

# Special Purpose Fuses

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## PROTECTION OF SPECIAL APPLICATIONS



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### MULTIMETER Fuse Links

#### CH gR SE (SPECIAL EDITION)

Fuse Link gG NV/NH 400V a.c. metering  
 Fuse Link gTr NV/NH 400V a.c. metering

#### DC Fuses:

NH DC 80 V - Telecom fuse  
 NH DC 250 V  
 NH DC 440 V  
 NH DC 1000 V aR  
 NV Telecom fuse disconnectors  
 Fuse base PK00 1000V a.c./d.c. M8-M8  
 Fuse base PK1, PK2 and PK3 DC  
 Fuse base PK1,2,3-100mm  
 Fuse base PK1L  
 Fuse base U1-1 1000V  
 Fuse base PK XL  
 Fuse disconnectors TL1-1/9/1000V

#### Mining Fuses:

Fuse-link aM NV/NH 1000V a.c.  
 Fuse-link aM NV/NH 1000V a.c.  
 Fuse-link gB NV/NH 00 1000V a.c.  
 Fuse-link gB NV/NH 01L 1000V a.c.

#### Non standard higher voltage gG and gS fuses and disconnectors:

Fuse-link gG NV/NH 800V a.c.  
 Fuse-link gS NV/NH 800V a.c.  
 Fuse-switch disconnectors type SL 800V  
 Fuse-link gG NV/NH 1000 V a.c.  
 Fuse-link gG NV/NH 1200 V a.c.

### Safe work fuses

#### NH Power capacitor fuse

#### Fuses for TVSS products protection:

CH SRF class II  
 CH SRF 25kA class I  
 CH SRF class II - DC

#### Fuses for railway applications:

NH1S/394/DC 4000V aR-fuse link  
 NH2 S/394/ DC 4000V aR - fuse link  
 NH1 /350/DC 4000V aR-fuse link  
 NH1 /130/DC 1000V gR - fuse link  
 Fuses for high-voltage switchgear

#### Battery Protection Fuses:

CH 10x38 BATTERY Fuse link 550V d.c.  
 CH 10x38 BATTERY Fuse link 800V d.c.  
 CH 14x51 BATTERY Fuse link 800V d.c.  
 NH BATTERY fuse link 80V d.c.  
 Fuses for protection of forklift batteries TRB  
 NH BATTERY fuse link 440V d.c.  
 NH BATTERY fuse link 550V d.c.  
 NH BATTERY fuse link 700V d.c.  
 NH BATTERY fuse link 800V d.c.  
 NH 01 XL battery fuse link 1500V d.c.  
 NHXL battery fuse link 1500V d.c.

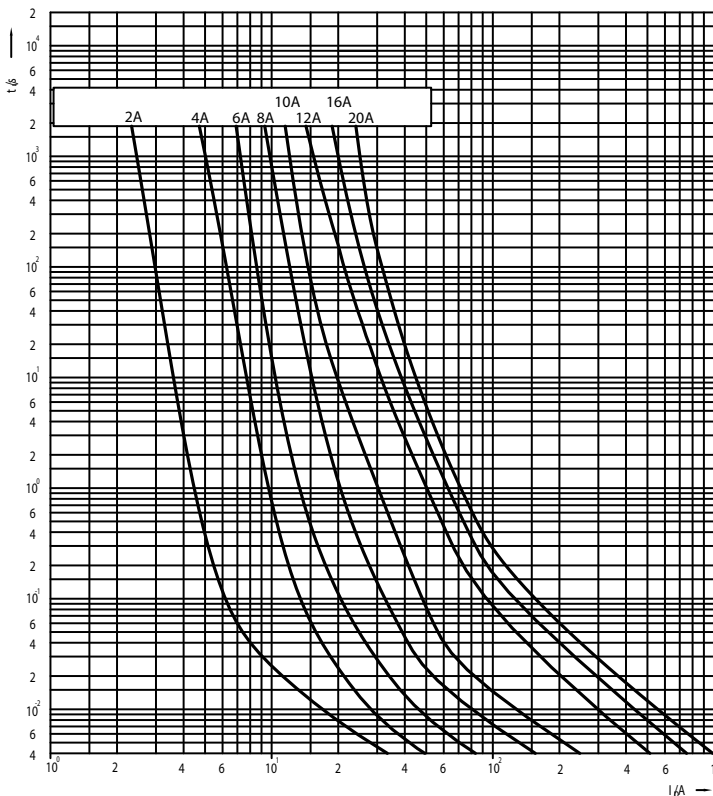
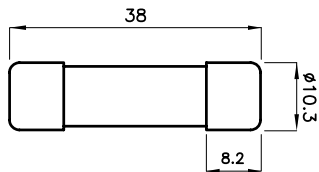
#### Fuel Cell Fuses

#### Minifuses

# MULTIMETER Fuse Links

General characteristics	
Rated voltage	1000V a.c./d.c.
Breaking capacity	30kA a.c./d.c.
Characteristics	gR
Standards	IEC 60269-4, UL 248-1, UL 248-13
Application	Multimeter fused

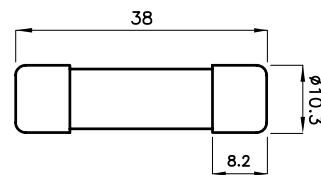
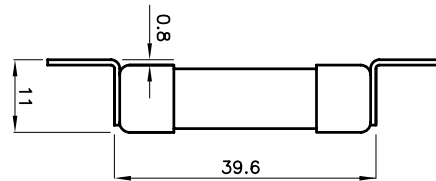
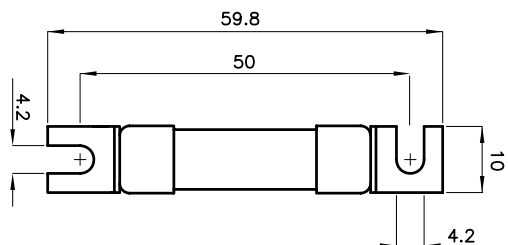
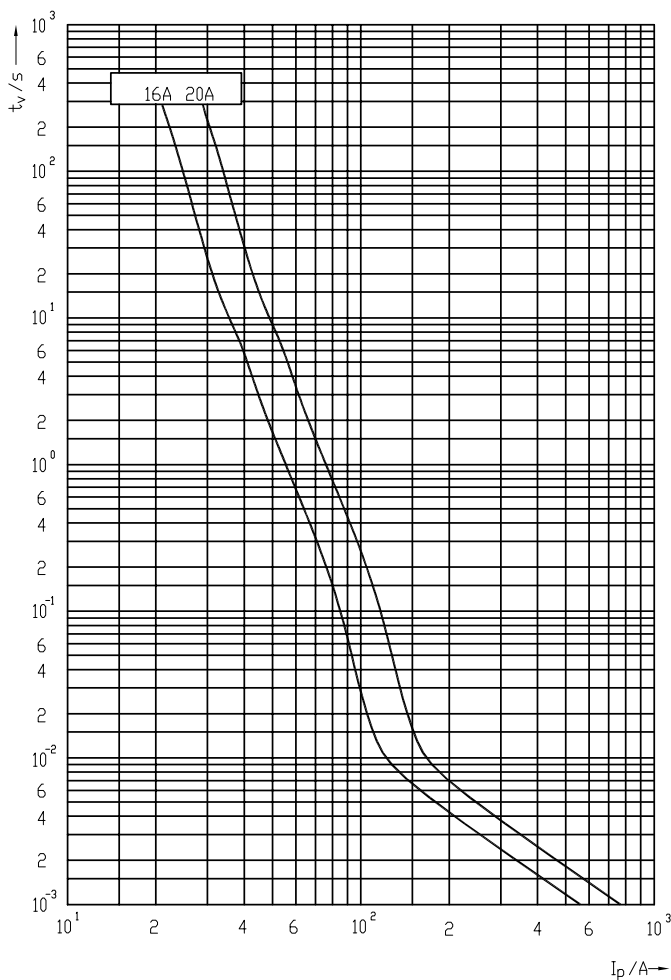
CH10 MULTI					
Size	I <sub>n</sub> [A]	Code No. standard indicator	Power dissipation [W]	Packaging [pcs]	Weight [g]
10x38	0,5	002625410		10/500	10
	1	002625411			
	2	002625400	0,9		
	4	002625401	1,2		
	6	002625402	1,6		
	8	002625403	1,8		
	10	002625404	2,1		
	12	002625405	1,7		
	16	002625406	2,3		
	20	002625407	3,15		



# CH gR SE (SPECIAL EDITION)

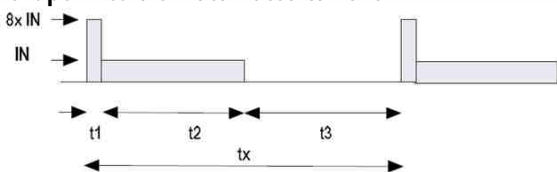
General characteristics	
Rated voltage	690V a.c.
Breaking capacity	100kA AC
Characteristic	gR, according to IEC 60269-4
Application	Fuses are fast acting, full range. Used in protection of the inverters, variable speed drives. Excellent cycling load capability (70 000 current cycling test).

CH 10x38gR SE 690V									
Size	$I_n$ [A]	Code Number "standard contacts"	Code Number "type SU contacts"	Pre-arcing Joule integral [A <sup>2</sup> s] L/R=10ms	Operating Joule integral [A <sup>2</sup> s] L/R=10ms	Power dissipation [0,8 x I <sub>n</sub> ] P <sub>d</sub> [W]	Power dissipation [1 x I <sub>n</sub> ] P <sub>d</sub> [W]	Packaging [pcs]	Weight [g]
10x38	16	002625046	002625048	32	166	1,6	2,8	10/500	10/12
	20	002625047	002625049	80	340	1,7	2,9	SU:10/380	



Simulating current of motor start  
70.000 current cycle test at  $T_{amb} = 70^{\circ}C$   
 $I_N = 6,5A$

Max. permissible motor rated current



# Fuse Link gG NV/NH 400V a.c. metering

General characteristics	
Rated voltage	400V a.c.
Breaking capacity	50kA a.c.
Standards	IEC 60269-1, IEC 60269-2
Characteristic	gG
Application	As metering fuse with strip fuse switch disconnecter and fuse switch disconnecter

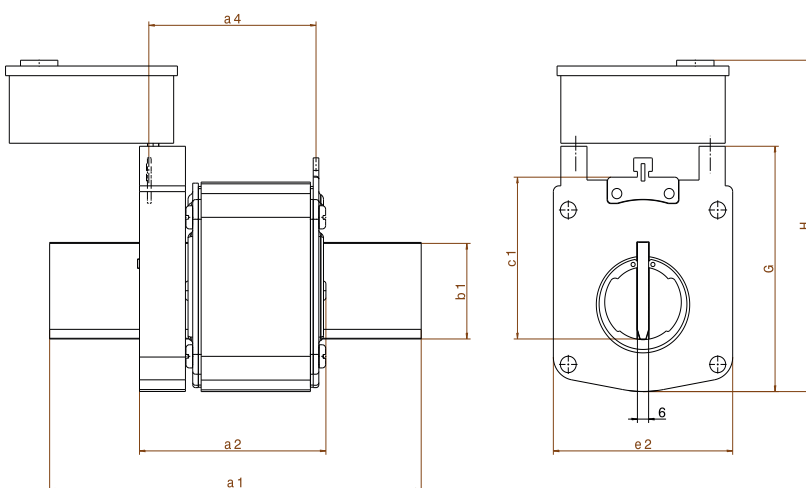
NV/NH 400V a.c.					
Size	I <sub>n</sub> [A]	standard indicator	Power dissipation [W]	Packaging [pcs]	Weight [g]
1	80	004113835	5,2	1/26	500
	100	004113836	6,2		
	125	004113837	7,9		
	160	004113838	9		
	200	004113839	12		
	250	004113840	17		
2	80	004113842	5,2	1/16	600
	100	004113843	6,2		
	125	004113844	7,9		
	160	004113845	9		
	200	004113846	12		
	250	004113847	17		
	315	004113848	20		
3	200	004113851	12	1/9	1000
	250	004113852	17		
	315	004113853	20		
	400	004113854	24		
	500	004113855	27		
4a	630	004113856	32	1	2000
	800	004113858	51		
	1000	004113859	61		
	1250	004113860	72		
		90			



# Fuse Link gTr NV/NH 400V a.c. metering

General characteristics	
Rated voltage	400V a.c.
Breaking capacity	25kA a.c.
Standards	IEC 60269-1, IEC 60269-2, DIN VDE 0636-21 (VDE 0636-21) 2015-03
Characteristic	gTr
Application	As metering fuse with strip fuse switch disconnecter and fuse switch disconnecter

NV/NH 400V a.c.						
Size	Nominal transformer power [kVA]	$I_n$ [A]	standard indicator	Power dissipation [W]	Packaging [pcs]	Weight [g]
1	100	144	004113865	11	1/26	500
	125	180	004113866	13		
	160	231	004113867	17		
2	100	144	004113872	11	1/16	600
	125	180	004113873	13		
	160	231	004113874	17		
	200	289	004113875	20		
	250	361	004113876	25		
3	125	180	004113881	13	1/9	1000
	160	231	004113882	17		
	200	289	004113883	20		
	250	361	004113884	25		
	315	455	004113885	32		
	400	577	004113886	40		
4a	250	361	004113890	25	1	2000
	315	455	004113891	32		
	400	577	004113892	40		
	500	722	004113893	54		
	630	909	004113894	71		
	800	1155	004113895	91		
	1000	1443	004113896	110		



Size	dimensions [mm]							
	a1	b1	c1	e1	G	H	a2	a4
1	135	24	40	52	67	112	75	65
2	150	30	48	60	74	119	75	65
3	150	32	60	74	89	134	75	65
4a	200	50	85	96	127	200	100	87

# Telecom Fuses

## FUSES FOR DC (Direct Current) APPLICATIONS -

### ETI solution for TELECOM Power Supply Circuits

ETI d.d. developed specially designed fuse-links for short circuit protection of d.c. telecom power supplies. They are typically installed into rectifier outputs, battery feeders or d.c. power distribution for protection of the load circuits.

All their characteristics are optimized to correspond to the operating conditions of telecom power supply equipment. Power dissipations and switching voltage provide optimal function and protection of telecom power supplies. The ETI TELECOM NH00 fuse-link is a high breaking capacity current limiting fuse-link with pure silver, age-resistant melting element.

## NH DC 80 V - Telecom fuse

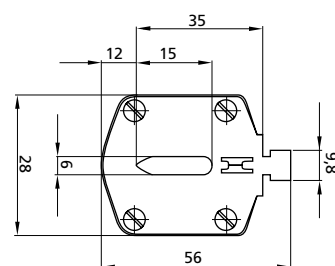
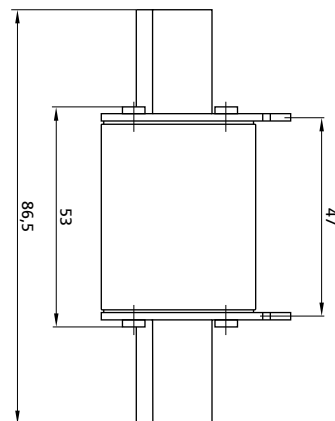
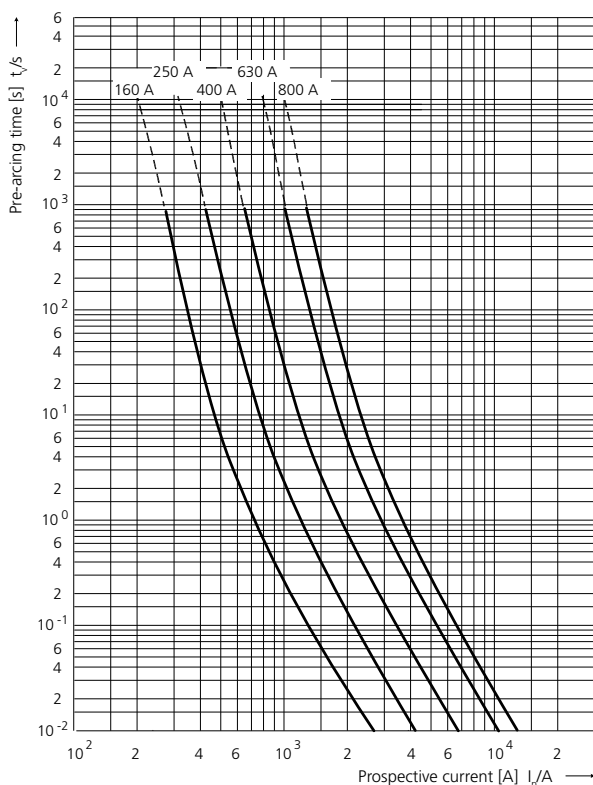
General characteristics	
Rated voltage	80 V d.c. (L/R = 20 ms)
Breaking capacity	25 kA d.c.
Standards	IEC 60269-1
Application	Fuse-link for battery and UPS protection. For installation in NV Telecom fuse disconnecter.

NH DC 80 V - Telecom fuse						
Size	I <sub>n</sub> [A]	Code No.		Power dissipation [W]	Packaging [pcs]	Weight [g]
		standard indicator	striker indicator			
00	160	004110106	004110101	9,0	3/90	173
	200	004110120	-	10,5		
	250	004110107	004110102	12,5		
	400	004110108	004110103	17,5		
	630	004110109	004110104	28,0		
	800	004110110	004110105	37,5		



Special Purpose Fuses

Time-current characteristics





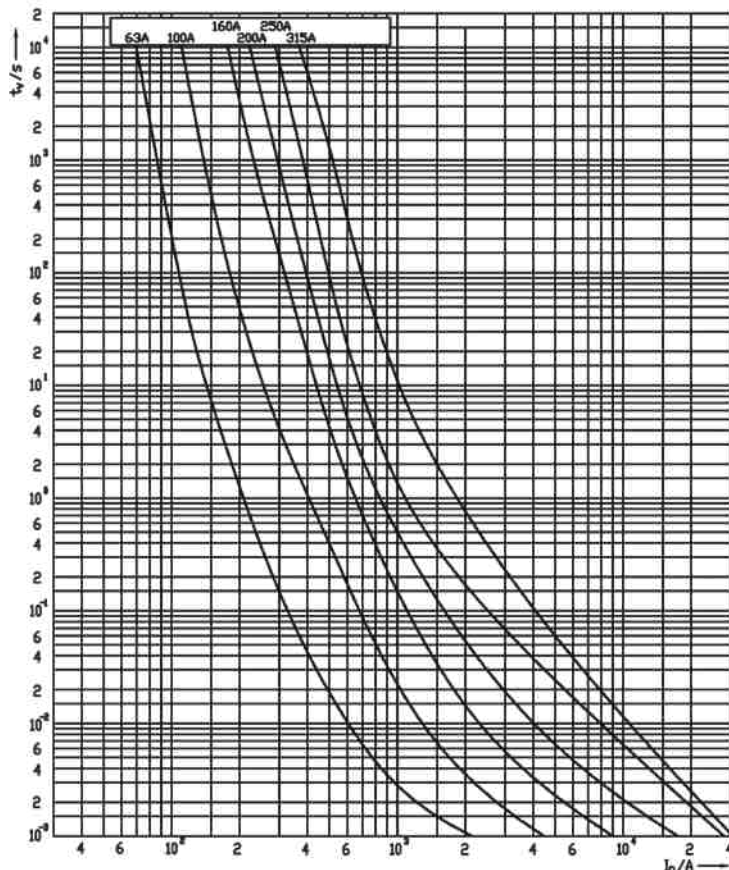
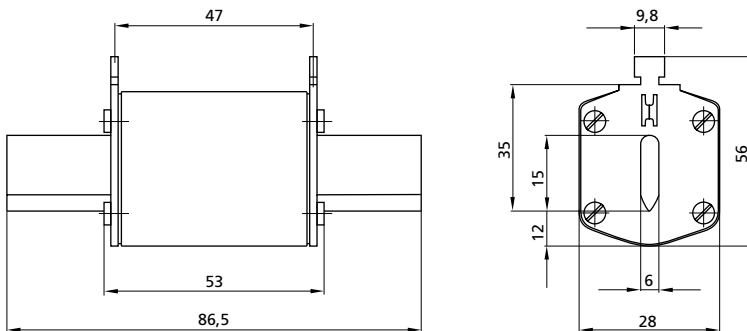
# NH DC 250 V

## General characteristics

Rated voltage	250 V d.c. (L/R = 20 ms)
Breaking capacity	25 kA d.c.
Standards	IEC 60269-1
Application	Fuse-link for DC application. For installation in NV Telecom fuse disconnecter.

## NH DC 250 V

Size	I <sub>n</sub> [A]	Code No.		Power dissipation [W]	Packaging [pcs]	Weight [g]
		standard indicator	striker indicator			
00	63	004110130	004110135	7,5	3	654
	100	004110131	004110136	8,6		
	160	004110132	004110137	13,8		
	200	004110140	004110141	18,5		
	250	004110133	004110138	21,2		
	315	004110134	004110139	24,0		

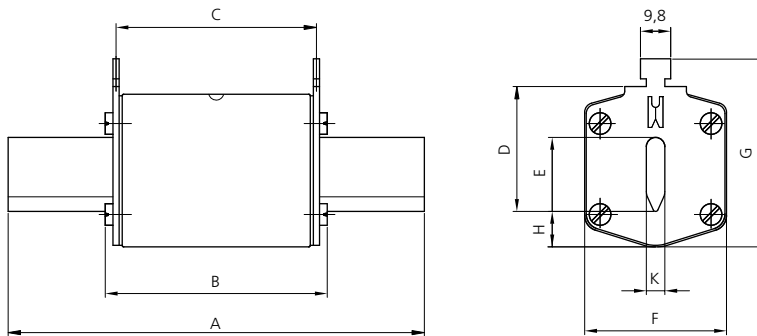




# NH DC 440 V

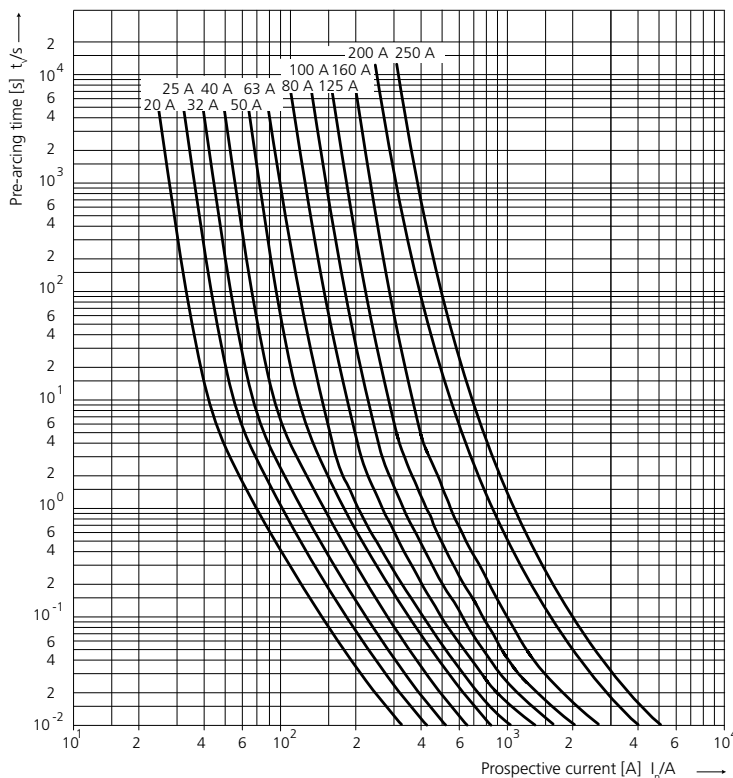
General characteristics	
Rated voltage	440 V d.c. (L/R = 20 ms)
Breaking capacity	50 kA d.c.
Standards	IEC 60269-1
Application	Fuse-link for DC application. Installation in PK or PT fuse bases.

$I_n$ [A]	Code No.				Size	Max. power dissipation [W]	Packaging [pcs]	Weight [g]
	00 C	00	1 C	1				
20	004110200		004110220		00 C	7,2	3/120	125
25	004110201		004110221		00	15,1	3/90	173
32	004110202		004110222		1 C	21,9	3/45	233
40	004110203		004110223		1	31,3	3/24	430
50	004110204		004110224					
63		004110210	004110225					
80		004110211	004110226					
100		004110212	004110227					
125		004110213	004110228					
160		004110214	004110229					
200				004110230				
250				004110231				



type	dimensions [mm]								
	A	B	C	D	E	F	G	H	K
00 C	79	53	47	35	15	21	52	7,5	6
00	79	53	47	35	15	28	56	12	6
1 C	135	68	65	40	15	28	61	12	6
1	135	72	65	40	20	46	65	14	6

Time-current characteristics



# NH DC 1000 V aR



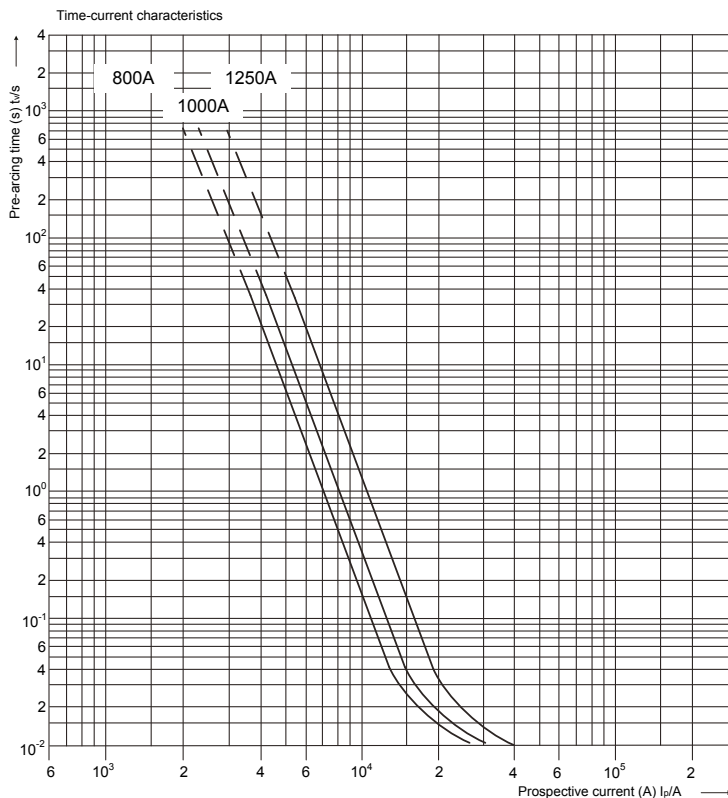
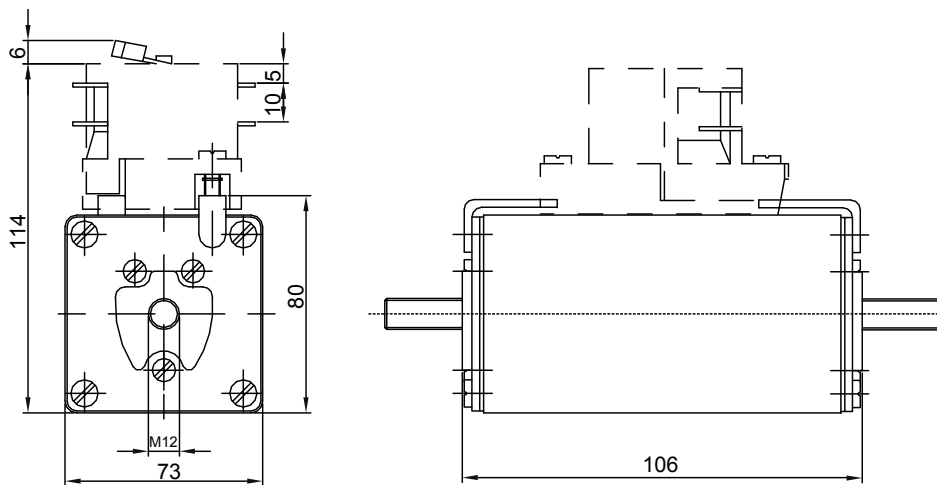
### General characteristics

Rated voltage	1000V d.c. (L/R=1ms)
Breaking capacity	30 kA d.c.
Standards	IEC 60269-4
Application	Fuse-link for DC application. Installation directly on copper rails.

### NH DC 1000 V aR

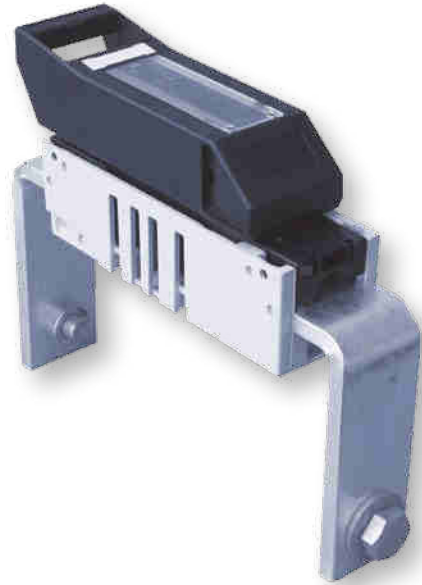
Size	$I_n$ [A]	Type with center trip indicator for microswitch MK	Power dissipation [W]	Pre-arcing Joule integral ( $I^2t$ ) L/R=1ms	Operating Joule integral ( $I^2t$ ) L/R=1ms	Packaging [pcs]	Weight [g]
3L	800	004305636	139	500.000	1.000.000	1	1500
	1000	004305637	154	900.000	1.600.000		
	1250	004305635	201	1.500.000	3.000.000		

Note: microswitch MK and adapter AMK2 must be ordered separately

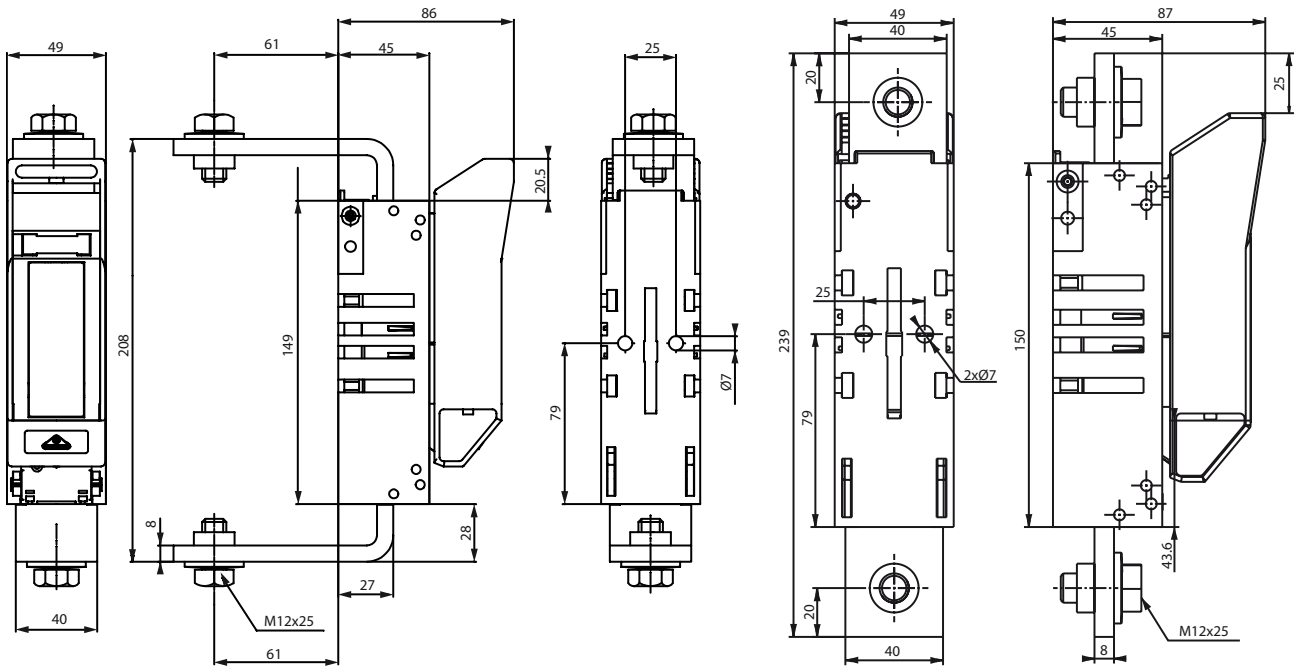


# NV Telecom fuse disconnectors

NV Telecom fuse disconnectors	
type	Code No.
HVL 00 Telecom 1P M12-M12, front connection, for striker	001692660
HVL 00 Telecom 1P M12-M12, front connection	001692662
HVL 00 Telecom 1P M12-M12, rear connection	001692663



Technical data for NV Telecom fuse disconnectors				
Technical Specifications				HVL 00
Electrical Characteristics				
Rated conditional short-circuit current	-	$kA_{\text{eff}}$		50
Utilization category	$I_e$	A		DC 20-B/800 A
Rated impulse withstand voltage	$U_{\text{imp}}$	kV		8
Operating cycles with current	-	-		100
Total power loss at $I_n$ (without TM)	$O_v$	W		44
Fuse links				
Size to DIN 43620	-	-		00
Max. rated current (gG)	$I_n$	A		800
Mechanical characteristics				
Operating cycles without current	-	-		500
Weight	-	kg		0,75
Cable connection				
Flat terminal	Bolt diameter	-	-	s. drawings
	Cable lug (DIN 43620)	-	mm <sup>2</sup>	240
	Flat bar	-	mm	30x10
	Tightening torque	$M_n$	Nm	30-35
Type of protection				
Front side	Operational state	-	-	IP 20
Device fitted	Front cover open	-	-	IP 10
Operating conditions				
Ambient temperature	$T_u$	°C		-25 to +55
Rated operating mode	-	-		Continuous operation
Actuation	-	-		dependent manual operation
Mounting position	-	-		vertical, horizontal
Altitude	-	m		up to 2000
Pollution degree	-	-		3
Overvoltage category	-	-		III



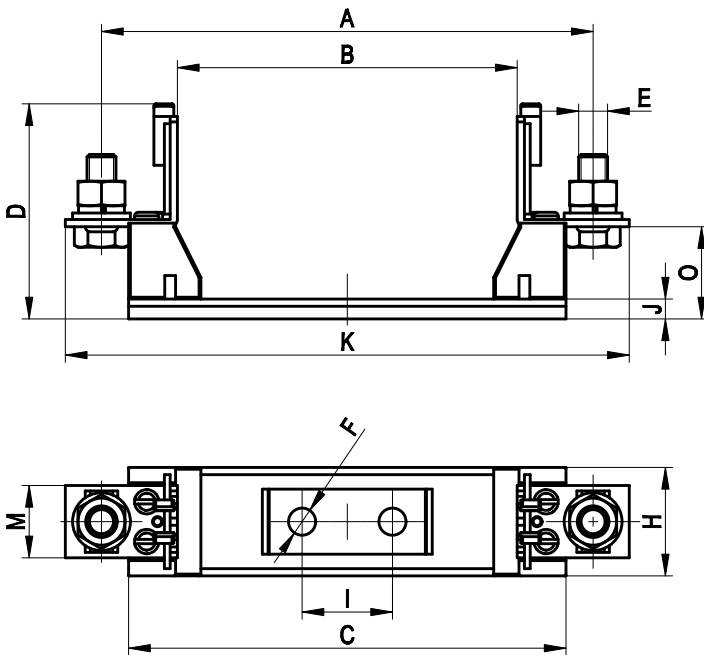
## Fuse base PK00 1000V a.c./d.c. M8-M8

### General characteristics

Rated voltage	1000V a.c./d.c.
Rated current	160A
Insulation class	C-VDE 0110
Standards	EN 60269, IEC 60269, DIN VDE 0636, DIN 43620, DIN 43623

### Fuse base PK00 1000V M8-M8

Type	I <sub>n</sub> [A]	Code No.	Weight [g]	Packaging [pcs]
PK00 1000Va.c./d.c. M8-M8	160	004132026	190	3/120

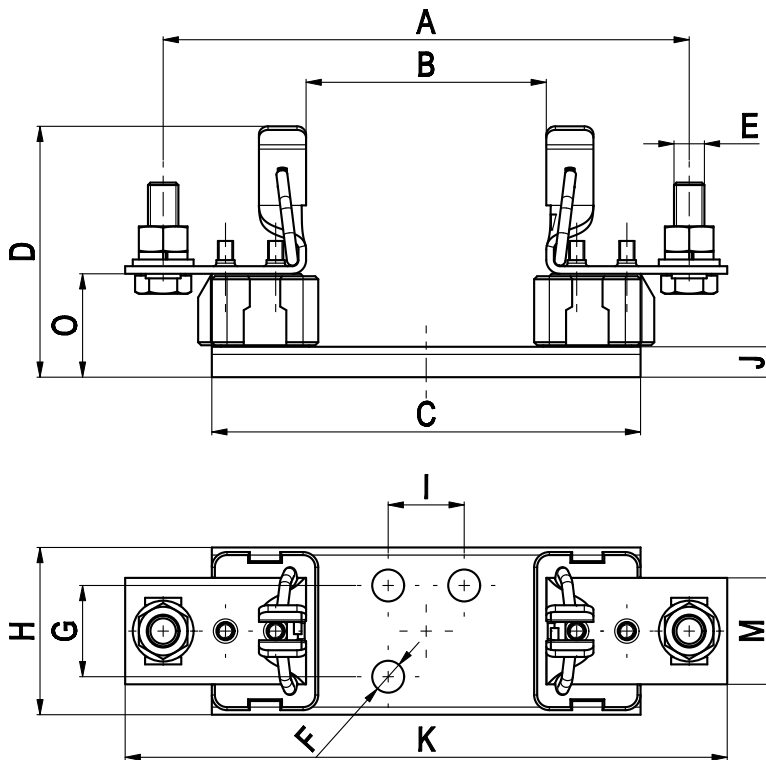


Type	Dimensions [mm]											
	A	B	C	D	E	F	H	I	J	K	M	O
PK00 1000V M8-M8	136	94	121	58,5	M8	7,5	30	25	4,5	156	20	25,5

# Fuse base PK1, PK2 and PK3 DC

General characteristics	
Rated voltage	1000V a.c./d.c.
Rated current	250A, 400A, 630A
Terminal torque	32 Nm
Cable lugs according to DIN 46235	25-150mm <sup>2</sup> , 25-240mm <sup>2</sup> , 25-300mm <sup>2</sup>
Insulation class	C-VDE 0110
Degree of protection	IP00
Standards	EN 60269, IEC 60269, DIN VDE 0636, DIN 43620, DIN 43623

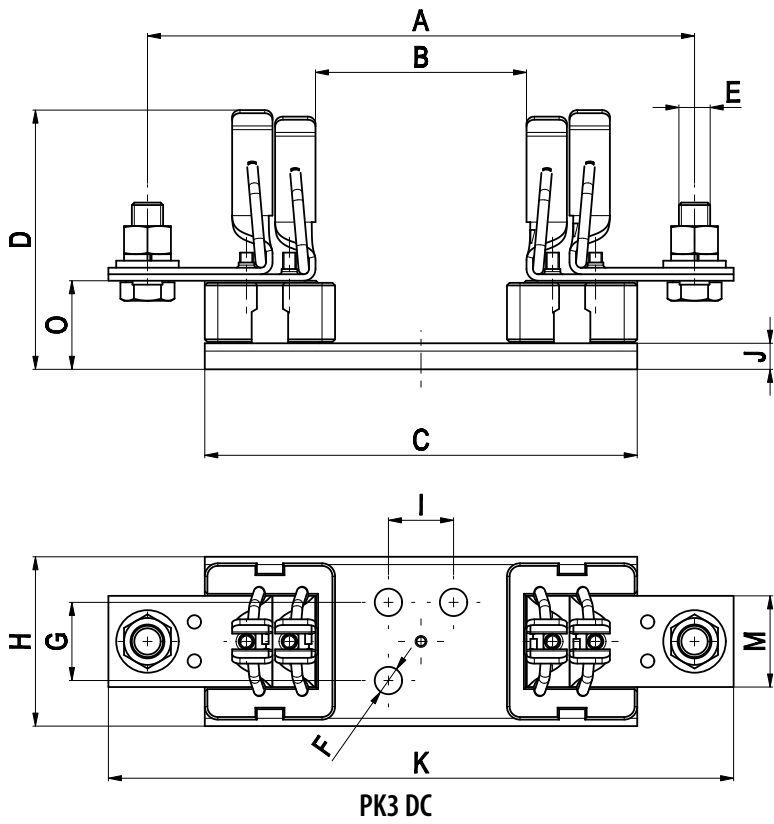
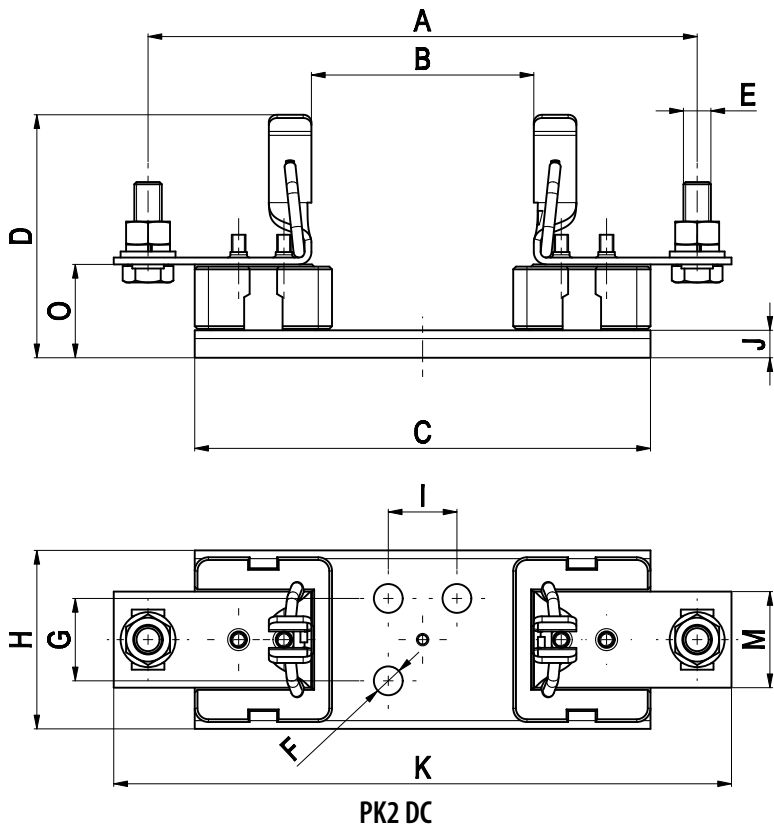
Fuse base PK					
Type	I <sub>n</sub> [A]	Cable lugs according to DIN 46235 [mm <sup>2</sup> ]	Code No.	Weight [g]	Packaging [pcs]
PK 1 M10-M10 DC 1000V 1p	250	25-150	004122025	605	3/18
PK 2 M10-M10 DC 1000V 1p	400	25-240	004122024	845	3/15
PK 3 M12-M12 DC 1000V 1p	630	25-300	004122023	1110	3/12



PK1 DC

Type	Dimensions [mm]												
	A	B	C	D	E	F	G	H	I	J	K	M	O
PK1 DC	175	80	141	82	M10-M10	Ø10,5	30	55,5	25	10	200	35	35





Type	Dimensions [mm]												
	A	B	C	D	E	F	G	H	I	J	K	M	O
PK2 DC	200	80	166	87	M10-M10	Ø10,5	30	65	25	10	225	35	35
PK3 DC	210	80	166	99	M12-M12	Ø10,5	30	65	25	10	240	35	35

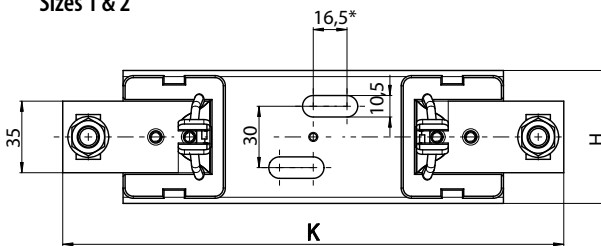
# Fuse base PK1,2,3-100mm

General characteristics	
Rated voltage	1000V a.c./d.c.
Rated current	250A, 400A, 630A
Terminal torque	32 Nm
Degree of protection	IP00
Standards	IEC 60269-2, DIN VDE 0636-21 (VDE 0636-21) 2015-03, DIN 43620
Application	For use with aM and gB fuse-links

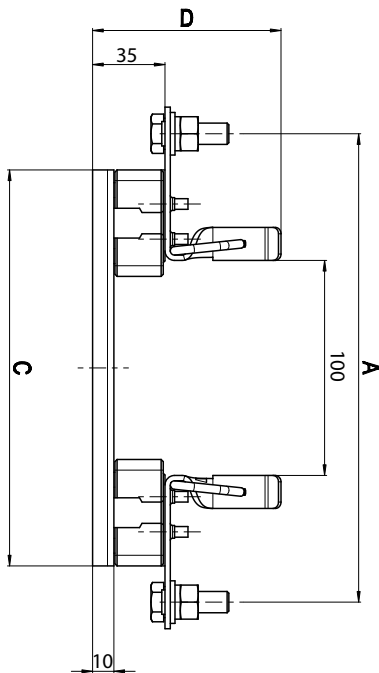
Fuse base PK-100mm					
Type	$I_n$ [A]	Cable lugs according to DIN 46235 [mm <sup>2</sup> ]	Code No.	Weight [g]	Packaging [pcs]
PK1-100 M10-M10 1p 1000V	250	25-150	004123400	623	3
PK2-100 M10-M10 1p 1000V	400	25-240	004123401	878	3
PK3-100 M12-M12 1p 1000V	630	25-300	004123402	1132	3



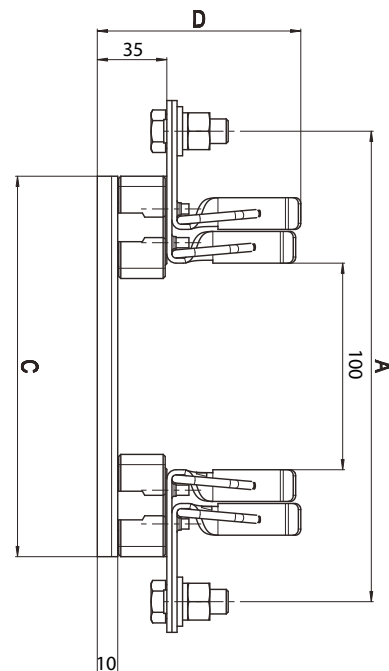
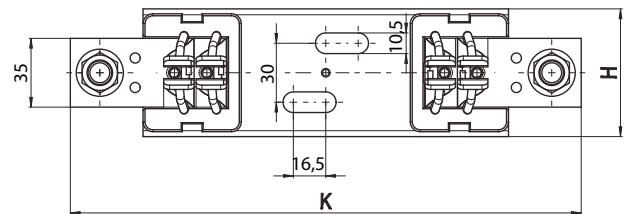
Sizes 1 & 2



