

Fuse range selection

06579N



Public distribution

Our Fusarc CF, Soléfuse, Tépéfuse and MGK fuses make up a broad, consistent and uniform range of high breaking capacity fuses and current limiters. They are all of combined type and are manufactured so that they can be installed both indoors and outdoors (depending on the type).

Schneider Electric fuses provide protection to medium voltage distribution devices (from 3 to 36 kV) from both the dynamic and thermal effects of short-circuit currents greater than the fuse's minimum breaking current.

Considering their low cost and their lack of required maintenance, medium voltage fuses are an excellent solution to protect various types of distribution devices:

- Medium voltage current consumers (transformers, motors, capacitors, etc.)
- Public and industrial electrical distribution networks.

They offer dependable protection against major faults that can occur either on medium or low voltage circuits.

This protection can be further enhanced by combining the fuses with low voltage protection systems or with an overcurrent relay.

06580N



Motor protection

Selection table

Depending on the equipment to be protected and its voltage rating, the table below gives the range of fuses which are best suited to the protection application.

Voltage (kV)	Motors	Power transformers	Capacitors	Voltage transformers
3.6	Fusarc CF MGK	Fusarc CF	Fusarc CF	Fusarc CF
7.2	Fusarc CF MGK	Fusarc CF Soléfuse	Fusarc CF Soléfuse	Fusarc CF
12	Fusarc CF	Fusarc CF Soléfuse	Fusarc CF Soléfuse	Tépéfuse Fusarc CF
17.5		Fusarc CF Soléfuse	Fusarc CF Soléfuse	Tépéfuse Fusarc CF
24		Fusarc CF	Fusarc CF Soléfuse	Tépéfuse Fusarc CF Soléfuse
36		Fusarc CF Soléfuse	Fusarc CF Soléfuse	Tépéfuse Fusarc CF

Soléfuse

(UTE standard;
transformer protection)

MGK

(UTE standard;
motor protection)

Fusarc CF

(DIN standard;
transformer, motor and
capacitor protection)

Tépéfuse

(UTE standard;
voltage transformer protection)

PE56920



References and characteristics

Table no. 1

Reference	Rated voltage (kV)	Operating voltage (kV)	Rated current (A)	Max. breaking current I1 (kA)	Min. breaking current I3 (A)	Cold resistance* (mΩ)	Dissipated power (W)	Length (mm)	Diameter (mm)	Weight (kg)					
757372AR	3.6	3/3.6	250	50	2.000	0.6	58	292	86	3.4					
51311006M0	7.2	3/7.2	4	63	20	762	20	192	50.5	1					
51006500M0			6.3		36	205	12								
51006501M0			10		34	102	14								
51006502M0			16		50	68.5	26								
51006503M0			20		62	53.5	32								
51006504M0			25		91	36.4	35								
51006505M0			31.5		101	26	42								
51006506M0			40		135	18	46								
51006507M0			50		180	11.7	44								
51006508M0			63		215	8.4	52								
51006509M0			80		280	6.4	68								
51006510M0			100		380	5.5	85								
757352BN			125		50	650	3.4				88	292	86	3.4	
757352BP			160				2.2				87				
757352BQ	200	1.8	95												
757374BR	250	2.200	0.9	95			442	5							
51311007M0	12	6/12	4	63	20	1143	27	292	50.5	1.2					
51006511M0			6.3		36	319	16								
51006512M0			10		34	158	18								
51006513M0			16		50	106	37								
51006514M0			20		62	82	42								
51006515M0			25		91	56	52								
51006516M0			31.5		101	40	59								
51006517M0			40		135	28	74								
51006518M0			50		180	17.4	70								
51006519M0			63		215	13.8	82								
51006520M0			80		280	10	102								
51006521M0			100		380	8	120								
757364CN			125		40	650	5.3				143	442	86	5	
757354CP			160				3.5				127				
757354CQ	200	2.7	172												
51006522M0	17.5	10/17.5	10	40	34	203	23	292	50.5	1.2					
51006523M0			16		50	132	47								
51006524M0			25		91	71	72								
51006525M0			31.5		101	51	78								
51006526M0			40		135	35	90								
51311008M0			4		40	650	20				1436	34	367	50.5	1.5
51006527M0			6.3				36				402	21			
51006528M0			10				34				203	25			
51006529M0			16				50				132	46			
51006530M0			20				62				103	52			
51006531M0			25				91				71	66			
51006532M0			31.5				101				51	74			
51006533M0			40				135				35	94			
51006534M0			50				31.5				650	180			
51006535M0	63	215	19.4	121											
51006536M0	80	330	13.5	145											
51006537M0	100	450	11	192				86	4.6						

* Resistances are given at $\pm 10\%$ for a temperature of 20°C. Fuses > 100 A rated current, are manufactured in glass fibre (for indoor use).

