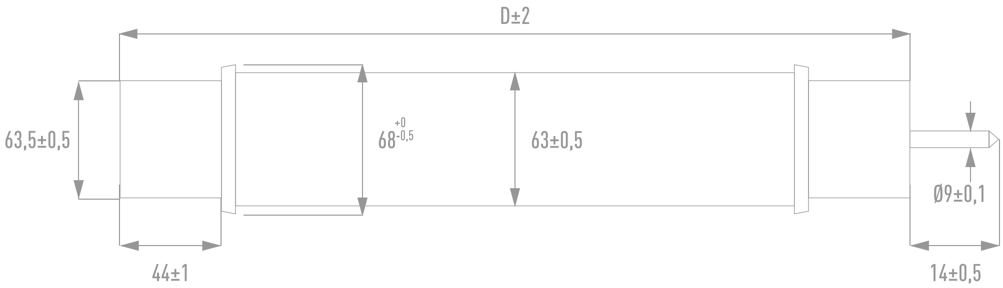
IEC 60282-1
UTE C64-10



Overview of Standard Dimensions of HV Back-up Fuse-links - BS Type

<table>
<tr><th></th><th></th><th colspan="14">Rated Current (A)</th></tr>
<tr><th>Rated Voltage</th><th>Body Length "D" (mm)</th><th>1</th><th>2</th><th>4</th><th>6.3</th><th>10</th><th>16</th><th>20</th><th>25</th><th>31,5</th><th>40</th><th>50</th><th>63</th><th>80</th><th>100</th></tr>
<tr><td>24kV</td><td>359</td><td colspan="9">359 x Ø63</td><td colspan="5"></td></tr>
<tr><td>12kV</td><td>254</td><td colspan="11">254 x Ø63</td><td colspan="3"></td></tr>
<tr><td>12kV</td><td>359</td><td colspan="13">359 x Ø63</td><td></td></tr>
<tr><td>7.2kV</td><td>254</td><td colspan="12">254 x Ø63</td><td colspan="2"></td></tr>
<tr><td>7.2kV</td><td>359</td><td colspan="14">359 x Ø63</td></tr>
</table>

IEC 60282-1
BS 2692-1



Oil-tight version is available upon request

<table>
<tr><th></th><th colspan="16">Rated Current (A)</th></tr>
<tr><th>Rated Voltage</th><th>Body Length "D" (mm)</th><th>1</th><th>2</th><th>4</th><th>6.3</th><th>10</th><th>16</th><th>20</th><th>25</th><th>31,5</th><th>40</th><th>50</th><th>63</th><th>80</th><th>100</th><th>125</th></tr>
<tr><td>36kV</td><td>359</td><td colspan="7">359 x Ø76</td><td colspan="8"></td></tr>
<tr><td>24kV</td><td>359</td><td colspan="10">359 x Ø76</td><td colspan="5"></td></tr>
<tr><td>12kV</td><td>254</td><td colspan="12">254 x Ø76</td><td colspan="3"></td></tr>
<tr><td>12kV</td><td>359</td><td colspan="14">359 x Ø76</td><td></td></tr>
<tr><td>7.2kV</td><td>254</td><td colspan="13">254 x Ø76</td><td colspan="2"></td></tr>
<tr><td>7.2kV</td><td>359</td><td colspan="15">359 x Ø76</td></tr>
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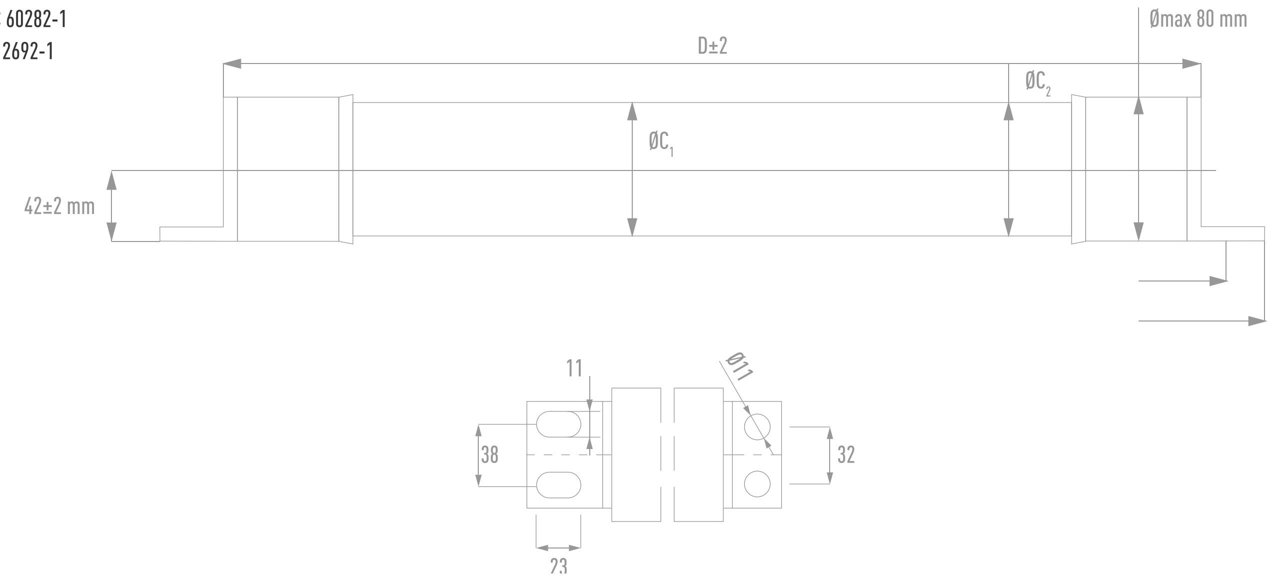
IEC 60282-1
BS 2692-1



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