\*PK1 1000V = 10,5



Size 3



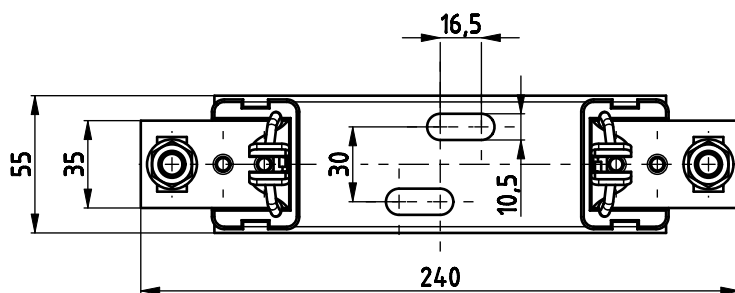
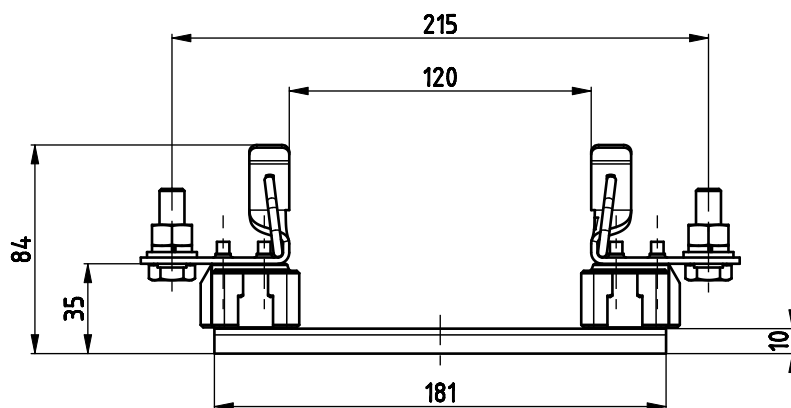
Type	Dimensions [mm]					
	A	C	D	E	H	K
PK1-100 M10-M10 1p 1000V	193	160	84	M10-M10	55,5	220
PK2-100 M10-M10 1p 1000V	220	186	90	M10-M10	65	245
PK3-100 M12-M12 1p 1000V	230	186	101	M12-M12	65	260



# Fuse base PK1L

General characteristics	
Rated voltage	1500V d.c.
Rated current	250A
Conv. free air thermal current with fuse links	250A
Max. permissible power dissipation per fuse link	32W
Max. breaking capacity per fuse link	200kA
Ambient temperature	-5...+40 °C
Rated operating mode	uninterrupted
Mounting position	vertical, horizontal
Pollution degree	3
Overvoltage category	III
Degree of protection	IP00 without covers; IP20 with covers fitted
Standards	DIN VDE 0636-21 (VDE 0636-21) 2015-03
Application	For use with gB fuse-links size 1L

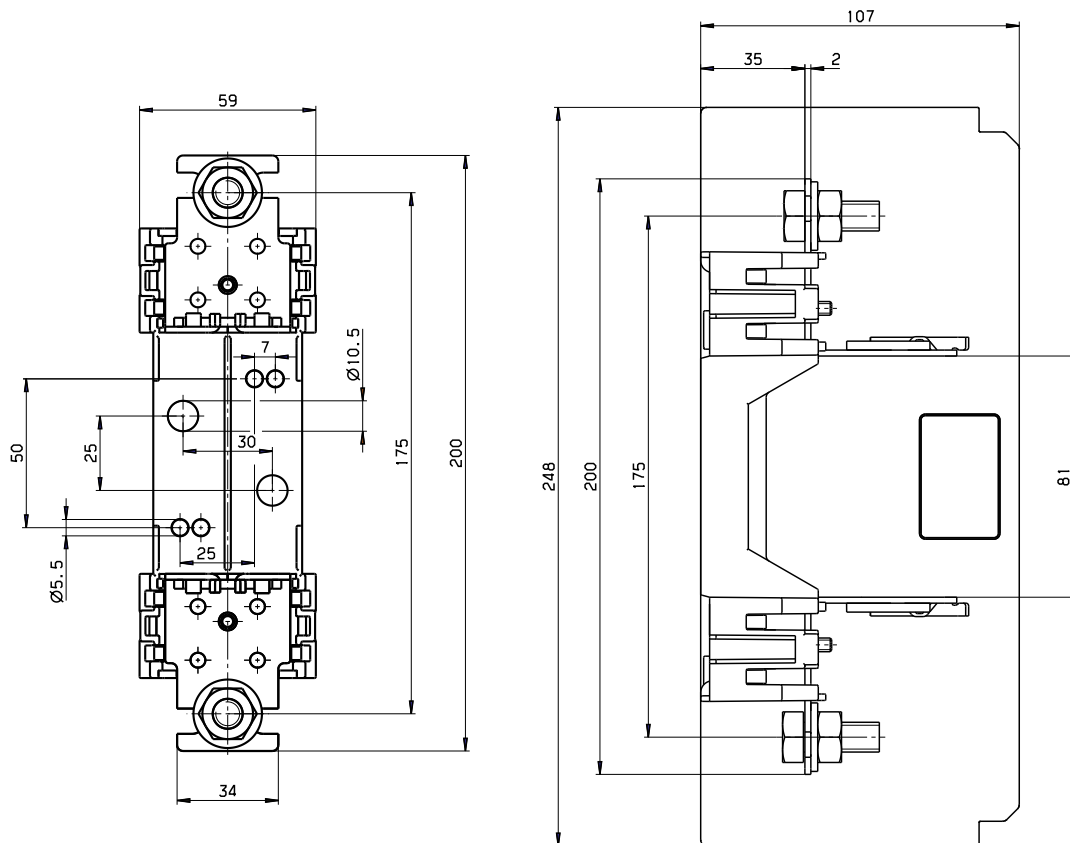
Fuse base PK-100mm					
Type	$I_n$ [A]	Cable lugs according to DIN 46235 [mm <sup>2</sup> ]	Code No.	Weight [g]	Packaging [pcs]
PK1L M10-M10 1p 1500V	250	25-300	004132035	670	3



# Fuse base U1-1 1000V

General characteristics		
Rated voltage	1000V d.c.	
Rated current	160A	
Conv. free air thermal current with fuse-links	160A	
Conv. free air thermal current with solid links	325A	
Max. permis. power dissipation per fuse-link	31W	
Cable terminal - Flat terminal	Screw	M10
	Cable lug (DIN 46235)	25-150 mm <sup>2</sup>
	Flat termination	30x10 mmx-mm
	Rated torque	30-35 Nm

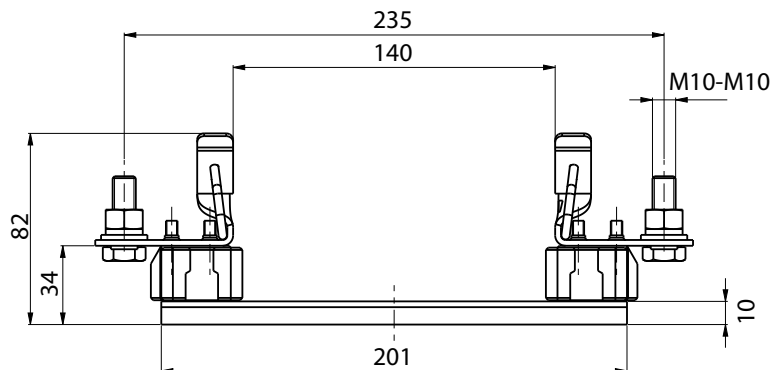
Fuse base U1-1 1000V					
Type	I <sub>n</sub> [A]	Code No.	Max. Connection (mm <sup>2</sup> )	Weight [g]	Packaging [pcs]
U1-1 1000V	160	004122035	150	387	1



# Fuse base PK XL

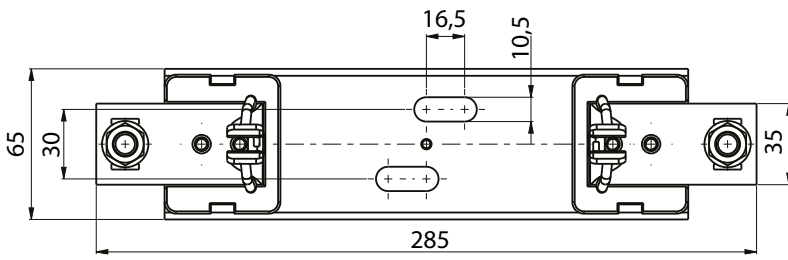
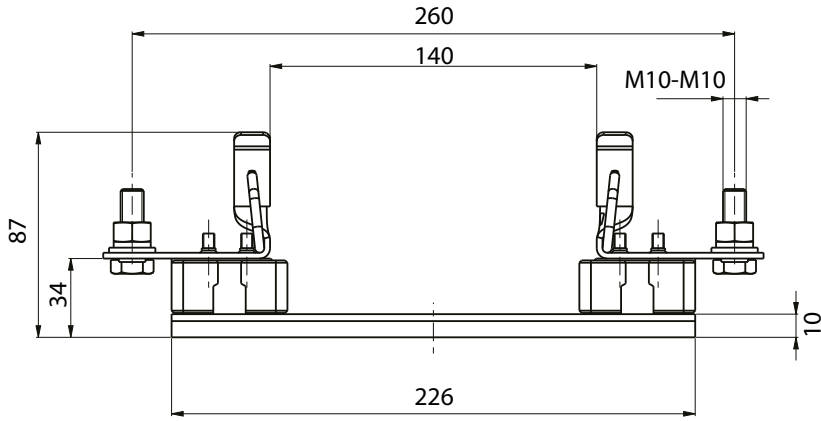
General characteristics	
Rated voltage	1500V a.c./d.c.
Rated current	250A, 400A, 630A
Insulation class	C-VDE 0110
Rated torque-contact (size 1XL,2XL,3L)	32Nm
Rated torque (mounting plate)	12Nm
Degree of protection	IP00
Standards	EN 60269, IEC60269, DIN VDE 0636-21 (VDE 0636-21) 2015-03, DIN 43620, DIN 43623

Fuse base PK XL					
Type	$I_n$ [A]	Cable lugs according to DIN 46235 [mm <sup>2</sup> ]	Code No.	Weight [g]	Packaging [pcs]
PK1XL M10-M10 1500V 1p	250	25-150	004132017	675	3
PK2XL M10-M10 1500V 1p	400	25-240	004132019	921	1
PK3L M12-M12 1500V 1p	630	25-300	004132023	1184	1

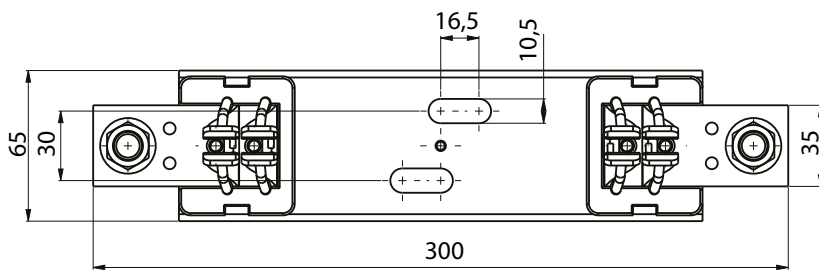
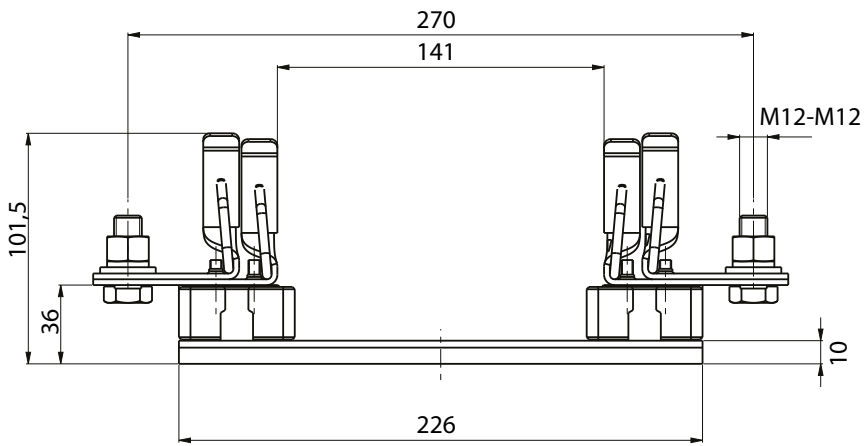


PK1XL





PK2XL



PK3L



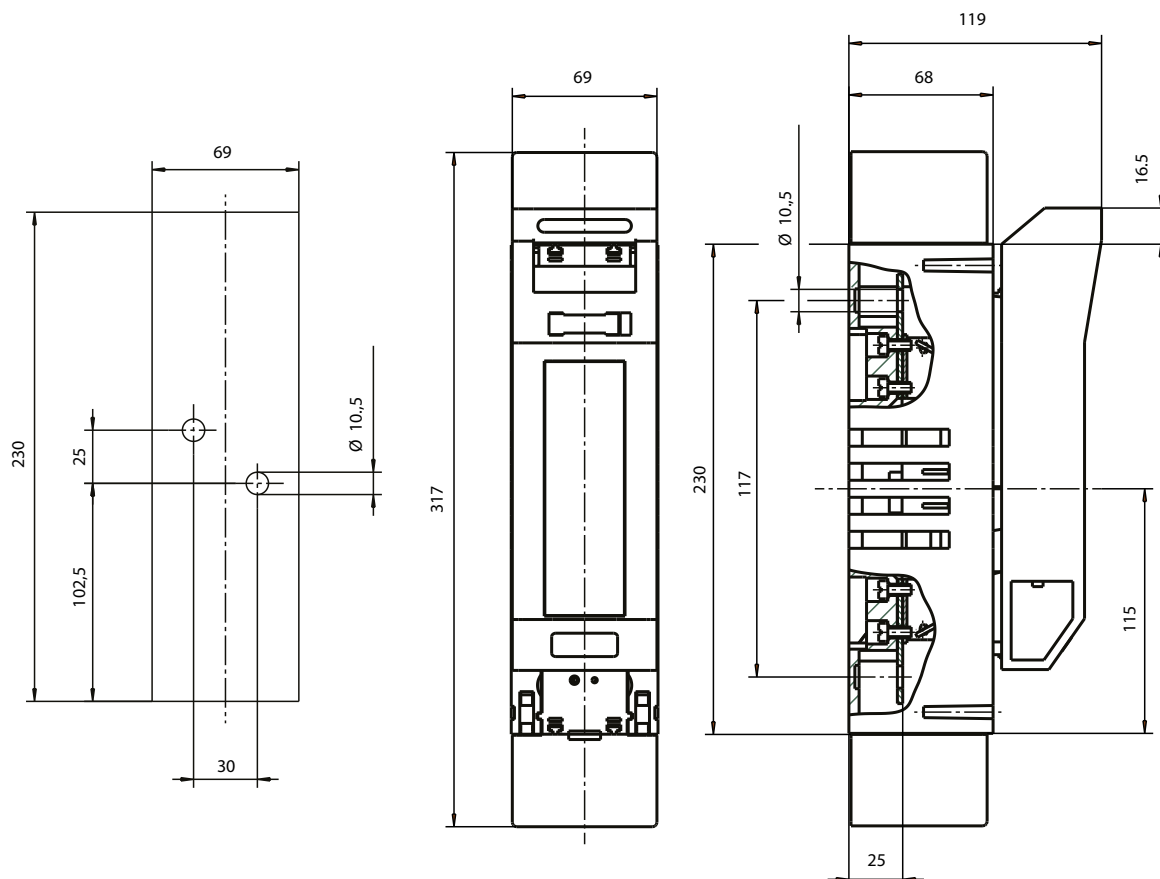
# Fuse disconnecter TL1-1/9/1000V

General characteristics		
Number of poles		1
Rated voltage		1000V d.c.
Rated current		160A
Conv. free air thermal current with fuse-links		160A
Utilization category		DC-20B
Fuse-links	Size to DIN 43620	1
	Max. rated current (gL/gG)	160A
	Max. permis. power loss per fuse-link	25W
Cable terminal - Flat terminal	Screw	M10
	Cable lug (DIN 46235)	25-240 mm <sup>2</sup>
	Flat termination	30x10 mm
	Rated torque	30-35 Nm
Type of protection - front side, device fitted		IP20, IP10
Operating conditions	Ambient temperature*	-25 to +55
	Rated operating mode	Cont. operation
	Actuation	Dependent manual actuation
	Mounting position	Vertical, horizontal
	Altitude	up to 2000 m
	Pollution degree	3
	Overvoltage category	III



\*35°C normal temperature, 55°C with reduced operating current

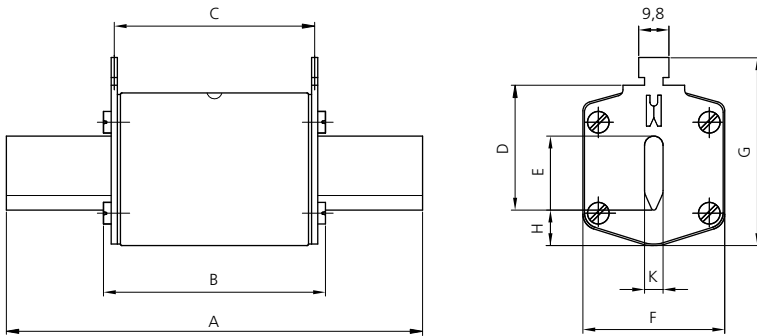
Fuse disconnecter TL1-1/9/1000V						
Type	I <sub>n</sub> [A]	Code No.	Max. Connection (mm <sup>2</sup> )	Terminal	Weight [g]	Packaging [pcs]
TL1-1/9/1000V	160	004122038	150	M10	1070	1



# Fuse-link aM NV/NH 1000V a.c.

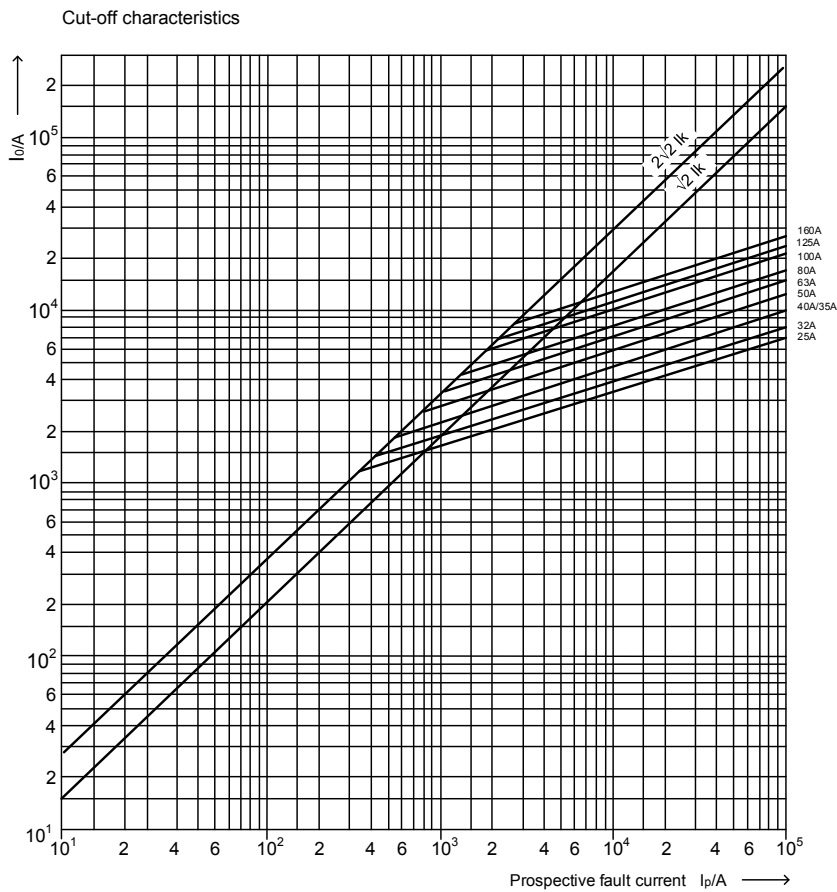
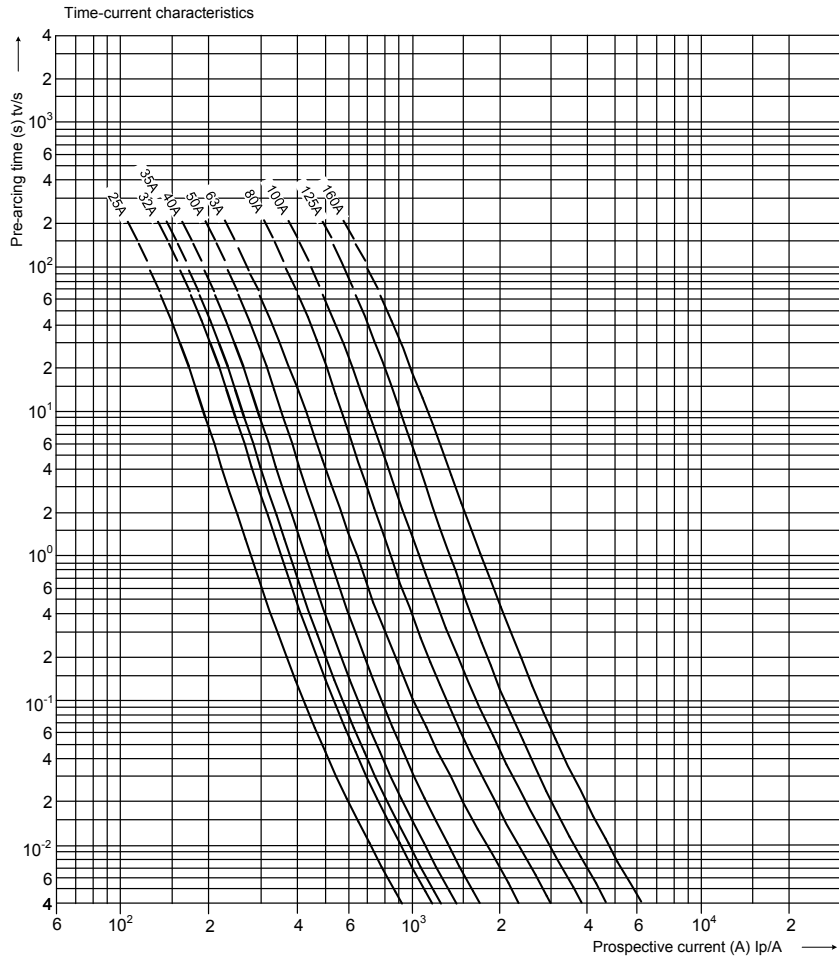
General characteristics	
Rated voltage	1000V a.c.
Breaking capacity	25kA a.c.
Standards	DIN VDE 0636-21 (VDE 0636-21) 2015-03
Characteristic	aM
Application	For equipment protection in mining industry. For relays, contactors and motors protection in case of short-circuit. Used with fuse base PK00 1000V.

1000V a.c. aM								
Size	I <sub>n</sub> [A]	Standard indicator	Pre-arcing Joule integral [A <sup>2</sup> s]	Operating Joule integral [A <sup>2</sup> s] at 635V	Operating Joule integral [A <sup>2</sup> s] at 1100V	Power dissipation [W]	Weight [g]	Packaging [pcs]
00	25	004182485	1.500	5.000	9.000	9	350	3/45
	32	004182486	2.500	9.500	15.000	10		
	35	004182487	3.500	12.000	20.000	10,5		
	40	004182488	4.000	15.000	25.000	11		
	50	004182489	7.000	23.000	40.000	13		
	63	004182490	11.000	40.000	60.000	15		
	80	004182491	17.000	63.000	100.000	17		
	100	004182492	32.000	110.000	170.000	19		
	125	004182493	45.000	150.000	230.000	21		
160	004182494	65.000	230.000	400.000	25			



Size	Dimensions [mm]									
	A	B	C	D	E	F	G	H	I	K
00	117	92	85	35	15	30	60	12	6	



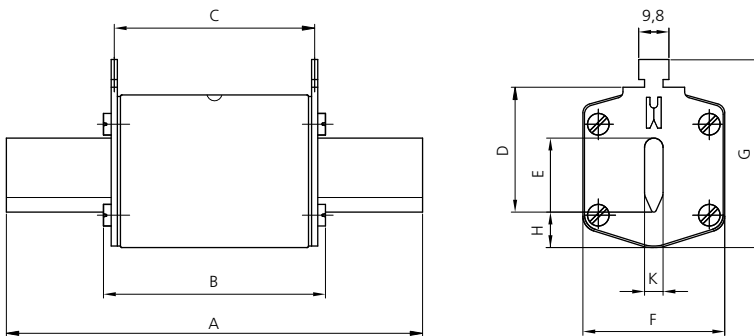




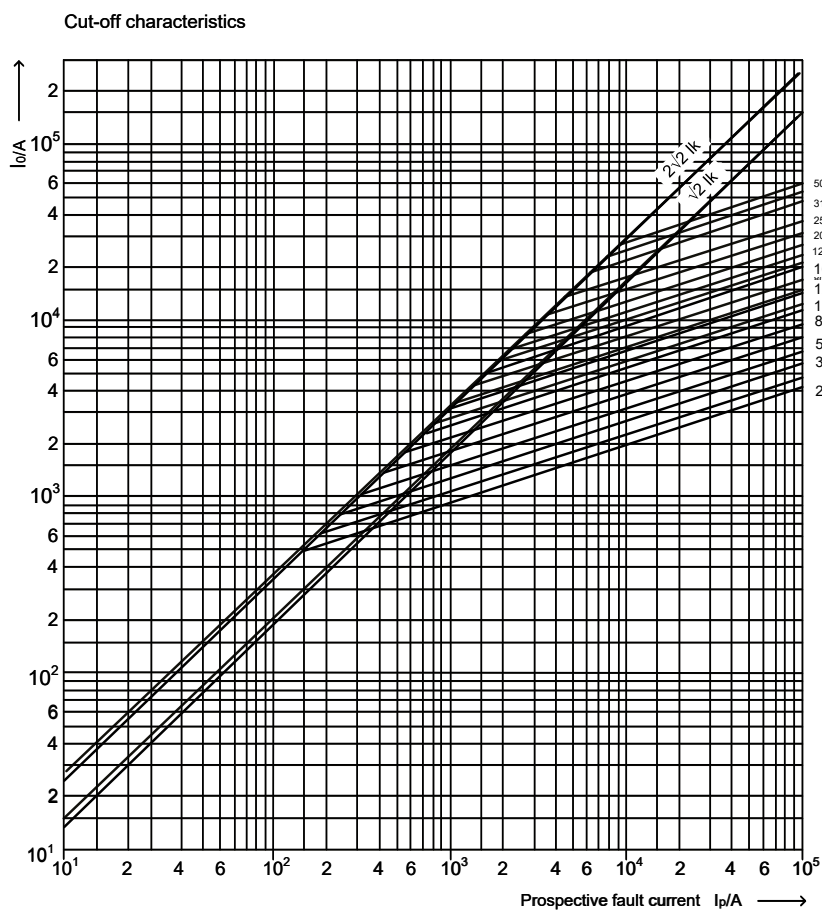
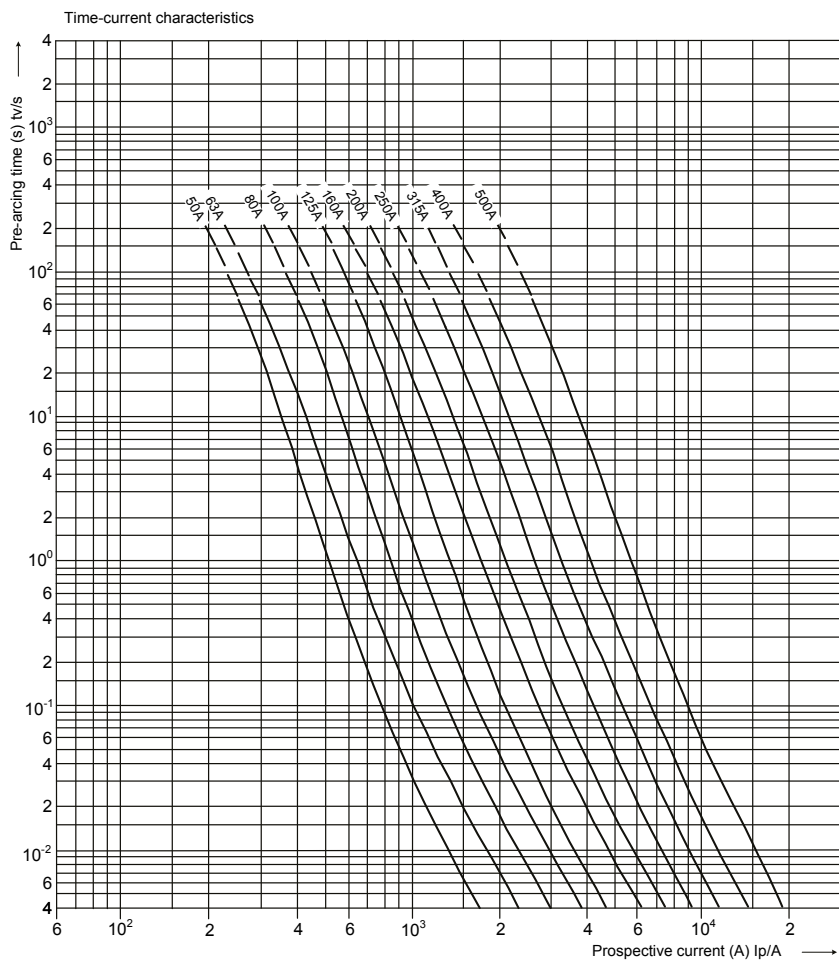
# Fuse-link aM NV/NH 1000V a.c.

General characteristics	
Rated voltage	1000V a.c.
Breaking capacity	25kA a.c.
Standards	DIN VDE 0636-21 (VDE 0636-21) 2015-03
Characteristic	aM
Application	For equipment protection in mining industry. For relays, contactors and motors protection in case of short-circuit. Used with fuse base PK1,2,3 - 100mm 1000V.

1000V a.c. aM								
Size	$I_n$ [A]	Standard indicator	Pre-arcing Joule integral [A <sup>2</sup> s]	Operating Joule integral [A <sup>2</sup> s] at 635V	Operating Joule integral [A <sup>2</sup> s] at 1100V	Power dissipation [W]	Weight [g]	Packaging [pcs]
1	50	004184432	7.000	23.000	40.000	13	530	1/8
	63	004184433	11.000	40.000	60.000	15		
	80	004184434	17.000	63.000	100.000	17		
	100	004184435	32.000	110.000	170.000	19		
	125	004184436	45.000	150.000	230.000	21		
	160	004184437	65.000	230.000	400.000	25		
3	200	004184438	110.000	400.000	600.000	28	1000	1/8
	250	004186434	180.000	650.000	1.000.000	31		
	315	004186435	340.000	1.400.000	2.000.000	41		
	400	004186436	500.000	2.000.000	3.000.000	50		
	425	004186437	550.000	2.150.000	3.300.000	53		
	500	004186439	700.000	2.500.000	4.000.000	60		



Size	Dimensions [mm]									
	A	B	C	D	E	F	G	H	K	
1	155	91	85	40	24	46	61	12	6	
3	170	91	85	60	32	64	84	13	6	

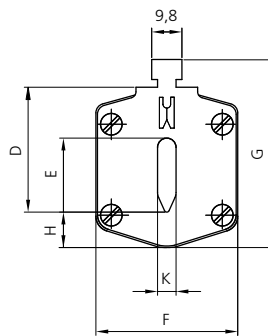
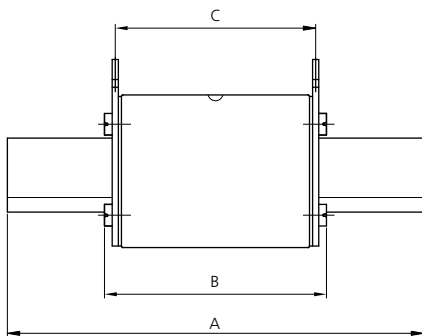


# Fuse-link gB NV/NH 00 1000V a.c.

General characteristics	
Rated voltage	1000V a.c.
Breaking capacity	25kA a.c. /100kA a.c. for 125A
Standards	DIN VDE 0636-21 (VDE 0636-21) 2015-03
Characteristic	gB
Application	For equipment protection in mining industry, "low spark" applications. Used with fuse base PK00 1000V.

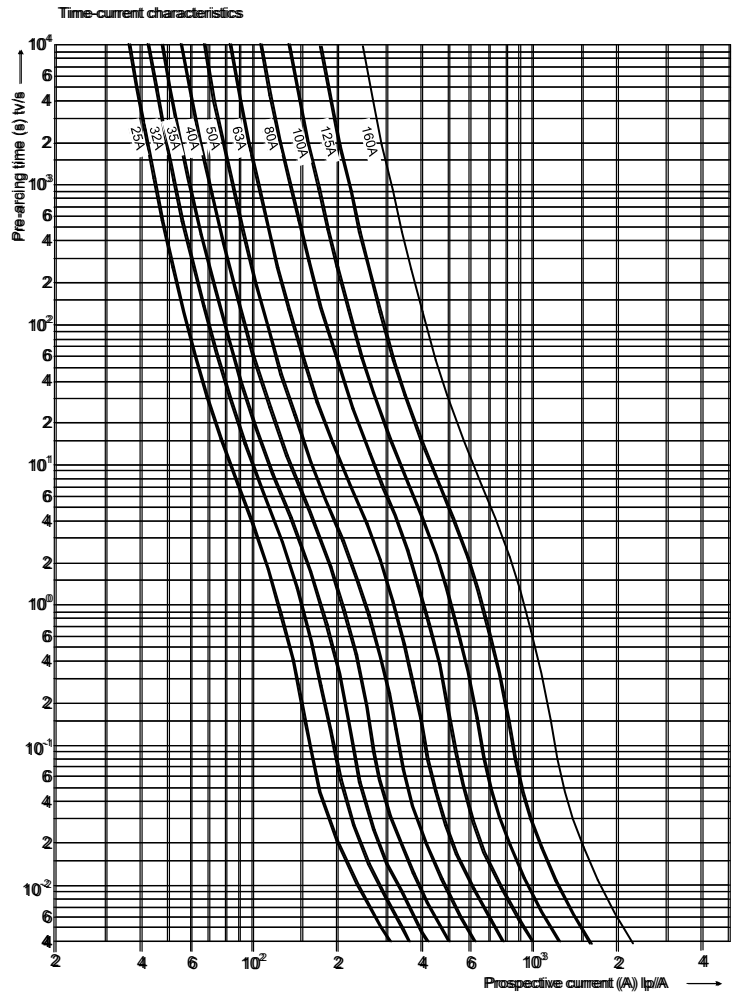


NV/NH gB 1000V a.c.									
Size	I <sub>n</sub> [A]	Standard indicator	Pre-arcing Joule integral [A <sup>2</sup> s]	Operating Joule integral [A <sup>2</sup> s] at 635V	Operating Joule integral [A <sup>2</sup> s] at 1100V	Power dissipation [W]	Cold resistance (mΩ) - Mean value	Weight [g]	Packaging [pcs]
00	25	004182475	110	1000	2900	4,2	5,51	350	3/45
	32	004182476	250	1600	4950	5,2	3,76		
	35	004182477	150	2500	4700	5,8	3,76		
	40	004182478	800	3000	4200	8,0	3,76		
	50	004182479	1200	4500	7000	5,6	1,88		
	63	004182480	1500	8000	23000	7,6	1,53		
	80	004182481	3200	12000	37000	8,6	1,09		
	100	004182482	4100	25000	48000	12,8	0,982		
	125	004182483	9100	30000	89000	15,0	0,728		
160	004182484	18000		170000	17,0	0,516			

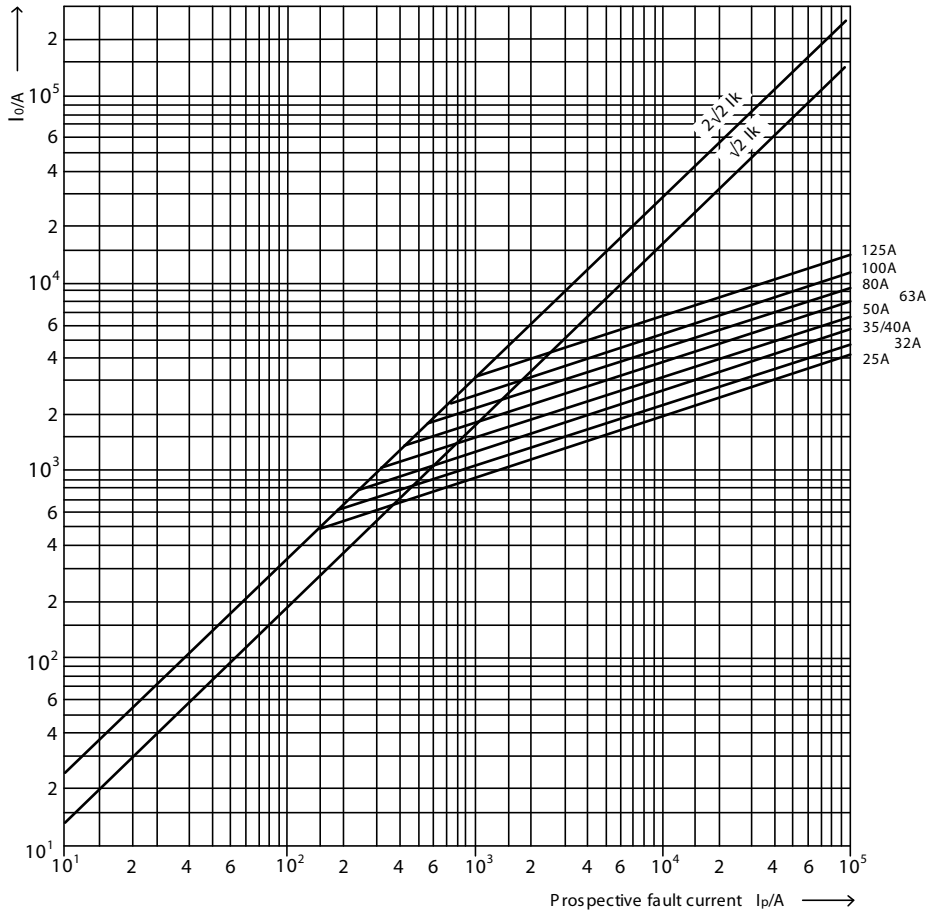


Size	Dimensions [mm]									
	A	B	C	D	E	F	G	H	K	
00	117	92	85	35	15	30	60	12	6	





Cut-off characteristics



# Fuse-link gB NV/NH 01L 1000V a.c.

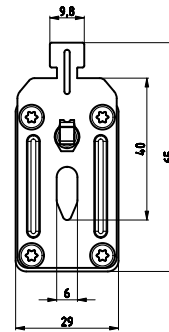
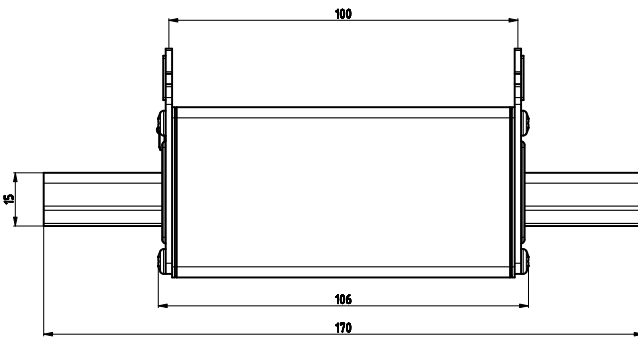
## General characteristics

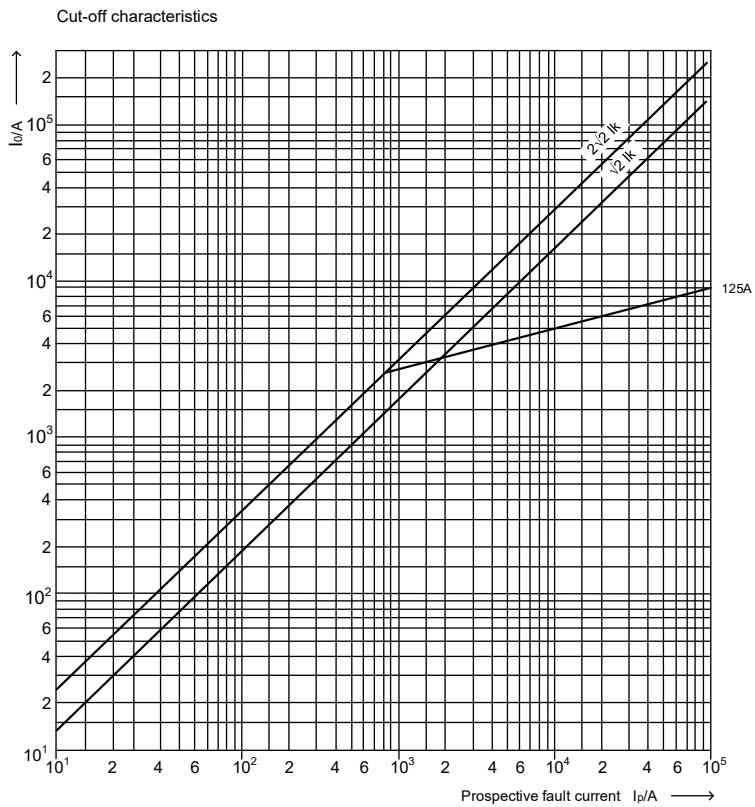
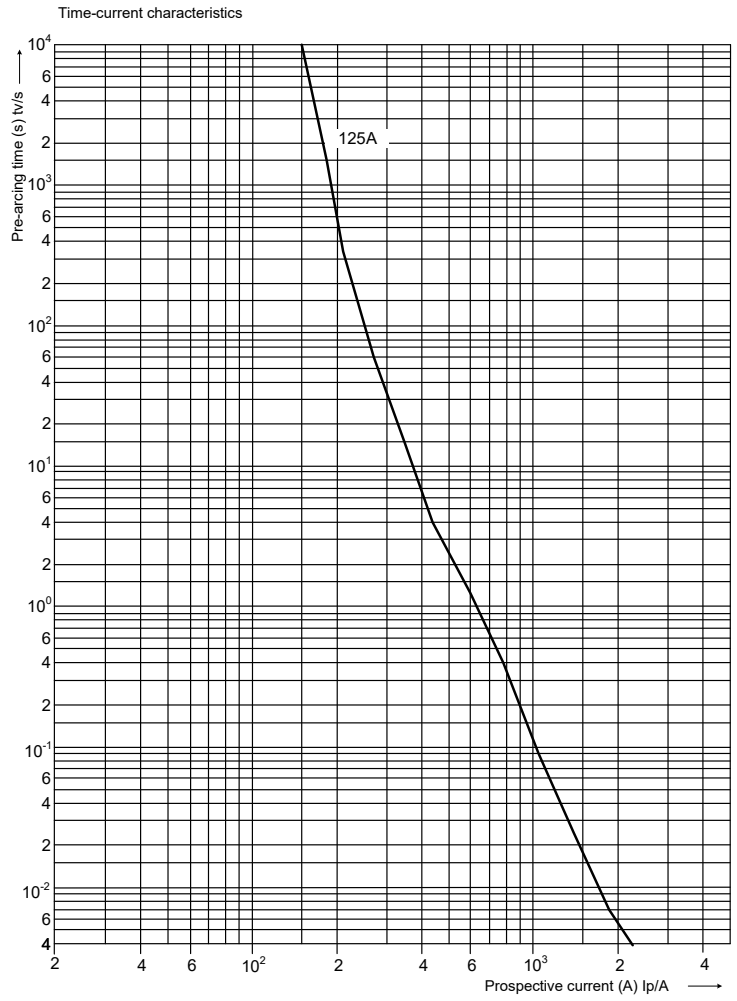
Rated voltage	1000V a.c.
Breaking capacity	100kA a.c.
Standards	DIN VDE 0636-21 (VDE 0636-21) 2015-03
Characteristic	gB
Application	For equipment protection in mining industry.



## NV/NH gB 1000V a.c.

Size	$I_n$ [A]	Standard indicator	Pre-arcing Joule integral [A <sup>2</sup> s]	Operating Joule integral [A <sup>2</sup> s] at 1100V a.c.	Power dissipation [W]	Weight [g]	Packaging [pcs]
01L	125	004182495	7.000	75.000	18,2	410	3/30





# Fuse-link gG NV/NH 800V a.c.

General characteristics	
Rated voltage	800V a.c.
Breaking capacity	120kA a.c. (NH1, NH3), 30kA a.c. (NH00)
Standards	IEC 60269-2
Characteristic	gG
Application	For cable protection on AC side of 1500V PV inverter.