References and characteristics

Table no. 1 (continued)

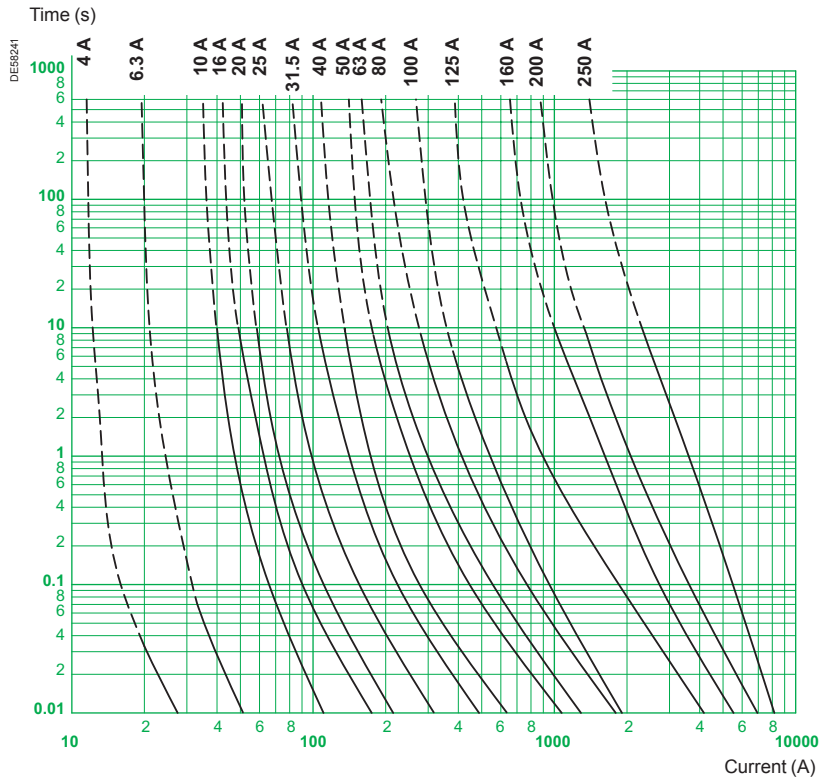
Reference	Rated voltage (kV)	Operating voltage (kV)	Rated current (A)	Max. breaking current I ₁ (kA)	Min. breaking current I ₃ (A)	Cold resistance* (mΩ)	Dissipated power (W)	Length (mm)	Diameter (mm)	Weight (kg)			
51108915M0	24	10/24	6.3	31.5	38	484	26	292	50.5	1.2			
51108916M0			10		40	248	35						
51108917M0			16		60	158	64						
51108918M0			20		73	123	84						
51108919M0			25		100	88	79		76	3.2			
51108920M0			31.5		112	61	90						
51108921M0			40		164	45	120		86	5			
51108922M0			50		233	30	157						
51108923M0			63	247	23	177							
51108807M0			24	10/24	6.3	40	36	485	26	367	50.5	1.5	
51108808M0					16		50	158	58				
51108813M0					20		62	123	67				
51108814M0					25		91	85	76				
51108809M0					31.5		101	61	93		76	3.9	
51108810M0	40	135			42		115						
51311009M0	4	20			1436		34	442	50.5		1.7		
51006538M0	6.3	36			485		25						
51006539M0	10	34			248	31							
51006540M0	16	50			158	58							
51006541M0	20	62			123	67							
51006542M0	25	91			85	79							
51006543M0	31.5	101			61	96							
51006544M0	40	135			42	119							
51006545M0	50	180	31.5	136	442	76	4.5						
51006546M0	63	215	22.8	144									
51006547M0	80	330	18	200									
51006548M0	100	450	13.5	240									
51311010M0	36	20/36	4	20	20	2109	51			537		50.5	1.9
51006549M0			6.3		36	750	39						
51006550M0			10		34	380	50						
51006551M0			16		50	252	98						
51006552M0			20		62	197	120						
51006553M0			25		91	133	133						
51006554M0			31.5		101	103	171	76	5.4				
51006555M0			40		135	70	207						
51006556M0			50	200	47	198	86	6.5					
51006557M0			63	250	35	240							

* Resistances are given at ±10% for a temperature of 20 °C. Fuses > 100 A rated current, are manufactured in glass fibre (for indoor use).

Fusarc CF

Fuse and limitation curves

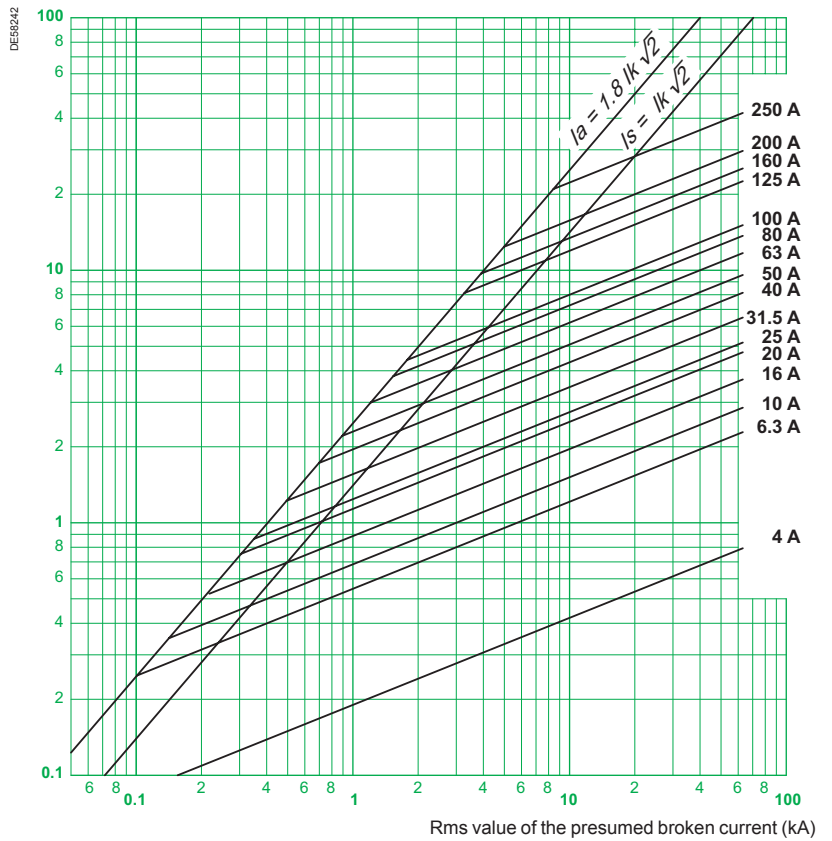
Time/current characteristics curves 3.6 - 7.2 - 12 - 17.5 - 24 - 36 kV



Current limitation curves 3.6 - 7.2 - 12 - 17.5 - 24 - 36 kV

Maximum value of cut-off current (kA peak)

The diagram shows the maximum limited broken current value as a function of the rms current value which could have occurred in the absence of a fuse.



References and characteristics

The Soléfuse range of fuses is manufactured according to UTE standard C64200. The rated voltage varies from 7.2 to 36 kV. They can be supplied with or without a striker and their weight is of around 2 kg. They are mainly intended to protect power transformers and distribution networks, and are solely for indoor installations (glass fibre enclosure).