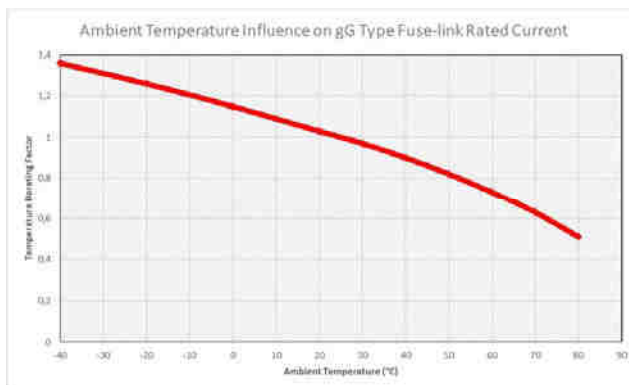
NV/NH gG 800V a.c.								
Size	Breaking capacity [kA]	I <sub>n</sub> [A]	Standard indicator	Pre-arcing Joule integral [A <sup>2</sup> s]	Operating Joule integral [A <sup>2</sup> s]	Power dissipation [W]	Weight [g]	Packaging [pcs]
00	30	6	004184464	120	240	1,50	173	3/90
		10	004184499	180	600	1,30		
		16	004184465	340	960	2,50		
		20	004184466	650	2000	2,90		
		25	004184491	1.300	3000	3,20		
		35	004184492	2.000	6000	3,80		
		40	004184493	2.500	7000	4,00		
		50	004184494	4.000	11000	5,40		
		63	004184495	9.000	19000	7,00		
1	120	25	004184482*	600	14.000	3,2	430	3/24
		35	004184483*	2.400	35.000	3,4		
		40	004184484*	3.200	50.000	4,0		
		50	004184485*	3.500	70.000	4,4		
		63	004184486*	5.500	120.000	5,5		
		80	004184487*	11.000	145.000	6,9		
		100	004184488*	18.000	185.000	8,6		
		125	004184489*	27.000	260.000	9,7		
3	200	200	004184496	50.000	650.000	16	1200	3/15
		250	004184497	85.000	1.100.000	20		
		315	004184498	140.000	1.340.000	29		

\*Kombi indicator



Special Purpose Fuses

## Ambient Temperature Influence on gG Type Fuse-link Rated Current



T <sub>amb</sub> (°C)	TDF
-40	1,36
-20	1,26
0	1,15
20	1,03
30	0,97
40	0,90
50	0,82
60	0,73
70	0,63
80	0,51

Legend:

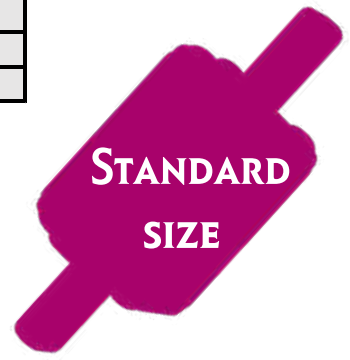
T<sub>amb</sub> – Ambient Temperature

TDF – Temperature Derating Factor

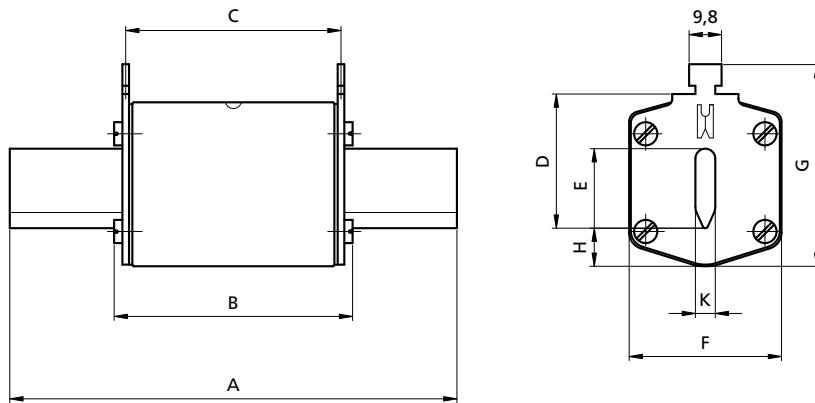
I<sub>N</sub> – Nominal Current of Fuse-link

I<sub>TDF</sub> – Nominal Current Including Temperature Derating Factor

$$\text{Current calculation: } I_{TDF} = I_N * TDF$$

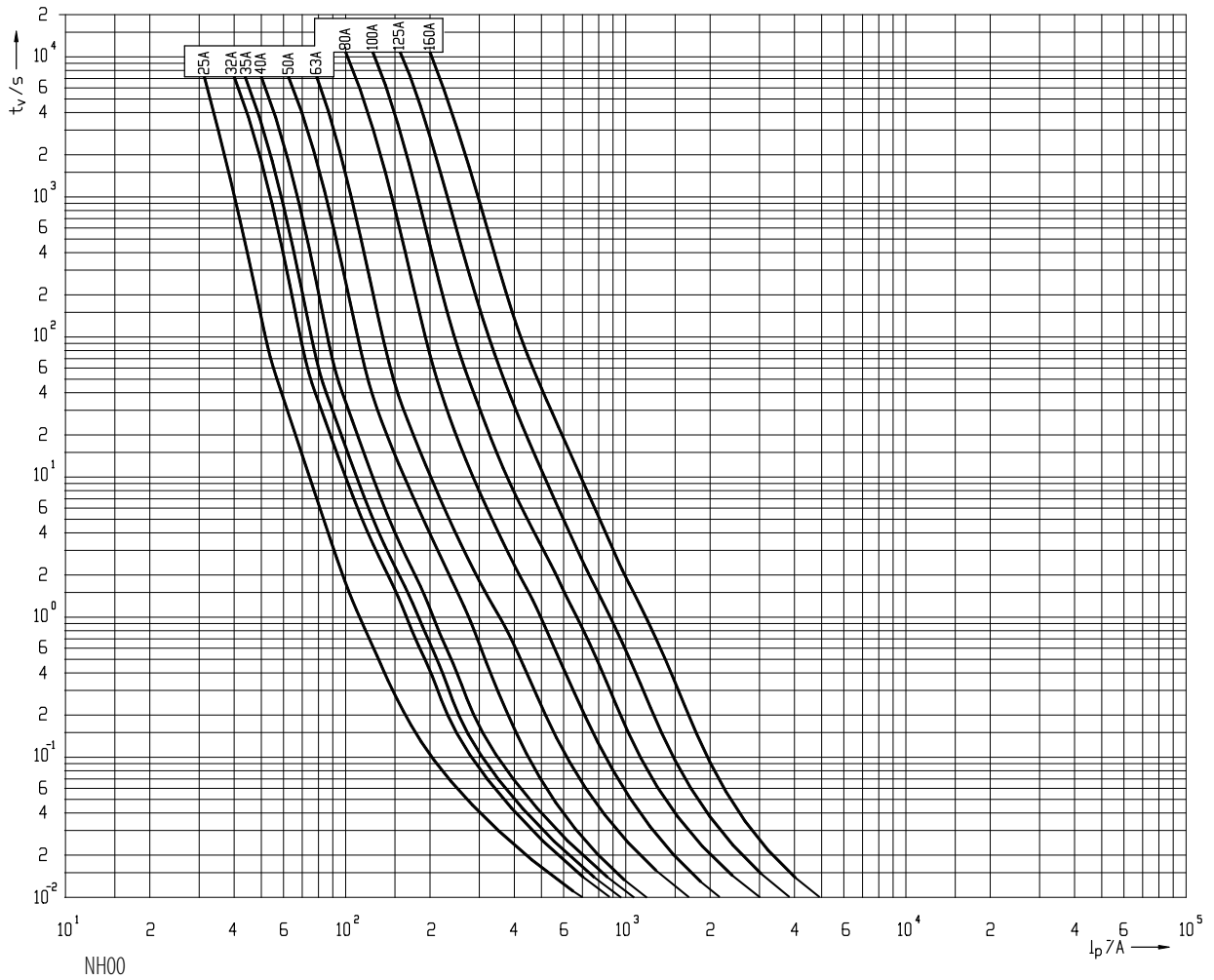


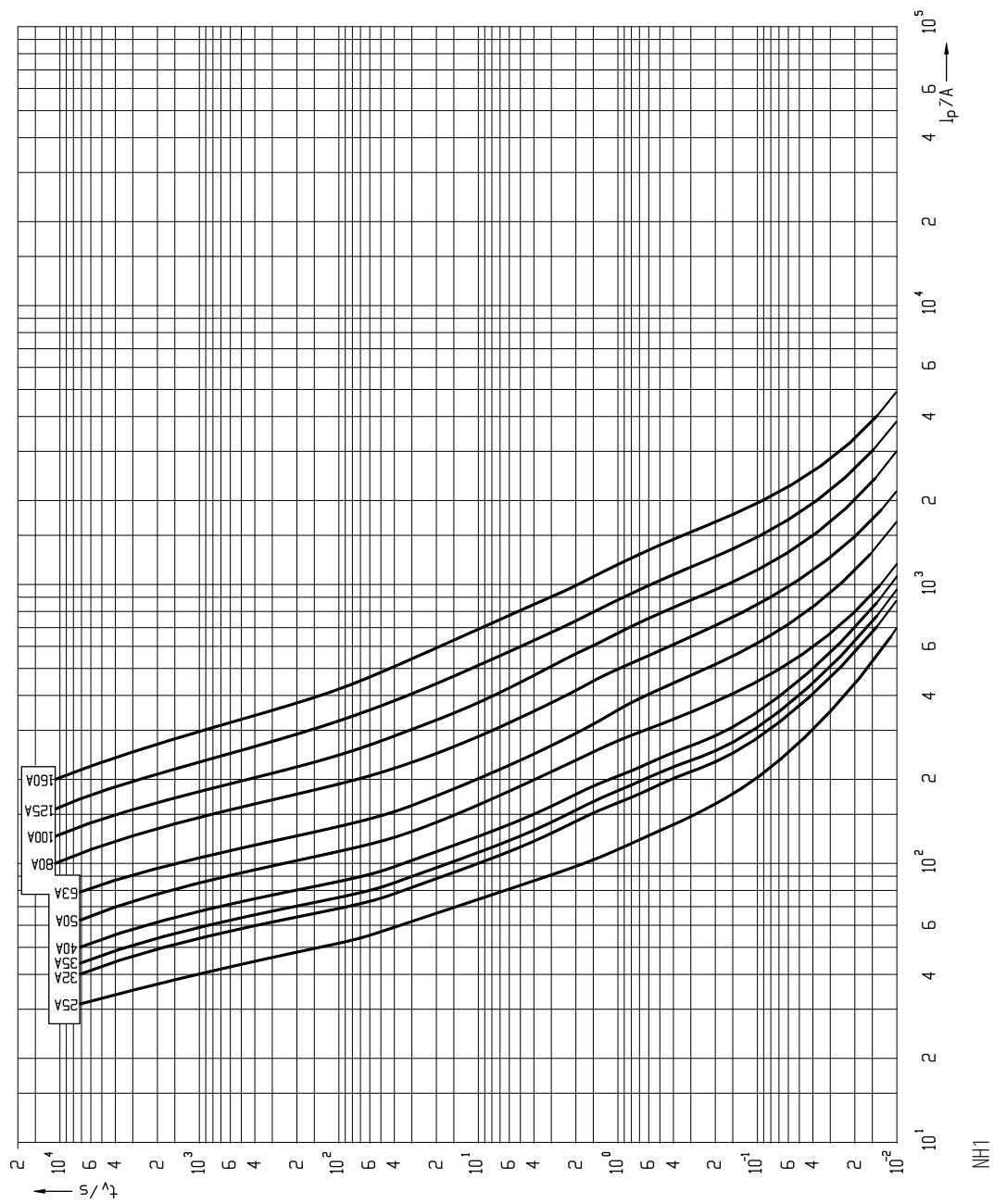




Size	Dimensions [mm]								
	A	B	C	D	E	F	G	H	K
00	79	53	47	35	15	28	56	12	6
1	135	72	65	40	20	46	65	14	6

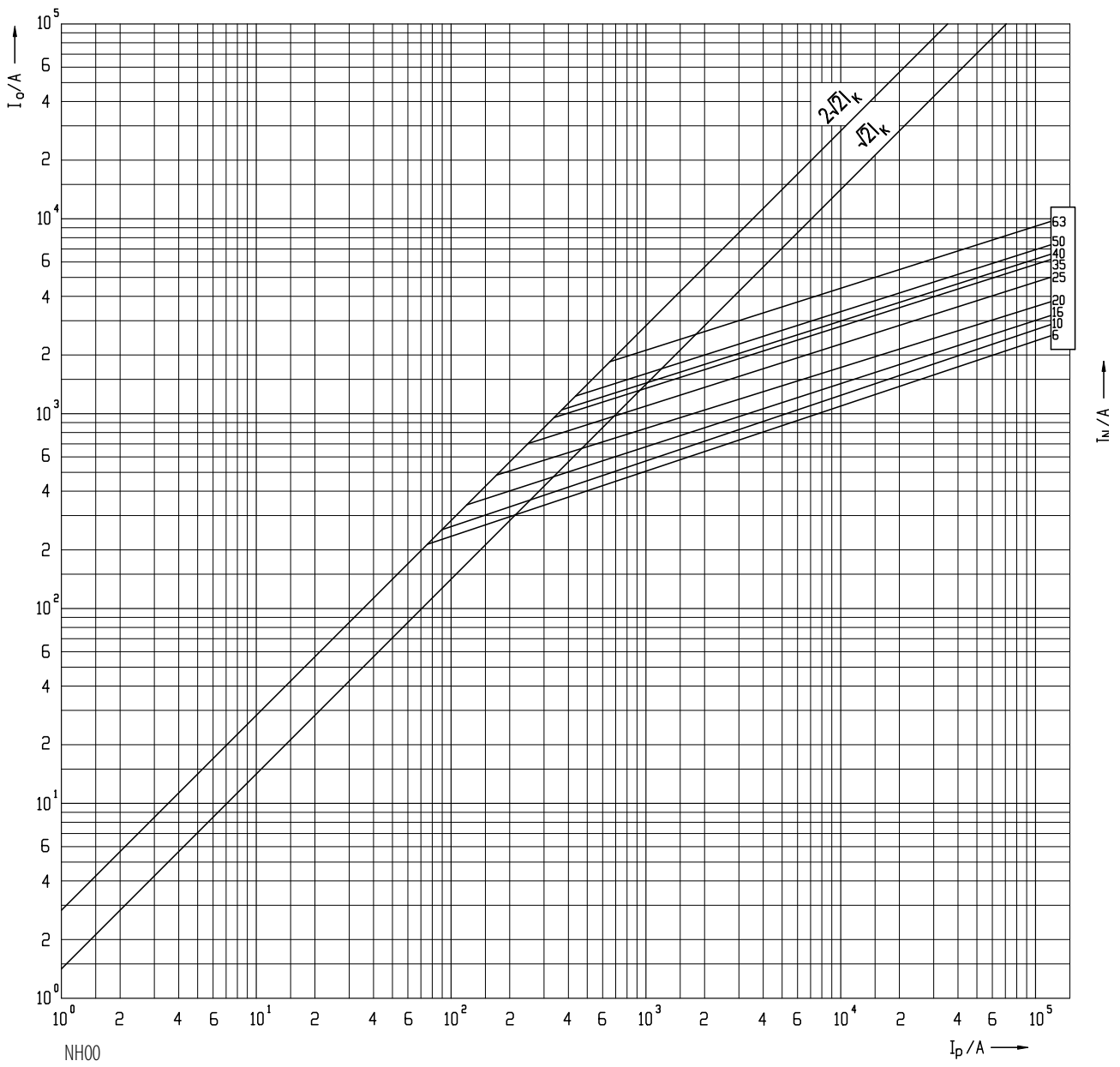
### t-I characteristics

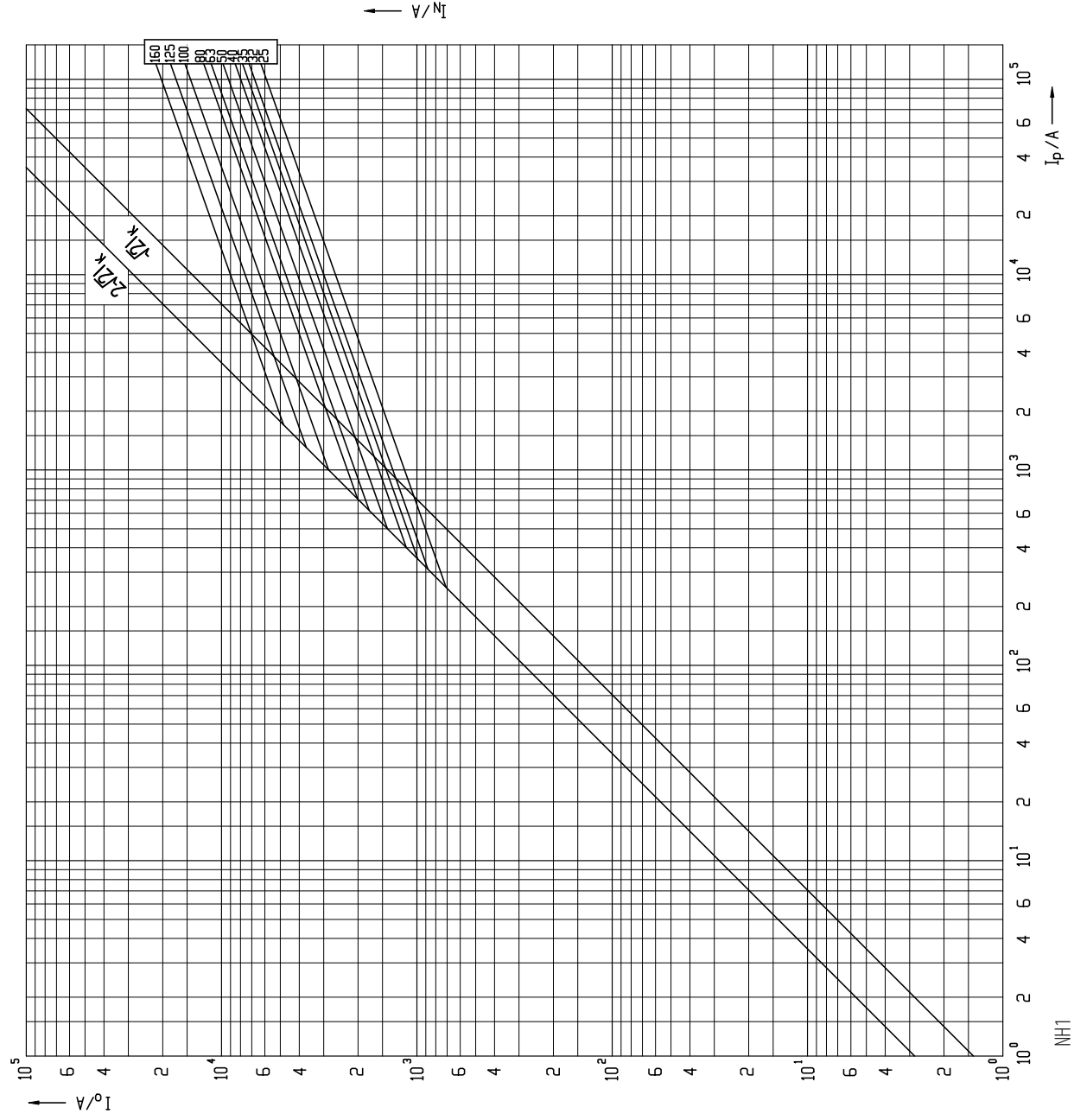


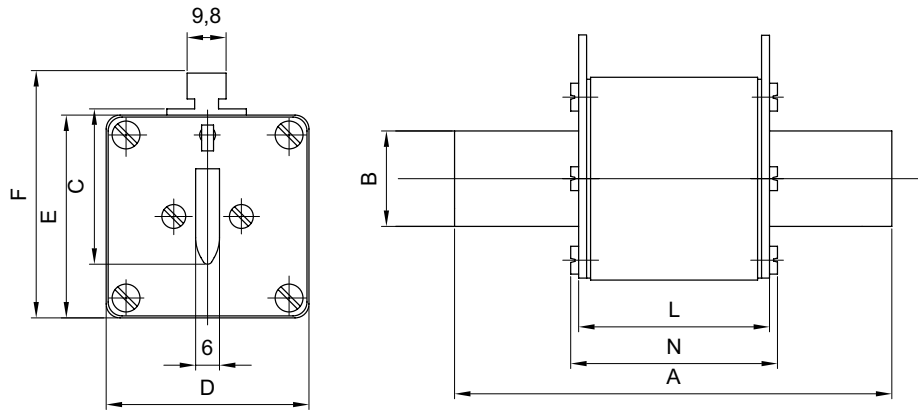


NH1

Cut-off current characteristics

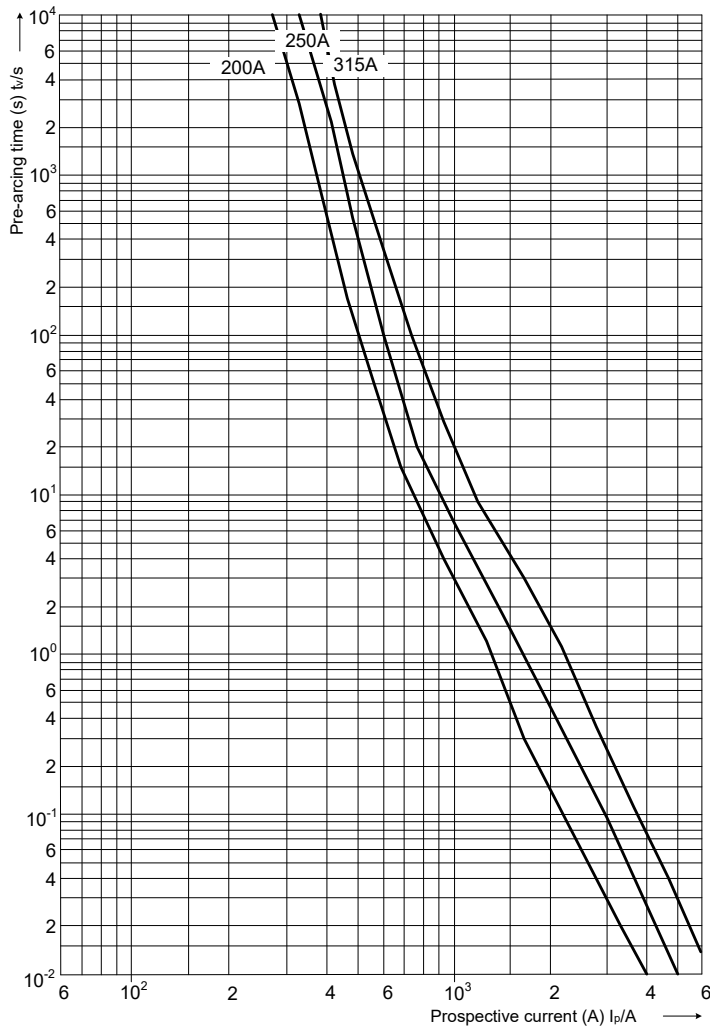






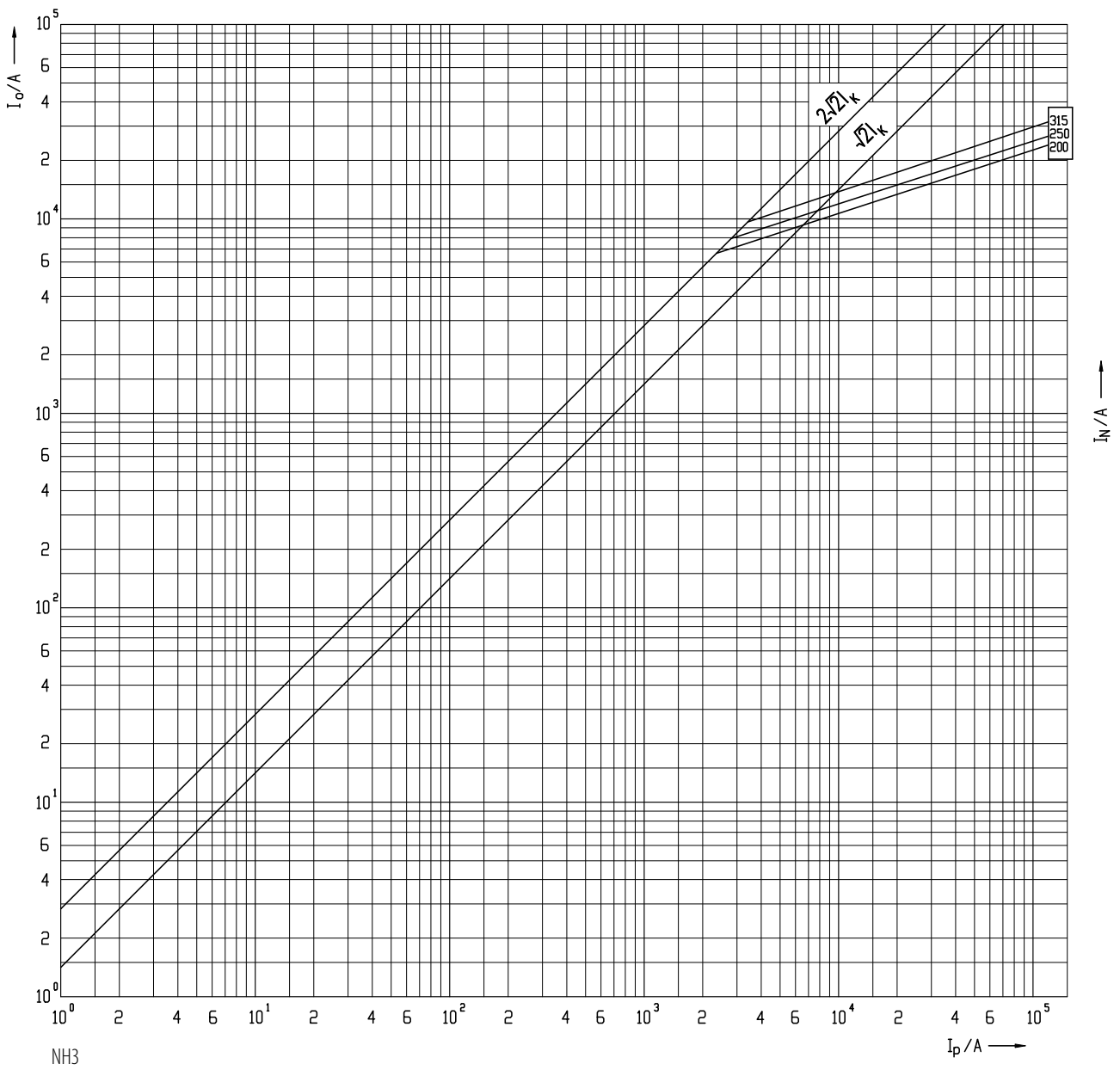
Size	Dimensions [mm]								
	A	B	C	D	E	F	L	N	K
3	150	37	60	73	73	87	70	74	6

t-I characteristics



NH3

Cut-off current characteristics



# Fuse-link gS NV/NH 800V a.c.

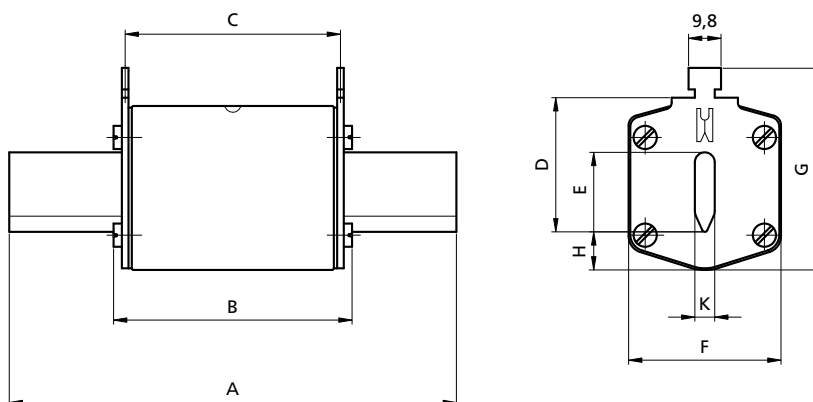
## General characteristics

Rated voltage	800V a.c.
Breaking capacity	120kA a.c. (NH1, NH2, NH2), 30kA a.c. (NH00)
Standards	IEC 60269-2
Characteristic	gS
Application	For cable protection on AC side of 1500V PV inverter.



## NV/NH gG 800V a.c.

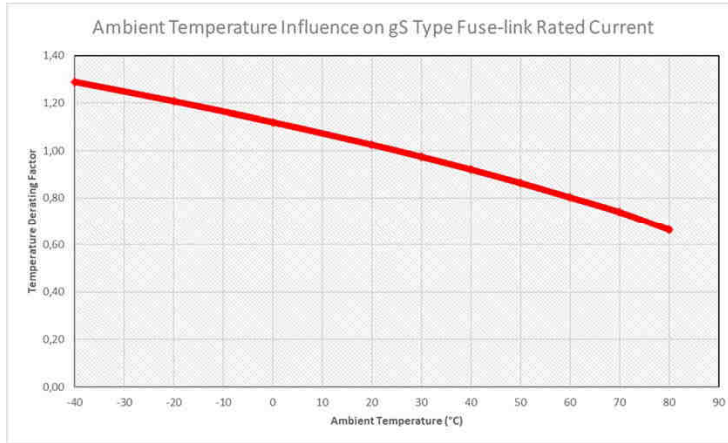
Size	Breaking capacity [kA]	I <sub>n</sub> [A]	Standard indicator	Pre-arcing Joule integral [A <sup>2</sup> s]	Operating Joule integral [A <sup>2</sup> s]	Power dissipation [W]	Weight [g]	Packaging [pcs]
00	30	16	004184504	15	1000	3,1	173	3/90
		20	004184505	32	1200	3,2		
		25	004184506	54	1600	4,3		
		35	004184507	250	5500	4,3		
		40	004184508	390	6300	4,5		
		50	004184509	460	9500	5,7		
		63	004184502	510	18.400	6,2		
		80	004184501	1360	32.000	6,7		
		100	004184500	3000	60.000	9,0		
		125	004184503	4000	72.000	12,9		
1	120	160	004723234	3500	110.000	17,0	500	3/24
		200	004723235	9000	145.000	19,0		
		250	004723236	18.000	275.000	22,0		
		315	004723237	35.000	490.000	28,0		
2	120	350	004724234	70.000	825.000	25,0	660	1/16
		400	004724235	95.000	1.020.000	30,0		
3	120	350	004725232	85.000	980.000	25,0	1200	3/15
		400	004725233	105.000	1.200.000	30,0		
		450	004725234	170.000	1.750.000	31,7		
		500	004725235	220.000	2.100.000	33,5		



Size	Dimensions [mm]									
	A	B	C	D	E	F	G	H	K	
00	79	53	47	35	15	28	56	12	6	



## Ambient Temperature Influence on gS Type Fuse-link Rated Current



T <sub>amb</sub> (°C)	TDF
-40	1,29
-20	1,21
0	1,12
20	1,03
30	0,97
40	0,92
50	0,86
60	0,80
70	0,74
80	0,66

Legend:

Current calculation:  $I_{TDF} = I_N * TDF$

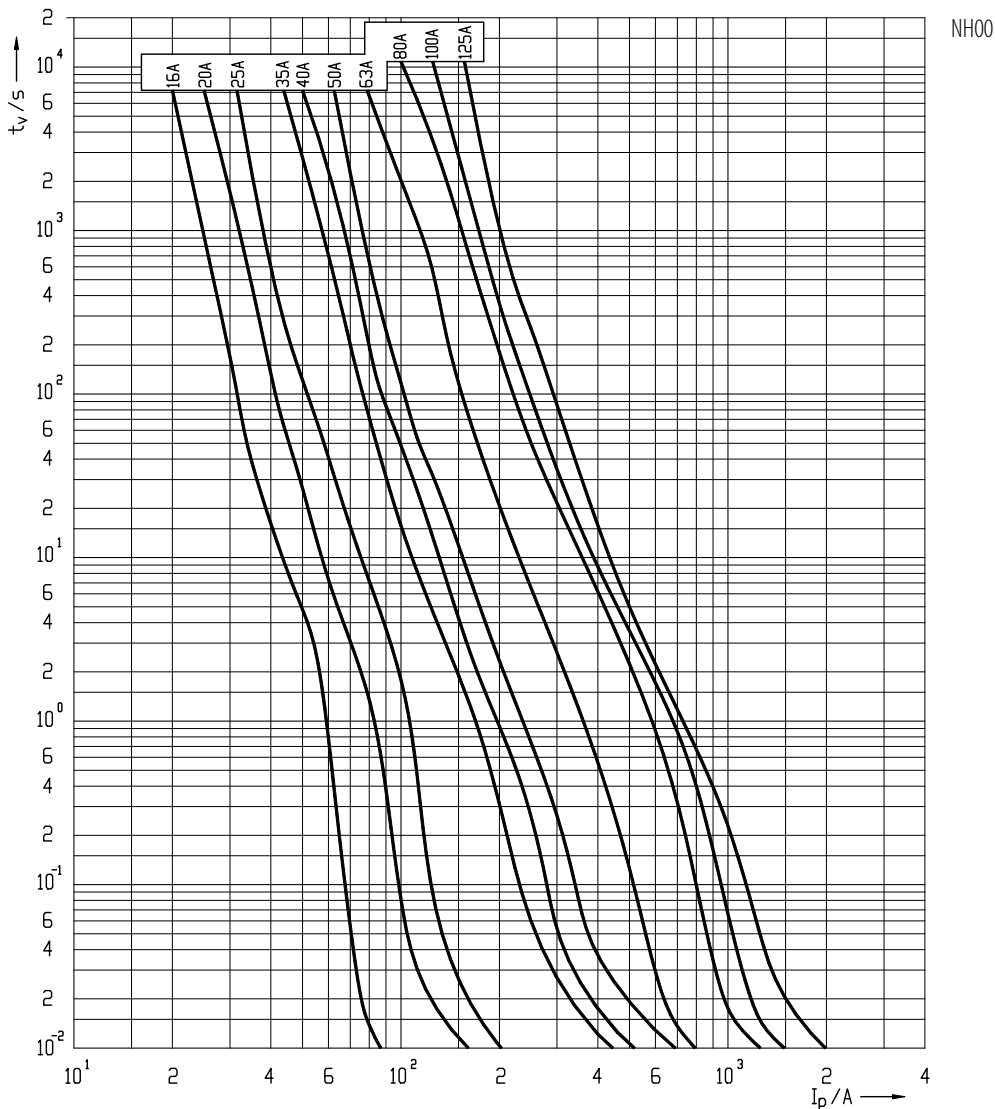
T<sub>amb</sub> – Ambient Temperature

TDF – Temperature Derating Factor

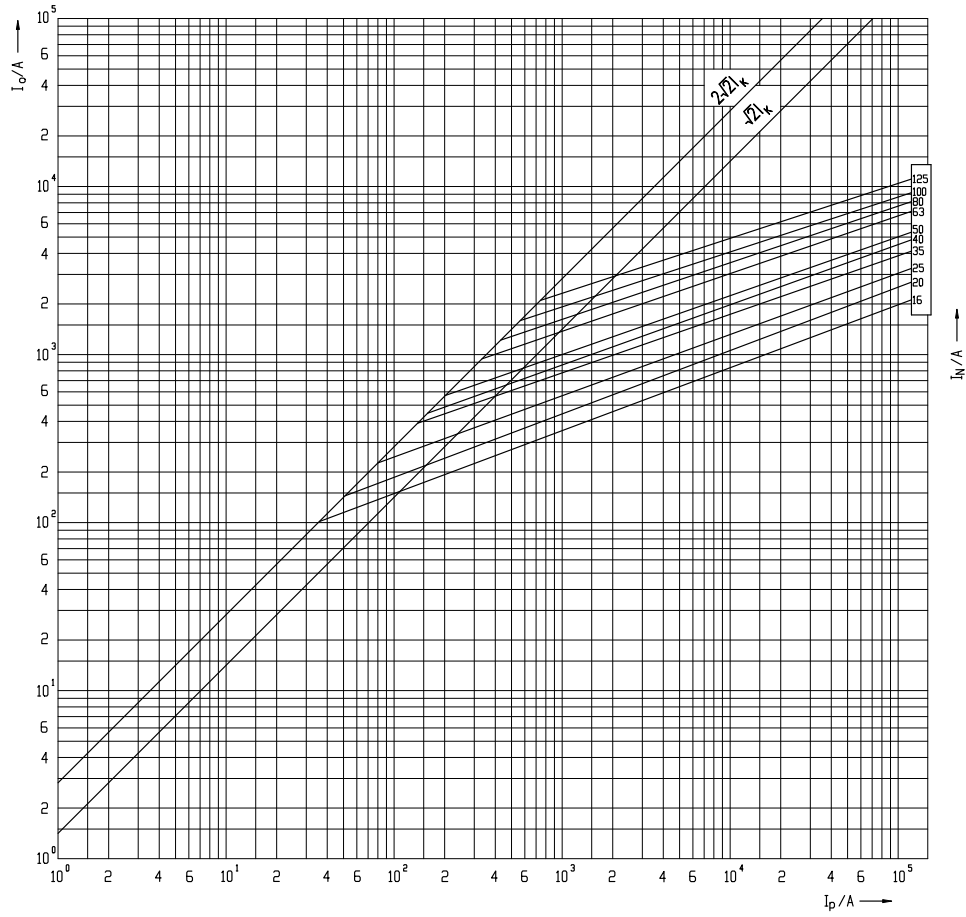
I<sub>N</sub> – Nominal Current of Fuse-link

I<sub>TDF</sub> – Nominal Current Including Temperature Derating Factor

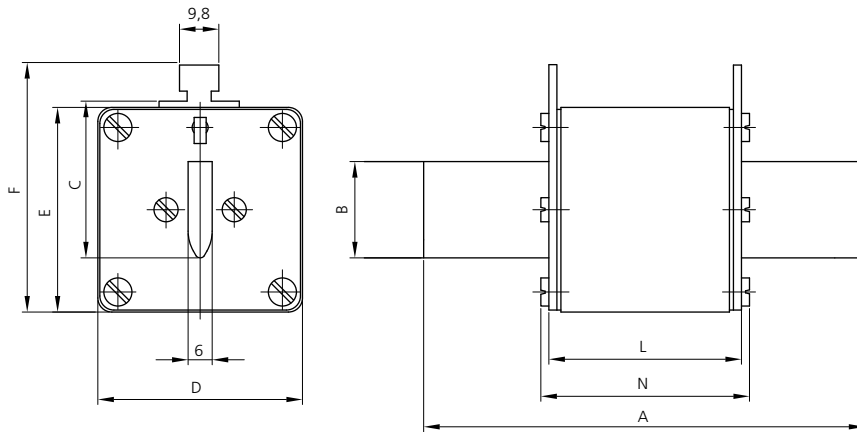
### t-I characteristics



### Cut-off current characteristics

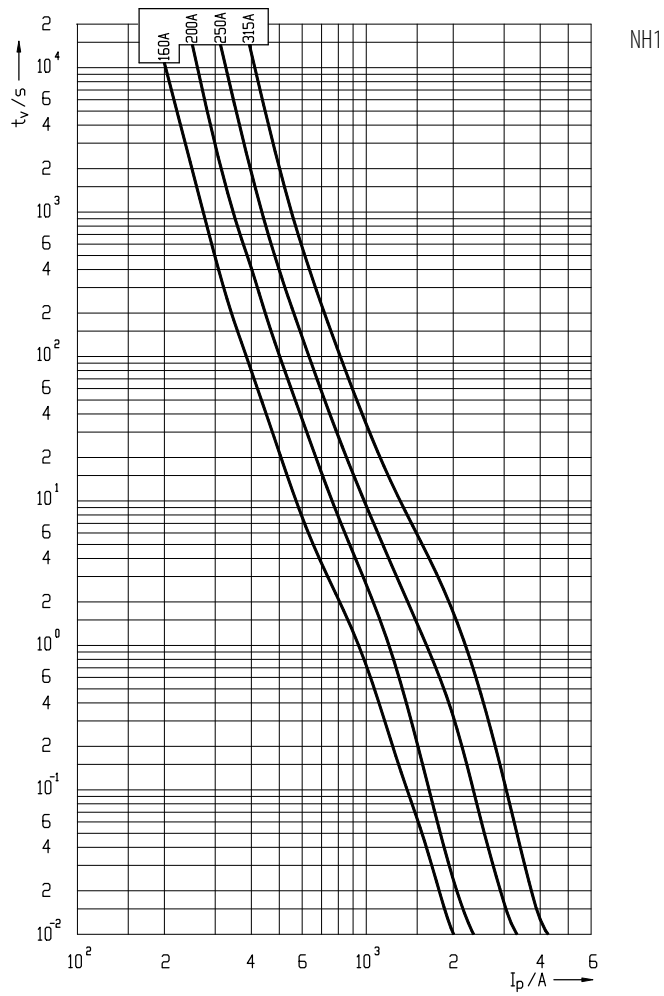


NH00

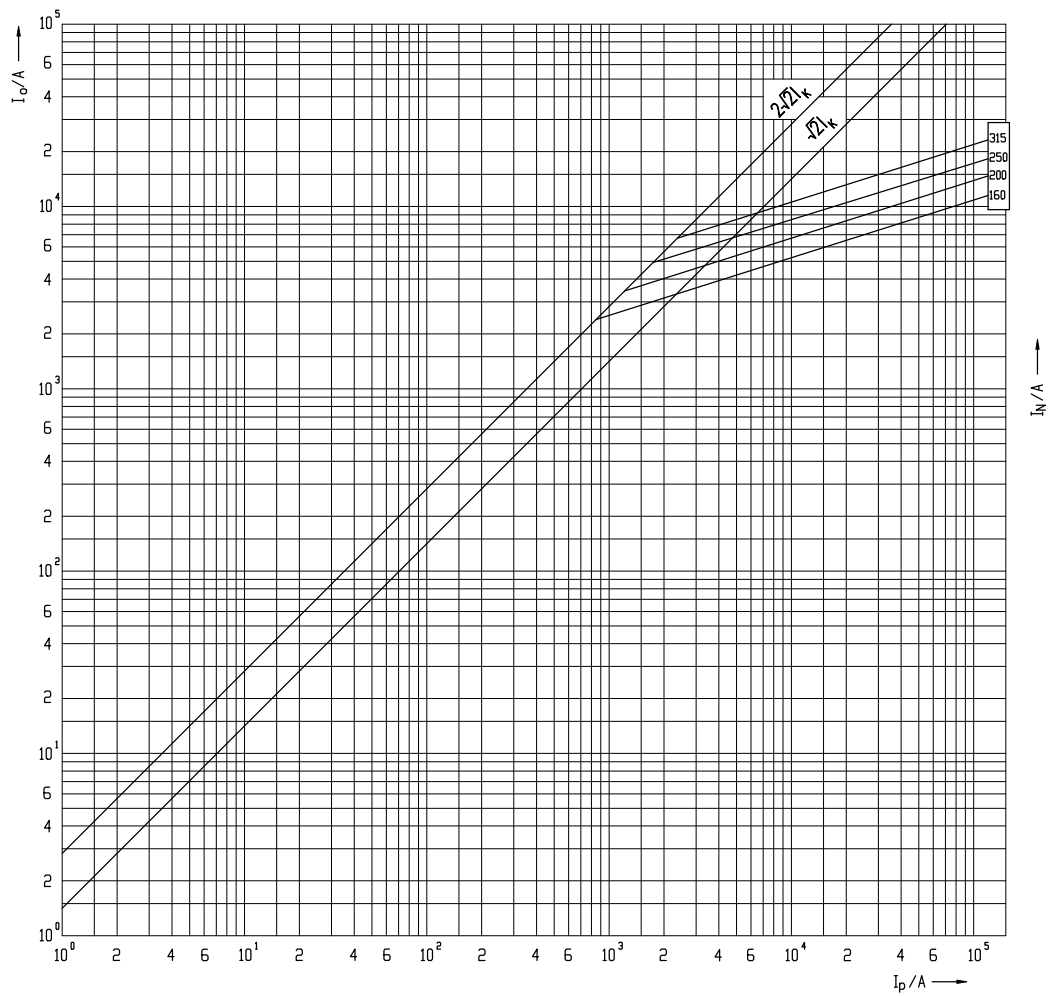


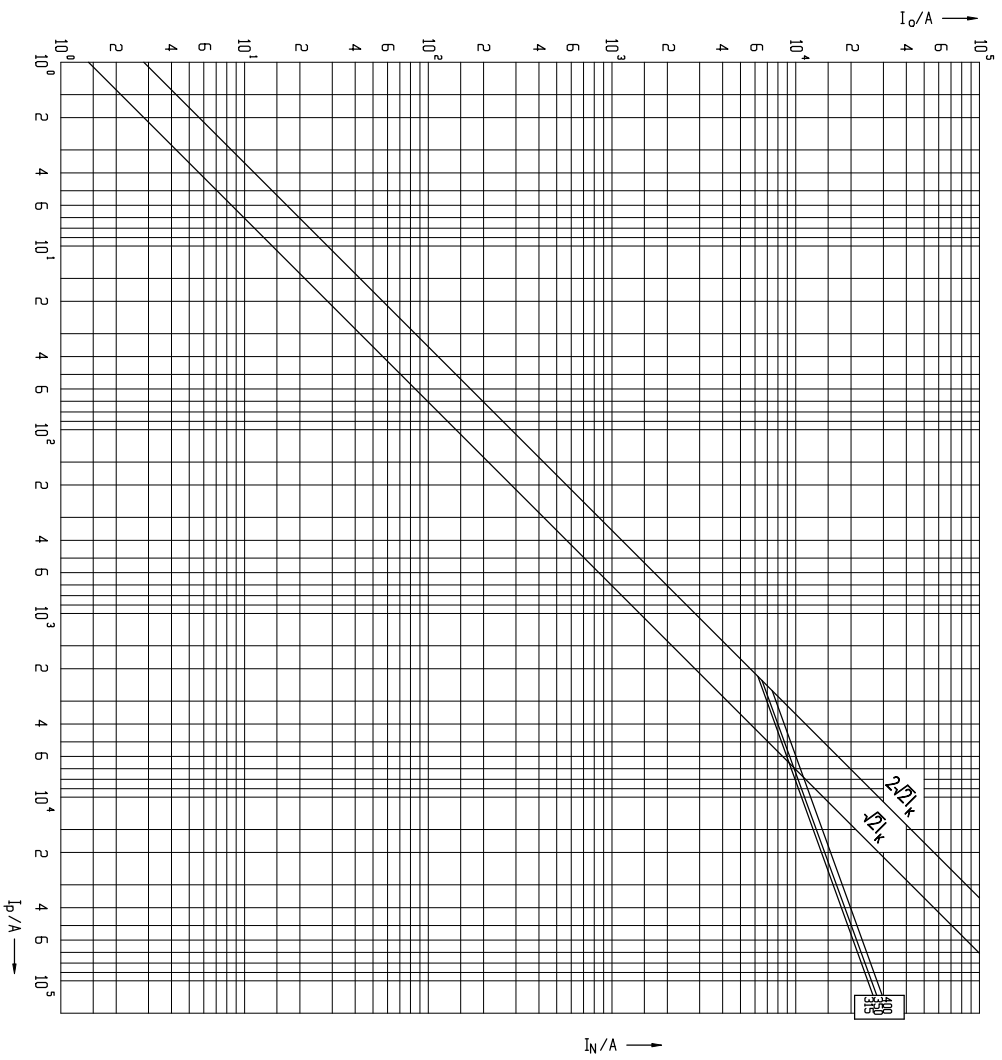
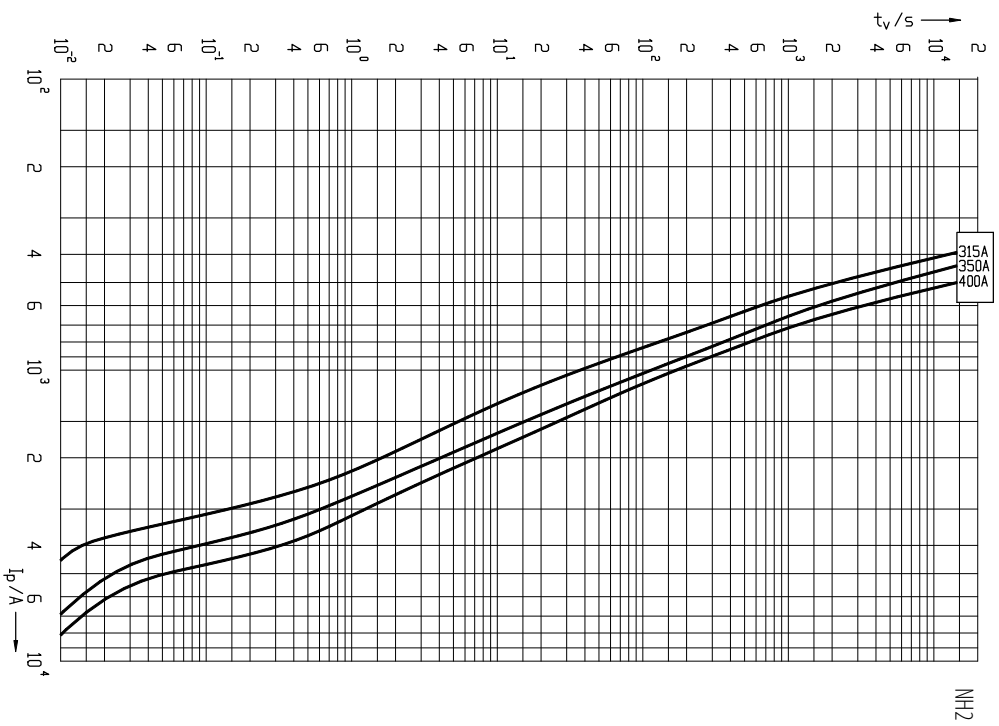
Size	Dimensions [mm]							
	A	B	C	D	E	F	L	N
1	135	24	40	46	52	62	65	72
2	150	30	48	54	61	71	65	72
3	150	37	60	64	74	84	65	72