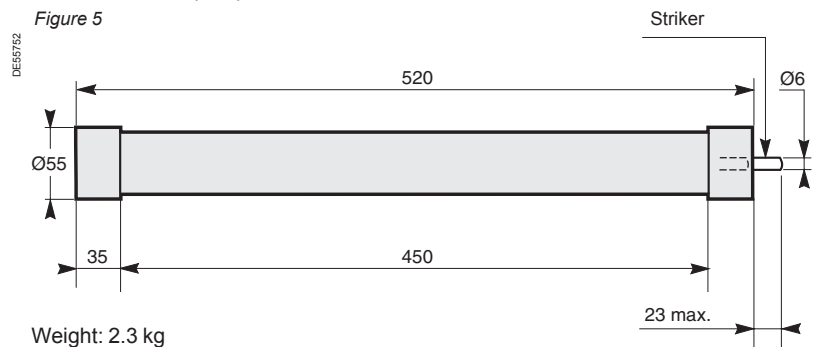
Electrical characteristics

Table no. 2

Reference	Rated voltage (kV)	Operating voltage (kV)	Rated current (A)	Min. breaking current I ₃ (A)	Max. breaking current I ₁ (kA)	Cold resistance * (mΩ)
757328BC	7.2	3/7.2	6.3	31.5	50	158.6
757328BE			16	80		51.7
757328BH			31.5	157.5		24.5
757328BK			63	315		11.3
757328BN			125	625		4.8
757328CM	7.2/12	3/12	100	500	50	7.7
757328DL	7.2/17.5	3/17.5	80	400	40	15.1
757328EC	12/24	10/24	6.3	31.5	30	445.9
757328EE			16	80		93.2
757328EH			31.5	157.5		45.8
757328EJ			43	215		38.5
757328EK			63	315		18.9
757331EC**	12/24	10/24	6.3	31.5	30	447.3
757331EE**			16	80		147.4
757331EH**			31.5	157.5		67.9
757331EJ**			43	215		39
757331EK**			63	315		19.3
757328FC	36	30/36	6.3	31.5	20	618.9
757328FD			10	50		252.9
757328FE			16	80		207.8
757328FF			20	100		133.2
757328FG			25	125		124
757328FH	31.5	157.5	93			

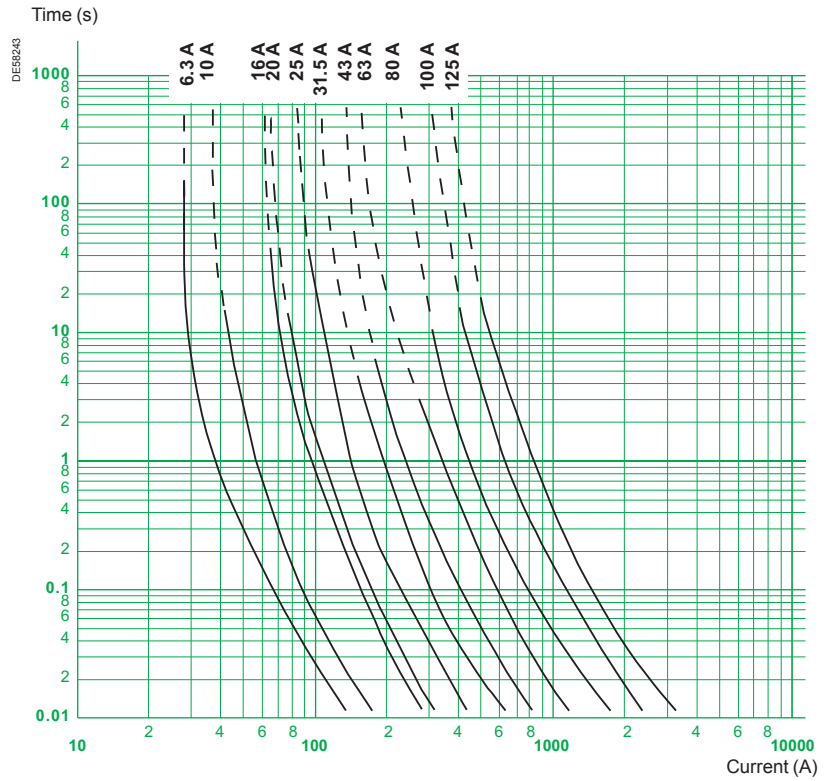
* Resistances are given at ±10% for a temperature of 20°C.
 ** Without striker.

Dimensions (mm)



Fuse and limitation curves

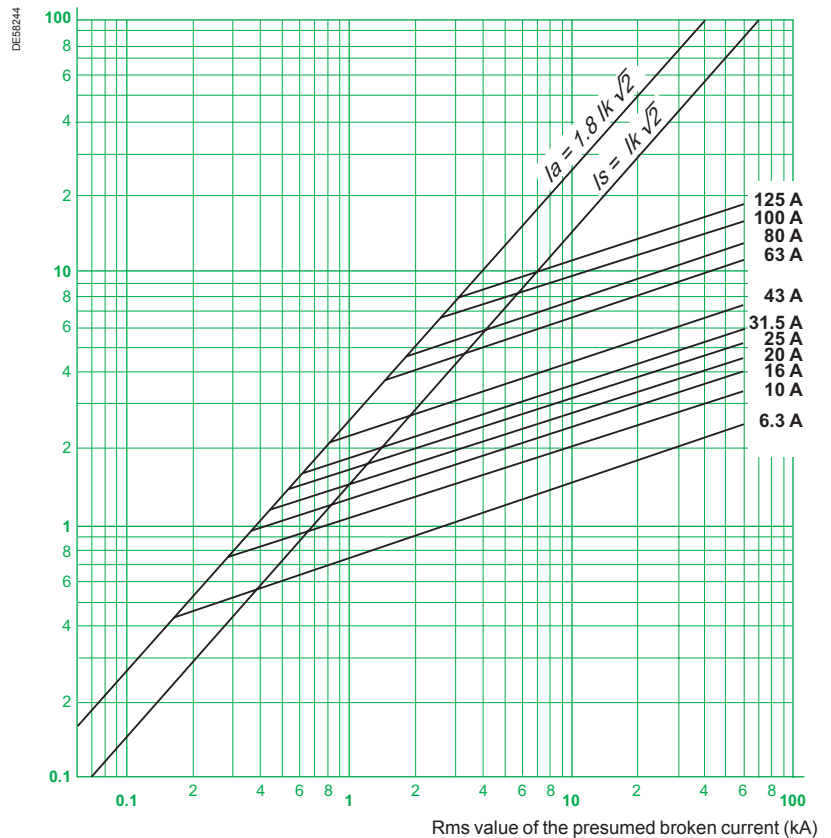
Time/current characteristic curves 7.2 - 12 - 17.5 - 24 - 36 kV



Current limitation curves 7.2 - 12 - 17.5 - 24 - 36 kV

Maximum value of cut-off current (kA peak)

The diagram shows the maximum limited broken current value as a function of the rms current value which could have occurred in the absence of a fuse.



Tépéfuse, Fusarc CF (metering transformer protection) References, characteristics and curves

We manufacture Tépéfuse and Fusarc CF type fuses intended for metering transformer protection which have the following references and characteristics:

Characteristics

Table no. 3

Type	Reference	Rated voltage (kV)	Operating voltage (kV)	Rated current (A)	Max. breaking current I1 (kA)	Min. breaking current I3 (A)	Cold resistance * (mΩ)	Length (mm)	Diameter (mm)	Weight (kg)
Tépéfuse	781825A	12	< 12	0.3	40	40	6.1	301	27.5	0.4
	781825B	24	13.8/24				11.6			
Fusarc CF	51311002M0	7.2	3/7.2	2.5	63	9.5	1278	192	50.5	0.9
	51311000M0	12	6/12	1			3834	292		1.2
	51311003M0			2.5			1917	367		1.5
	51311011M0	17.5	10/17.5	2.5	2407		442	1.6		
	51311001M0	24	10/24	1	4815		537	1.8		
	51311004M0			2.5	2407					
	51311005M0	36	20/36	2.5	3537					

* Resistances are given at ±10% for a temperature of 20°C.

Tépéfuse fuses are only made in glass fibre when intended for indoor usage.

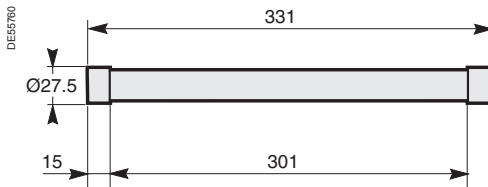
Fuses for metering transformer protection are made without strikers, according to figures 6 and 7.

Dimensions (mm)

Fusarc CF (Figure 6)

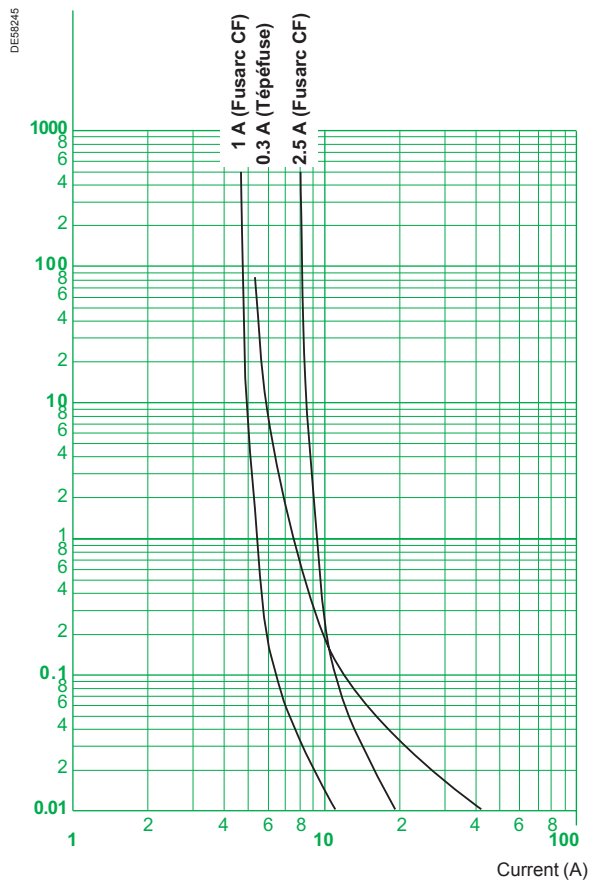


Tépéfuse (Figure 7)