t-I characteristics

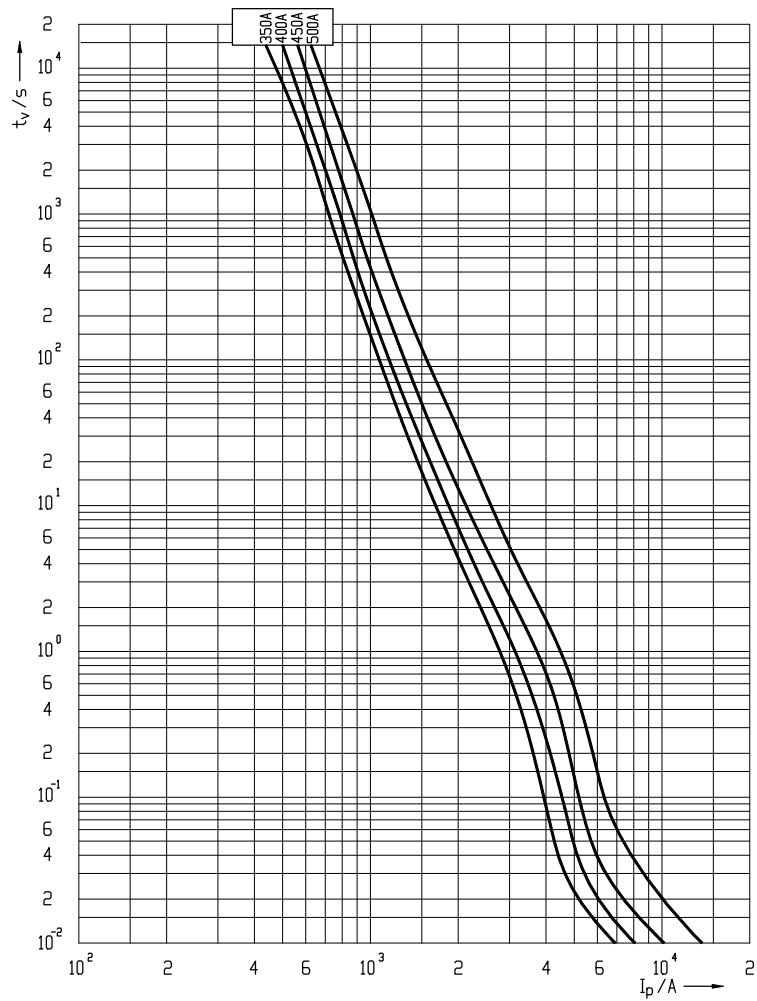


Cut-off current characteristics

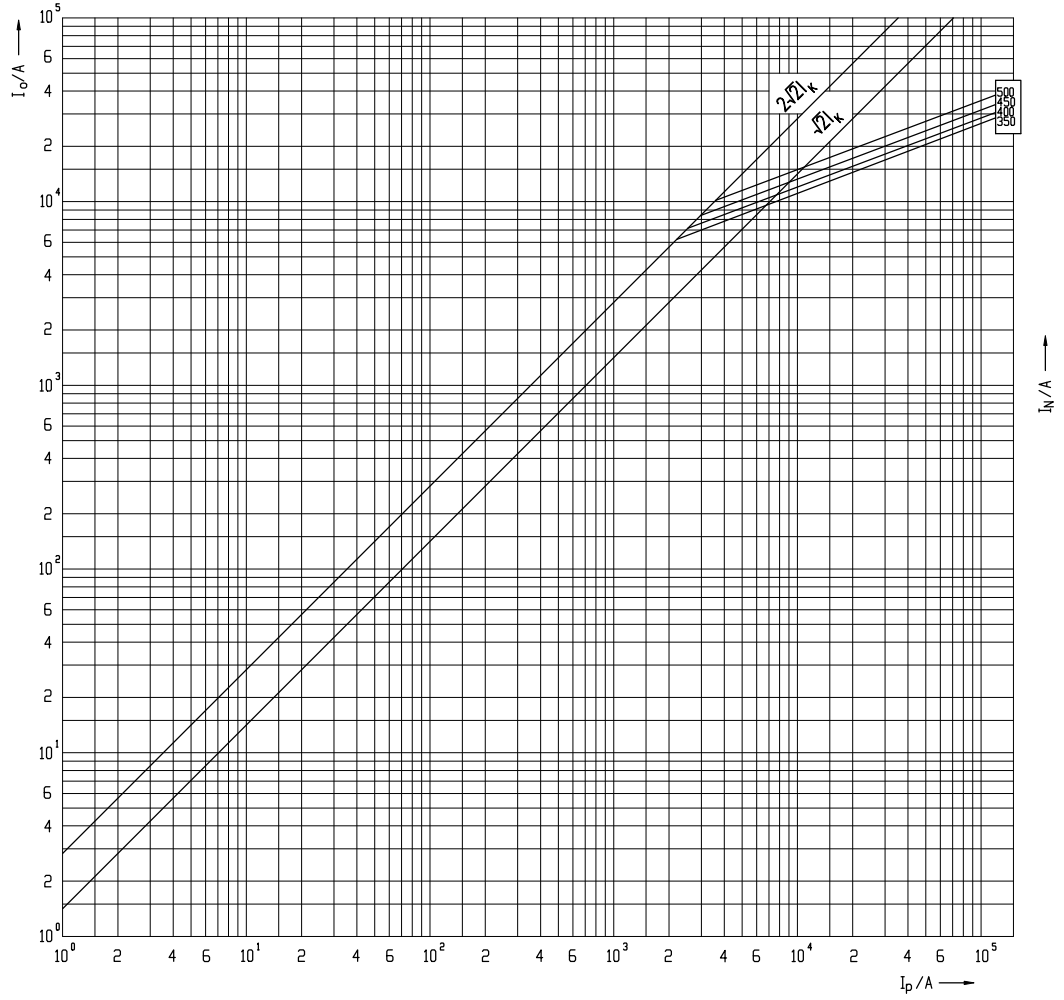




t-I characteristics



Cut-off current characteristics

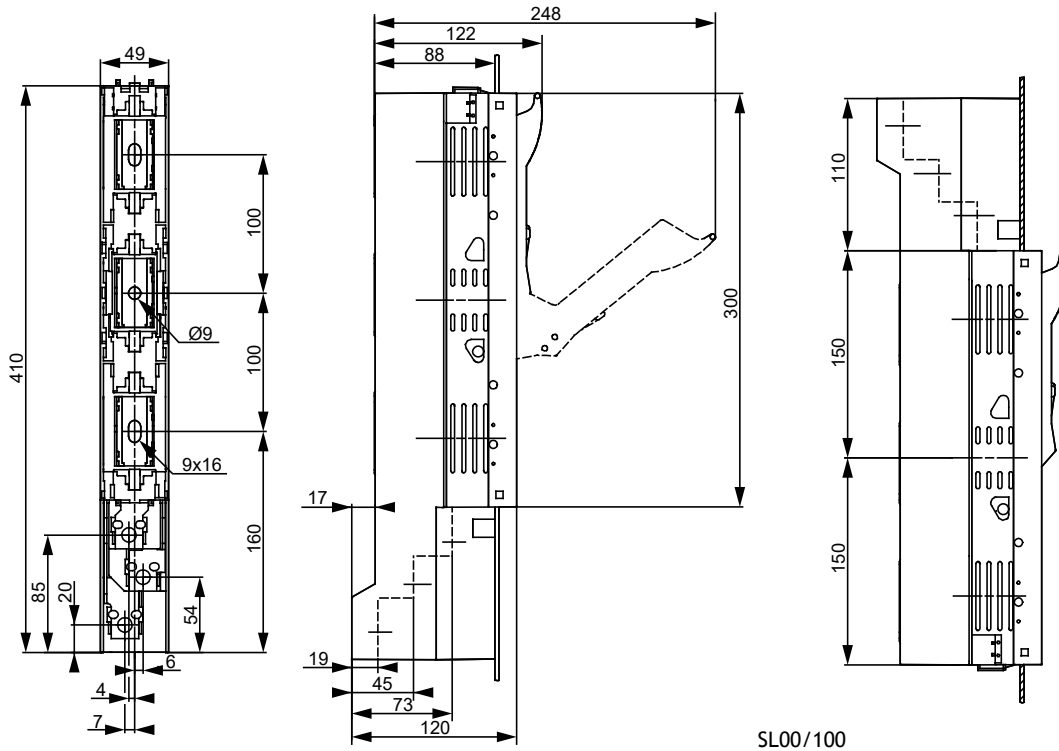


# Fuse-switch disconnecter type SL 800V

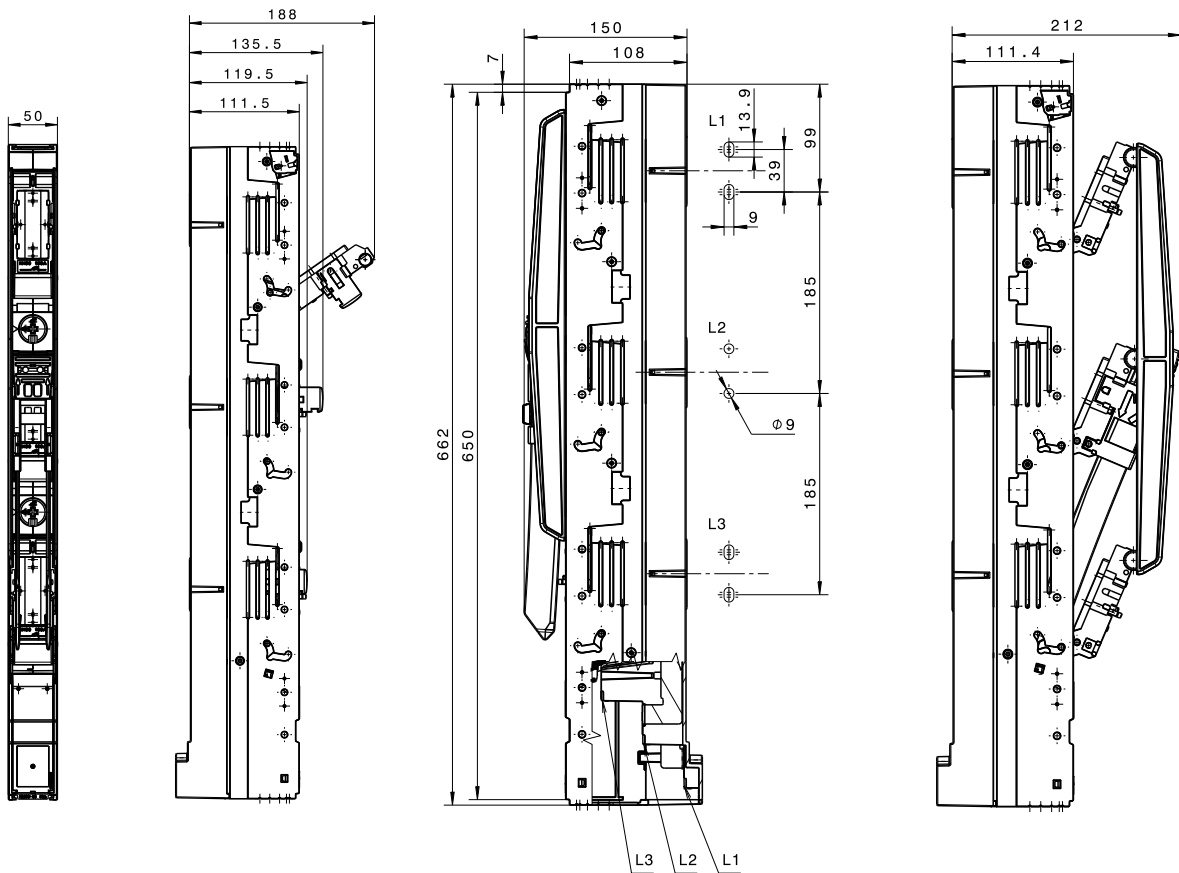
SL 800V						
Size	Code No.	Busbar system	Type	Connection description	Weight [kg]	Packaging [pcs]
00	001690860	100	SL00/100 3P M8 800AC	flat connection – screw M8	0,85	1
	001690861	185	SL00 3P M8 800AC	flat connection – screw M8	1,79	1
1	001690862	185	SL1 3P M10 800AC	flat connection – screw M10	4,66	1
3	001690863	185	SL3 3P M12 800AC	flat connection – screw M12	5,48	1



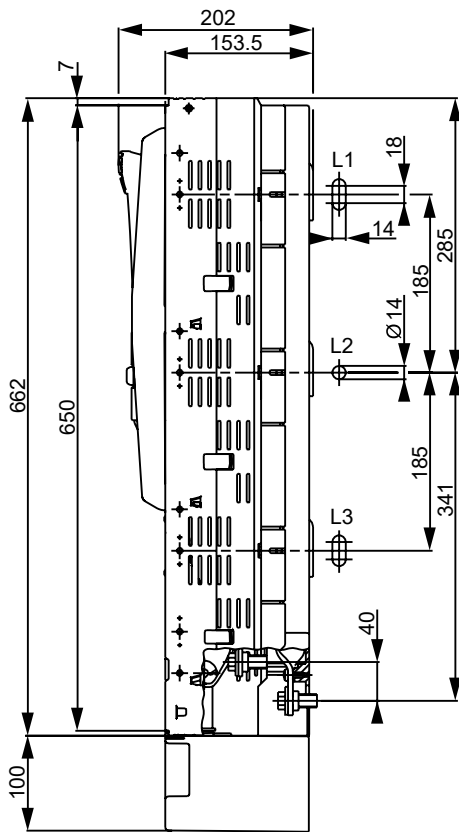
General characteristics						
Size			SL00/100	SL00/185	SL1	SL3
Technical Characteristics						
Rated operational voltage	$U_e$	V	800 a.c.	800 a.c.	800 a.c.	800 a.c.
Rated operational current	$I_e$	A	63	63	160	315
Rated frequency	$f$	Hz	40-60	40-60	40-60	40-60
Rated insulation voltage	$U_i$	V	800 a.c.	800 a.c.	800 a.c.	800 a.c.
Total power loss at $I_n$ (without fuse)	$P_v$	W	18	23	23	115
Utilisation category			a.c.-21B (160A/800V)	a.c.-21B (160A/800V)	a.c.-21B (250A/800V)	a.c.-21B (315A/800V)
Fuse links						
Size - DIN 43620, IEC 60269-2	-	-	000/00		1	3
Max. permissible power loss per fuse link	$P_a$	W	12		32	48
Dimensions						
Mass	-	kg	100mm=1,40	185mm=2,40	4,9	5,6
Bubars (distance)	-	mm	100	185	185	48
Cable connection						
Screw			M8		M10	M12
Protection						
Operational state	-	-	IP30		IP30	IP30
Cover open	-	-	IP10		IP10	IP10
Operating condition						
Ambient temperature	$T_{amb}$	°C	-25 ... +55		-25 ... +55	-25 ... +55
Operating condition	-	-	Continuous operation			
Mounting	-	-	vertical, horizontal			
Altitude	-	m	≤ 2000			
Pollution degree	-	-	3			
Overvoltage category	-	-	III	III	III	III



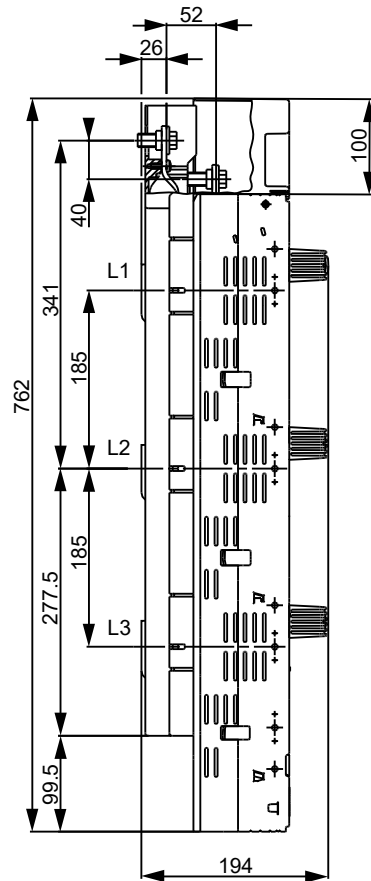
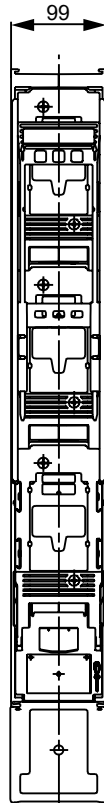
SL00/100



SL00/185



SL1, SL3



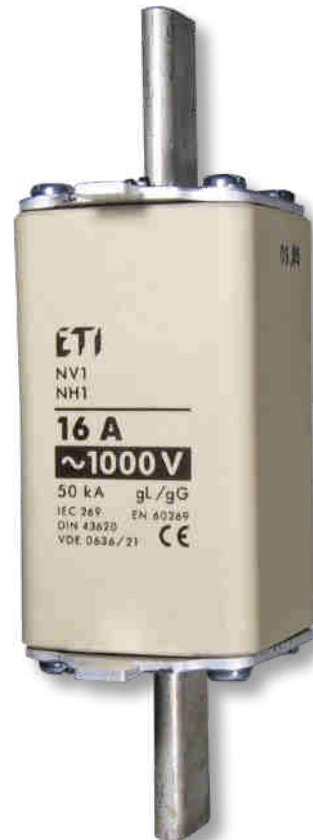
## Fuse-link gG NV/NH 1000 V a.c.

### General characteristics

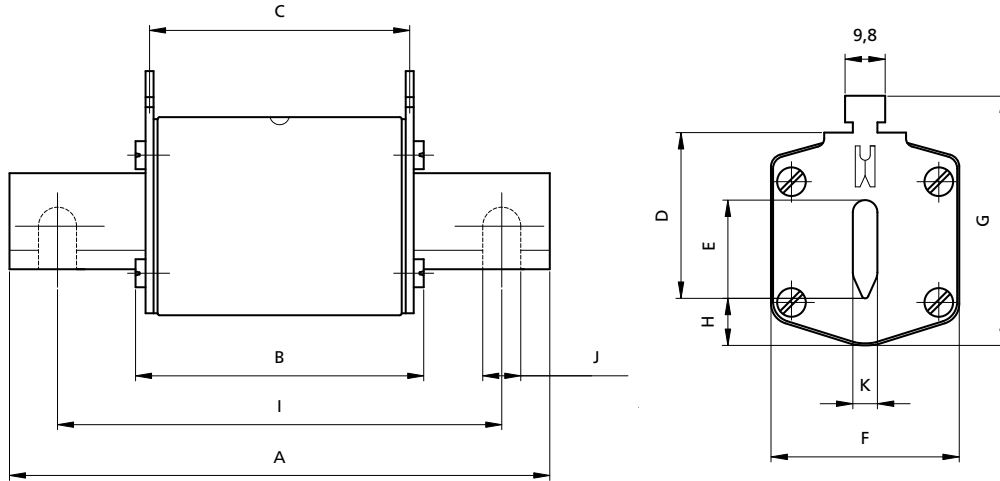
Rated voltage	1000V a.c.
Breaking capacity	50 kA a.c.
Standards	IEC 60269-1:2005 / EN 60269-1:1998+A1:2005 IEC 60269-2:1986+Corr.1:1996+A11995+A2:2001 / EN 60269-2:1995+A1:1998+A2:2002 IEC 60269-2-1:2004 / HD 60269-2-1:2005
Characteristic	gG
Application	For cable protection, installation in fuse base PK1/1000V

### 1000V a.c. gG

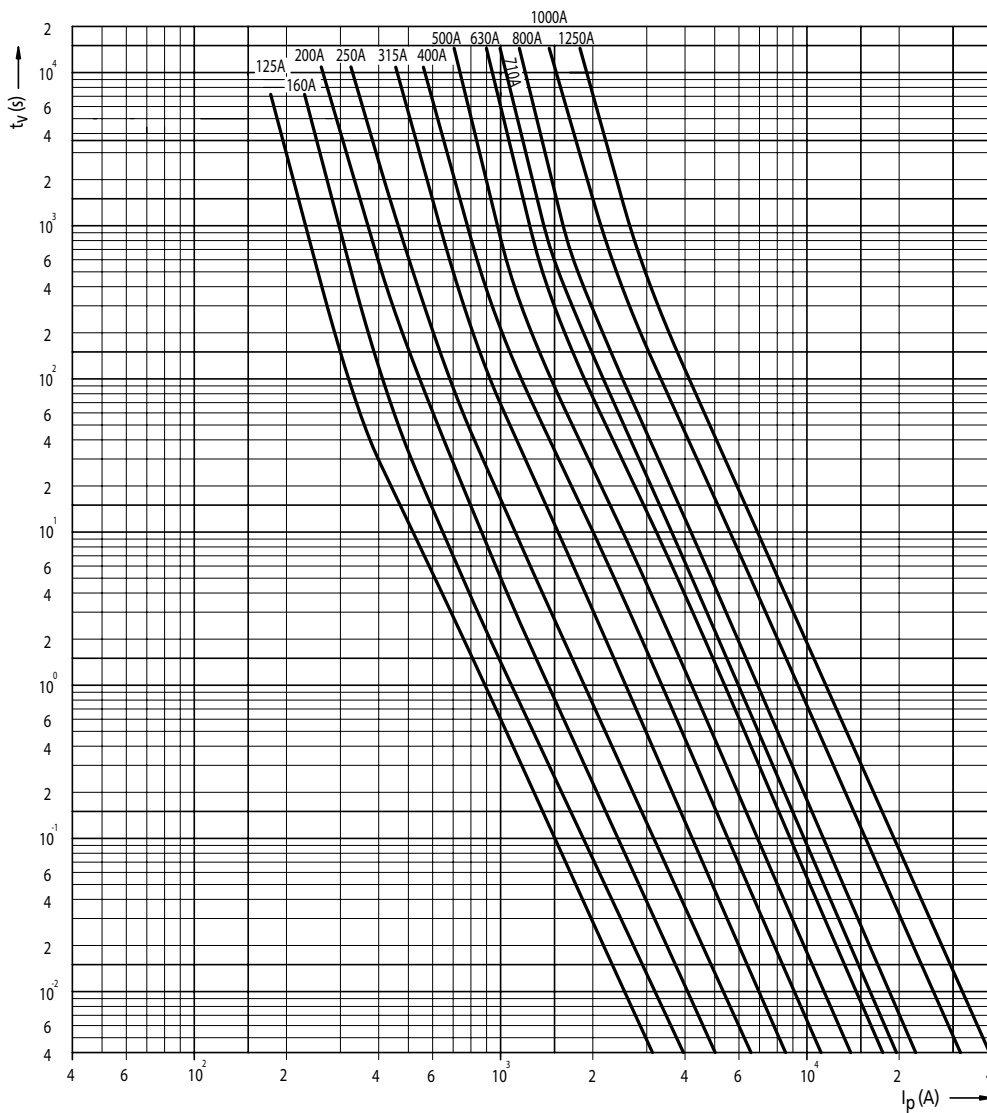
Size	I <sub>n</sub> [A]	Code No.	Power dissipation [W]	Weight [g]	Packaging [pcs]
1	10	004113703	1,9	487	3/24
	16	004113704	3,9		
	20	004113705	3,9		
	25	004113706	4,3		
	32	004113707	3,8		
	35	004113708	4,6		
	40	004113710	5,5		
	50	004113711	7,6		
	63	004113712	10		
	80	004113713	10,5		
	100	004113714	13,0		
	125	004113715	16,9		
	160	004113716	21		
	200	004113717	24,8		







Size	Dimensions [mm]									
	A	B	C	D	E	F	G	H	K	
NV1/1000V	155	90	87	40	20	45	59	9	6	



NV 1000V a.c. gG I/t characteristics

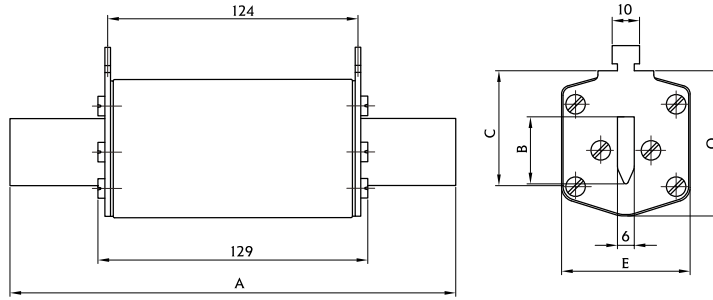
# Fuse-link gG NV/NH 1200 V a.c.

General characteristics	
Rated voltage	1200V a.c.
Breaking capacity	50 kA a.c.
Standards	IEC 60269-2
Characteristic	gG
Application	For installation in PK1XL,2XL,3L fuse bases.

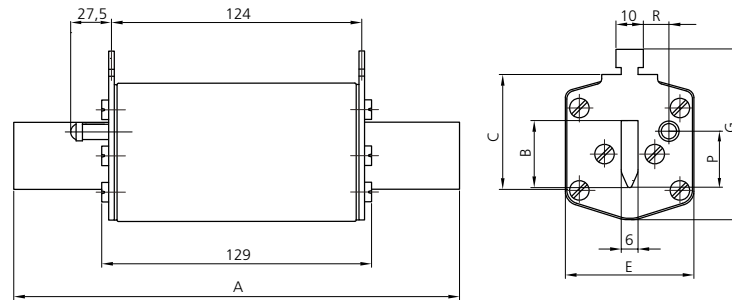
1200V a.c. gG						
Size	I <sub>n</sub> [A]	Standard indicator (pic.1)	Striker indicator - K (pic.2)	Power dissipation [W]	Weight [g]	Packaging [pcs]
1XL	6	004113721	004113796	3,2	750	1
	10	004113722	004113797	3,7		
	16	004113723	004113798	4,1		
	20	004113724	004113799	5,0		
	25	004113725	004113800	5,0		
	32	004113726	004113801	5,8		
	35	004113727	004113802	6,1		
	40	004113728	004113803	8,1		
	50	004113729	004113804	8,8		
	63	004113730	004113805	10,2		
	80	004113731	004113806	11,0		
	100	004113732	004113807	12,0		
	125	004113733	004113808	16,0		
	160	004113734	004113809	19,0		
200	004113735	004113810	25,0			
2XL	32	004113736	004113811	5,8	1050	1
	35	004113737	004113812	6,1		
	40	004113738	004113813	8,1		
	50	004113739	004113814	8,8		
	63	004113740	004113815	10,2		
	80	004113741	004113816	11,0		
	100	004113742	004113817	12,0		
	125	004113743	004113818	16,0		
	160	004113744	004113819	19,0		
	200	004113745	004113820	25,0		
250	004113746	004113821	30,0			
315	004113747	004113822	35,0			
3L	80	004113748	004113823	11,0	1360	1
	100	004113749	004113824	12,0		
	125	004113750	004113825	16,0		
	160	004113751	004113826	19,0		
	200	004113752	004113827	25,0		
	250	004113791	004113828	30,0		
	315	004113792	004113829	35,0		
	355	004113790	-	37,0		
	400	004113793	004113830	40,0		
500	004113794	004113831	50,0			
630	004113795	004113832	70,0			



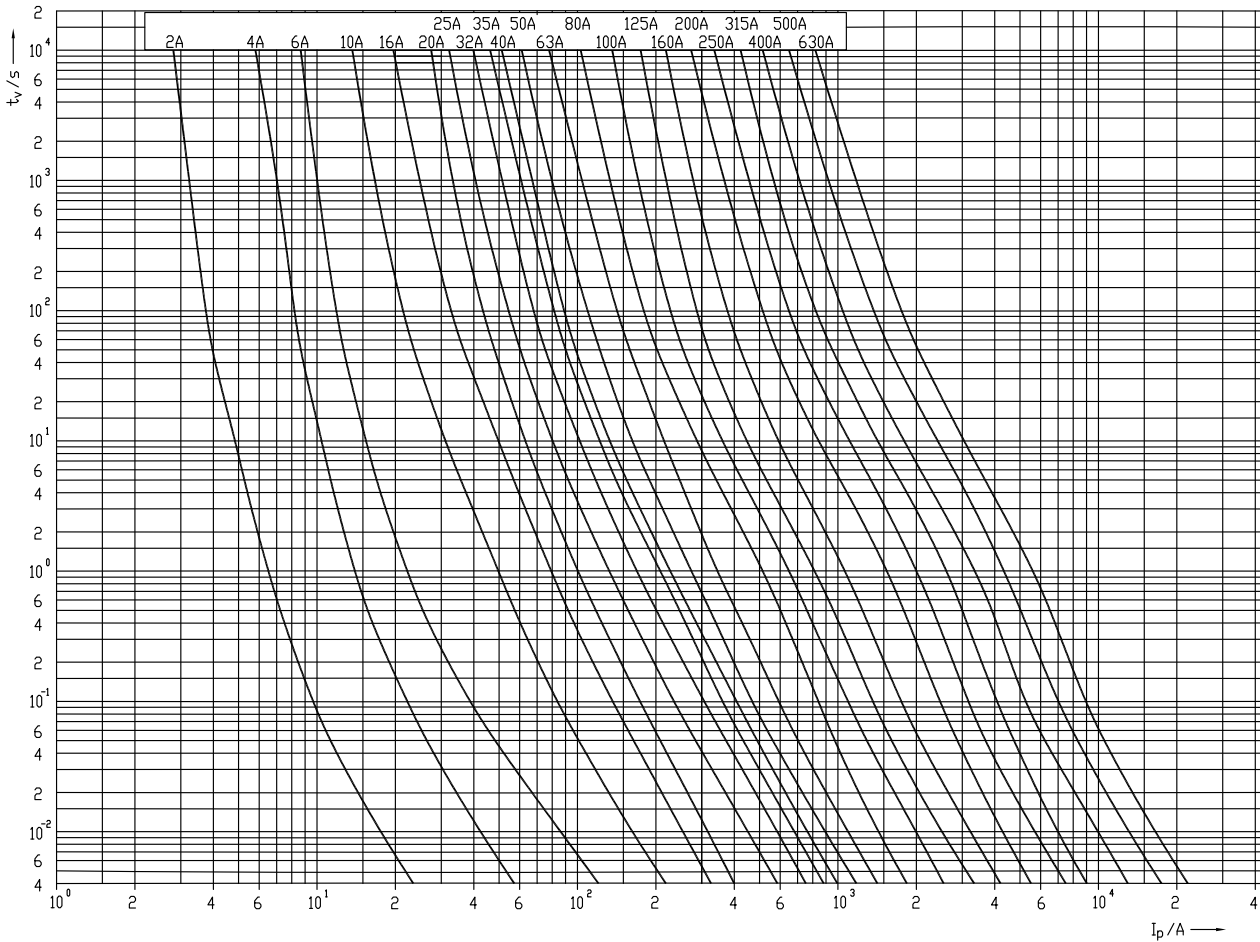
Picture 1



Picture 2



Size	Dimensions [mm]								
	A	B	C	E	G	P	R	M	O
1XL	194	24	40	46	61,5	20,5	13,7	50	52
2XL	209	30	48	54	71	27,3	16,2	59	61
3L	209	37	60	64	82	35,6	17,0	70	74



NV 1200V a.c. gG I/t characteristics

# Safe work fuses

## Fuse links SWF

ETI offer fuse links type SWF for protection against arc.

Characteristics of SWF fuse links:

- current limiting
- short operating time
- available in size 000,1,2,3 acc. standard DIN 43620
- marking like "SWF fuse link"
- standard with top indicator

By replacing NH fuse link with a characteristic gG acc. to VDE 0636-21 and IEC 60269-2 with faster fuse link type SWF acc. to VDE 0636-23 and IEC 60269-4, we can safeguard persons against electrical arc.

Because of higher power dissipation, we can use SWF fuse link only between maintenance under voltage. After that, we must replace it with a gG fuse link.

Damaged SWF fuse links must necessarily be replaced with new SWF fuse links.



## Arc energy

$$E_T \propto I_{RMS}^2 \times t$$

$E_T$ (protection with SWF fuse link)	$E_T$ (protection with gG fuse link)
1	∞ 30

Selection nominal current of SWF fuse link:

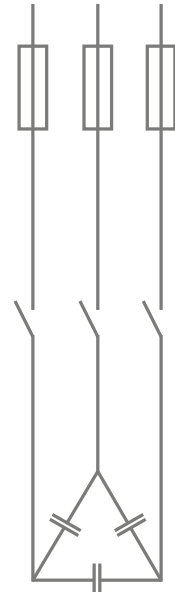
$$I_n (SWF) = I_n (gG)$$



SWF fuse links						
Size	I [A]	Type	Power Dissipation [W]	Code Nr.	Packaging [pcs]	Weight [g]
00 C	32	M00C/SWF/32A/500V	14	004711220	3	130
	35	M00C/SWF/35A/500V	15	004711221		
	40	M00C/SWF/40A/500V	16	004711222		
	50	M00C/SWF/50A/500V	17	004711223		
	63	M00C/SWF/63A/500V	20	004711224		
	80	M00C/SWF/80A/500V	23	004711225		
	100	M00C/SWF/100A/500V	26	004711226		
	125	M00C/SWF/125A/500V	34	004711227		
	160	M00C/SWF/160A/500V	40	004711228		
1	63	M1/SWF/63A/500V	20	004713220	3	420
	80	M1/SWF/80A/500V	23	004713221		
	100	M1/SWF/100A/500V	26	004713222		
	125	M1/SWF/125A/500V	34	004713223		
	160	M1/SWF/160A/500V	40	004713224		
	200	M1/SWF/200A/500V	44	004713225		
	224	M1/SWF/224A/500V	48	004713226		
250	M1/SWF/250A/500V	53	004713227			
2	125	M2/SWF/125A/500V	34	004714225	3	660
	160	M2/SWF/160A/500V	40	004714226		
	200	M2/SWF/200A/500V	44	004714227		
	224	M2/SWF/224A/500V	48	004714228		
	250	M2/SWF/250A/500V	53	004714229		
	315	M2/SWF/315A/500V	63	004714230		
	350	M2/SWF/350A/500V	66	004714231		
400	M2/SWF/400A/500V	70	004714232			
3	250	M3/SWF/250A/500V	53	004715230	3	870
	315	M3/SWF/315A/500V	63	004715231		
	350	M3/SWF/350A/500V	66	004715232		
	400	M3/SWF/400A/500V	70	004715233		
	425	M3/SWF/425A/500V	75	004715234		
	500	M3/SWF/500A/500V	96	004715235		

# NH Power capacitor fuse

General characteristics	
Rated voltage fuse link	690V a.c.
System voltage	400V a.c.
Breaking capacity	100/120kA
Standards	IEC 60269-2
Description	Special designed fuse according to rated power of 3 phase capacitor at nominal voltage 400V a.c. 50Hz.
Application	Current protection in low voltage reactive power compensation systems with 3 phase capacitor steps.

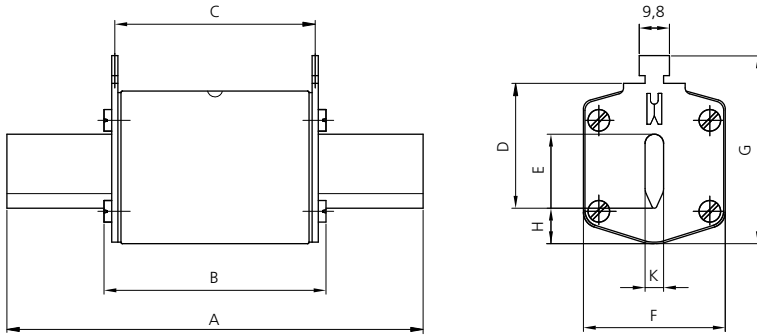


Size	Rated Power [kVAr]	Standard indicator	Power dissipation	Weight	Packaging
	At 400V		Pd(W)	(g)	(pcs)
000	1	004117101	0,8	125	3/120
	1,5	004117102	0,8		
	2,5	004117103	1		
	3	004117104	1,3		
	4	004117105	1,3		
	5	004117106	1,7		
	10	004117107	2		
	12,5	004117108	2,6		
	15	004117109	2,7		
	20	004117110	4		
00	25	004117111	5	173	3/90
	30	004117112	6		
	40	004117113	7,6		
	50	004117114	9,1		



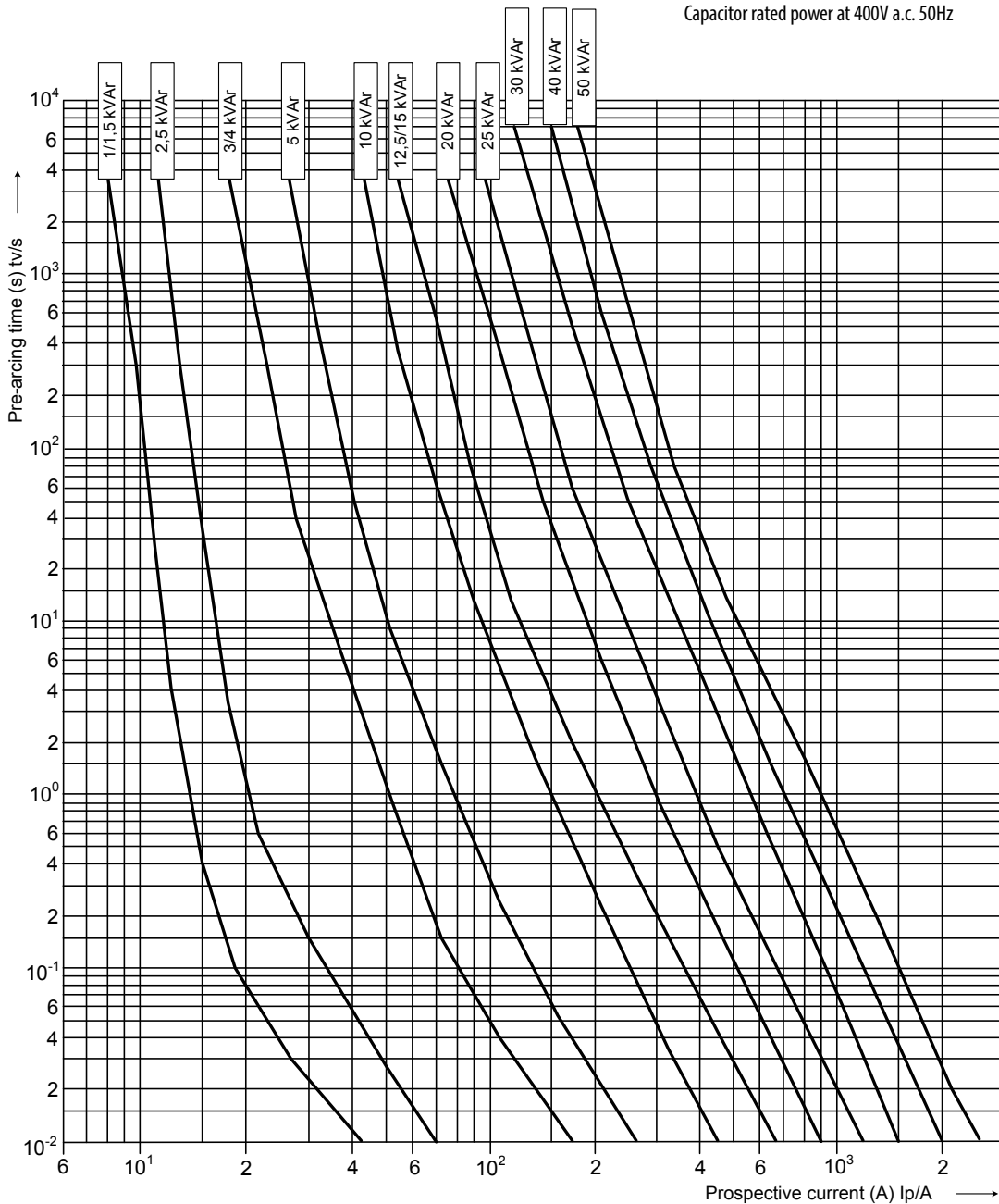
Automatic Power Factor Correction Banks

### Dimensions



type	dimensions [mm]									
	A	B	C	D	E	F	G	H	K	
000	79	53	47	35	15	21	52	7,5	6	
00	79	53	47	35	15	28	56	12	6	

### I-t characteristics



# Fuses for TVSS products protection

## SRF Series Surge Fuse

Through the past few years, the transient voltage surge suppression (TVSS) industry has grown to one of the fastest-growing segments among power protection products. Newness from ETI is series of fuses named SRF (Surge Rated Fuses), intended for the protection of TVSS products. The SRF Series has been designed to survive 8/20  $\mu$ s or 10/350  $\mu$ s lighting surge pulses without operating, allowing the TVSS system to react to the surge. Surge fuses have either 8/20  $\mu$ s or 10/350  $\mu$ s ratings, not a continuous current rating.

These fuses are intended to be installed in series with the TVSS devices and do not normally carry current, except for the periodic random surges caused by TVSS breakdown during normal operation. Under AC short circuit conditions these SRF surge suppression fuses have extremely high capability for current limitation.

## Features / Benefits

- Rated voltage 600V a.c. (8/20  $\mu$ s) or 400V a.c. (10/350  $\mu$ s)
- Breaking capacity 200 kA (8/20  $\mu$ s) or 50kA (10/350  $\mu$ s)
- Available in Surge Ratings from 10 kA to 40 kA (8/20  $\mu$ s) and 25 kA (10/350  $\mu$ s)
- Designed to meet UL1449 Second Edition requirements,
- Comply with the applicable requirements in UL 248-1 Low Voltage Fuses – Part 1, General Requirements.

## Approvals

Recognized under the components program of Underwriters Laboratories for Special Purpose Fuses, File number UL E310767 (SRF 10).

## CH SRF class II

General characteristics	
Designed for	8/20 lighting surge pulses
Rated voltage	600V a.c.
Breaking capacity	200kA a.c.
Standards	Comply with the applicable requirements in UL 248-1 Low Voltage Fuses-Part1, General Requirements.
Application	These fuses are intended for installation in series with TVSS devices and do not normally carry current, except for the periodic random surges caused by TVSS breakdown during normal operation.

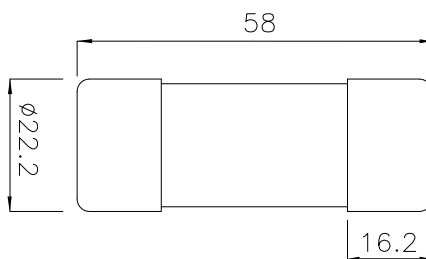


CH SRF 8/20 $\mu$ s								
Size	Type	Code No.	8x20 $\mu$ sec Surge rating [A]	Melting I <sup>2</sup> t [A <sup>2</sup> s]	Total I <sup>2</sup> t [A <sup>2</sup> s]	I <sub>PEAK</sub> at 130 kA	Packaging [pcs]	Weight [g]
14x51	CH14 SRF10-II	002636004	10.000	2.360	10.370	8.320	10/500	18,6
	CH14 SRF20-II	002636005	20.000	5.490	17.700	10.430		
	CH14 SRF30-II	002636006	30.000	16.750	39.880	13.540		
	CH14 SRF40-II	002636007	40.000	33.680	72.800	17.480		
22x58	CH22 SRF60-II	002646006	60.000	133.630	247.180	21.260	10/480	55

# CH SRF 25kA class I

General characteristics	
Designed for	10/350 lighting surge pulses
Rated voltage	400V a.c.
Breaking capacity	50kA a.c.
Standard	IEC 61643-11
Application	These fuses are intended for installation in series with TVSS devices and do not normally carry current, except for the periodic random surges caused by TVSS breakdown during normal operation.

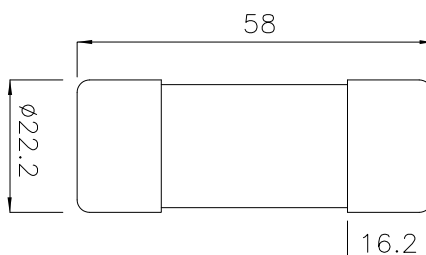
CH 22x58 SRF 25kA 10/350 $\mu$ s							
Size	Type	Code Number	10/350 $\mu$ sec Surge rating [A]	Pre-arcing Joule integral [A <sup>2</sup> s]	Operating Joule integral [A <sup>2</sup> s]	Packaging [pcs]	Weight [g]
22x58	CH22 SRF25-I	002646010	25.000	322.700	504.300	24/240	55



# CH SRF class II - DC

General characteristics	
Designed for	8/20 $\mu$ sec lighting surge pulses
Rated voltage	1000V d.c.
Breaking capacity	1000A d.c.
Application	Fuses withstand not only a single shot of surge current, but a sequence of min.15 shots of surge current. Use in typical DC application: PV Photovoltaic, battery supply, rectifier These fuses are intended for installation in series with TVSS devices and do not normally carry current, except for the periodic random surges caused by TVSS breakdown during normal operation.

CH 22x58SRF DC 8/20 $\mu$ s							
Size	Type	Code Number	8/20 $\mu$ sec Surge rating [A]	Pre-arcing Joule integral [A <sup>2</sup> s]	Operating Joule integral [A <sup>2</sup> s]	Packaging [pcs]	Weight [g]
22x58	CH22 SRF3-II-DC	002646015	3.000	660	1380	10/480	55
	CH22 SRF8-II-DC	002646016	8.000	6.930	8.730		
	CH22 SRF12-II-DC	002646017	12.000	85.500	86.500		





# Fuses for railway applications



## Advantages

ETI's Railway Fuses successfully combine two usually conflicting fuse requirements:

- ✓ **low operating joule integral**, necessary for the protection of semiconductors,
- ✓ **low power dissipation**, allowing for lower energy losses and thus **lower operating costs**, following the latest ecological trends.

These unique technical characteristics are achieved by a completely **new design of the ceramic body**, a special construction developed on the basis of long standing expert knowledge, which allows for significantly better cooling of the fuse.

The operation of fuses is especially **adapted for railway applications**, as they have **improved resistance to current cyclic loading**, a phenomenon that causes unnecessary fuse operating in these applications. This way, ETI's Railway Fuses help **decrease downtime** significantly, leading to further **cost savings** and **improved efficiency**.

The melting element inside Railway Fuses is made of silver, which makes them **highly insensitive to ageing** processes.

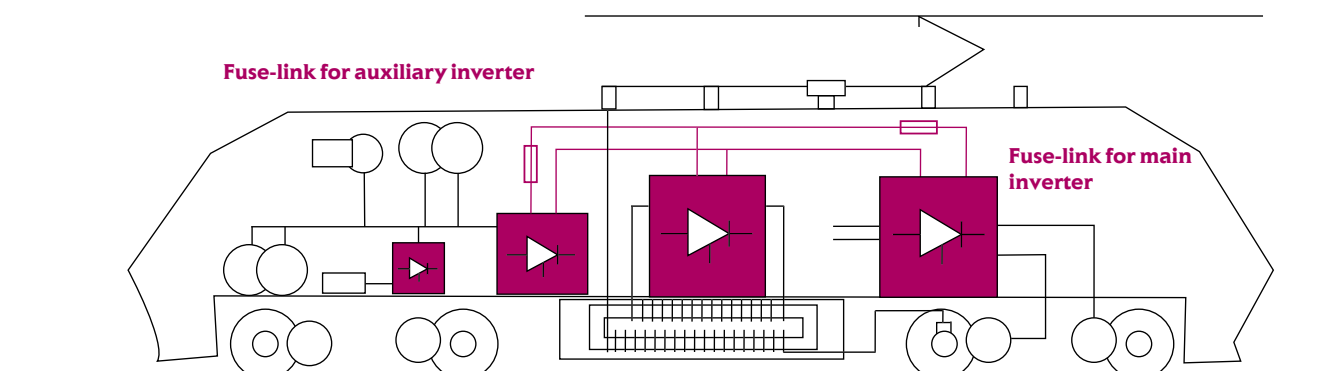
ETI Railway fuse-links ensure short circuit protection from minimum breaking capacity ( $5 \times I_n$ ) up to maximum breaking capacity 30kA d.c. at time constant 15ms.

## Application

Protection of DC link and semiconductor devices (diodes, thyristors, GTO) in railway inverters.

## Standards

ETI Railway Fuses comply with the IEC 60269-4 and IEC 60077-5 standards.