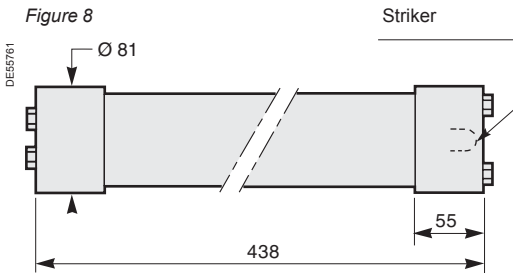
Fuse curve 7.2 - 12 - 24 - 36 kV

Time (s)



Dimensions (mm)

Figure 8



Weight: 4.1 kg

MGK fuses are intended to protect medium voltage motors at 7.2 kV (indoor application).

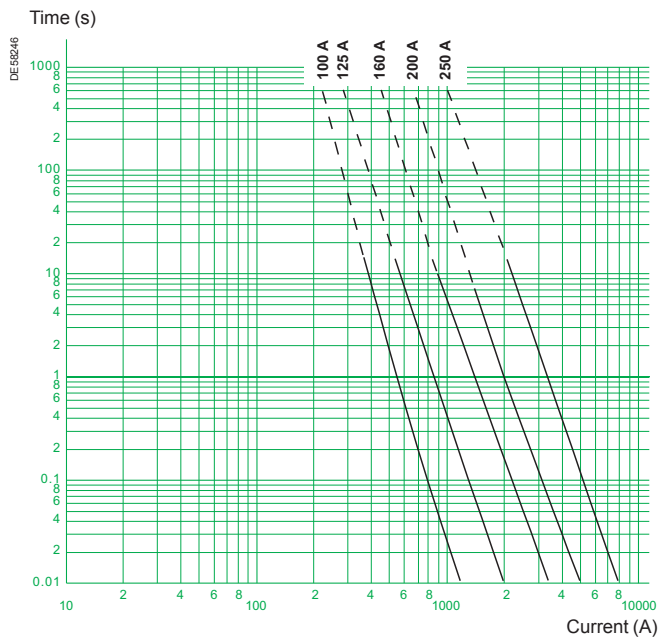
Electrical characteristics

Table no. 4

Reference	Rated voltage (kV)	Operating voltage (kV)	Rated current (A)	Min. breaking current I ₃ (A)	Max. breaking current I ₁ (kA)	Cold resistance* (mΩ)
757314	7.2	≤ 7.2	100	360	50	6.4
757315			125	570	50	4.6
757316			160	900	50	2.4
757317			200	1400	50	1.53
757318			250	2200	50	0.95

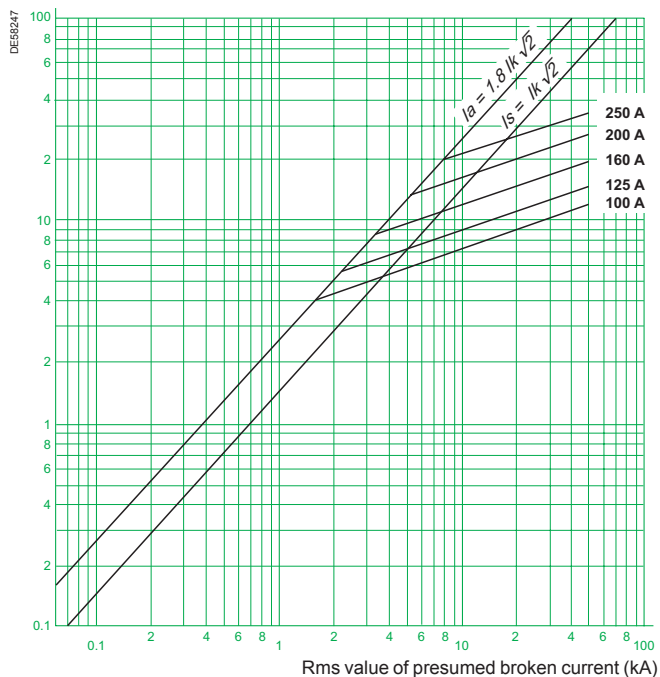
* Resistances are given at ±10% for a temperature of 20°C.

Fuse curve 7.2 kV



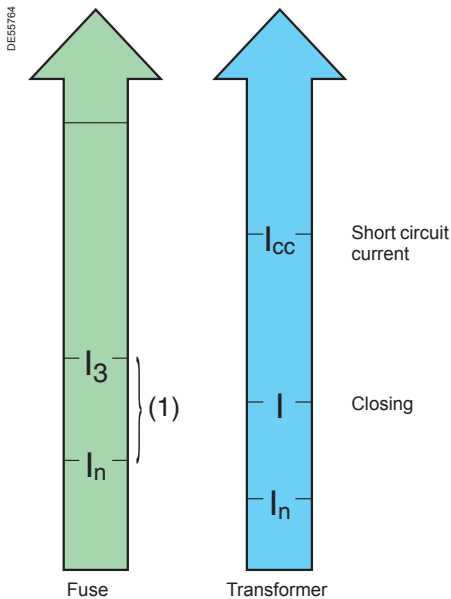
Current limitation curve 7.2 kV

Maximum value of limited broken current (kA peak)



The diagram shows the maximum limited broken current value as a function of the rms current value which could have occurred in the absence of a fuse.

General Transformer protection



(1) In this current zone, any overloads must be eliminated by LV protection devices or by a MV switch equipped with an overcurrent relay.

General

According to their specific characteristics, the various types of fuses (Fusarc CF, Soléfuse, Tépéfuse and MGK) provide real protection for a wide variety of medium and high voltage equipment (transformers, motors, capacitors).

It is of the utmost importance to always remember the following points:

- U_n of the fuse must be greater than or equal to the network voltage
- I_1 of a fuse must be greater than or equal to the network short circuit current
- The characteristics of the equipment to be protected must always be taken into consideration.

Transformer protection

A transformer imposes three main stresses on a fuse. This is why the fuses must be capable of:

■ ... Withstanding the peak start-up current which accompanies transformer closing

The fuses' fusion current at 0.1 s must be more than 12 times the transformer's rated current.

$$I_f(0.1 \text{ s}) > 12 \times I_n \text{ transfo.}$$

■ ... Breaking fault currents across the terminals of the transformer secondary

A fuse intended to protect a transformer has to break its rated short circuit current (I_{sc}) before it can damage the transformer.

$$I_{sc} > I_f(2 \text{ s})$$

■ ... Withstanding the continuous operating current together with possible overloads

In order to achieve this, the fuse's rated current must be over 1.4 times the transformer's rated current.

$$I_n \text{ fuse} > 1.4 I_n \text{ transfo.}$$

Choice of rating

In order to correctly select the fuse's rated current to protect a transformer, we have to know and take account of:

■ The transformer characteristics:

- power (P in kVA)
- short circuit voltage (U_{sc} in %)
- rated current.

■ The fuse characteristics:

- time/current characteristics ($I_f 0.1 \text{ s}$ and $I_f 2 \text{ s}$)
- the minimum rated breaking current (I_3).

■ The installation and operating conditions:

- open air, cubicle or fuse chamber
- presence or otherwise of permanent overload
- short circuit current in the installation
- indoor or outdoor usage.

Comment: whether used in Schneider Electric's SM6, RM6, CAS 36 or in a device from another manufacturer, the equipment manufacturer's own user's instructions must be referred to when choosing the fuse.

Transformer protection Selection table

Fusarc CF fuses DIN standard for transformer protection (rating in A) ^{(1) (2) (3)}