# NH1S/394/DC 4000V aR-fuse link

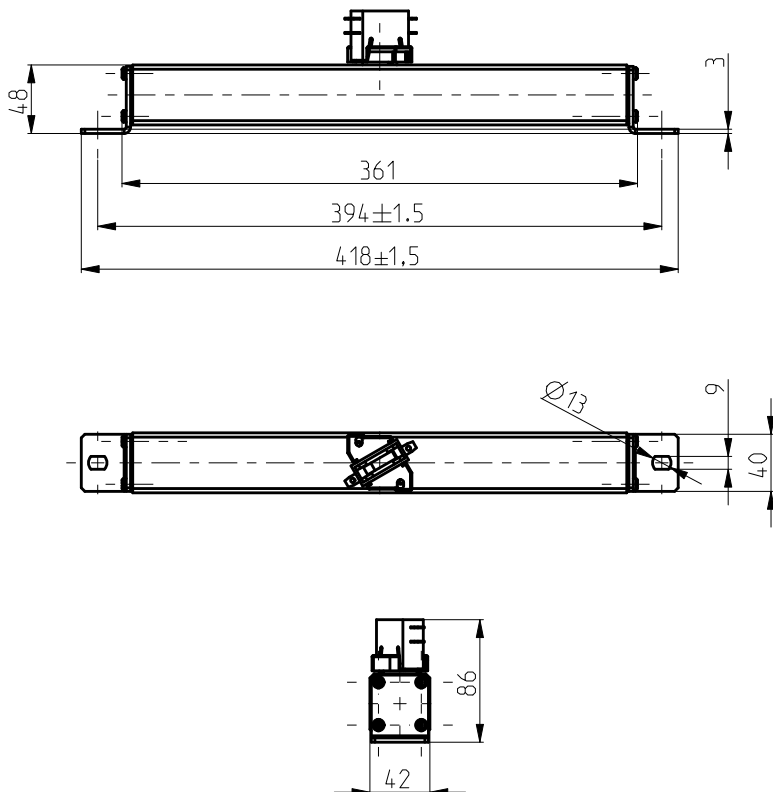
## General characteristics

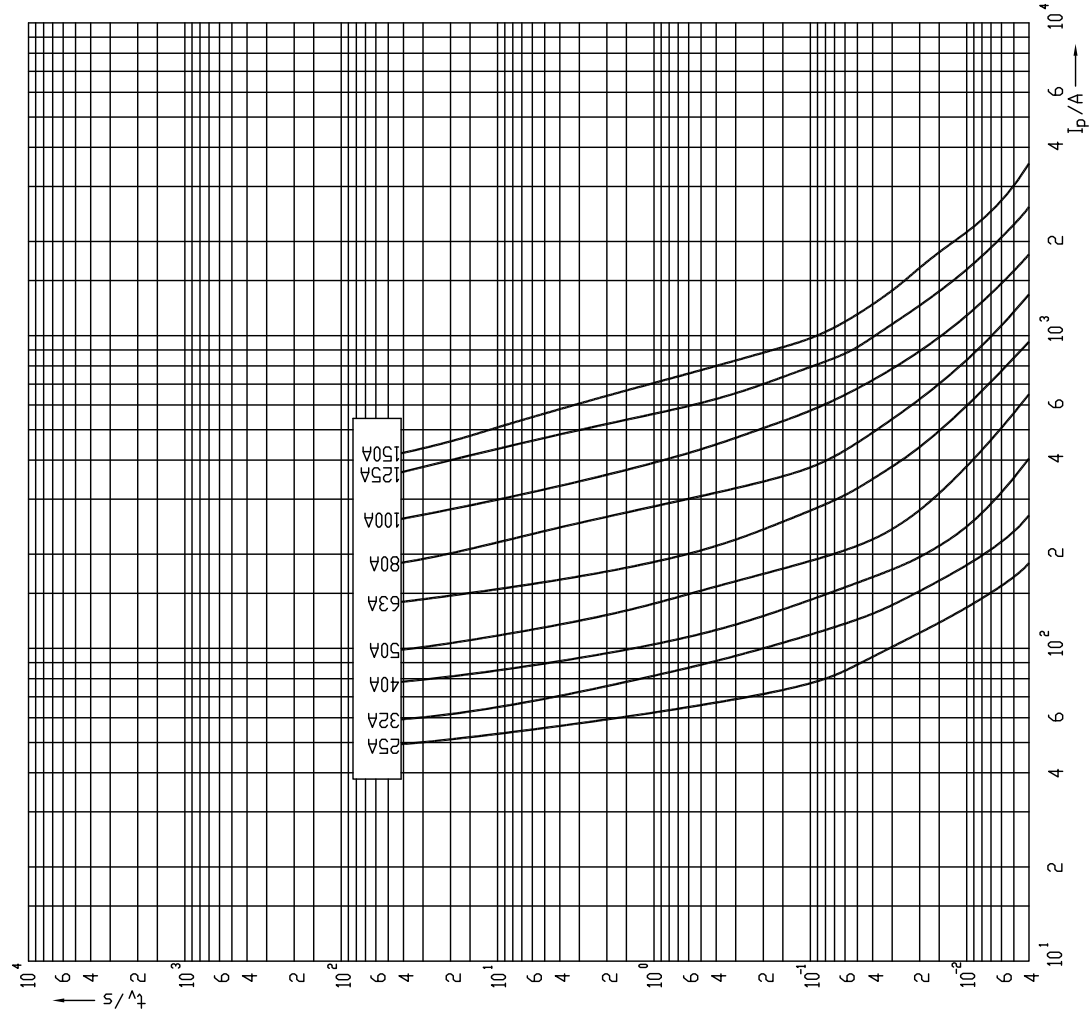
Rated voltage	4000V d.c. (L/R=15ms), rated test voltage 4200V d.c.
Breaking capacity	30kA d.c.
Characteristic	aR
Standards	IEC 60269-4, IEC 60077-5
Application	Heating system in railway vagon

## RAILWAY fuse link

$I_n$ [A]	Code No. Type with centre trip indicator for microswitch MK	Code No. Type without centre trip indicator for microswitch MK	Power dissipation [W]	Pre-arcing Joule integral [A <sup>2</sup> s]	Operating Joule integral [A <sup>2</sup> s] (L/R=15ms)	Weight [g]	Pack. [pcs]
25	004735615	004735627	43	28	150	1800	1/1
32	004735616	004735628	65	40	300		
40	004735617	004735629	88	63	600		
50	004735618	004735630	105	112	1.400		
63	004735619	004735631	105	252	2.500		
80	004735620	004735632	114	494	5.500		
100	004735621	004735633	115	1.147	10.000		
125	004735622	004735634	132	2.168	19.000		
150	004735623	004735635	155	3.388	31.000		

Note: microswitch MK and adapter AMK1 must be ordered separately



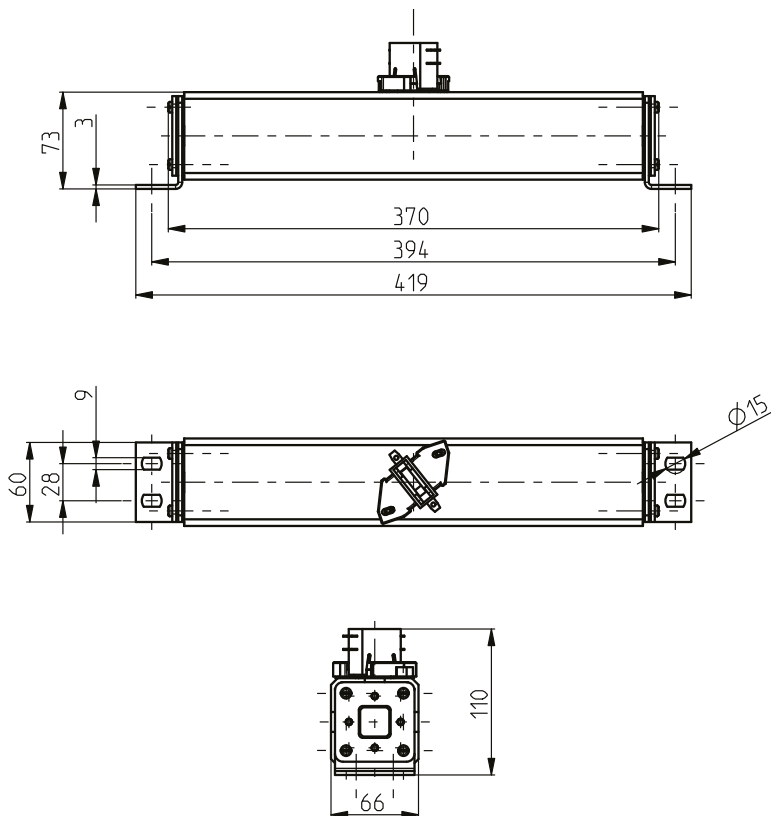


# NH2 S/394/ DC 4000V aR - fuse link

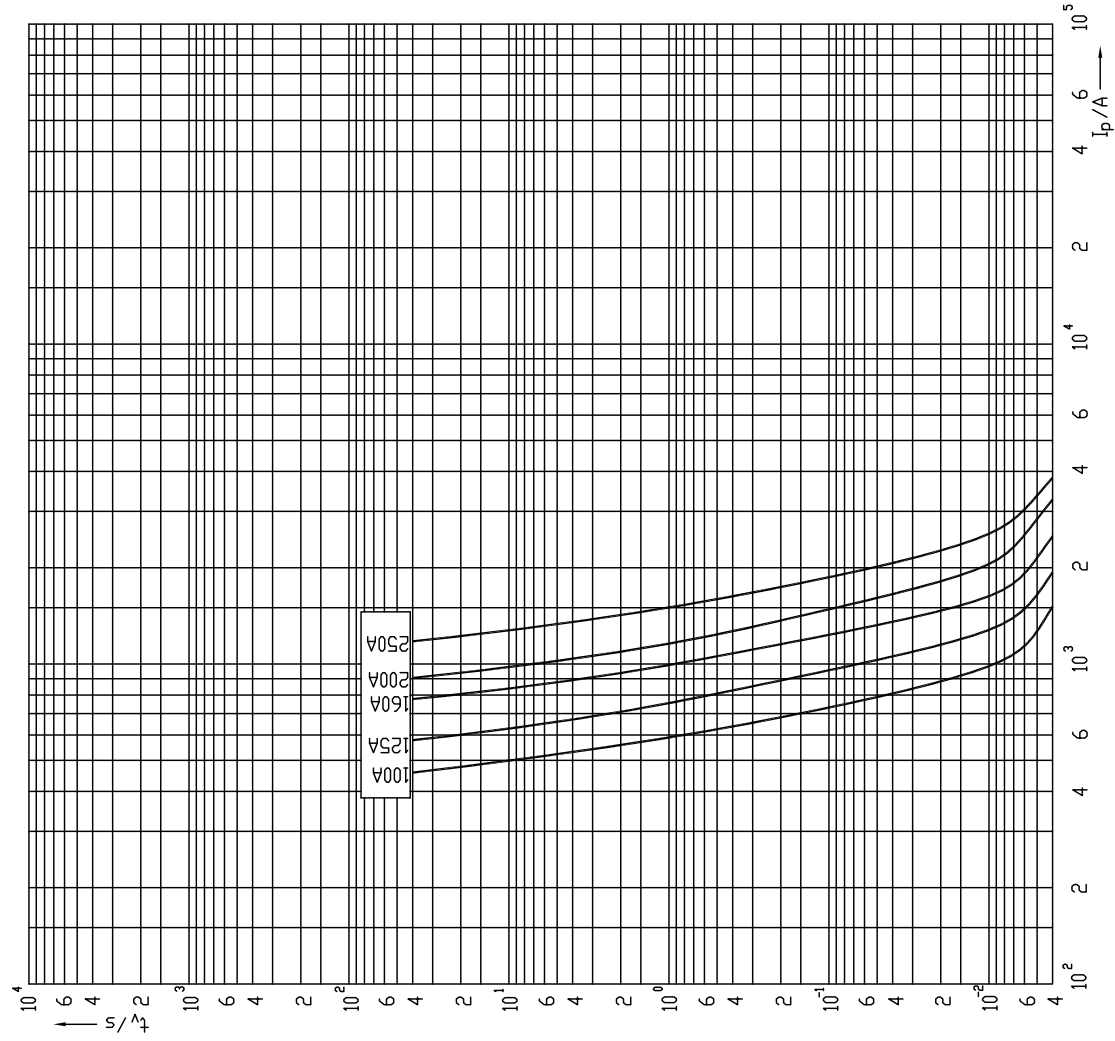
General characteristics	
Rated voltage	4000V d.c. (L/R=15ms), rated test voltage 4200V d.c.
Breaking capacity	30kA d.c.
Characteristic	aR
Standards	IEC 60269-4, IEC 60077-5
Application	Fuse link for DC link protection of railway inverter.

RAILWAY fuse link							
$I_n$ [A]	Code No. Type with centre trip indicator for microswitch MK	Code No. Type without centre trip indicator for microswitch MK	Power dissipation [W]	Pre-arcing Joule integral [A <sup>2</sup> s]	Operating Joule integral [A <sup>2</sup> s] (L/R=15ms)	Weight [g]	Pack. [pcs]
100	004735601	004735606	58	2.300	20.000	3500	1/1
125	004735602	004735607	82	3.700	33.000		
160	004735603	004735608	100	5.800	55.000		
200	004735604	004735609	127	10.000	100.000		
250	004735605	004735610	160	21.000	180.000		

Note: microswitch MK and adapter AMK2 must be ordered separately



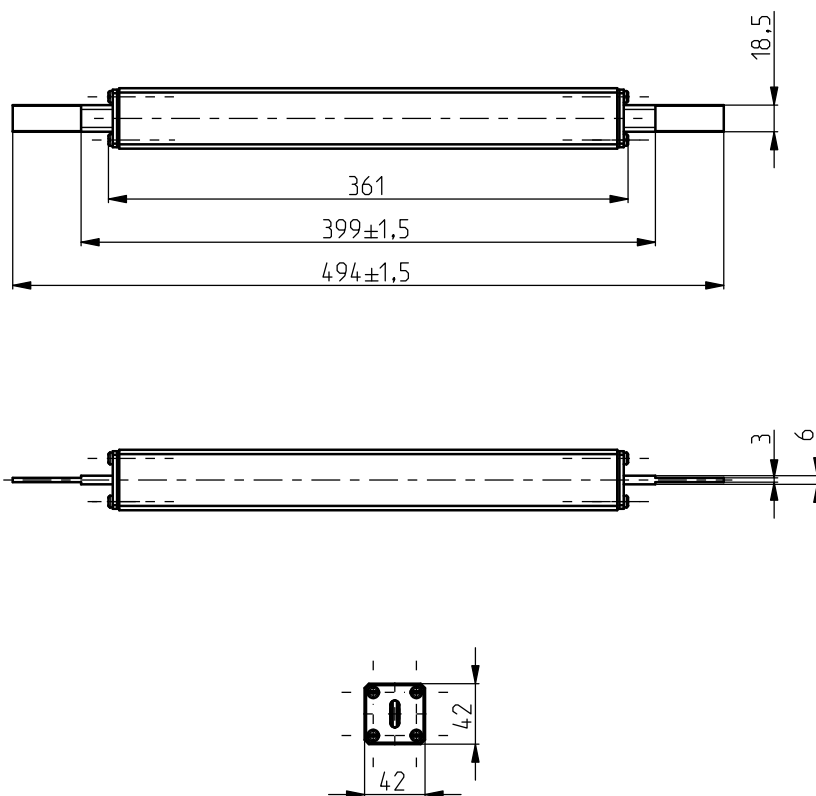
**CORELESS  
FUSE LINK**

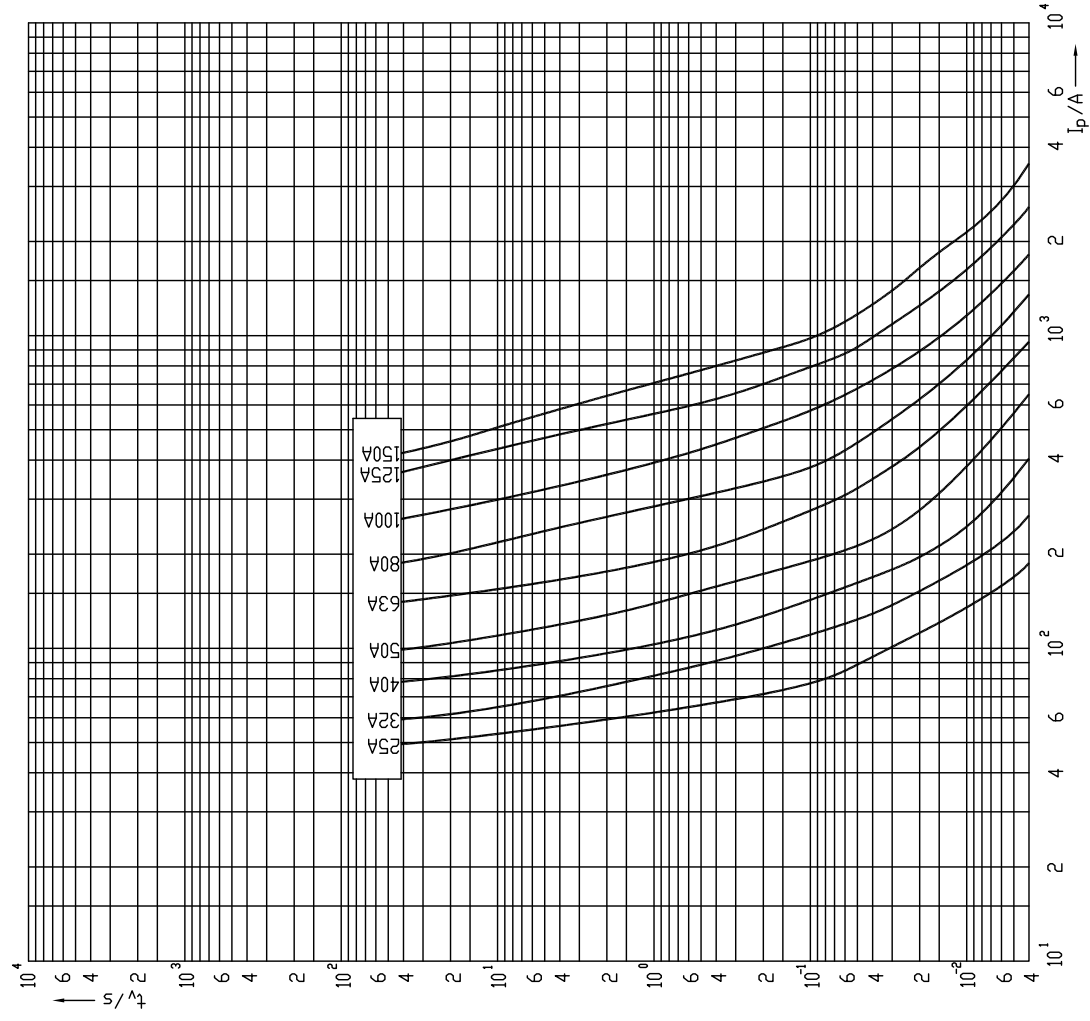


# NH1 /350/DC 4000V aR-fuse link

General characteristics	
Rated voltage	4000V d.c. (L/R=15ms)
Breaking capacity	30kA d.c.
Characteristics	aR
Standard	IEC 60269-4, IEC 60077-5
Application	Heating system in railway vagon

RAILWAY fuse link						
$I_n$ [A]	Code No.	Power dissipation [W]	Pre-arcing Joule integral [A <sup>2</sup> s]	Operating Joule integral [A <sup>2</sup> s] (L/R=15ms)	Weight [g]	Pack. [pcs]
25	004735636	43	28	150	1800	1/1
32	004735637	65	40	300		
40	004735638	88	63	600		
50	004735639	105	112	1.400		
63	004735640	105	252	2.500		
80	004735641	114	494	5.500		
100	004735642	115	1.147	10.000		
125	004735643	132	2.168	19.000		
150	004735644	155	3.388	31.000		



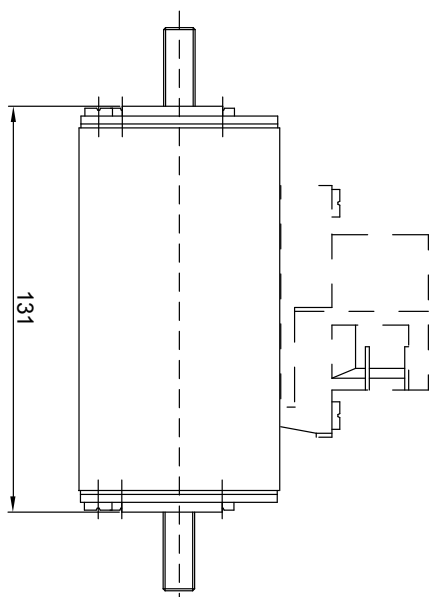
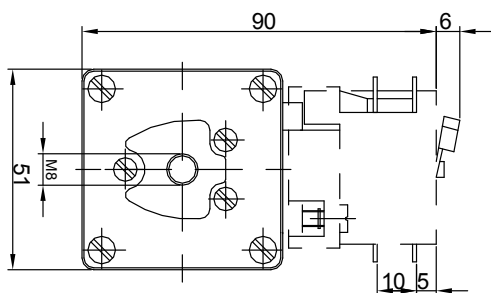


# NH1 / 130 / DC 1000V gR - fuse link

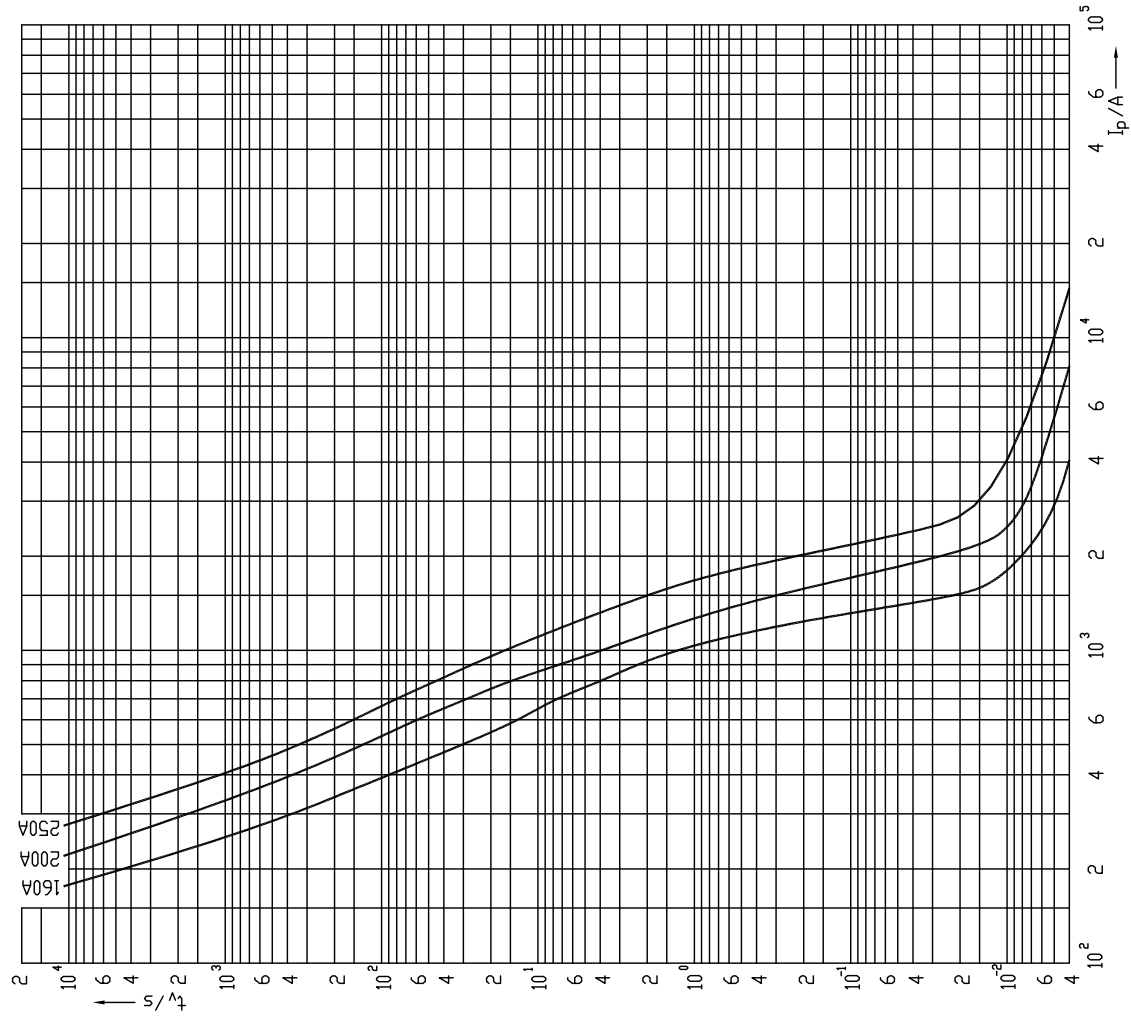
General characteristics	
Rated voltage	1000V d.c. (L/R=10ms)
Breaking capacity	30kA d.c.
Characteristic	gR
Standards	IEC 60269-4
Application	Railway inverter protection Installation directly on copper rails.

RAILWAY fuse link								
$I_n$ [A]	Code No.	Code No. Type with centre trip indicator for microswitch MK+AMK2	Power dissipation ( $0,7 \times I_n$ ) [W]	Power dissipation $I_n$ [W]	Pre-arcing Joule integral [A <sup>2</sup> s]	Operating Joule integral [A <sup>2</sup> s] (L/R=15ms)	Weight [g]	Pack. [pcs]
160	004303530	004303527	15,3	36,5	10.000	16.000	900	1/16
200	004303531	004303528	17,5	42,6	18.000	38.000		
250	004303532	004303529	23,6	56	30.000	60.000		

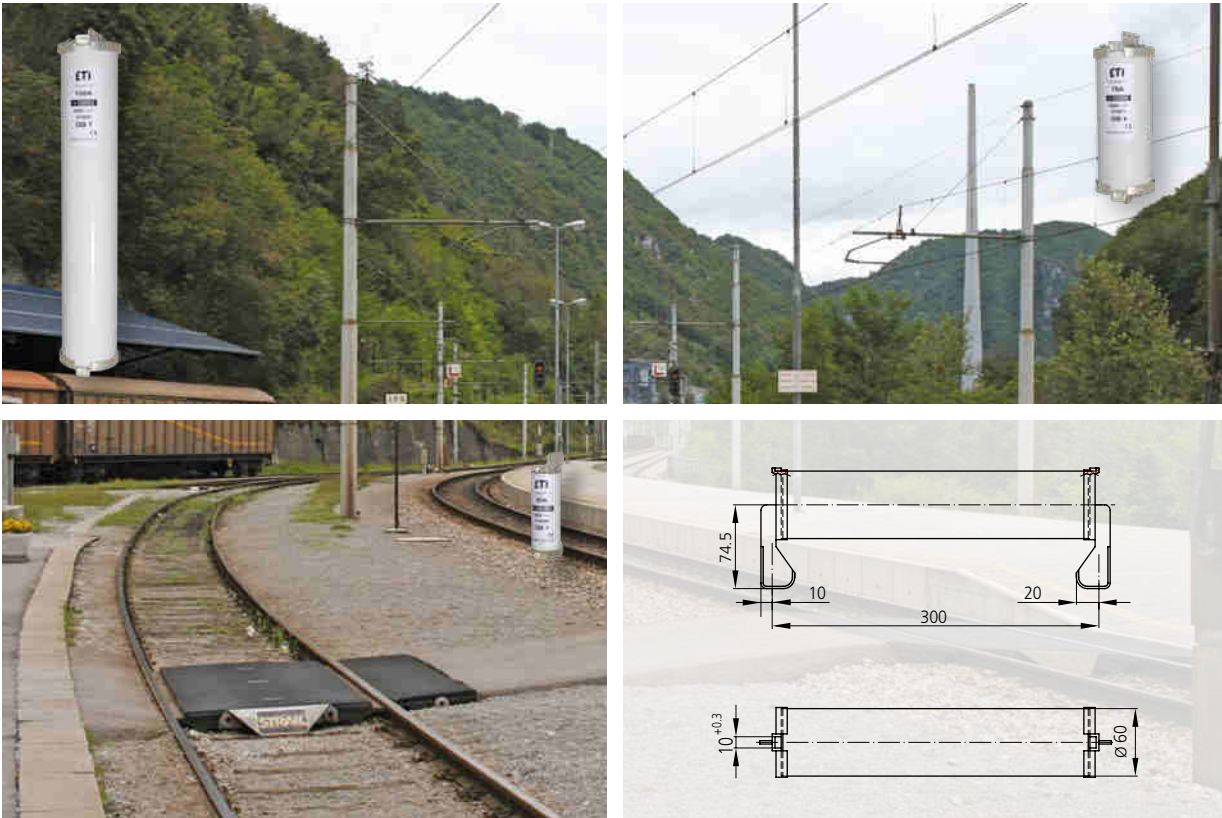
Note: microswitch MK and adapter AMK2 must be ordered separately







## Fuses for high-voltage switchgear



### Fuses for high-voltage switchgear DB, S<sub>368</sub> Series

For the protection of high-voltage switchgear ETI offers a complete range of high-voltage fuses. The series-connected fuses provide failsafe surge protection for the downstream equipment in every situation. This is true for short circuits and also for overcurrents exceeding five times the value of the nominal current ( $5 \times I_n$ ).

DB, S<sub>368</sub> series fuses are main fuses designed for nominal currents of 7,5 A to 125 A.

DB, S<sub>368</sub> series fuses are available for the following voltage ratings:

- 1 kV AC and 1 kV DC
- 1,5 kV AC and 1,5 kV DC
- 3 kV AC and 3 kV DC
- 5 kV DC

This range of fuses covers all existing train line voltages of the European railway systems.

### Features

- Compact design
- 4 different sizes
- Fuses designed for 5 kV DC
- Standards: UIC 550, EN 50163 and IEC 60077-5.

### Applications

- Main fuses for power supplies of rail vehicles, e.g. electric equipment and heating system
- Distribution fuses for branch circuits

Size	$U_n$ [V]	$I_n$ [A]	Code No.	Packaging [pcs]	Weight [g]
DB 1	1000	7,5	004735555	4	270
		10	004735556		
		16	004735557		
		20	004735558		
		25	004735559		
		30	004735560		
		40	004735562		



Size	$U_n$ [V]	$I_n$ [A]	Code No.	Packaging [pcs]	Weight [g]
DB 2	1000	50	004735564	4	450



Size	$U_n$ [V]	$I_n$ [A]	Code No.	Packaging [pcs]	Weight [g]
DB 3	1000	60	004735566	2	690
	1500	7,5	004735567		
		20	004735568		



Size	$U_n$ [V]	$I_n$ [A]	Code No.	Packaging [pcs]	Weight [g]
DB 4	1000	70	004735571	2	1000



Size	$U_n$ [V]	$I_n$ [A]	Code No.	Packaging [pcs]	Weight [g]
DB 5	1500	40	004735573	2	994
		60	004735575		
		10	004735576		
	3000	15	004735577		
		20	004735578		
		30	004735580		
		50	004735581		



Size	$U_n$ [V]	$I_n$ [A]	Code No.	Packaging [pcs]	Weight [g]
DB 6	1000	100	004735583	2	2050
		125	004735584		
		10	004735585		
	3000	20	004735586		
		30	004735587		
		40	004735588		
		50	004735589		
		60	004735590		
		70	004735591		

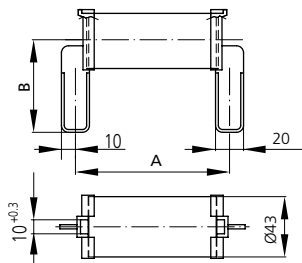


Size	U <sub>n</sub> [V]	I <sub>n</sub> [A]	Code No.	Packaging [pcs]	Weight [g]
DB 7	3000	100	004735593	1	2250

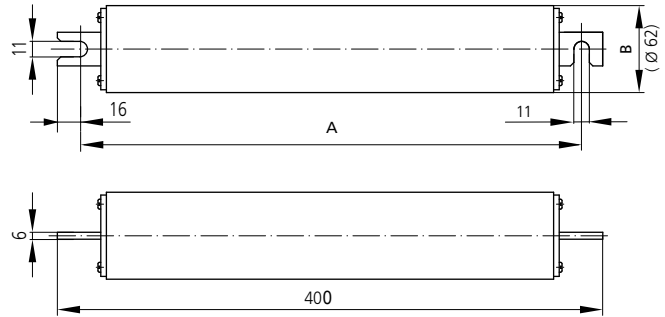
Size	U <sub>n</sub> [V]	I <sub>n</sub> [A]	Code No.	Packaging [pcs]	Weight [g]
S <sub>368</sub>	5000	20	004735594	1	3000
		30	004735595		
		40	004735596		
		50	004735597		
		60	004735598		
		70	004735599		
		100	004735600		



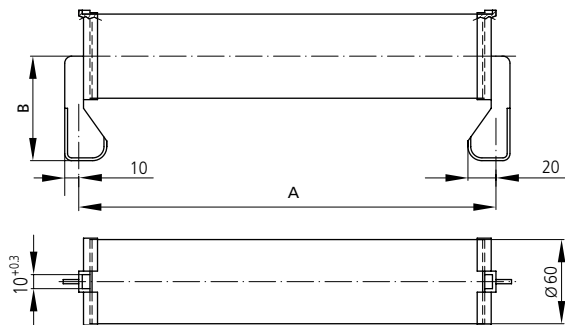
Size 1, 2, 3 and 5: Main fuses DB 1/2/3/5



Size 8: Main fuses S<sub>368</sub>



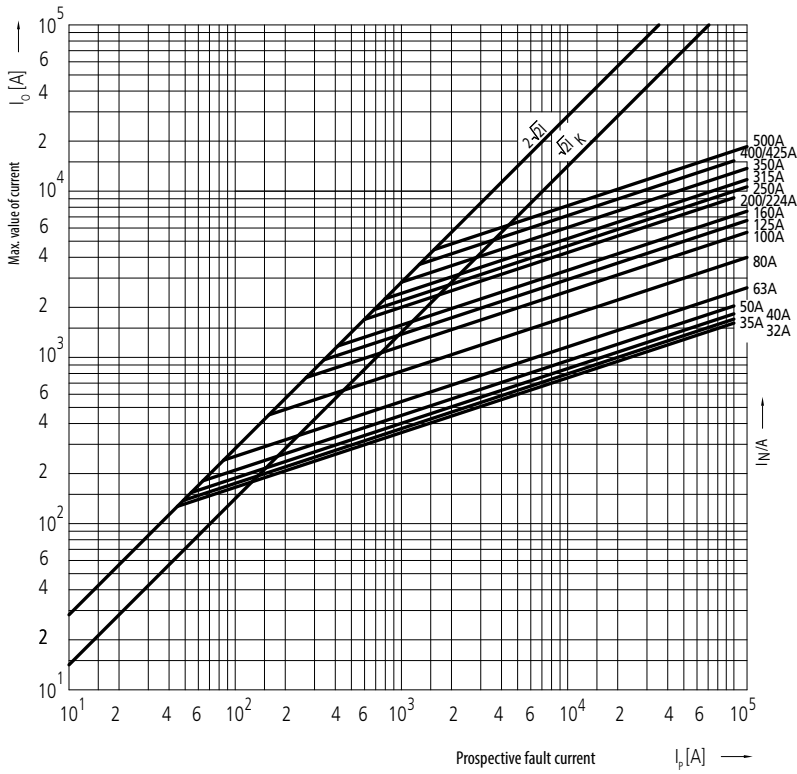
Size 4, 6 and 7: Main fuses DB 4/6/7



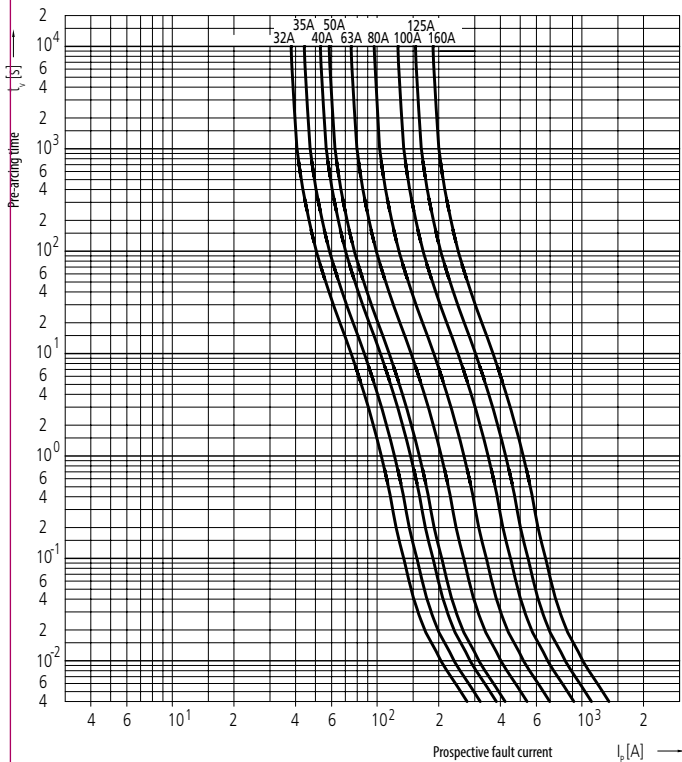
size	dimensions [mm]	
	A	B
DB 1	110	61,0
DB 2	110	61,0
DB 3	170	66,0
DB 4	170	74,5
DB 5	260	66,0
DB 6	300	74,5
DB 7	350	74,5
S <sub>368</sub>	368	62,0

Dimensions according to IEC 60269-2, see also ETI general catalogue

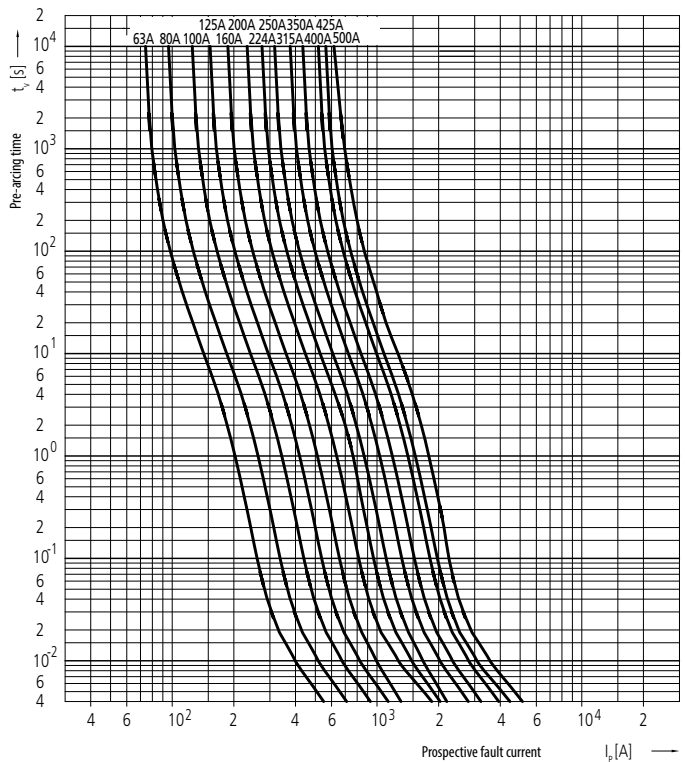
Cut-off characteristics SWF fuse links-size 00C,1,2,3



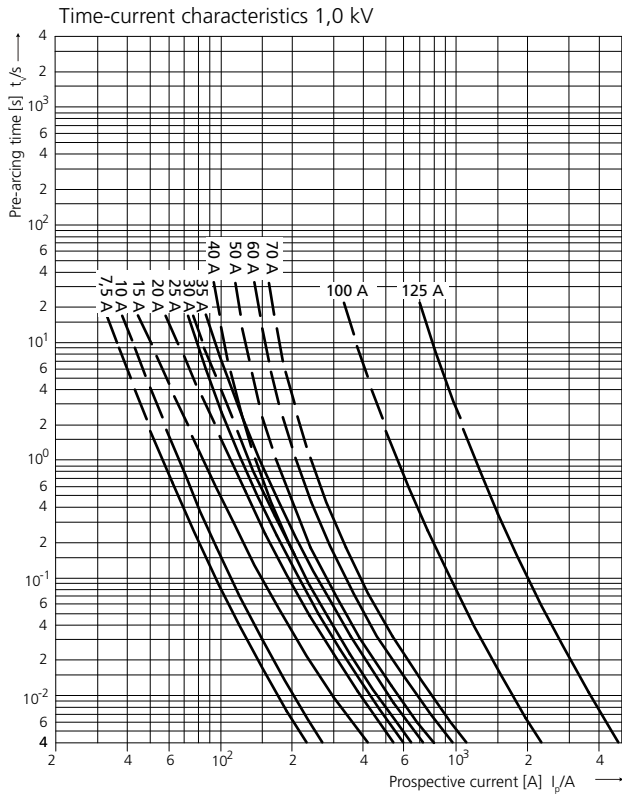
Time/current characteristics of fuse link type SWF-size 00C



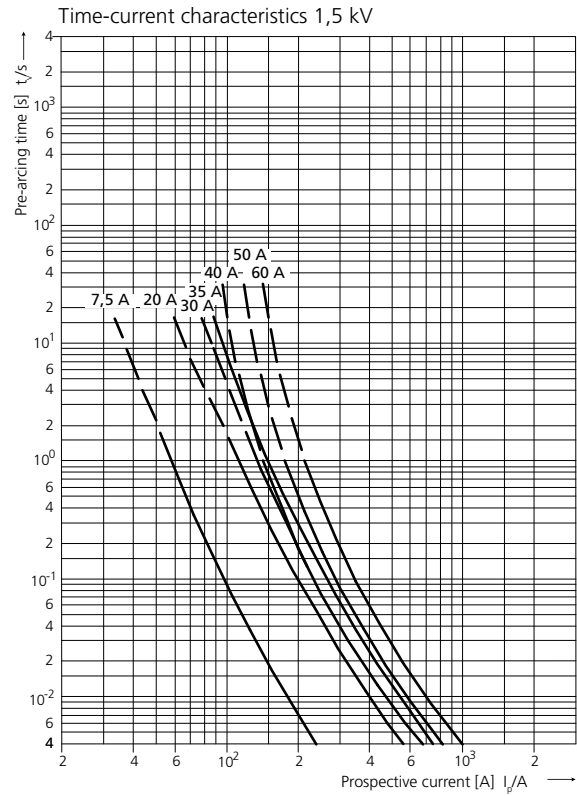
Time/current characteristics of fuse link type SWF-size 1,2,3



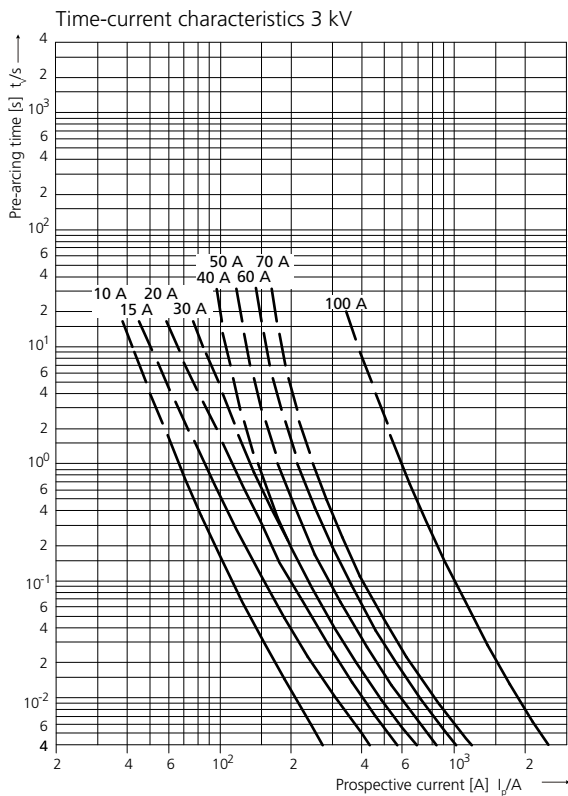
### DB series 1.0 kV



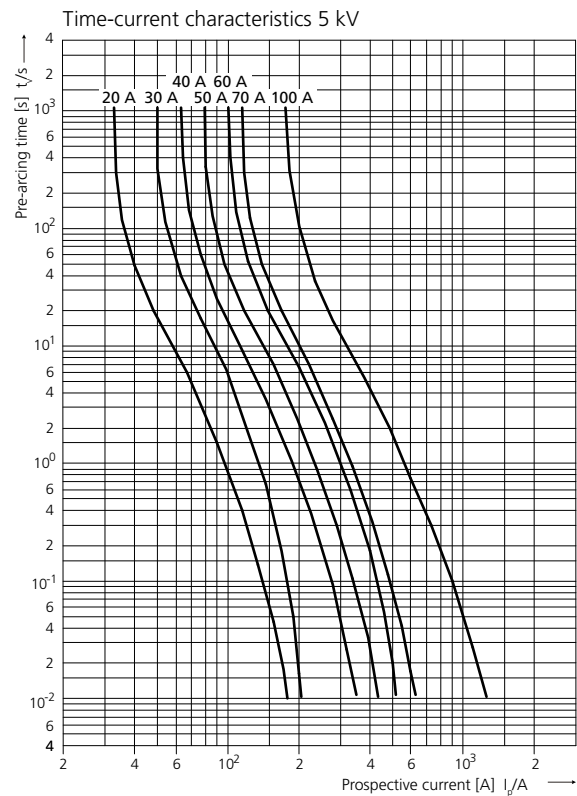
### DB series 1.5 kV



### DB series 3.0 kV



### S<sub>368</sub> series 5 kV



# Battery Protection Fuses

## Application

- in battery storage systems
- in UPS systems
- in e-mobility

## Short circuit current

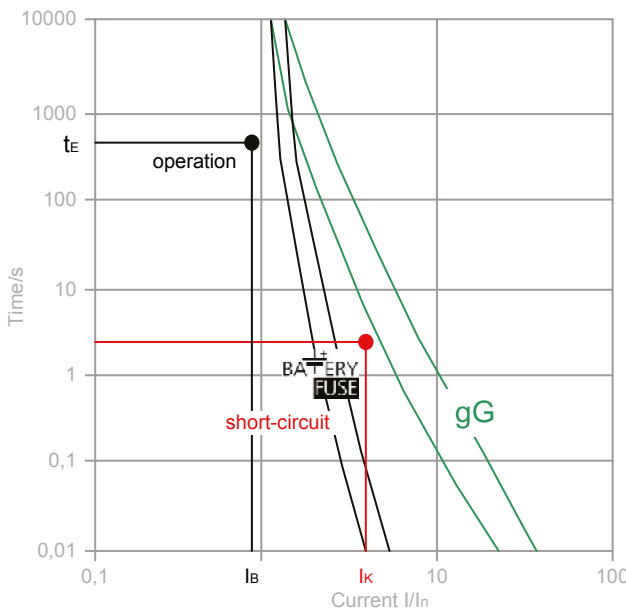
- Short circuit current depending on battery model, type and capacity, low compared to operating current
- Short circuit current has to be interrupted in <5 seconds

**Required steep characteristics: protection with Battery fuse link required!**

## Operating current

- Operating current depends on battery storage specification
- Battery operation: voltage of DC link circuit decreases to the final discharge voltage

**Consider maximum current at final discharge voltage for fuse link selection**



**BECAUSE EVERY SECOND COUNTS**  
 In accordance with IEC SC 32B standardisation work.

## Short circuit point ( $I_k$ )

- Short circuit current depending on battery model and type
- Manufacturer datasheets to include short circuit current according to IEC896
- Operating point has to be in adequate distance below the curve
- Short-circuit point has to be above the range of tolerance of the curve

## Operating point ( $t_E/I_B$ )

- maximum operating current  $I_B$  has to be calculated from battery storage true power and final discharge voltage  $U_E$ :  
 $I_B = P_w / U_E$
- $t_E$  is the back-up time of battery storage system

**When choosing fuse switch disconnector consider fuse link power dissipation!**

$$P_d(I_B) < P_y$$

Power dissipation of fuse link at maximal operating current ( $I_B$ ):

$$P_d(I_B) = (I_B / I_n)^2 \times P_d(I_n)$$

$I_B$  - maximal operating current

$P_d(I_B)$  - power dissipation of fuse link at maximal operating current

$P_d(I_n)$  - power dissipation of fuse link at nominal current

$P_y$  - maximal permissible fuse link power dissipation mounted in fuse switch disconnector



# CH 10x38 BATTERY Fuse link 550V d.c.

## General characteristics

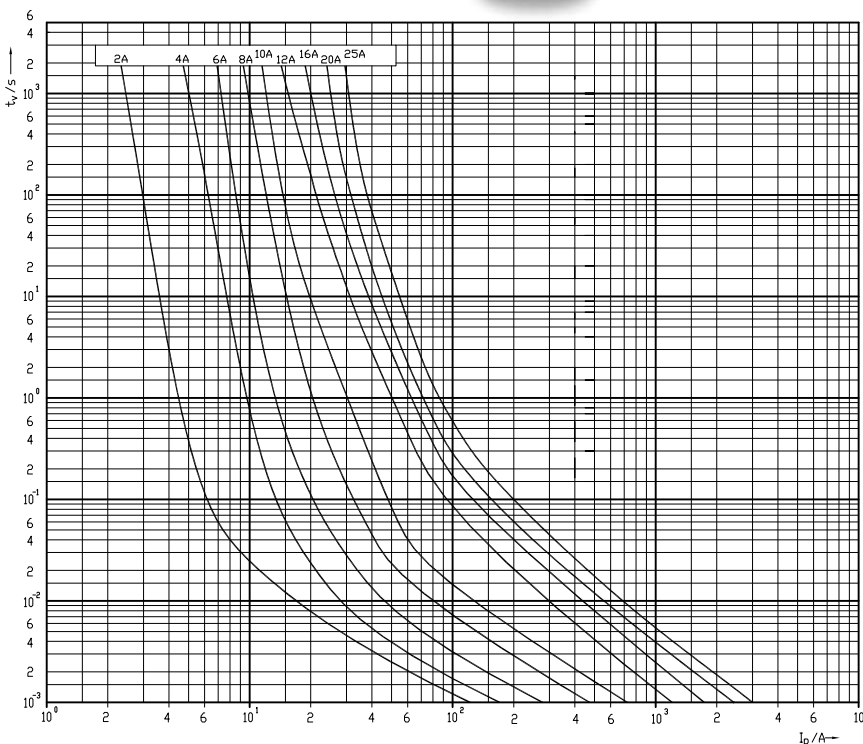
Rated voltage	550V d.c. (L/R=10ms)
Breaking capacity	30kA d.c.
Standard	IEC 60269-2
Application	Battery protection. For installation in EFH 10.