Table no. 6

Operating voltage (kV)	Rated voltage (kV)	Transformer power (kVA)																
		25	50	75	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000
3	7.2	16	25	31.5	40	50	63	63	80									
		20	31.5	40	50	63	80	80	100	100	125	125	160	200	250			
		25	40	50	63	80	100	100		125	160	160						
5	7.2	16	25	31.5	40	50	63	63	80	63	80							
		10	20	31.5	40	50	63	80	63	80	100	100	125	125	160	200	250	
		16	25	40	50	50	63	80	100	100		125	160	160				
6	7.2	6.3	16	20	25	31.5	40	40	50	63	63	80						
		10	20	25	31.5	40	50	50	63	80	80	100	100	125	125	160	200	250
		25	31.5	40	50	63	63	80	100	100		125						
6.6	7.2	6.3	16	20	25	25	31.5	40	50	50	63	80						
		10	20	25	31.5	31.5	40	50	63	63	80	100	100	125	125	160	200	250
		25	31.5	40	40	50	63	80	80	100	100		125					
10	12	6.3	10	16	20	25	31.5	40	50	50	63	80	63					
		6.3	10	16	20	25	31.5	40	40	50	63	80	80	80	100	125	125	160
		16	20	25	31.5	40	50	50	63	80	100	100	100	100	125			
11	12	10	16	20	25	25	31.5	40	50	50	63	80	63					
		6.3	10	16	20	25	31.5	31.5	40	50	63	63	80	80	100	125	125	160
		20	25	31.5	40	40	50	63	80	80	100	100	100	125				
13.2	17.5	6.3	10	16	16	20	25	25	31.5	40	50	50	63					
		4	10	16	20	20	25	31.5	31.5	40	50	63	63	80	80	100		
		25	25	31.5	40	40	50	63	80	80	100	100	100					
13.8	17.5	6.3	10	16	20	25	25	31.5	40	50	50	63	80	63				
		4	10	16	16	20	25	31.5	31.5	40	50	63	63	80	80	100	100	
		20	25	31.5	40	40	50	63	80	80	100	100	100					
15	17.5	10	16	20	25	25	31.5	40	50	50	63	80	63	63	80			
		4	6.3	10	16	20	20	25	31.5	40	50	50	63	80	80	100	100	100
		20	25	25	31.5	40	50	63	63	80	80	100	100					
20	24	6.3	10	16	16	20	25	31.5	40	50	50	63	80	63				
		6.3	10	10	16	20	20	25	31.5	40	40	50	63	63	80	80	100	100
		16	20	25	25	31.5	40	50	50	63	63	80	100	100	100			
22	24	10	16	20	25	25	31.5	40	50	50	63	80	63					
		6.3	6.3	10	16	16	20	25	31.5	31.5	40	50	50	63	80	80	100	100
		20	25	31.5	40	40	50	63	63	80	100	100						
25	36	6.3	10	16	16	20	25	31.5	40	50	50	63	80	63				
		4	6.3	10	10	16	20	20	25	31.5	40	50	50	63	63	63		
		10	20	25	25	31.5	40	50	63	63	80	80	100	100				
30	36	6.3	10	16	16	20	25	31.5	40	50	50	63	80	63				
		4	6.3	6.3	10	10	16	20	20	25	31.5	40	40	50	63	63	63	
		10	16	16	20	25	25	31.5	40	50	50	63	80	63				

Soléfuse fuses UTE standard for transformer protection (rating in A) ^{(1) (2) (3)}

Table no. 7

Operating voltage (kV)	Rated voltage (kV)	Transformer power (kVA)														
		25	50	100	125	160	200	250	315	400	500	630	800	1000	1250	1600
3	7.2	16	16	31.5	63	63	63	80	100	100	125					
3.3	7.2	16	16	31.5	31.5	63	63	80	80	100	125					
4.16	7.2	6.3	16	31.5	31.5	31.5	63	63	80	80	100	125				
5.5	7.2	6.3	16	16	31.5	31.5	31.5	63	63	63	80	100	125			
6	7.2	6.3	16	16	31.5	31.5	31.5	63	63	63	80	100	100	125		
6.6	7.2	6.3	16	16	16	31.5	31.5	31.5	63	63	80	80	100	125		
10	12	6.3	6.3	16	16	16	31.5	31.5	31.5	43	43	63	80	80	100	
11	12	6.3	6.3	16	16	16	16	31.5	31.5	31.5	43	63	63	80	100	
13.8	17.5/24	6.3	6.3	16	16	16	16	16	31.5	31.5	31.5	43	63	63	80	
15	17.5/24	6.3	6.3	16	16	16	16	16	31.5	31.5	31.5	43	43	63	80	80
20	24	6.3	6.3	6.3	6.3	16	16	16	16	16	31.5	31.5	43	43	63	
22	24	6.3	6.3	6.3	6.3	16	16	16	16	16	31.5	31.5	31.5	43	43	63
30	36			6.3	6.3	6.3	16	16	16	16	16	16	31.5	31.5	31.5	

(1) Fuse ratings correspond to open air installation with a transformer overload of 30%, or to an indoor installation without transformer overload.

(2) If the fuse is incorporated in a distribution switchboard, please refer to the selection table provided by the manufacturer of this device.

(3) although the ratings shown in bold type are the most appropriate, the others also protect transformers in a satisfactory manner.