## CH BATTERY fuse link

Size	$I_n$	Code No. "standard contacts" 550V DC	Code No. "type SU contacts" 550V DC	Pre-arcing Joule integral L/R=10ms	Operat- ing Joule integral L/R=10ms	Power dissipation [0,7 x $I_n$ ] $P_d$	Power dissipation [1 x $I_n$ ] $P_d$	Weight [g]	Pack. [pcs]
	[A]	30kA	30kA	[A <sup>2</sup> s]	[A <sup>2</sup> s]	[W]	[W]		
10x38	2	002626002	002626102	1,1	1,8	0,47	1,12	10/12	10/500 SU: 10/380
	4	002626004	002626104	3,0	7,8	0,52	1,25		
	6	002626006	002626106	14,1	27,3	0,73	1,75		
	8	002626008	002626108	25,1	53,4	0,8	1,9		
	10	002626010	002626110	8,0	18,8	0,97	2,4		
	12	002626012	002626112	18,5	41,5	0,8	1,9		
	16	002626016	002626116	42	88	1,1	2,6		
	20	002626020	002626120	86	166	1,3	3,2		
	25	002626025	002626125	140	270	1,65	4,1		



Note:  
CH Battery fuse links are used in combination  
with fuse disconnecter EFH 10 DC



I/t characteristics for CH 10x38  
Battery fuses



# CH 10x38 BATTERY Fuse link 800V d.c.

## General characteristics

Rated voltage	800V d.c. (L/R=10ms)
Breaking capacity	30kA d.c.
Standard	IEC 60269-2
Application	Battery protection. For installation in EFH 10.

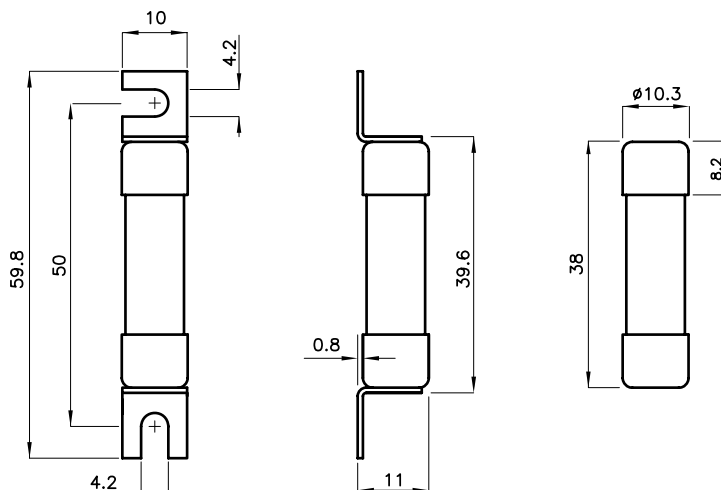
## CH BATTERY fuse link

Size	$I_n$ [A]	Code No. "standard contacts" 800V DC 30kA	Code No. "type SU contacts" 800V DC 30kA	Pre-arcing Joule integral L/R=10ms [A <sup>2</sup> s]	Oper- ing Joule integral L/R=10ms [A <sup>2</sup> s]	Power dissipation [0,7 x $I_n$ ] $P_d$ [W]	Power dissipation [1 x $I_n$ ] $P_d$ [W]	Weight [g]	Pack. [pcs]
10x38	2	002626030	002626130	1,2	1,6	0,47	1,12	10/12	10/500 SU: 10/380
	4	002626032	002626132	3,6	8,9	0,52	1,25		
	6	002626034	002626134	9,5	27,2	0,73	1,75		
	8	002626036	002626136	27,3	65,8	0,8	1,9		
	10	002626038	002626138	8,2	26,6	0,97	2,4		
	12	002626040	002626140	20,6	54,6	0,8	1,9		
	16	002626042	002626142	44,4	109,3	1,1	2,6		



Note:  
CH Battery fuse links  
are used in combination  
with fuse disconnecter  
EFH 10 DC

## Dimensions CH 10x38 Battery fuses



# CH 14x51 BATTERY Fuse link 800V d.c.

## General characteristics

Rated voltage	800V d.c. (L/R=10ms)
Breaking capacity	30kA d.c.
Standard	IEC 60269-2
Application	Battery protection. For installation in EFH 14.

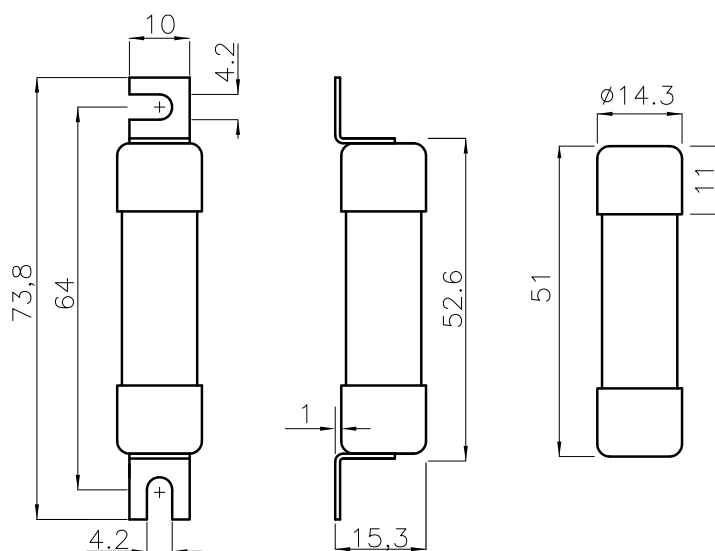
## CH BATTERY fuse link

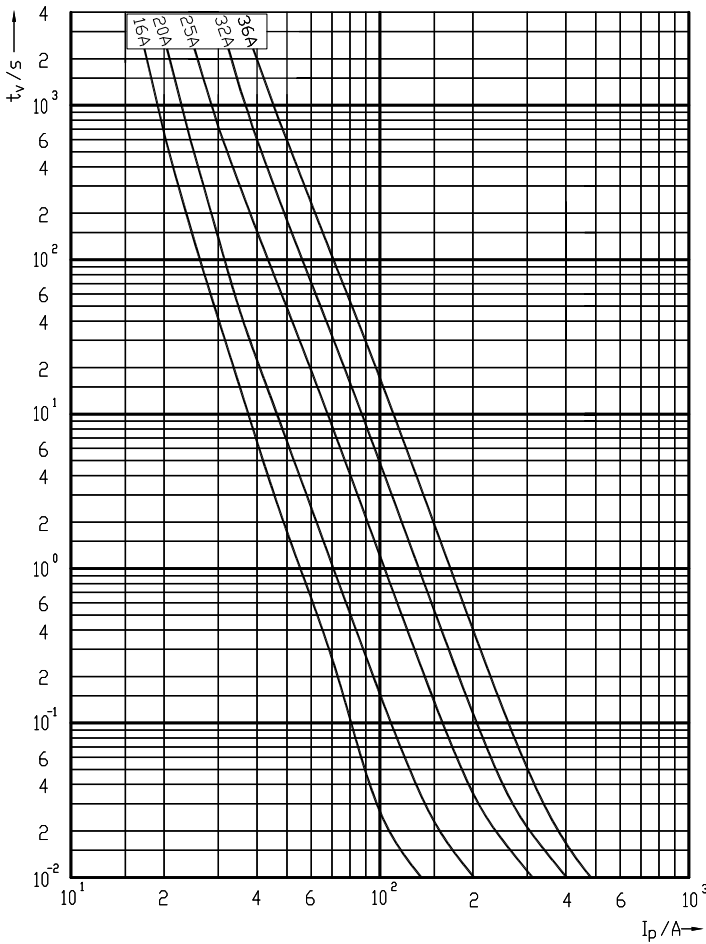
Size	$I_n$ [A]	Code No. "standard contacts" 800V DC 30kA	Code No. "type SU contacts" 800V DC 30kA	Pre-arcing Joule integral L/R=10ms [A <sup>2</sup> s]	Oper- ing Joule integral L/R=10ms [A <sup>2</sup> s]	Power dissipation [0,7 x $I_n$ ] $P_d$ [W]	Power dissipation [1 x $I_n$ ] $P_d$ [W]	Weight [g]	Pack. [pcs]
14x51	16	002637405	002637505	37	136	1,4	3,1	19/21	10/200 SU: 10/260
	20	002637407	002637507	80	284	1,5	3,2		
	25	002637409	002637509	128	438	2	4		
	32	002637411	002637511	296	1050	2,1	5,1		
	36	002637412	002637512	370	1160	2,3	5,6		



Note:  
CH Battery fuse links  
are used in combination  
with fuse disconnecter  
EFH 14 DC.

## Dimensions CH 14x51 Battery fuses

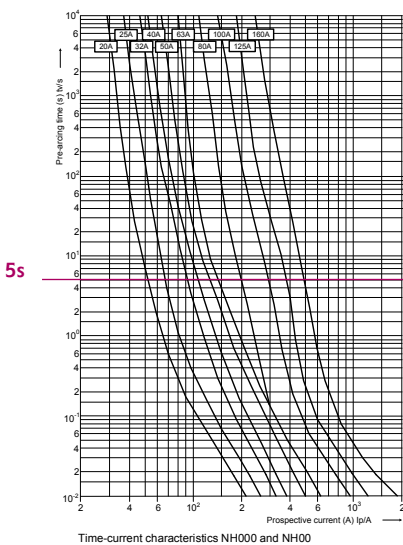




I/t characteristics for CH 14x51  
Battery fuses

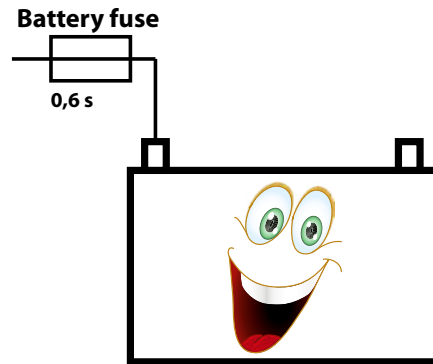
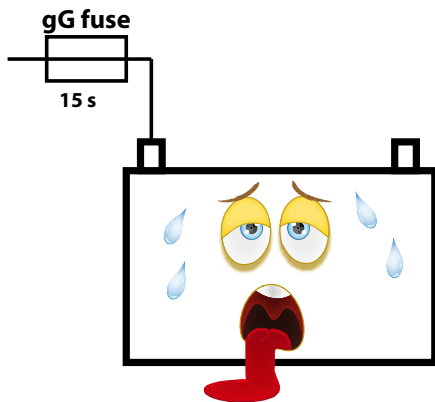
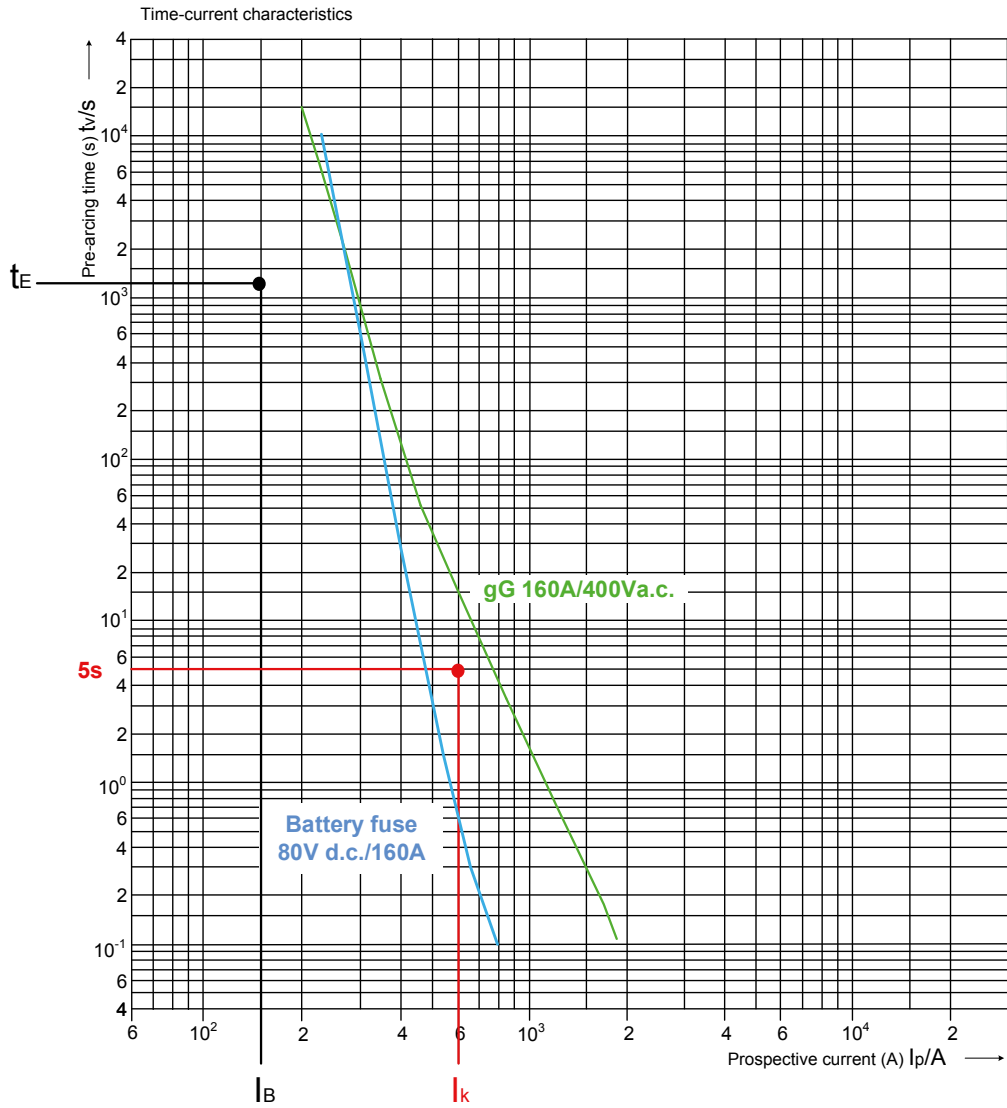
## NH BATTERY fuse link 80V d.c.

Low power dissipation and fast characteristic in time range of 5s!



Discharge .....	-20~60°C
Charge .....	-10~60°C
Storage .....	-20~60°C
Max. Discharge Current 77°F(25°C) .....	1000A(5s)
Short Circuit Current .....	3300A
Charge Methods: Constant Voltage Charge 77°F(25°C)	
Cycle use .....	14.4-14.7V
Maximum charging current .....	60A
Temperature compensation .....	-30mV/°C

Better protection of battery cells on overheating in case of short circuit comparable to standard gG characteristic

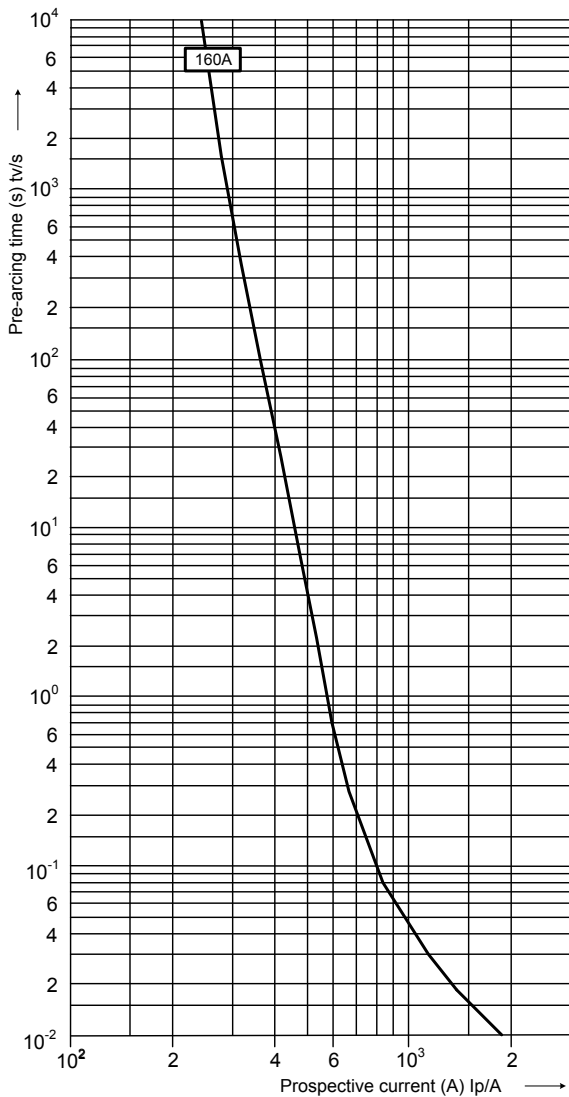


### General characteristics

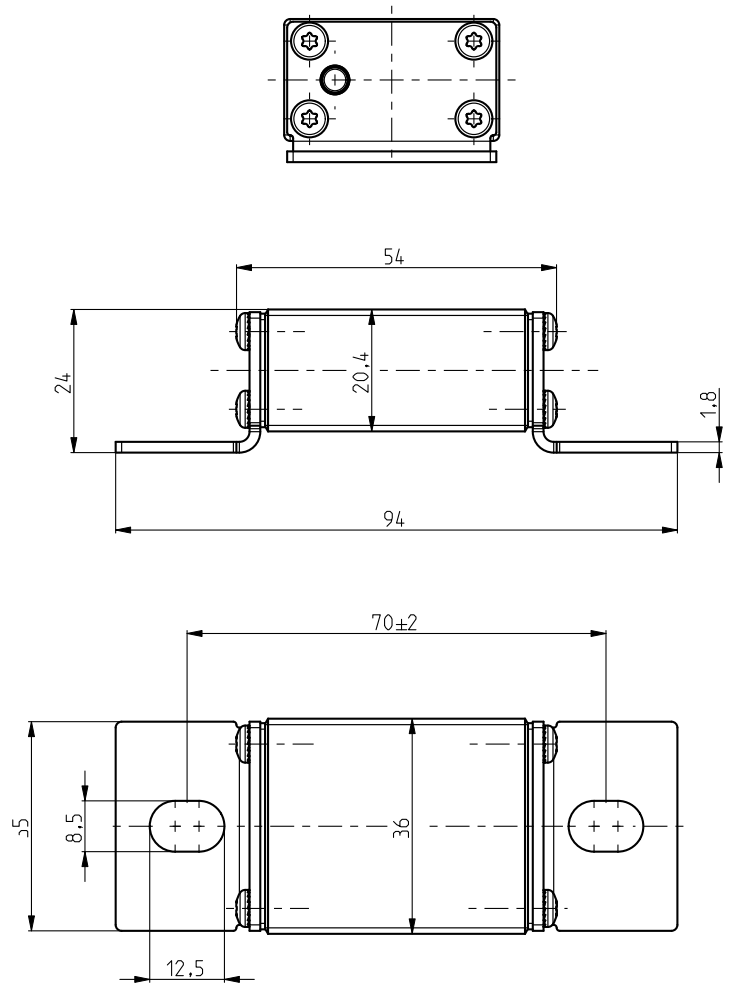
Rated voltage	80V d.c., L/R=10ms
Breaking capacity	30kA d.c.
Standard	IEC 60269-2
Application	Battery protection.

### NH BATTERY fuse link 80V d.c.

Size	$I_n$ [A]	Code No	Power dissipation [W]	Pre-arcing Joule integral [A <sup>2</sup> s]	Operating Joule integral [A <sup>2</sup> s]	Weight [g]	Pack. [pcs]
000L	160	004110070	15,5	27.000	30.000	125	3/120



Time-current characteristics NH000L



### General characteristics

Rated voltage	80V d.c., L/R=10ms
Breaking capacity	50kA d.c.
Standard	IEC 60269-2
Application	Battery protection. For installation PK, PT fuse bases or fuse disconnectors.

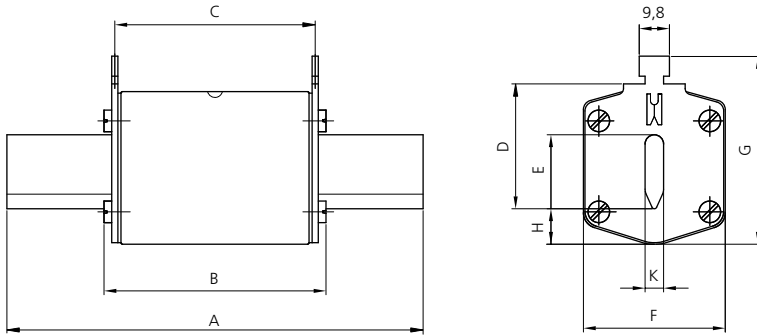
### NH BATTERY fuse link 80V d.c.

Size	$I_n$	Standard indicator	Power dissipation	Power dissipation $0,7 \times I_n$	Pre-arcing Joule integral	Operating Joule integral	Weight [g]	Pack. [pcs]
	[A]	Pic. 1	[W]	[W]	[A <sup>2</sup> s]	[A <sup>2</sup> s]		
00C	20	004110075	4,6	2	360	414	125	3/120
	25	004110076	5,8	2,6	710	817		
	32	004110077	6,6	3	920	1.058		
	40	004110078	9,4	4,2	1.440	1.656		
	50	004110079	11,1	5	2.820	3.243		
00	63	004110080	11,7	5,2	4.160	4.784	173	3/90
	80	004110081	10,4	4,7	4.670	5.371		
	100	004110082	11,1	5	9.360	10.764		
	125	004110083	13,4	6	14.750	16.963		
	160	004110084	15,5	7	27.880	32.062		
1C	20	004110085	6,3	2,8	360	414	233	3/45
	25	004110086	7,3	3,3	710	817		
	32	004110087	9	4	920	1.058		
	40	004110088	11,2	5	1.440	1.656		
	50	004110089	14,5	6,5	2.820	3.243		
	63	004110090	16,8	7,5	4.160	4.784		
	80	004110091	11,4	5,1	4.670	5.371		
	100	004110092	12	5,4	9.360	10.764		
	125	004110093	14,8	6,6	14.750	16.963		
1	200	004110095	26,6	11,9	41.990	48.289	430	3/24
	250	004110096	31	13,9	81.000	93.150		



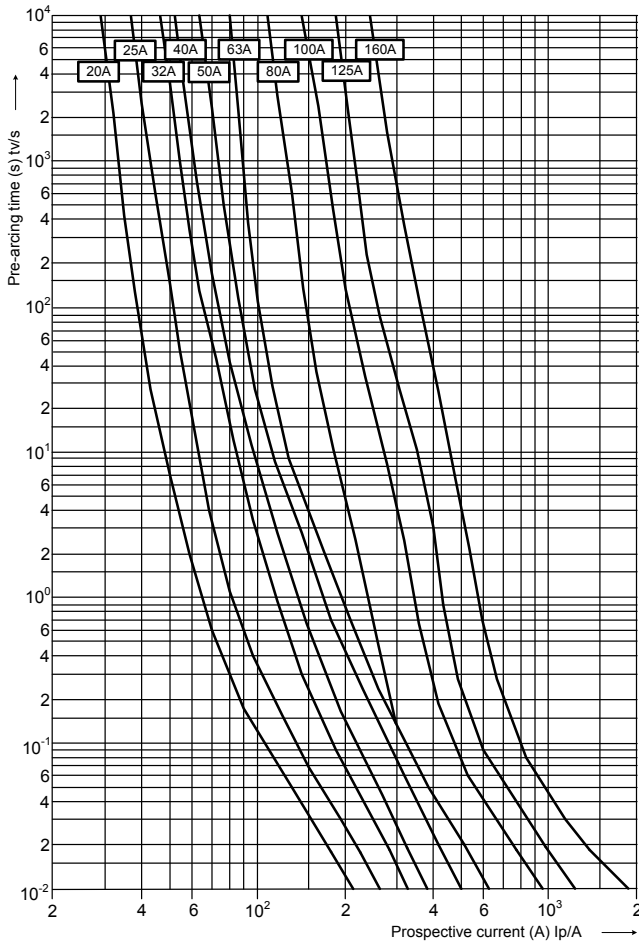
Dimensions NH Battery fuses 80 V d.c.

pic. 1

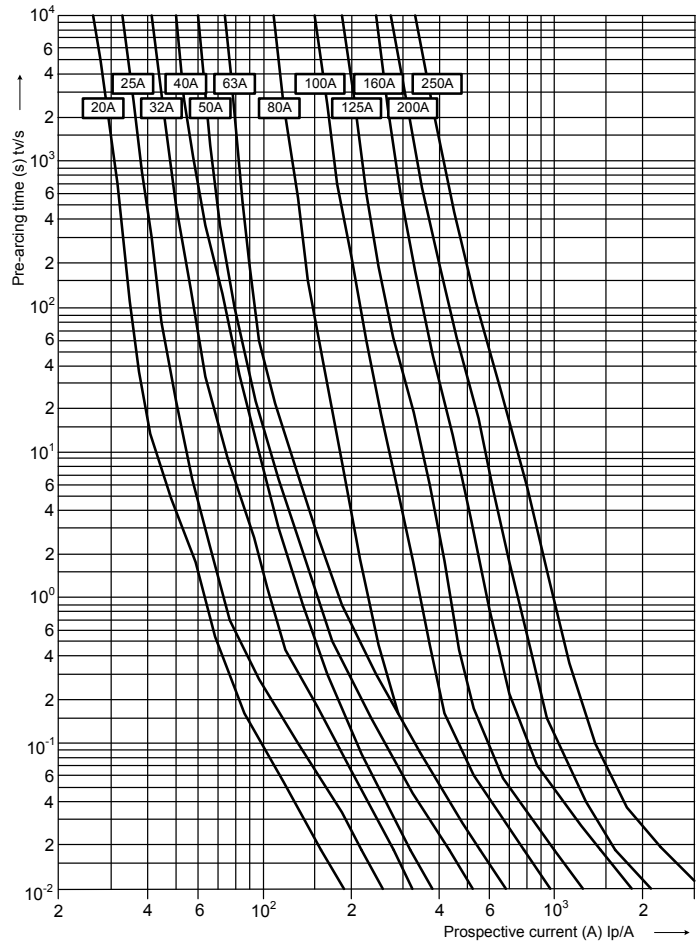


Size	A	B	C	D	E	F	G	H	K
000	79	53	47	35	15	21	52	7,5	6
00	79	53	47	35	15	28	56	12	6
1 C	135	68	65	40	15	28	61	12	6
1	135	72	65	40	20	46	65	14	6

I/t characteristics for NH Battery fuses 80V d.c.



Time-current characteristics NH000 and NH00

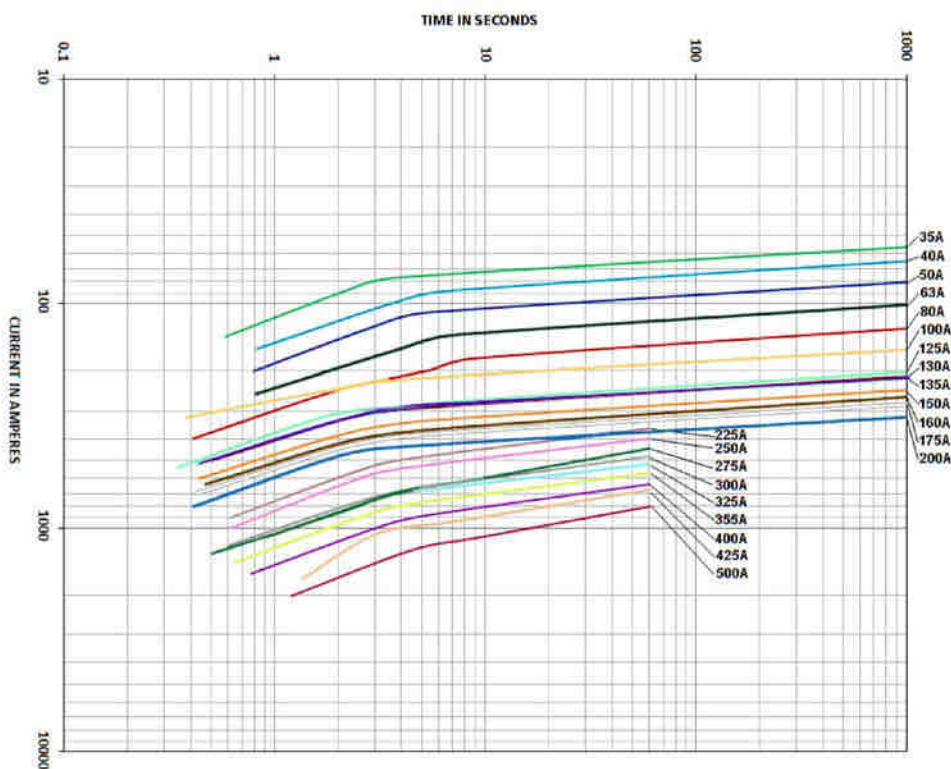


Time-current characteristics NH1C and NH1

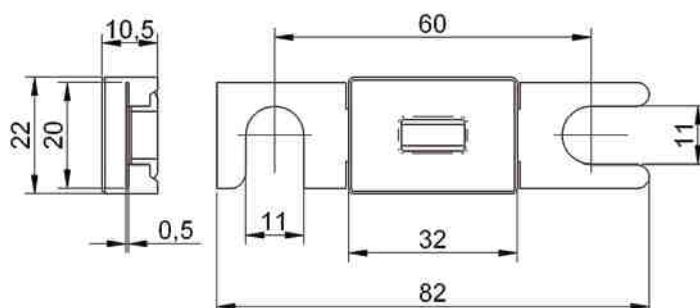
# Fuses for protection of forklift batteries TRB

General characteristics	
Rated voltage	80V d.c.
Standards	DIN 43560/1
Application	TRB fuse-links are used to protect the forklift battery

TRB fuse link				
$I_n$ [A]	Type	Code Nr.	Weight [g]	Packaging [pcs]
35	TRB 35A/80V	004341020	10	20
50	TRB 50A/80V	004341021		
63	TRB 63A/80V	004341022		
80	TRB 80A/80V	004341023		
100	TRB 100A/80V	004341024		
125	TRB 125A/80V	004341025		
160	TRB 160A/80V	004341026		
200	TRB 200A/80V	004341027		
250	TRB 250A/80V	004341028		
300	TRB 300A/80V	004341029		
355	TRB 355A/80V	004341030		
425	TRB 425A/80V	004341031		



Dimensions TRB fuses





# NH BATTERY fuse link 440V d.c.

General characteristics	
Rated voltage	440V d.c., L/R=10ms (NH1C), L/R=5ms (NH00)
Breaking capacity	30kA d.c.
Standard	IEC 60269-2
Application	Battery protection. For installation PK, PT fuse bases or fuse disconnectors.

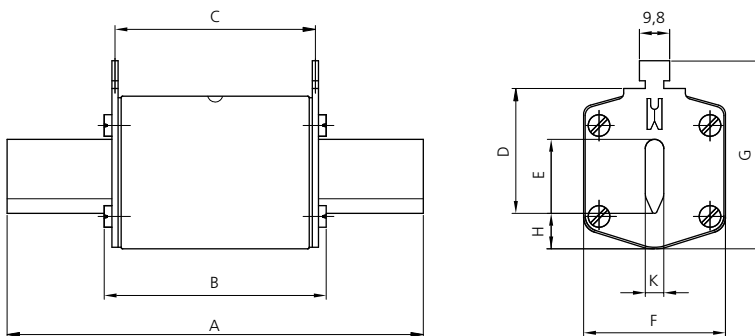


NH BATTERY fuse link								
Size	$I_n$	Standard indicator	Power dissipation	Power dissipation $0,7 \times I_n$	Pre-arcing Joule integral	Operating Joule integral	Weight	Pack.
	[A]		[W]	[W]	[A <sup>2</sup> s]	[A <sup>2</sup> s]	[g]	[pcs]
00	32	004110209	6,6	3	920	1.656	173	3/90
	40	004110219	9,4	4,2	1.440	2.592		
	50	004110218	11,1	5	2.820	5.076		
	63	004110217	11,7	5,2	4.160	7.488		
	80	004110216	10,4	4,7	4.670	8.406		
	100	004110215	11,1	5	9.360	16.848		
1C	20	004723103	6,3	2,8	360	648	233	3/45
	25	004723104	7,3	3,3	710	1.278		
	32	004723105	9	4	920	1.656		
	40	004723106	11,2	5	1.440	2.592		
	50	004723107	14,5	6,5	2.820	5.076		
	63	004723108	16,8	7,5	4.160	7.488		
	80	004723109	11,4	5,1	4.670	8.406		
	100	004723110	12	5,4	9.360	16.848		
	125	004723111	14,8	6,6	14.750	26.550		
	160	004723112	17,6	7,9	27.880	50.184		



Special Purpose Fuses

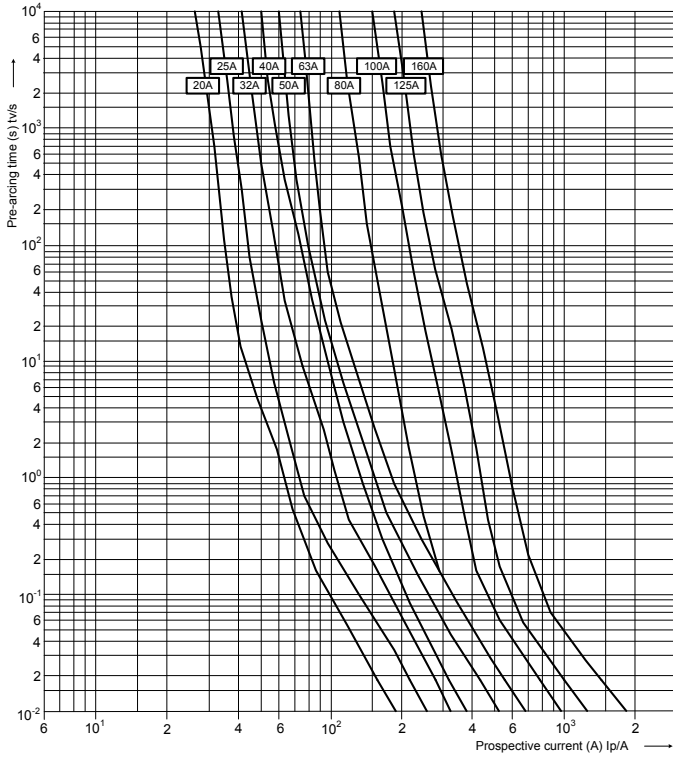
## Dimensions



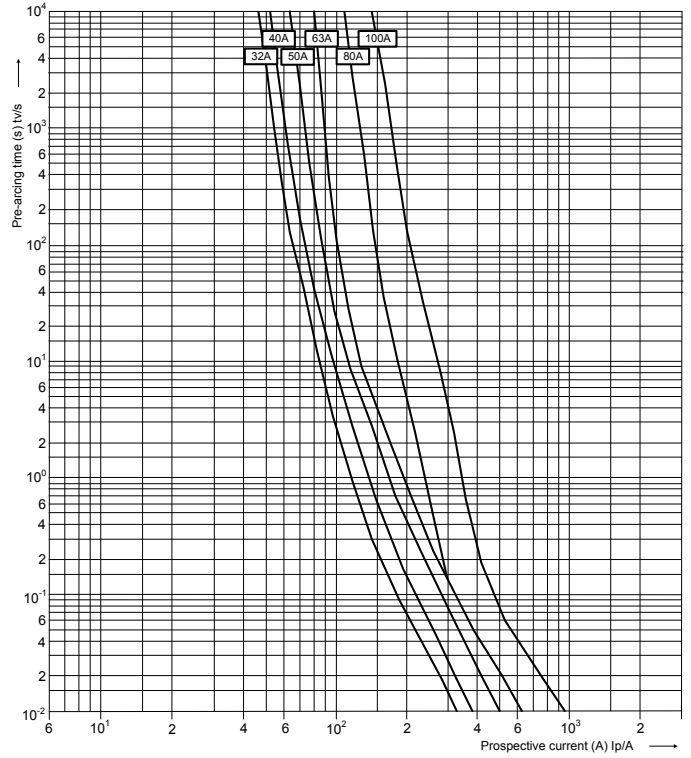
type	dimensions [mm]								
	A	B	C	D	E	F	G	H	K
00	79	53	47	35	15	28	56	12	6
1C	135	68	65	40	15	28	61	12	6



I/t characteristics

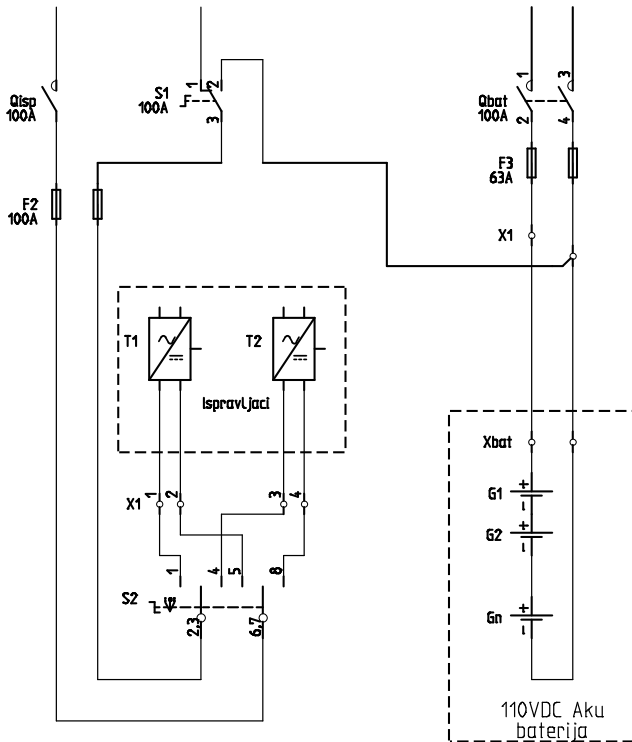


Time-current characteristics NH1C



Time-current characteristics NH00

Application



# NH BATTERY fuse link 550V d.c.

General characteristics	
Rated voltage	550V d.c. (L/R=10ms)
Breaking capacity	30kA d.c.
Standard	IEC 60269-2
Application	Battery protection. For installation PK fuse bases or fuse disconnectors 1000V d.c..



NH BATTERY fuse link										
Size	$I_n$	Standard indicator	Striker indicator	Standard indicator S110mm	Power dissipation	Power dissipation $0,7 \times I_n$	Pre-arcing Joule integral	Operating Joule integral	Weight	Pack.
	[A]	pic. 1	pic. 1	pic. 2	[W]	[W]	[A <sup>2</sup> s]	[A <sup>2</sup> s]	[g]	[pcs]
1	40	004723259	004723279	004723269	6	2,7	250	833	420	3/24
	50	004723260	004723280	004723270	7	3,1	449	1.495		
	63	004723261	004723281	004723271	9	4	700	2.331		
	80	004723262	004723282	004723272	12	5,4	1.200	3.996		
	100	004723263	004723283	004723273	15	6,7	1.650	5.495		
	125	004723264	004723284	004723274	20	9	2.200	7.326		
	160	004723265	004723285	004723275	26	11,7	4.300	14.319		
	200	004723266	004723286	004723276	32	14,4	8.500	28.305		
	224	004723267	004723287	004723277	37	16,6	10.000	33.300		
2	250	004723268	004723288	004723278	43	19,3	15.000	50.000	660	3/24
	125	004724260	004724280	004724270	20	9	2.200	10.296		
	160	004724261	004724281	004724271	26	11,7	4.300	20.124		
	200	004724262	004724282	004724272	32	14,4	8.500	39.780		
	224	004724263	004724283	004724273	37	16,6	10.000	46.800		
	250	004724264	004724284	004724274	43	19,3	15.000	70.200		
	315	004724265	004724285	004724275	57	26,6	20.000	93.600		
3	350	004724266	004724286	004724276	67	30	28.000	131.040	870	3/24
	400	004724267	004724287	004724277	76	34,2	32.000	150.000		
	250	004725260	004725280	004725270	43	19,3	15.000	65.550		
	315	004725261	004725281	004725271	57	26,6	20.000	87.400		
	350	004725262	004725282	004725272	67	30	28.000	122.360		
	400	004725263	004725283	004725273	76	34,2	32.000	139.840		
	425	004725264	004725284	004725274	84	37,8	40.000	174.800		
	500	004725265	004725285	004725275	110	49,5	44.000	192.280		
630	004725266	004725286	004725276	160	72	80.000	350.000			



# NH BATTERY fuse link 700V d.c.

General characteristics	
Rated voltage	700V d.c. (L/R=10ms)
Breaking capacity	30kA d.c.
Standard	IEC 60269-2
Application	Battery protection. For installation PK DC fuse bases or fuse disconnectors 1000V d.c..



## NH BATTERY fuse link

Size	$I_n$	Standard indicator pic. 1	Striker indicator pic. 1	Standard indicator S110mm pic. 2	Power dissipation [W]	Power dissipation $0,7 \times I_n$ [W]	Pre-arcing Joule integral [A <sup>2</sup> s]	Operating Joule integral [A <sup>2</sup> s]	Weight [g]	Pack. [pcs]
1	40	004723289	004723309	004723299	6	2,7	250	1.000	420	3/24
	50	004723290	004723310	004723300	7	3,1	449	1.796		
	63	004723291	004723311	004723301	9	4	700	2.800		
	80	004723292	004723312	004723302	12	5,4	1.200	4.800		
	100	004723293	004723313	004723303	15	6,7	1.650	6.600		
	125	004723294	004723314	004723304	20	9	2.200	8.800		
	160	004723295	004723315	004723305	26	11,7	4.300	17.200		
	200	004723296	004723316	004723306	32	14,4	8.500	34.000		
	224	004723297	004723317	004723307	37	16,6	10.000	40.000		
2	250	004723298	004723318	004723308	43	19,3	15.000	60.000	660	3/24
	125	004724290	004724310	004724300	20	9	2.200	11.682		
	160	004724291	004724311	004724301	26	11,7	4.300	22.833		
	200	004724292	004724312	004724302	32	14,4	8.500	45.135		
	224	004724293	004724313	004724303	37	16,6	10.000	53.100		
	250	004724294	004724314	004724304	43	19,3	15.000	79.650		
	315	004724295	004724315	004724305	57	26,6	20.000	106.200		
3	350	004724296	004724316	004724306	67	30	28.000	148.680	870	3/24
	400	004724297	004724317	004724307	76	34,2	32.000	170.000		
	250	004725290	004725304	004725297	43	19,3	15.000	75.000		
	315	004725291	004725305	004725298	57	26,6	20.000	100.000		
	350	004725292	004725306	004725299	67	30	28.000	140.000		
	400	004725293	004725307	004725300	76	34,2	32.000	160.000		
	425	004725294	004725308	004725301	84	37,8	40.000	200.000		
500	004725295	004725309	004725302	110	49,5	44.000	220.000			
630	004725296	004725310	004725303	160	72	80.000	400.000			



# NH BATTERY fuse link 800V d.c.

## General characteristics

Rated voltage	800V d.c. (L/R=10ms)
Breaking capacity	30kA d.c.
Standard	IEC 60269-2
Application	Battery protection. For installation PK DC fuse bases or fuse disconnectors 1000V d.c..



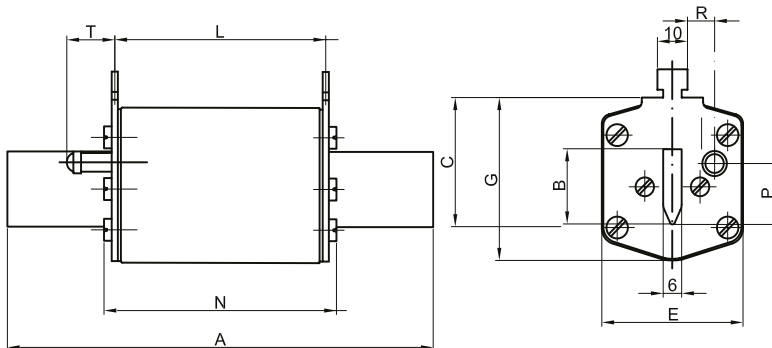
## NH BATTERY fuse link

Size	$I_n$	Standard indicator pic. 1	Striker indicator pic. 1	Standard indicator S110mm pic. 2	Power dissipation [W]	Power dissipation $0,7 \times I_n$ [W]	Pre-arcing Joule integral [A <sup>2</sup> s]	Operating Joule integral [A <sup>2</sup> s]	Weight [g]	Pack. [pcs]
1	40	004723320	004723330	004723340	6	2,7	250	1.750	420	3/24
	50	004723321	004723331	004723341	7	3,1	449	3.143		
	63	004723322	004723332	004723342	9	4	700	4.900		
	80	004723323	004723333	004723343	12	5,4	1.200	8.400		
	100	004723324	004723334	004723344	15	6,7	1.650	11.550		
	125	004723325	004723335	004723345	20	9	2.200	15.400		
	160	004723326	004723336	004723346	26	11,7	4.300	30.100		
2	125	004724320	004724330	004724340	20	9	2.200	13.046	660	3/24
	160	004724321	004724331	004724341	26	11,7	4.300	25.499		
	200	004724322	004724332	004724342	32	14,4	8.500	50.405		
	224	004724323	004724333	004724343	37	16,6	10.000	59.300		
	250	004724324	004724334	004724344	43	19,3	15.000	88.950		
	315	004724325	004724335	004724345	57	26,6	20.000	118.600		
	350	004724326	004724336	004724346	67	30	28.000	166.040		
3L*	400	004724327	004724337	004724347	76	34,2	32.000	190.000	1970	1/10
	500	004110350	-	-	112	50	150.000	300.000		

\*Dimensions: pic. 3

## Dimensions NH Battery fuses

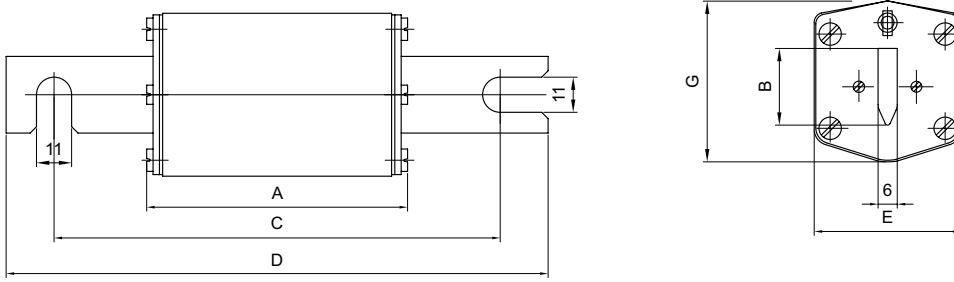
pic. 1



Size	A	B	C	E	G	S	L	N	P	R	T
1	135	24	40	46	52	6	65	73	20,5	13,7	27,5
2	150	30	48	54	61	6	65	73	27,3	16,2	27,5
3	150	37	60	64	74	6	65	73	35,6	17	27,5

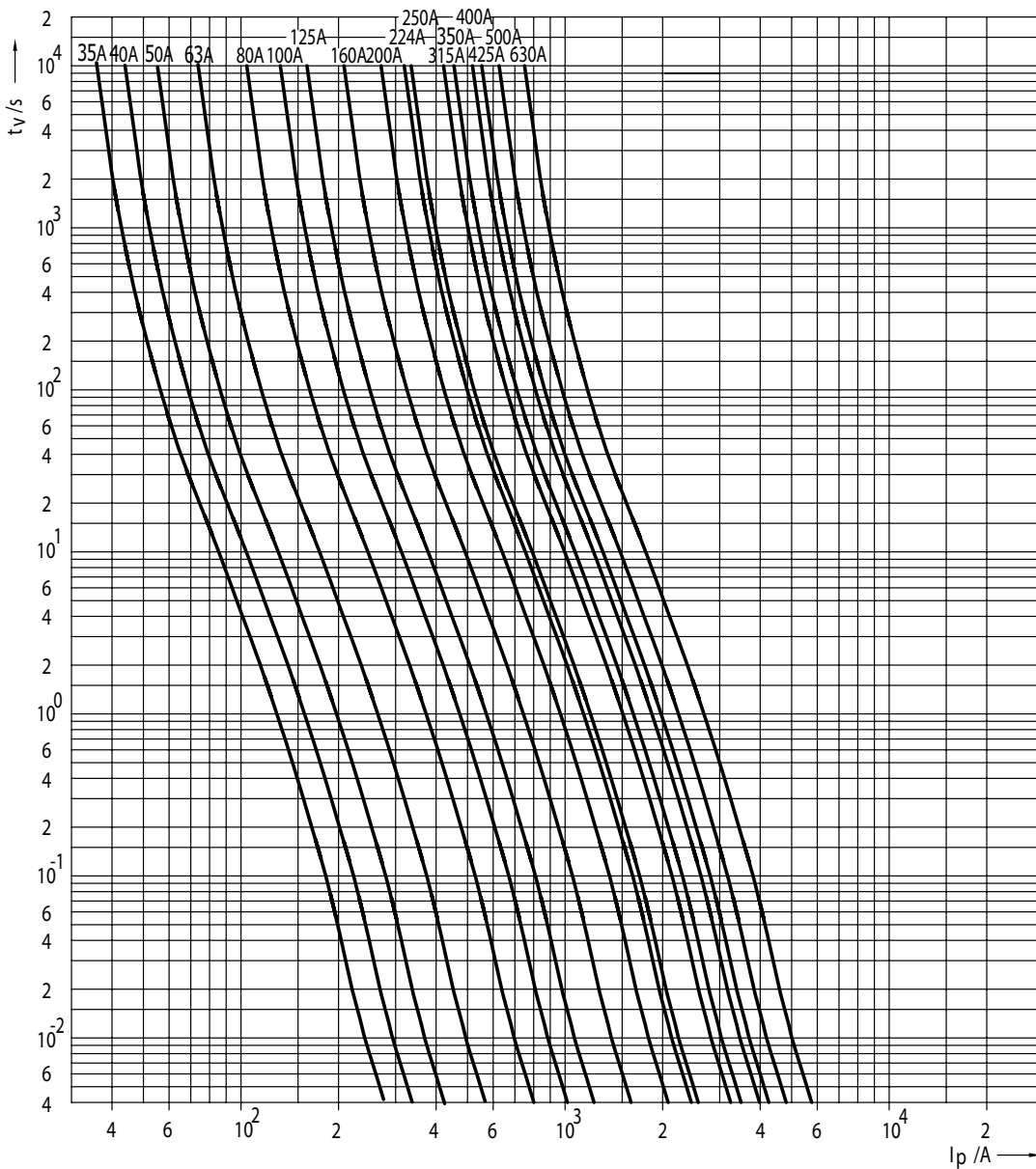


pic. 2

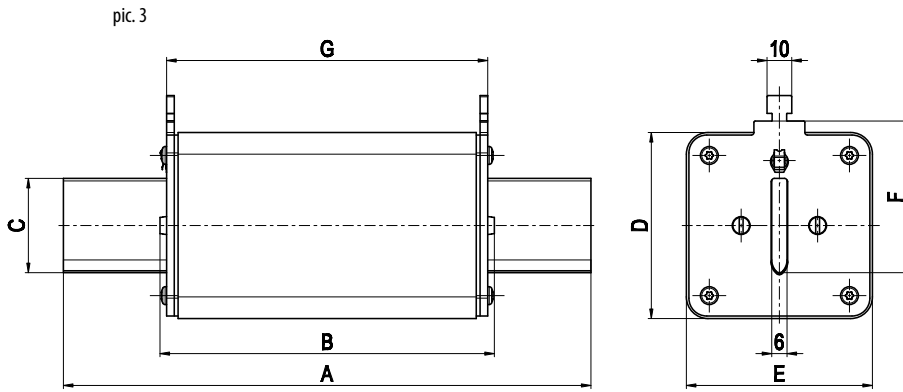


Size	A	B	C	D	E	G
1	72	24	110	140	46	51
2	72	30	110	140	54	59
3	72	37	110	140	64	70

I/t characteristics for NH Battery fuses

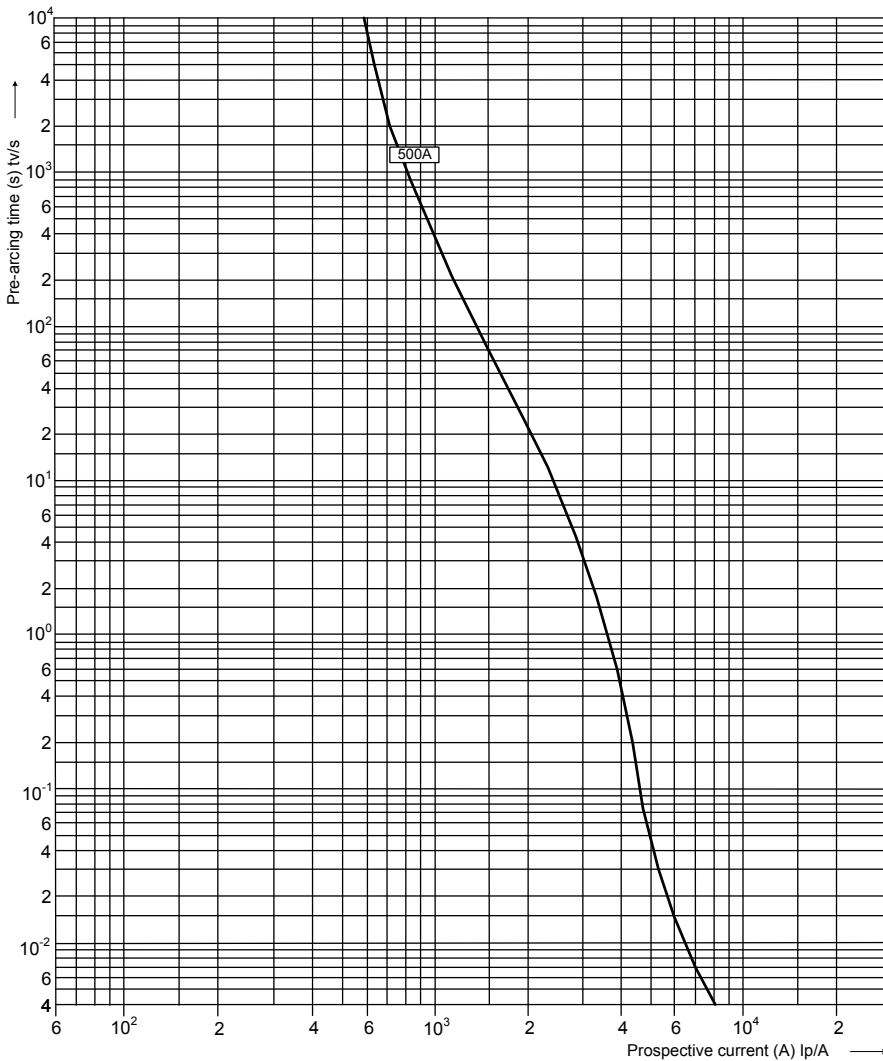


### Dimensions NH Battery fuses

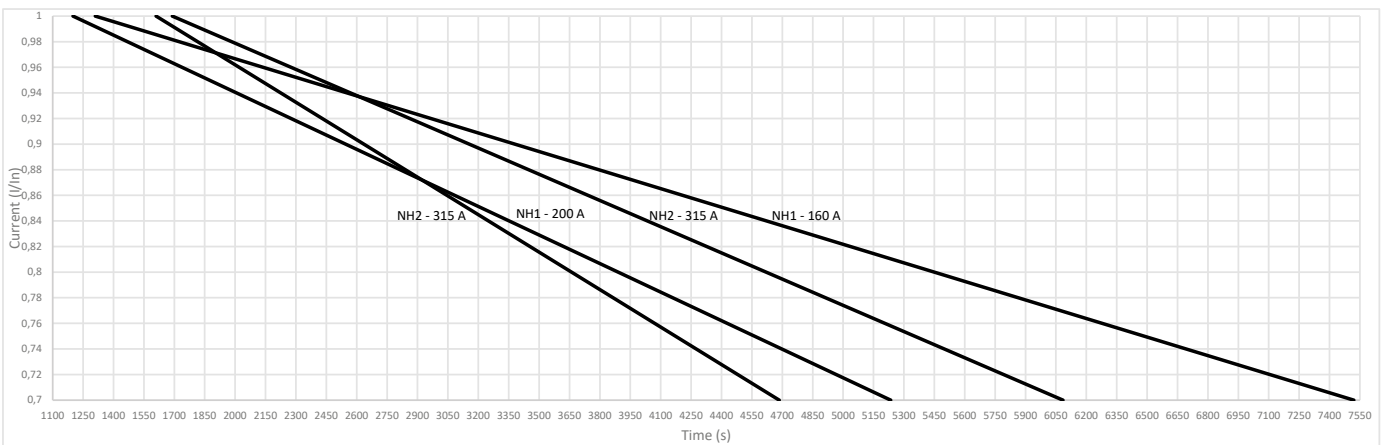
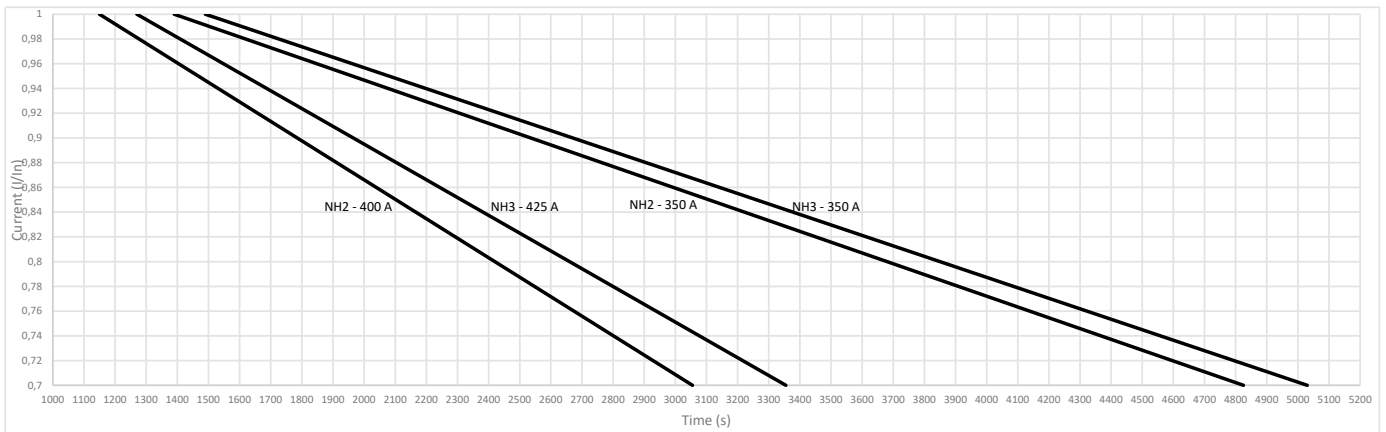
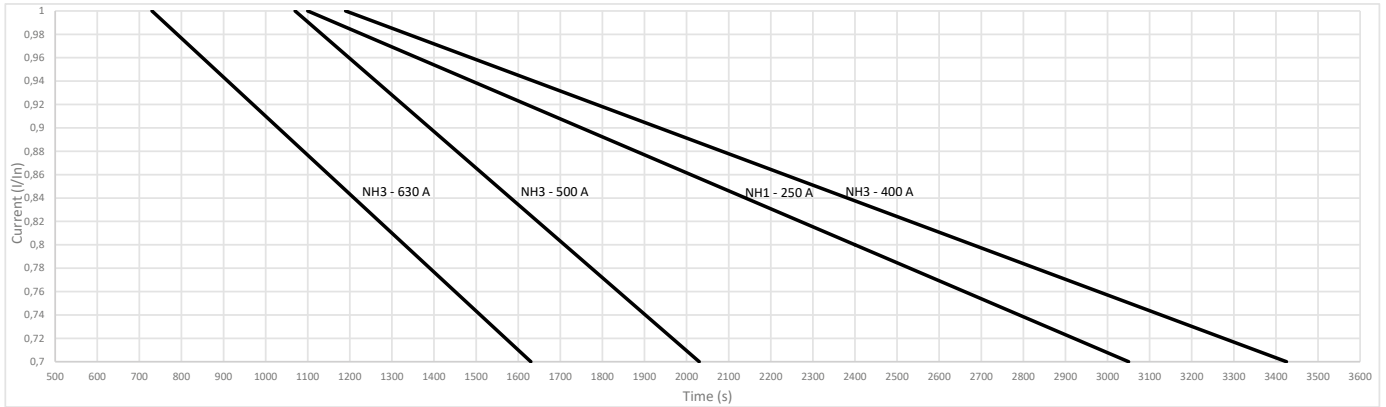


	A	B	C	D	E	F	G	H	J
3L	208	130	37	73	73	60	126	11	13

### I/t characteristics for NH Battery fuses



### Battery fuse NH1,2,3 550V, 700V, 800V d.c.-current loading derating factor in disconnector





# NH battery fuse link 1000V d.c.

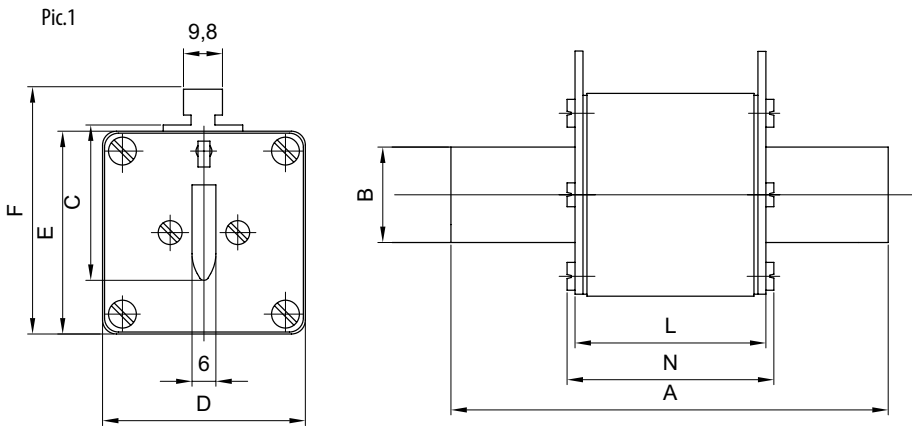
## General characteristics

Rated voltage	1000V d.c. (L/R=1ms)
Breaking capacity	30kA d.c.
Standard	IEC 60269
Application	Fuse link for battery protection.



## NH gBAT fuse link

Size	$I_n$	Standard indicator	$S_{110}$ screw contact	$U_{110}$ screw contact	G screw contact with centre trip indicator for microswitch MK	Power dissipation	Power dissipation $0,7 \times I_n$	Pre-arcing Joule integral	Operating Joule integral	Weight	Pack.
	[A]	pic. 1	pic. 2	pic. 3	pic. 4	[W]	[W]	[A <sup>2</sup> s]	[A <sup>2</sup> s]	[g]	[pcs]
1	200	004110760	/	/	/	27	11	4.400	29.000	500	3/24
	200	004110761	004110769	004110774	004110755	26	11	4.400	29.000		
2	250	004110762	004110770	004110775	004110756	36	15	6.000	38.000	650	1/16 (G type 2/32)
	160	004110763	/	/	/	38	15	5.000	10.000		
	200	004110764	/	/	/	45	18	10.000	20.000		
3	250	004110765	/	/	/	44	18	20.000	40.000	1200	3/15 (G type 2/9)
	315	004110766	004110771	004110776	004110757	54	24	40.000	80.000		
	350	004110767	004110772	004110777	004110758	55	25	45.000	90.000		
	400	004110768	004110773	004110778	004110759	58	24	46.000	138.000		

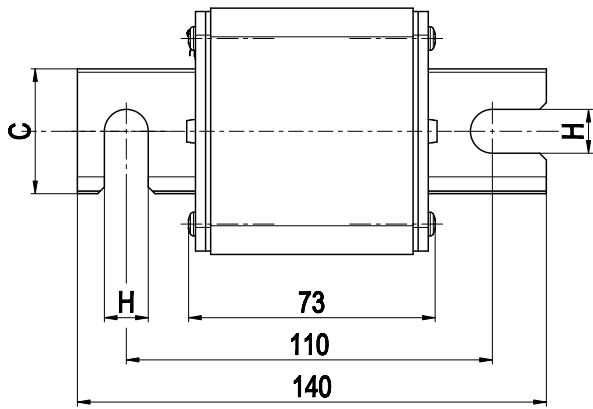


Standard indicator

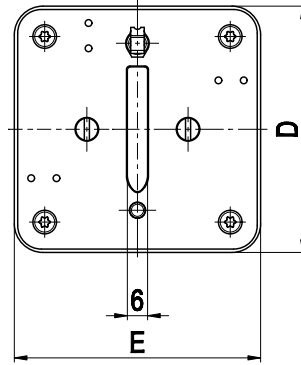
Size	A	B	C	D	E	F	L	N
1	135	24	42	51	51	67	70	74
2	150	30	48	61	61	71	70	74
3	150	37	60	73	73	87	70	74



Pic.2

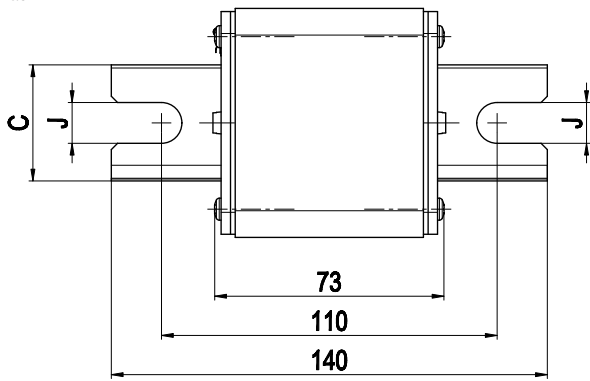


S<sub>110</sub> screw contact

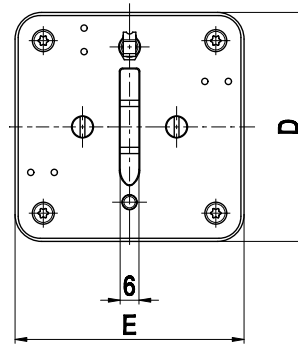


Size	C	E	D	H
2	30	60	60	11
3	37	73	73	11

Pic.3

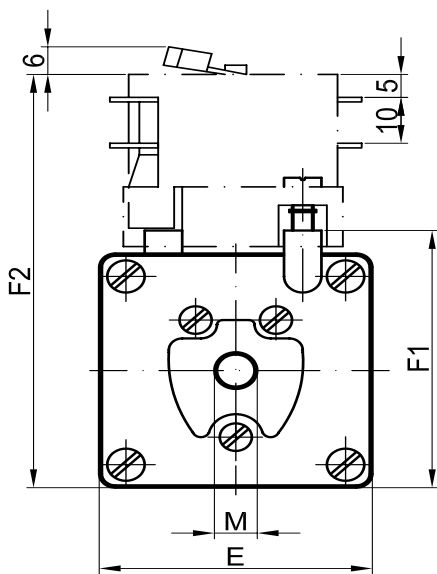


U<sub>110</sub> screw contact

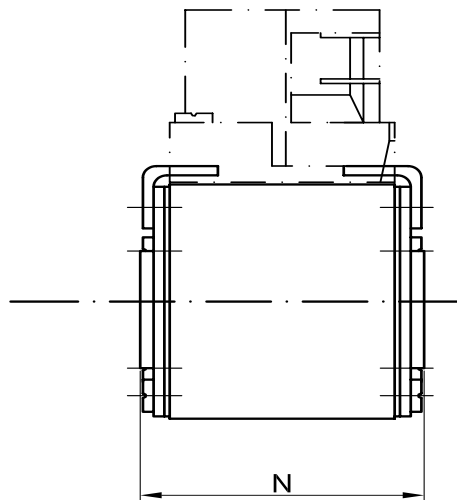


Size	C	J	E	D
2	30	13	60	60
3	37	13	73	73

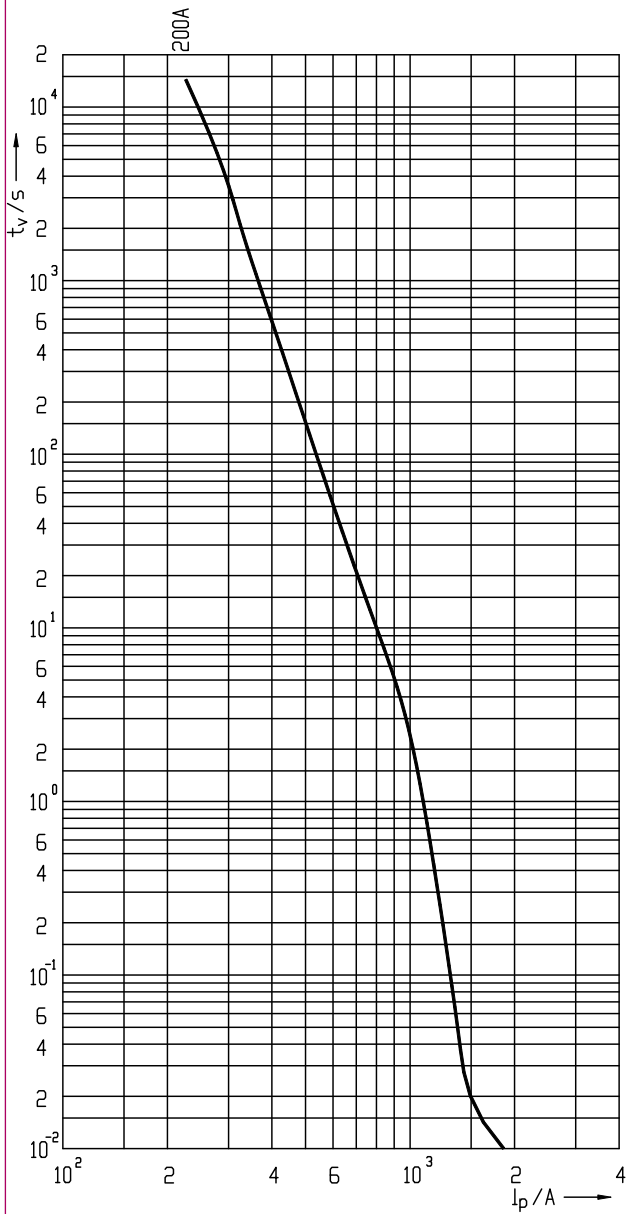
Pic.4



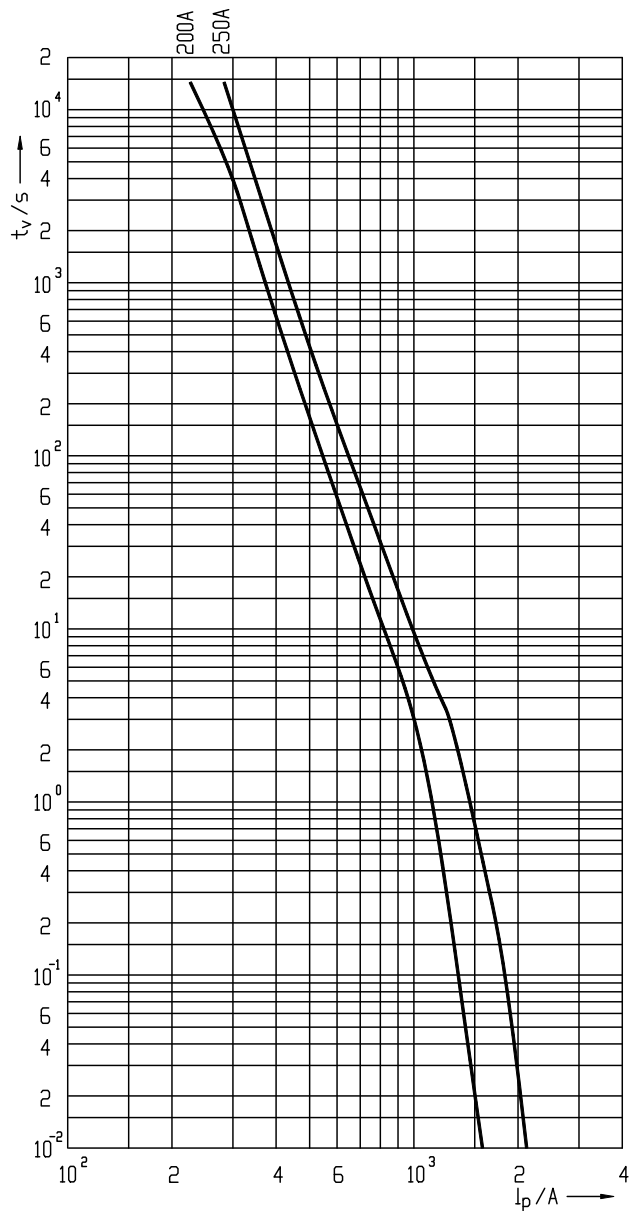
G screw contact



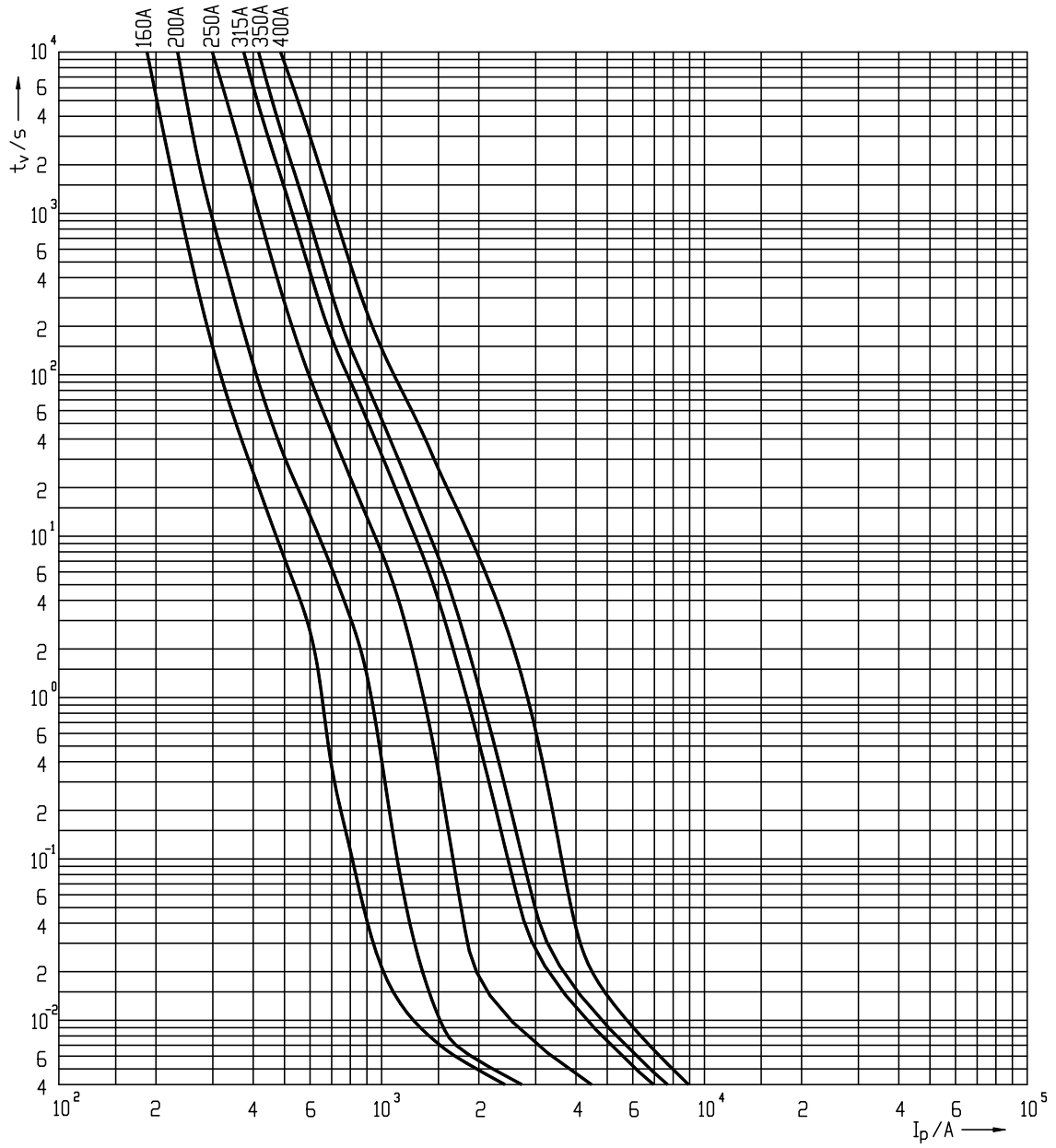
Size	D	E	F1	F2	M	N
2	60	60	65	99	M10	75
3	75	75	80	114	M12	75



NH1  
1000V t-I  
characteristics



NH2  
1000V t-I  
characteristics



NH3 1000V t-I characteristics

# NHXL battery fuse link 1100V d.c.

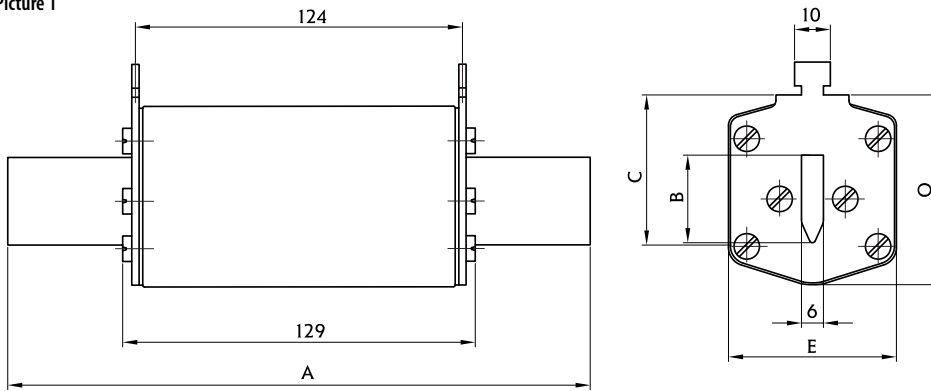
General characteristics	
Rated voltage	1100V d.c. (L/R = 2ms)
Breaking capacity	10 kA d.c.
Standard	UL 2579, UL 248-1
Application	Fuse link for DC application. Applied in fuse base PK XL 1500V.

NH gBAT fuse link										
Size	I <sub>n</sub>	Standard indicator	S <sub>170</sub> screw contact	U <sub>170</sub> screw contact	Power dissipation	Power dissipation 0,7xI <sub>n</sub>	Pre-arcing Joule integral	Operating Joule integral	Weight	Pack.
	[A]	pic. 1	pic. 2	pic. 3	[W]	[W]	[A <sup>2</sup> s]	[A <sup>2</sup> s]	[g]	[pcs]
1XL	63	004723350	004723356	004723362	15,0	6,2	2.720	3.520	750	1/17
	80	004723351	004723357	004723363	17,0	7	4.000	5.500		
	100	004723352	004723358	004723364	20,0	8,2	6.500	9.000		
	125	004723353	004723359	004723365	23,0	9,6	11.000	15.000		
	160	004723354	004723360	004723366	35,0	14,6	19.400	28.640		
	200	004723355	004723361	004723367	32,6	13,9	42.600	83.400		
2XL	200	004724356	004724360	004724364	42,0	17,8	40.000	60.000	1050	1/15
	250	004724357	004724361	004724365	46,0	17,9	85.260	117.400		
	315	004724358	004724362	004724366	53	22	35.000	115.000		
	350*	004724359	004724363	004724367	65,5	27	40.000	130.000		
3L	200	004725315	004725323	004725331	41	17	40.000	59.000	1360	1/10
	250	004725316	004725324	004725332	45	17,7	85.000	115.000		
	315	004725317	004725325	004725333	54,0	25,2	166.800	221.900		
	350	004725318	004725326	004725334	60,5	28,2	175.000	260.000		
	400	004725319	004725327	004725335	67,0	28,8	235.000	345.000		
	450*	004725320	004725328	004725336	98	40	110.000	280.000		
	500*	004725321	004725329	004725337	112	42	150.000	370.000		
630*	004725322	004725330	004725338	119	46	180.000	450.000			

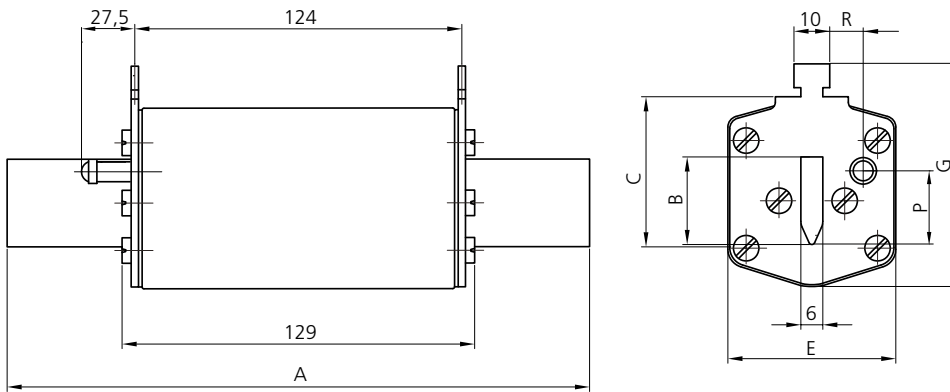
\*L/R=2ms, 30kA d.c.; special dimensions (see next page)



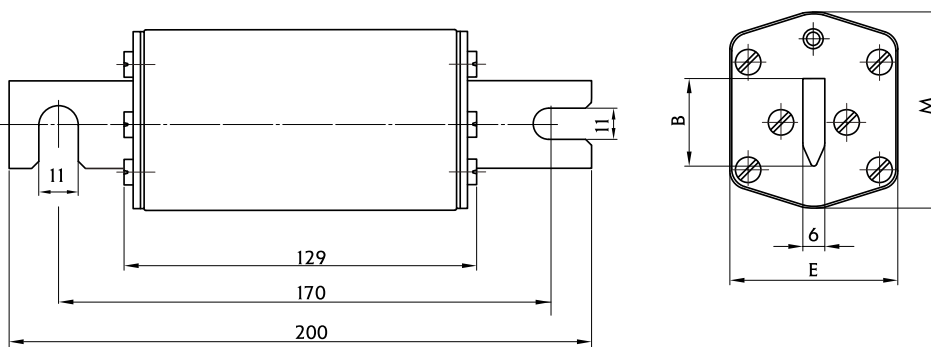
Picture 1



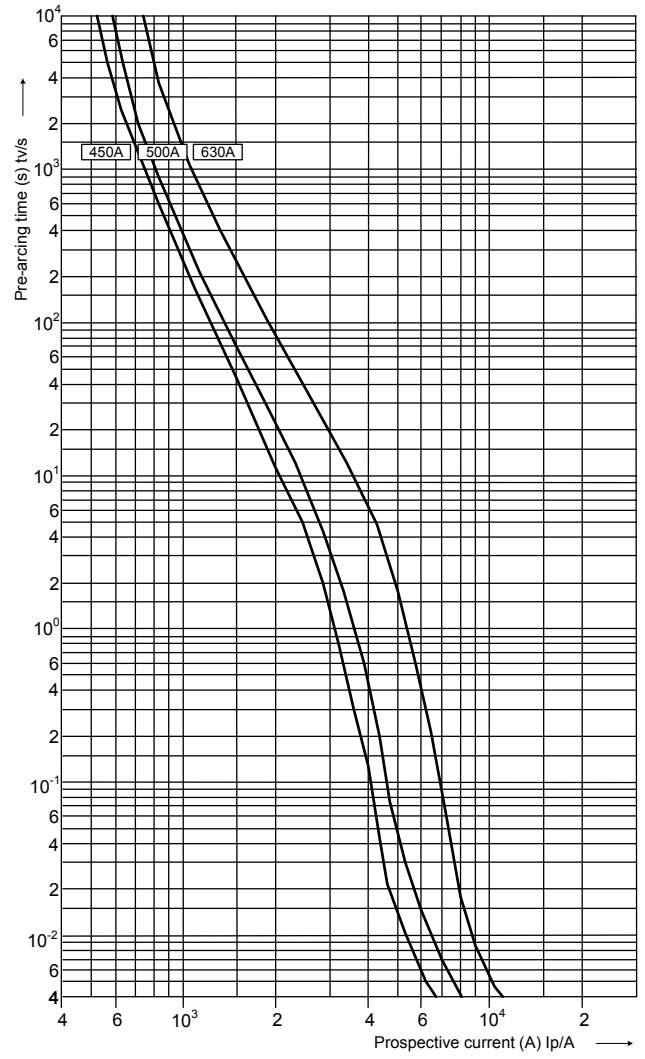
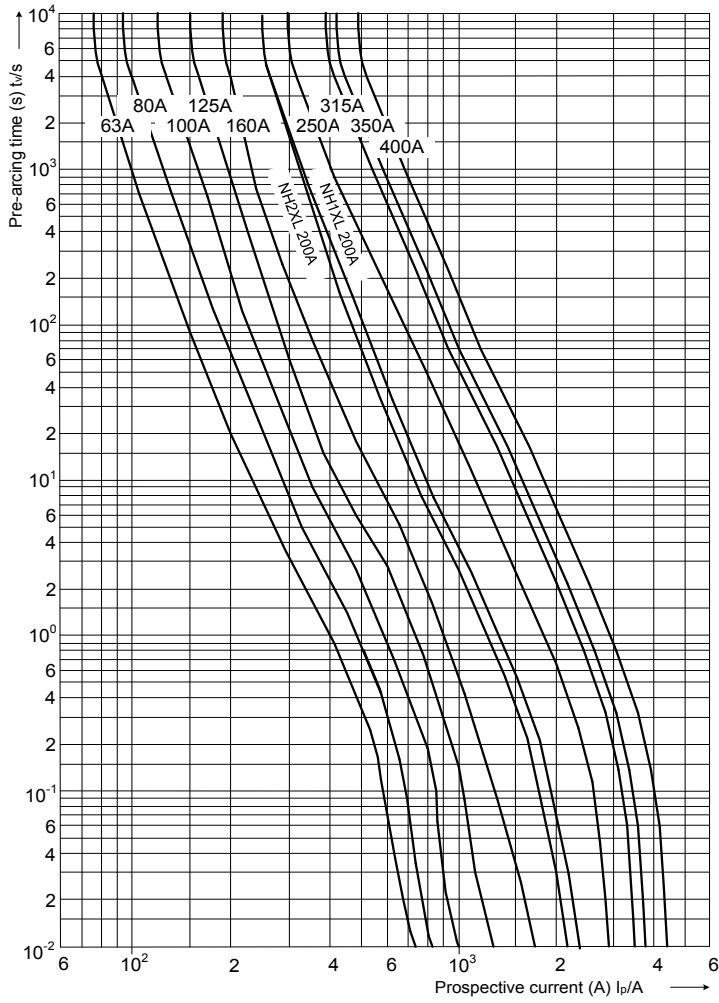
Picture 2



Picture 3

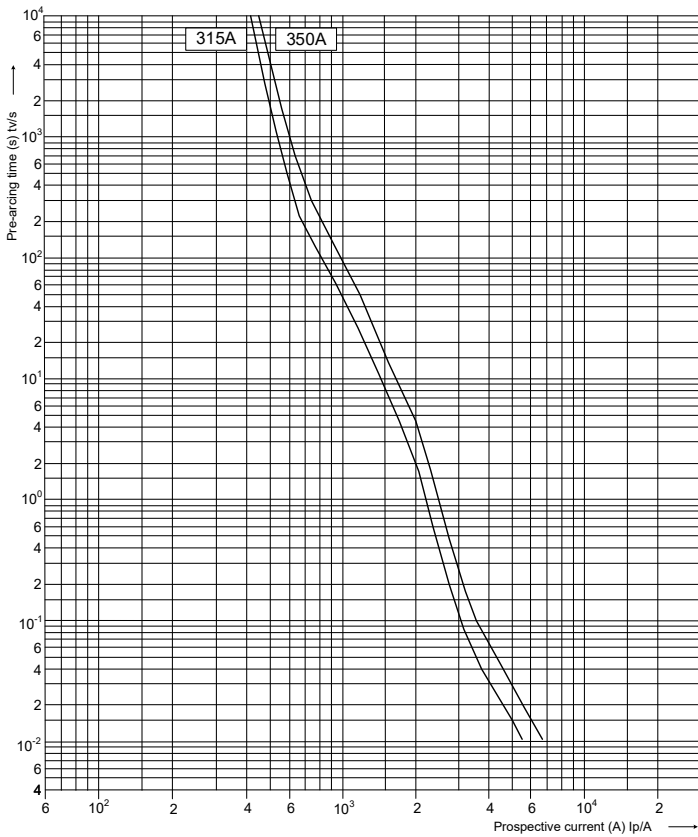


Size	A	B	C	E	G	P	R	M	O
1XL	194	24	40	46	61,5	20,5	13,7	50	52
2XL	209	30	48	54	71	27,3	16,2	59	61
*2XL (350A)	208	30	48	60	/	/	/	60	/
3L	209	37	60	64	82	35,6	17,0	70	74
*3L (450A, 500A, 630A)	209	37	60	73	/	/	/	73	77



**NH2XL 315,350A DC 1100V gPV**

Time-current characteristic



# NH 01 XL battery fuse link 1500V d.c.

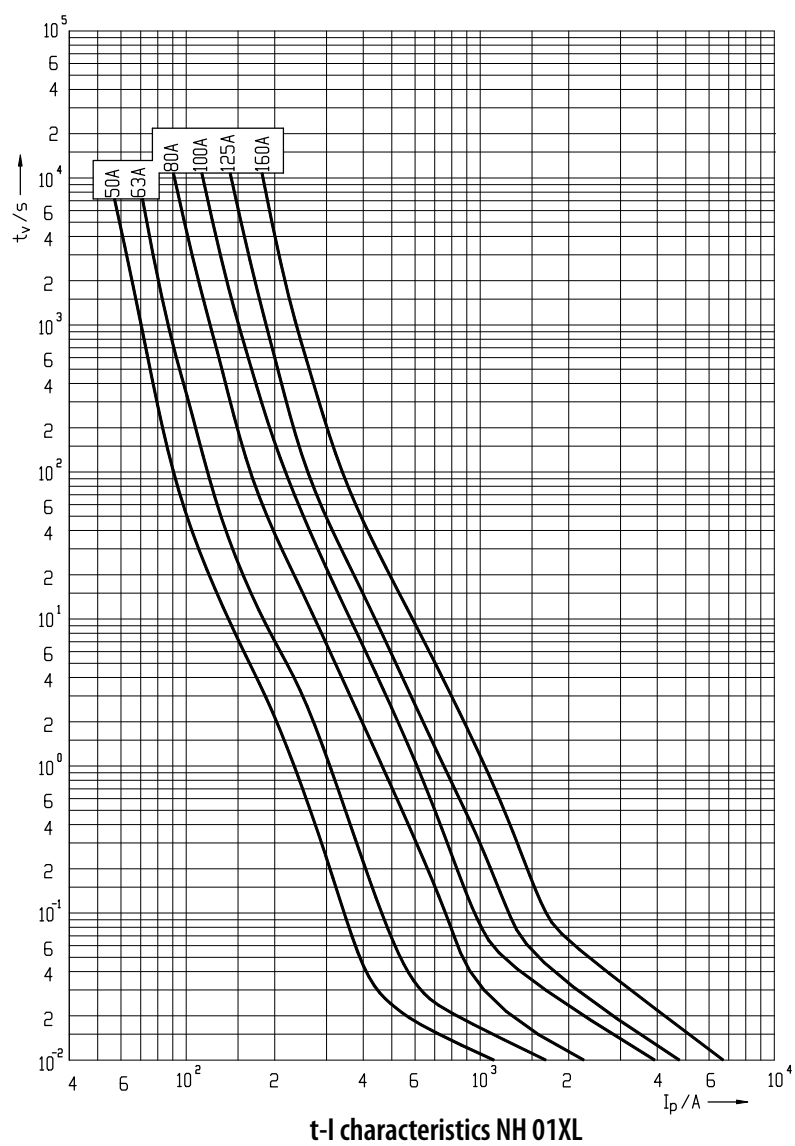
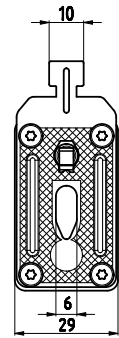
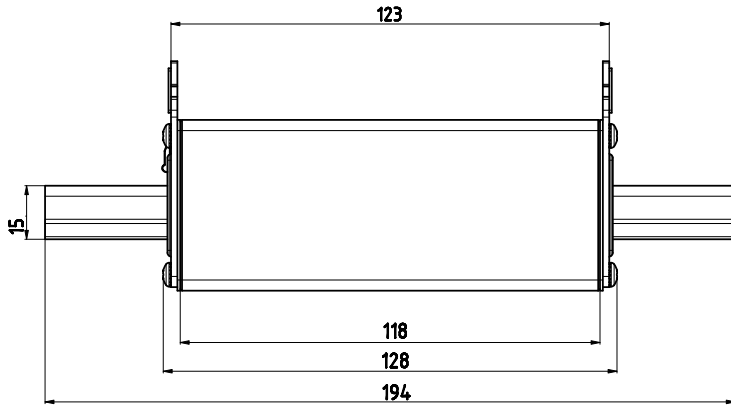


General characteristics	
Rated voltage	1500V d.c. (L/R=3ms)
Breaking capacity	30kA d.c.
Standard	IEC60269
Application	Fuse link for DC application. Applied in fuse base PK1XL.

NH 01XL gBAT fuse link 1500V d.c.								
Size	$I_n$ [A]	Standard indicator	Power dissipation [W]	Power dissipation $0,7 \times I_n$ [W]	Pre-arcing Joule integral [A <sup>2</sup> s]	Operating Joule integral [A <sup>2</sup> s]	Weight [g]	Pack. [pcs]
01XL	50	004110698	18	7	500	3.000	450	3/30
	63	004110699	22	8,5	1.000	6.000		
	80	004110700	21	9	2.000	15.000		
	100	004110701	29	11	3.500	25.000		
	125	004110702	36	13	4.000	30.000		
	160	004110703	46	17	6.000	48.000		







# NHXL battery fuse link 1500V d.c.

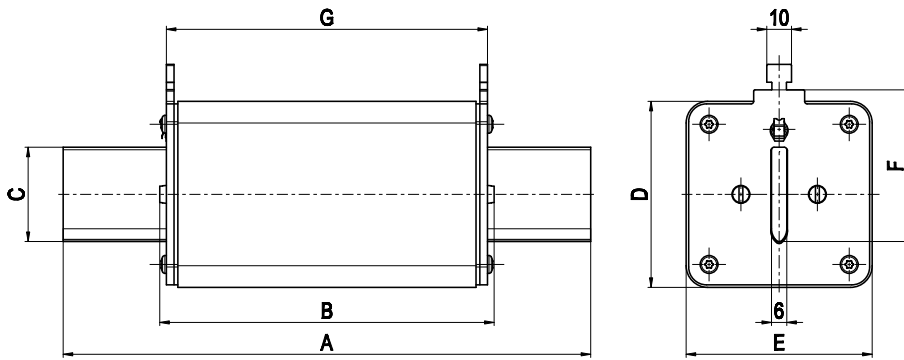


General characteristics	
Rated voltage	1500V d.c. (L/R=3ms)
Breaking capacity	30kA d.c.
Standard	IEC60269-7
Application	Fuse link for DC application. Applied in fuse base PK XL 1500V.

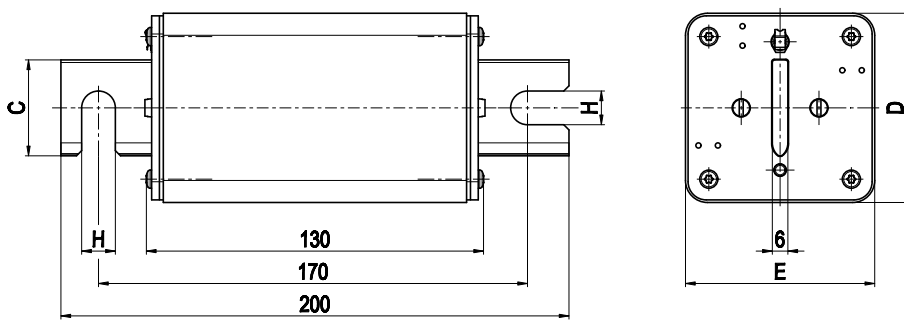
NH gBAT fuse link										
Size	$I_n$	Standard indicator	$S_{170}$ screw contact	$U_{170}$ screw contact	Power dissipation	Power dissipation $0,7 \times I_n$	Pre-arcing Joule integral	Operating Joule integral	Weight	Pack.
	[A]	pic. 1	pic. 2	pic. 3	[W]	[W]	[A <sup>2</sup> s]	[A <sup>2</sup> s]	[g]	[pcs]
1XL	50	004110650	004110657	004110664	14	6	800	3500	950	1/15
	63	004110651	004110658	004110665	14	6,2	1.500	6.000		
	80	004110652	004110659	004110666	16	7	5.000	15.000		
	100	004110653	004110660	004110667	19	8,3	10.000	26.000		
	125	004110654	004110661	004110668	22	9,7	15.000	37.000		
	160	004110655	004110662	004110669	30	13,2	19.000	48.000		
2XL	200	004110656	004110663	004110670	32,5	13,7	22.000	75.000	1350	1/9
	200	004110671	004110673	004110675	36	15,9	42.000	75.000		
	250	004110672	004110674	004110676	44	19,3	73.000	132.000		
3L	315	004110677	004110682	004110687	57	22,2	65.000	300.000	1970	1/9
	350	004110678	004110683	004110688	61	23,7	75.000	350.000		
	400	004110679	004110684	004110689	67	26,8	85.000	450.000		
	450	004110680	004110685	004110690	75	29	130.000	600.000		
	500	004110681	004110686	004110691	79	44,3	160.000	700.000		



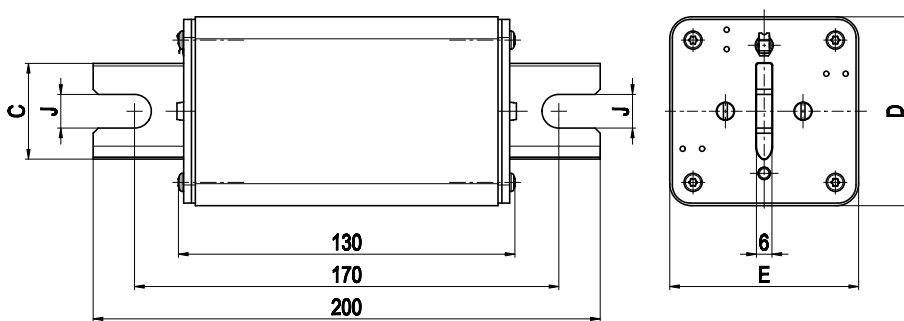
Picture 1



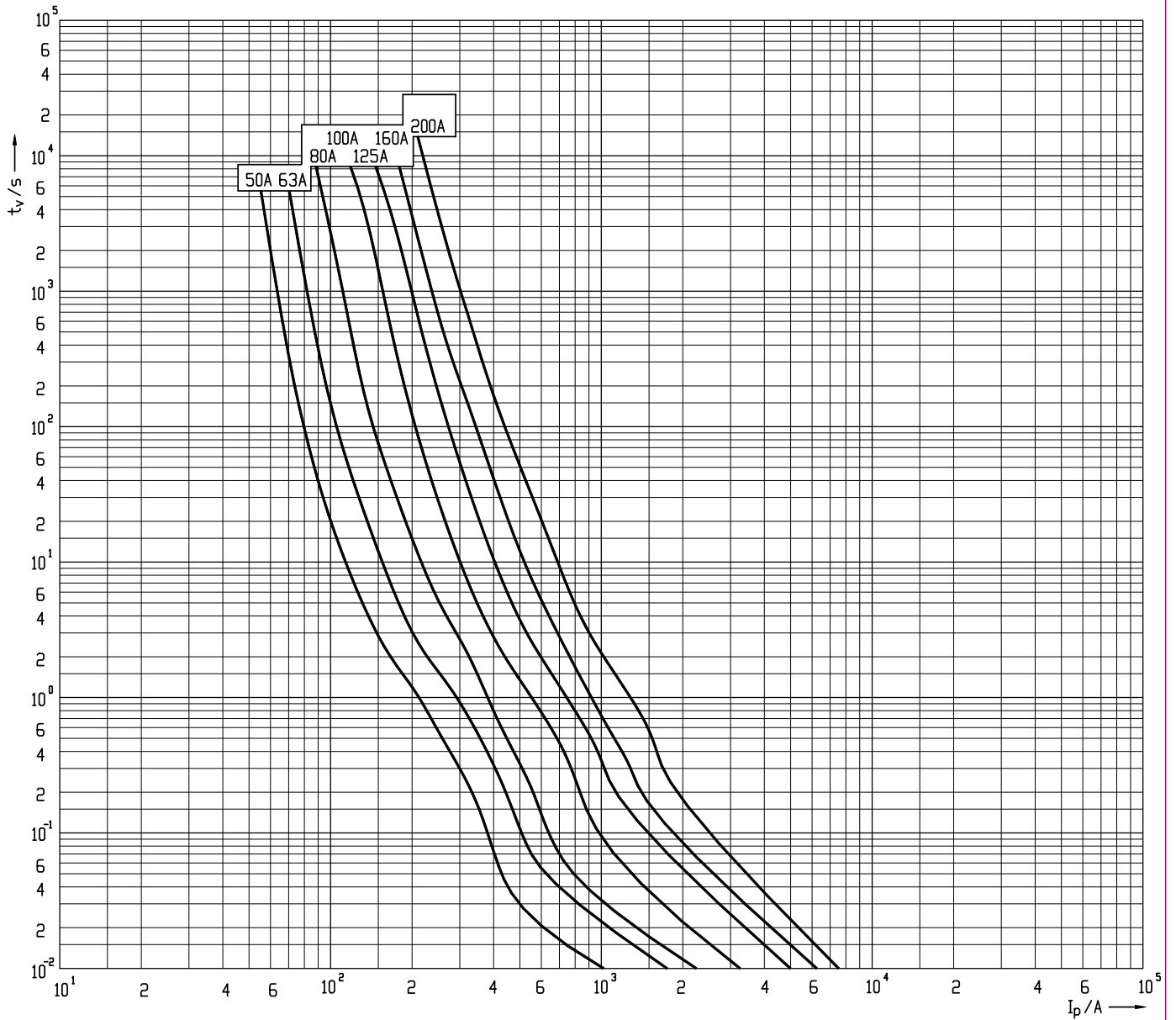
Picture 2



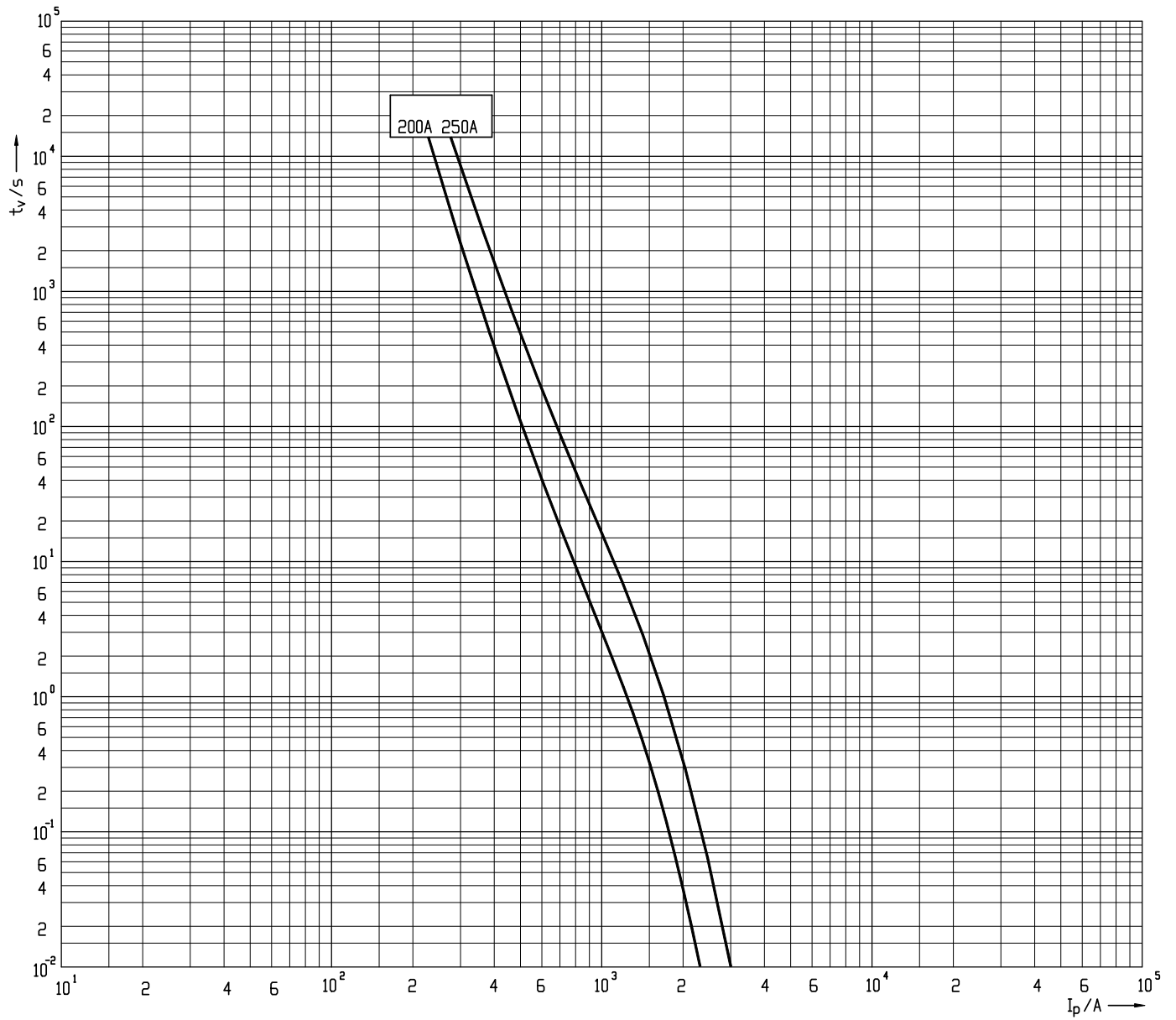
Picture 3



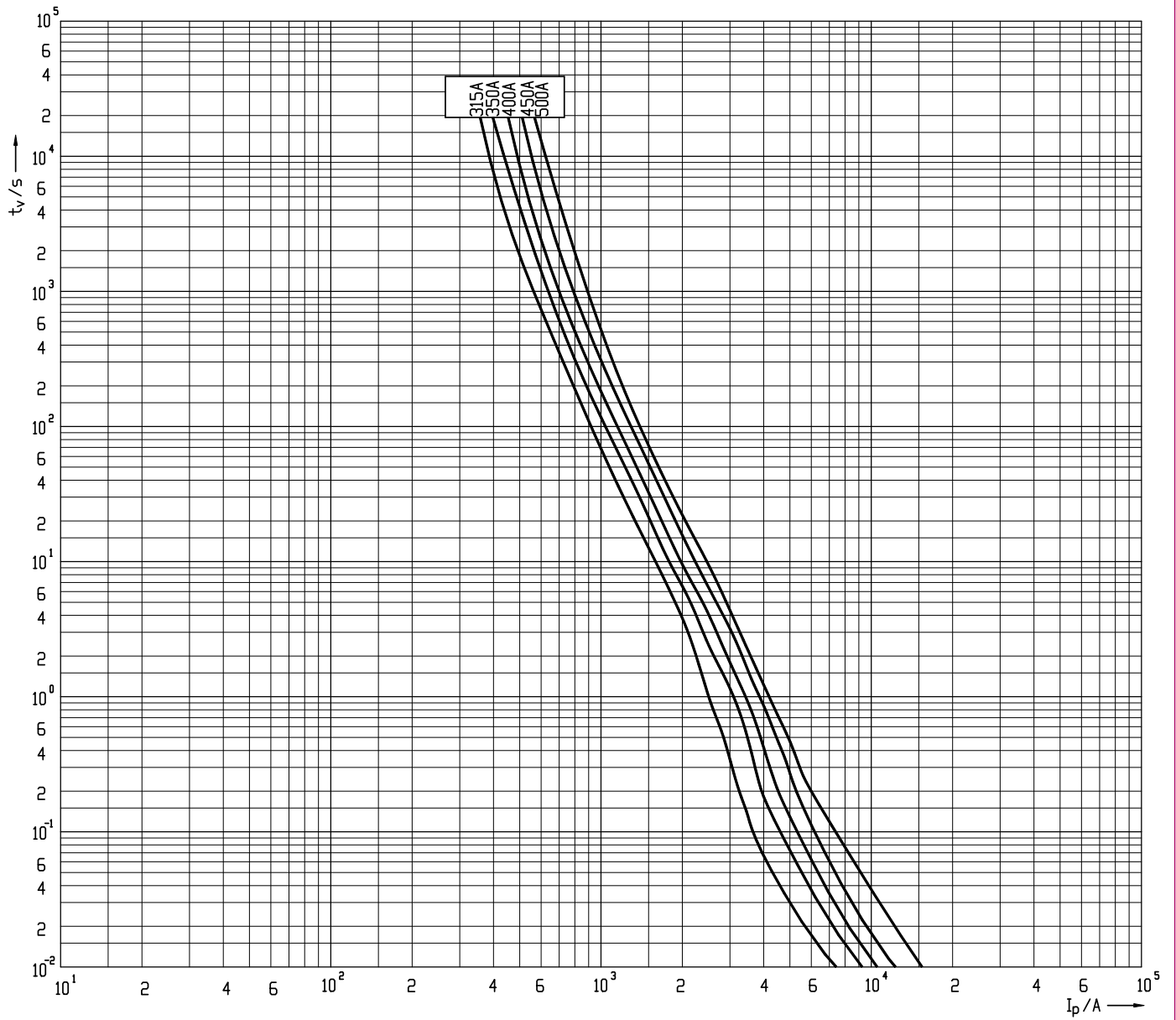
Size	A	B	C	D	E	F	G	H	J
1XL	192	131	24	51	51	43,5	125	11	11
2XL	208	130	30	60	60	48	126	11	13
3L	208	130	37	73	73	60	126	11	13



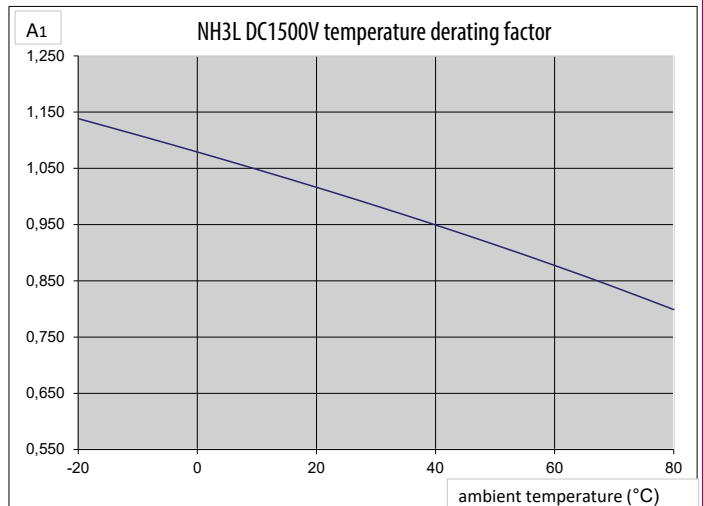
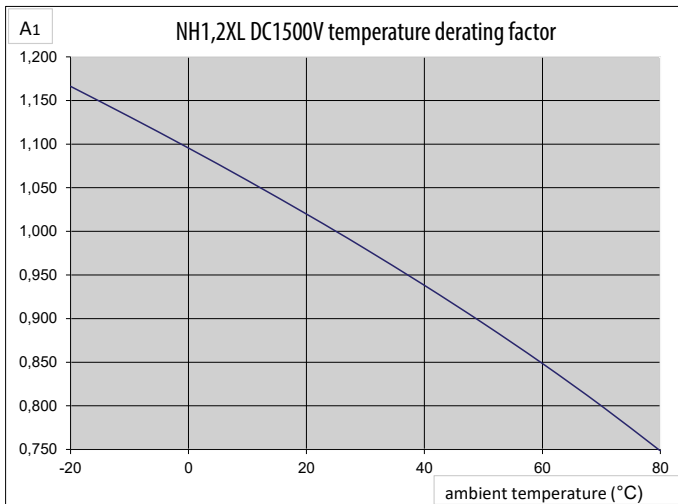
t-I characteristics NH 1XL



t-I characteristics NH 2XL



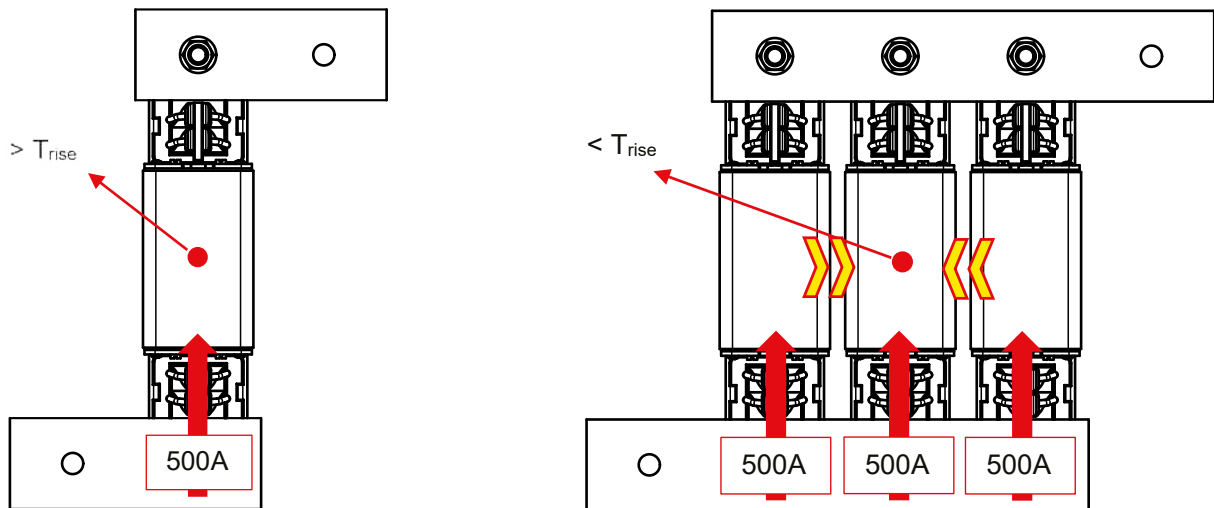
t-I characteristics NH 3L



# Parallel connection of fuse-links to increase the rated current

Rules for parallel connection of fuse-links:

- ✘ The fuse-links have to be the same type, size, and rating.
- ✘ The combination of parallel fuses must be selected by the manufacturer.
- ✘ The current rating of parallel-connected fuse-links is lower than the sum of the single fuse-links ( $n \times I_n > I_{n \text{ parallel}}$ ).
- ✘ The current distribution on all parallel fuse-links must be the same.
- ✘ Parallel fuse-links must be connected as prescribed by the manufacturer.
- ✘ The incoming and outgoing connection must have prescribed cross-section.
- ✘ The values of power dissipation are equal to the sum of values of power dissipation of a single fuse link.
- ✘ The pre-arcing Joule integral is approximately equal to  $n^2 \times I^2 t_{\text{[single fuse-link]}}$ \*
- ✘ Breaking capacity is not larger than  $I$  of a single fuse-link.
- ✘ The cut-off current is approximately equal  $n \times I_{\text{cut-off [single fuse-link]}}$ \*
- ✘ The temperature rise of each parallel fuse-links is higher than the temperature rise of single fuse-link.



Parallel solutions	
Type	Code No.
NH 550V	On request
NH 700V	
NH 800V	
NH 1000V	
NH 1100V	
NH 1500V	

# Fuel Cell Fuses

The characteristics of fuel cell fuses FCF are developed according to standard ISO 8820-7 to meet the needs of fuel cell protection. Fuse links are used in fuel cell applications up to the nominal voltage 450V d.c. and maximum breaking capacity 2000A at time constant up to 10ms. Minimum breaking capacity is  $2 \times I_n$  at nominal voltage.

Without the protection of the specially designed FCF, the high DC voltage could experience severe arcing, thermal incidents or other hazards in the event of the overload or short circuit on fuel cells.

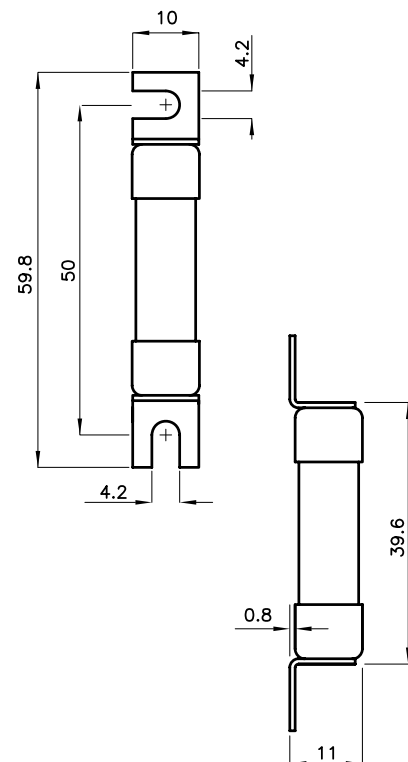
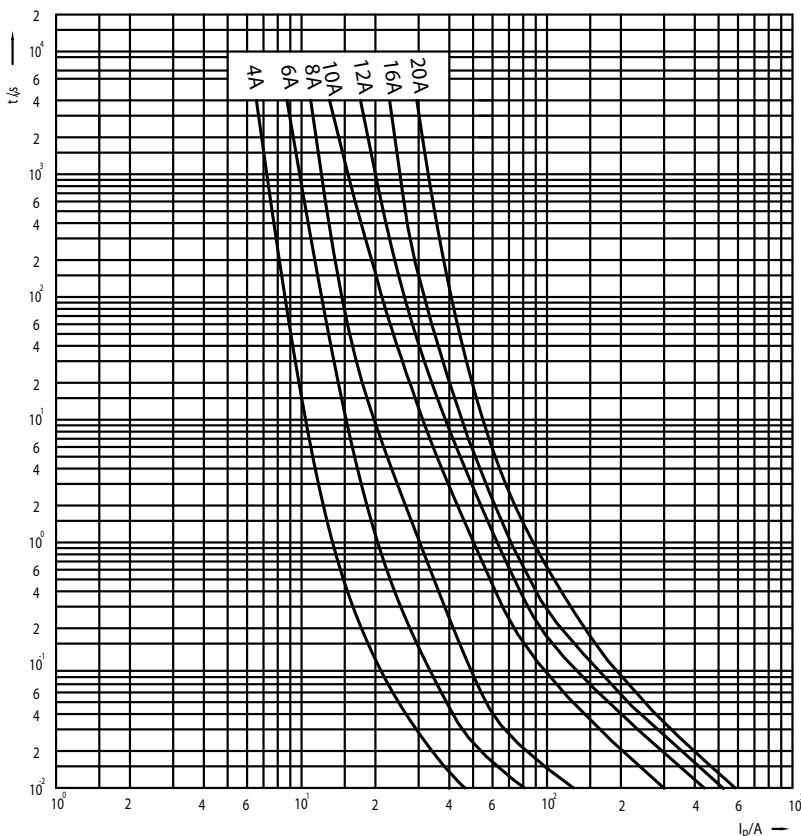
The design of FCF is based on DC fuses. It has been redesigned to fit the needs the fuel cell protection acc. to Standard ISO 8820-7 2007.

Fuel cell fuse-FCF is a reverse current protection device for a fuel cell of a power circuit and it protects the fuel cell from damage caused by reverse current into the fuel cell.

General characteristics	
Rated voltage	450V d.c. (L/R=10ms)
Breaking capacity	2kA d.c.
Standard	ISO 8820-7
Application	For protection of fuel cells



CH 10x38 FUEL CELL FUSE DC								
Size	$I_n$ [A]	Code No. type SU contacts 450V d.c.	Pre-arcing Joule integral [A <sup>2</sup> s] L/R=10ms	Operating Joule integral [A <sup>2</sup> s] L/R=10ms	Power dissipation [0,7 x $I_n$ ] $P_d$ [W]	Power dissipation [1x $I_n$ ] $P_d$ [W]	Weight [g]	Packaging [pcs]
10x38	4	002626202	12	24	0,3	0,6	12	10/380
	6	002626204	26	52	0,4	0,9		
	8	002626206	9	21	0,6	1,3		
	10	002626208	22	55	0,6	1,35		
	12	002626210	61	111	0,6	1,35		
	16	002626212	105	237	0,8	1,8		
	20	002626214	215	371	1,0	2,2		

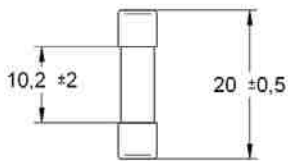




# Minifuses

General characteristics	
Rated voltage	250V a.c.
Characteristic	F (Fast operation)
Standard	IEC 60127-1, IEC 60127-2
Application	Miniature fuses F are used for protection electronic and telecommunication devices, as well as for semiconductors protection such as transistors, diodes, thyristors...

CH Minifuse 5x20 F								
Size	$I_n$ [A]	Type	Code No	Breaking capacity [A]	Max. $\Delta V$ [mV]	Char.	Weight [g]	Packaging [pcs]
5x20	100mA	CH 5x20 F 100mA/250V	006710009	35A	3500	F	5	10
	125mA	CH 5x20 F 125mA/250V	006710010	35A	2000	F		
	160mA	CH 5x20 F 160mA/250V	006710011	35A	2000	F		
	200mA	CH 5x20 F 200mA/250V	006710012	35A	1700	F		
	250mA	CH 5x20 F 250mA/250V	006710013	35A	1400	F		
	315mA	CH 5x20 F 315mA/250V	006710014	35A	1300	F		
	400mA	CH 5x20 F 400mA/250V	006710015	35A	1200	F		
	500mA	CH 5x20 F 500mA/250V	006710002	35A	1000	F		
	630mA	CH 5x20 F 630mA/250V	006710016	35A	650	F		
	800mA	CH 5x20 F 800mA/250V	006710017	35A	240	F		
	1A	CH 5x20 F 1A/250V	006710003	35A	200	F		
	1,25A	CH 5x20 F 1,25A/250V	006710018	35A	200	F		
	1,6A	CH 5x20 F 1,6A/250V	006710019	35A	190	F		
	2A	CH 5x20 F 2A/250V	006710031	35A	170	F		
	2,5A	CH 5x20 F 2,5A/250V	006710021	35A	170	F		
	3,15A	CH 5x20 F 3,15A/250V	006710022	35A	150	F		
	4A	CH 5x20 F 4A/250V	006710023	35A	130	F		
	5A	CH 5x20 F 5A/250V	006710024	35A	130	F		
	6,3A	CH 5x20 F 6,3A/250V	006710025	63A	130	F		
	8A	CH 5x20 F 8A/250V	006710026	63A	120	F		
	10A	CH 5x20 F 10A/250V	006710027	63A	120	F		
	12A	CH 5x20 F 12A/250V	006710028	63A	120	F		
	15A	CH 5x20 F 15A/250V	006710029	63A	120	F		
	20A	CH 5x20 F 20A/250V	006710032	63A	120	F		
	25A	CH 5x20 F 25A/250V	006710033	63A	120	F		

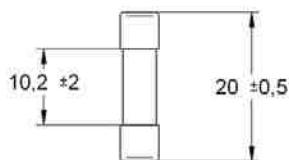


## Test currents of time

Rated current	Test current					
	$2,1 \times I_n$		$2,75 \times I_n$		$4 \times I_n$	
	max	min	max	min	max	$10 \times I_n$ max
32mA ... 100mA	30min	10ms	500ms	3ms	100ms	20ms
100mA ... 6,3A	30min	50ms	2s	10ms	300ms	20ms
pow. 6,3A ... 20A	30min	50ms	2s	10ms	400ms	40ms

General characteristics	
Rated voltage	250V a.c.
Characteristic	T (Delayed operation)
Standard	IEC 60127-1, IEC 60127-2
Application	Miniature fuses T are used for protection electronic and telecommunication devices

CH Minifuse 5x20 T								
Size	$I_n$ [A]	Type	Code No	Breaking capacity [A]	Max. $\Delta V$ [mV]	Char.	Weight [g]	Packaging [pcs]
5x20	32mA	CH 5x20 T 32mA/250V	006710034	35A	5000	T	5	10
	40mA	CH 5x20 T 40mA/250V	006710035	35A	4000	T		
	50mA	CH 5x20 T 50mA/250V	006710036	35A	3500	T		
	63mA	CH 5x20 T 63mA/250V	006710037	35A	3000	T		
	80mA	CH 5x20 T 80mA/250V	006710038	35A	3000	T		
	100mA	CH 5x20 T 100mA/250V	006710039	35A	2500	T		
	125mA	CH 5x20 T 125mA/250V	006710040	35A	2000	T		
	160mA	CH 5x20 T 160mA/250V	006710004	35A	1900	T		
	200mA	CH 5x20 T 200mA/250V	006710041	35A	1500	T		
	250mA	CH 5x20 T 250mA/250V	006710042	35A	1300	T		
	315mA	CH 5x20 T 315mA/250V	006710005	35A	1100	T		
	400mA	CH 5x20 T 400mA/250V	006710043	35A	1000	T		
	500mA	CH 5x20 T 500mA/250V	006710044	35A	900	T		
	630mA	CH 5x20 T 630mA/250V	006710045	35A	300	T		
	800mA	CH 5x20 T 800mA/250V	006710046	35A	250	T		
	1A	CH 5x20 T 1A/250V	006710006	35A	150	T		
	1,25A	CH 5x20 T 1,25A/250V	006710047	35A	150	T		
	1,6A	CH 5x20 T 1,6A/250V	006710048	35A	150	T		
	2A	CH 5x20 T 2A/250V	006710049	35A	150	T		
	2,5A	CH 5x20 T 2,5A/250V	006710050	35A	120	T		
	3,15A	CH 5x20 T 3,15A/250V	006710051	35A	100	T		
	4A	CH 5x20 T 4A/250V	006710052	40A	100	T		
	5A	CH 5x20 T 5A/250V	006710053	50A	100	T		
	6,3A	CH 5x20 T 6,3A/250V	006710054	63A	100	T		
	8A	CH 5x20 T 8A/250V	006710007	63A	100	T		
	10A	CH 5x20 T 10A/250V	006710008	63A	100	T		
	12A	CH 5x20 T 12A/250V	006710055	63A	90	T		
	15A	CH 5x20 T 15A/250V	006710056	63A	90	T		
20A	CH 5x20 T 20A/250V	006710057	63A	90	T			
25A	CH 5x20 T 25A/250V	006710058	63A	90	T			

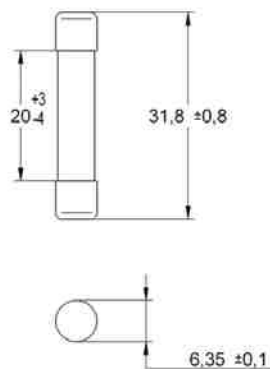


### Test currents of time

Rated current	Test current						
	$2,1 \times I_n$		$2,75 \times I_n$		$4 \times I_n$		$10 \times I_n$
	max	min	max	min	max	min	max
32mA ... 100mA	2min	200ms	10s	40ms	3s	10ms	300ms
125mA ... 25A	2min	600ms	10s	150ms	3s	20ms	300ms

General characteristics	
Rated voltage	250V a.c.
Characteristic	F (Fast operation)
Standard	IEC 60127-1, IEC 60127-2
Application	Miniature fuses F are used for protection electronic and telecommunication devices, as well as for semiconductors protection such as transistors, diods, tiristors...

CH Minifuse 6,3x32 F								
Size	$I_n$ [A]	Type	Code No	Breaking capacity [A]	Max. $\Delta V$ [mV]	Char.	Weight [g]	Packaging [pcs]
6,3x32	50mA	CH 6,3x32 F 50mA/250V	006710059	35	3700	F	5	10
	63mA	CH 6,3x32 F 63mA/250V	006710060	35	3700	F		
	80mA	CH 6,3x32 F 80mA/250V	006710061	35	3500	F		
	100mA	CH 6,3x32 F 100mA/250V	006710062	35	3500	F		
	125mA	CH 6,3x32 F 125mA/250V	006710063	35	2800	F		
	160mA	CH 6,3x32 F 160mA/250V	006710064	35	2500	F		
	200mA	CH 6,3x32 F 200mA/250V	006710065	35	2000	F		
	250mA	CH 6,3x32 F 250mA/250V	006710066	35	2000	F		
	315mA	CH 6,3x32 F 315mA/250V	006710067	35	1700	F		
	400mA	CH 6,3x32 F 400mA/250V	006710068	35	1500	F		
	500mA	CH 6,3x32 F 500mA/250V	006710069	35	1200	F		
	630mA	CH 6,3x32 F 630mA/250V	006710070	35	1100	F		
	800mA	CH 6,3x32 F 800mA/250V	006710071	35	800	F		
	1A	CH 6,3x32 F 1A/250V	006710072	35	350	F		
	1,25A	CH 6,3x32 F 1,25A/250V	006710073	100	250	F		
	1,6A	CH 6,3x32 F 1,6A/250V	006710074	100	250	F		
	2A	CH 6,3x32 F 2A/250V	006710075	100	180	F		
	2,5A	CH 6,3x32 F 2,5A/250V	006710076	100	180	F		
	3,15A	CH 6,3x32 F 3,15A/250V	006710077	100	150	F		
	4A	CH 6,3x32 F 4A/250V	006710078	200	150	F		
	5A	CH 6,3x32 F 5A/250V	006710079	200	150	F		
	6,3A	CH 6,3x32 F 6,3A/250V	006710080	200	150	F		
	8A	CH 6,3x32 F 8A/250V	006710081	200	120	F		
	10A	CH 6,3x32 F 10A/250V	006710082	200	100	F		
	12A	CH 6,3x32 F 12A/250V	006710083	200	100	F		
15A	CH 6,3x32 F 15A/250V	006710084	200	100	F			
20A	CH 6,3x32 F 20A/250V	006710085	200	100	F			
25A	CH 6,3x32 F 25A/250V	006710086	200	100	F			



### Test currents of time

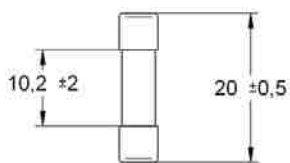
Rated current	Test current					
	$2,1x I_n$ max	$2,75x I_n$		$4x I_n$		$10x I_n$ max
		min	max	min	max	
50mA ... 100mA	20min	2ms	200ms	1ms	30ms	5ms
pow. 100mA ... 25A	20min	20ms	1500ms	8ms	400ms	80ms

### General characteristics

Rated voltage	250V a.c.
Characteristic	T (Delayed operation)
Standard	IEC 60127-1, IEC 60127-2
Application	Miniature fuses T are used for protection electronic devices

### CH Minifuse 6,3x32 T

Size	$I_n$ [A]	Type	Code No	Breaking capacity [A]	Max. $\Delta V$ [mV]	Char.	Weight [g]	Packaging [pcs]
6,3x32	32mA	CH 6,3x32 T 32mA/250V	006710087	35	5500	T	5	10
	50mA	CH 6,3x32 T 50mA/250V	006710088	35	4400	T		
	63mA	CH 6,3x32 T 63mA/250V	006710089	35	3700	T		
	80mA	CH 6,3x32 T 80mA/250V	006710090	35	3500	T		
	100mA	CH 6,3x32 T 100mA/250V	006710091	35	3300	T		
	125mA	CH 6,3x32 T 125mA/250V	006710092	35	2800	T		
	160mA	CH 6,3x32 T 160mA/250V	006710093	35	2400	T		
	200mA	CH 6,3x32 T 200mA/250V	006710094	35	1900	T		
	250mA	CH 6,3x32 T 250mA/250V	006710095	35	1600	T		
	315mA	CH 6,3x32 T 315mA/250V	006710096	35	1400	T		
	400mA	CH 6,3x32 T 400mA/250V	006710097	35	1200	T		
	500mA	CH 6,3x32 T 500mA/250V	006710098	35	1000	T		
	630mA	CH 6,3x32 T 630mA/250V	006710099	35	1000	T		
	800mA	CH 6,3x32 T 800mA/250V	006710100	35	500	T		
	1A	CH 6,3x32 T 1A/250V	006710101	35	350	T		
	1,25A	CH 6,3x32 T 1,25A/250V	006710102	100	250	T		
	1,6A	CH 6,3x32 T 1,6A/250V	006710103	100	250	T		
	2A	CH 6,3x32 T 2A/250V	006710104	100	180	T		
	2,5A	CH 6,3x32 T 2,5A/250V	006710105	100	180	T		
	3,15A	CH 6,3x32 T 3,15A/250V	006710106	100	130	T		
4A	CH 6,3x32 T 4A/250V	006710107	200	130	T			
5A	CH 6,3x32 T 5A/250V	006710108	200	130	T			
6,3A	CH 6,3x32 T 6,3A/250V	006710109	200	100	T			
8A	CH 6,3x32 T 8A/250V	006710110	200	100	T			
10A	CH 6,3x32 T 10A/250V	006710111	200	100	T			
12A	CH 6,3x32 T 12A/250V	006710112	200	100	T			
15A	CH 6,3x32 T 15A/250V	006710113	200	100	T			
20A	CH 6,3x32 T 20A/250V	006710114	200	100	T			



### Test currents of time

Rated current	Test current					
	$2,1 \times I_n$ max	$2,75 \times I_n$		$4 \times I_n$		$10 \times I_n$ max
	min	max	min	max		
50mA ... 100mA	20s	2ms	200ms	1ms	30ms	5ms
pow. 100mA ... 20A	20s	20ms	1500ms	8ms	400ms	80ms

General characteristics	
Rated voltage	250V a.c.
Breaking capacity	1,5 kA
Characteristic	FF (Very fast operation), HF
Standard	IEC 60127-1, IEC 60127-2
Application	Miniature fuses HF are used for protection electronic devices. Miniature fuses FF are used for semiconductors protection such as transistors, diods, tiristors...

CH MiniFFuse 5x20 FF & HF								
Size	$I_n$ [A]	Type	Code No	Operating Joule integral $I^2t$ [A <sup>2</sup> s]	Power dissipation $P_d$ [W]	Char.	Weight [g]	Packaging [pcs]
5x20 FF	500mA	CH 5X20 FF 500mA/250V	006710115	0,12	0,4	FF	5	10
	630mA	CH 5X20 FF 630mA/250V	006710116	0,17	0,44	FF		
	800mA	CH 5X20 FF 800mA/250V	006710117	0,26	0,48	FF		
	1A	CH 5X20 FF 1A/250V	006710118	0,17	0,75	FF		
	1,25A	CH 5X20 FF 1,25A/250V	006710119	0,26	0,94	FF		
	1,6A	CH 5X20 FF 1,6A/250V	006710120	0,31	1,12	FF		
	2A	CH 5X20 FF 2A/250V	006710121	0,64	1,3	FF		
	2,5A	CH 5X20 FF 2,5A/250V	006710122	0,88	1,5	FF		
	3,15A	CH 5X20 FF 3,15A/250V	006710123	4,6	1,73	FF		
	4A	CH 5X20 FF 4A/250V	006710124	3,2	2	FF		
	5A	CH 5X20 FF 5A/250V	006710125	5,9	2,5	FF		
	6,3A	CH 5X20 FF 6,3A/250V	006710126	10	2,84	FF		
	8A	CH 5X20 FF 8A/250V	006710127	19	3,2	FF		
	10A	CH 5X20 FF 10A/250V	006710128	30	4	FF		
12,5A	CH 5X20 FF 12,5A/250V	006710129	44	4,96	FF			
5x20 HF	50mA	CH 5X20 HF 50mA/250V	006710192	0,00022	0,2	HF		
	63mA	CH 5X20 HF 63mA/250V	006710193	0,00037	0,25	HF		
	80mA	CH 5X20 HF 80mA/250V	006710194	0,00073	0,26	HF		
	100mA	CH 5X20 HF 100mA/250V	006710195	0,0011	0,26	HF		
	125mA	CH 5X20 HF 125mA/250V	006710196	0,0018	0,31	HF		
	160mA	CH 5X20 HF 160mA/250V	006710197	0,0034	0,3	HF		
	200mA	CH 5X20 HF 200mA/250V	006710198	0,007	0,34	HF		
	250mA	CH 5X20 HF 250mA/250V	006710199	0,031	0,7	HF		
	315mA	CH 5X20 HF 315mA/250V	006710200	0,049	0,79	HF		
	400mA	CH 5X20 HF 400mA/250V	006710201	0,062	0,8	HF		
	500mA	CH 5X20 HF 500mA/250V	006710202	0,15	0,9	HF		
	630mA	CH 5X20 HF 630mA/250V	006710203	0,25	0,95	HF		
	800mA	CH 5X20 HF 800mA/250V	006710204	0,6	0,96	HF		
	1A	CH 5X20 HF 1A/250V	006710205	0,95	1	HF		
	1,25A	CH 5X20 HF 1,25A/250V	006710206	1,6	1	HF		
	1,6A	CH 5X20 HF 1,6A/250V	006710207	2,7	0,96	HF		
	2A	CH 5X20 HF 2A/250V	006710208	4,2	1	HF		
	2,5A	CH 5X20 HF 2,5A/250V	006710209	7,8	1	HF		
	3,15A	CH 5X20 HF 3,15A/250V	006710210	12	1,1	HF		
	4A	CH 5X20 HF 4A/250V	006710211	20	1,2	HF		
5A	CH 5X20 HF 5A/250V	006710212	32	1,25	HF			
6,3A	CH 5X20 HF 6,3A/250V	006710213	51	1,26	HF			
8A	CH 5X20 HF 8A/250V	006710214	67	1,6	HF			
10A	CH 5X20 HF 10A/250V	006710215	121	2	HF			

### Test currents of time

Rated current	Test current					
	2,1x $I_n$ max	2,75x $I_n$		4x $I_n$		10x $I_n$ max
		min	max	min	max	
500mA ... 12,5A FF	<1s	2ms	100ms	1ms	15ms	2ms
50mA ... 3,15A HF	<30min	10ms	2s	3ms	300ms	<20ms
54A ... 10A HF	<30min	10ms	3s	3ms	300ms	<20ms

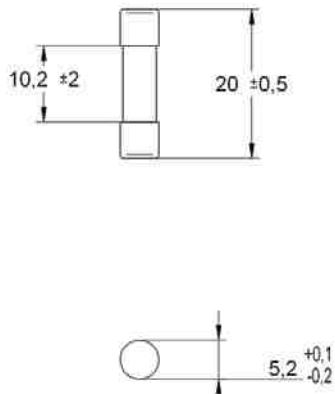


### General characteristics

Rated voltage	250V a.c.
Breaking capacity	1,5 kA
Characteristic	HT (Delayed operation)
Standard	IEC 60127-1, IEC 60127-2
Application	Miniature fuses HT are used for protection electronic devices

### CH Minifuse 5x20 HT

Size	$I_n$ [A]	Type	Code No	Operating Joule integral $I^2t$ [A <sup>2</sup> s]	Power dissipation $P_d$ [W]	Char.	Weight [g]	Packaging [pcs]
5x20	100mA	CH 5x20 HT 100mA/250V	006710288	0,029	0,25	HT	5	10
	125mA	CH 5x20 HT 125mA/250V	006710289	0,045	0,28	HT		
	160mA	CH 5x20 HT 160mA/250V	006710290	0,08	0,34	HT		
	200mA	CH 5x20 HT 200mA/250V	006710291	0,14	0,34	HT		
	250mA	CH 5x20 HT 250mA/250V	006710292	0,074	0,38	HT		
	315mA	CH 5x20 HT 315mA/250V	006710293	0,12	0,35	HT		
	400mA	CH 5x20 HT 400mA/250V	006710294	0,31	0,34	HT		
	500mA	CH 5x20 HT 500mA/250V	006710295	0,49	0,38	HT		
	630mA	CH 5x20 HT 630mA/250V	006710296	0,78	0,38	HT		
	800mA	CH 5x20 HT 800mA/250V	006710297	1,5	0,28	HT		
	1A	CH 5x20 HT 1A/250V	006710298	2,3	0,25	HT		
	1,25A	CH 5x20 HT 1,25A/250V	006710299	3,6	0,31	HT		
	1,6A	CH 5x20 HT 1,6A/250V	006710300	5,9	0,32	HT		
	2A	CH 5x20 HT 2A/250V	006710301	12	0,38	HT		
	2,5A	CH 5x20 HT 2,5A/250V	006710302	23	0,45	HT		
	3,15A	CH 5x20 HT 3,15A/250V	006710303	25	0,44	HT		
	4A	CH 5x20 HT 4A/250V	006710304	51	0,4	HT		
	5A	CH 5x20 HT 5A/250V	006710305	80	0,5	HT		
	6,3A	CH 5x20 HT 6,3A/250V	006710306	135	0,63	HT		
8A	CH 5x20 HT 8A/250V	006710307	205	0,8	HT			
10A	CH 5x20 HT 10A/250V	006710308	352	1	HT			



### Test currents of time

Rated current	Test current					
	2,1x $I_n$ max	2,75x $I_n$ min	2,75x $I_n$ max	4x $I_n$ min	4x $I_n$ max	10x $I_n$ max
50mA ... 3,15A	<30min	1s	80s	95ms	5s	10ms-100ms
pow. 100mA ... 20A	<30min	1s	80s	150ms	5s	20ms-100ms

General characteristics	
Rated voltage	500V a.c.
Breaking capacity	1,5 kA
Characteristic	FF (Very fast operation), HF
Standard	IEC 60127-1, IEC 60127-2
Application	Miniature fuses HF are used for protection electronic devices. Miniature fuses FF are used for semiconductors protection such as transistors, diods, tiristors...

CH MiniFFuse 6,3x32 FF & HF								
Size	$I_n$ [A]	Type	Code No	Operating Joule integral $I^2t$ [A <sup>2</sup> s]	Power dissipation $P_d$ [W]	Char.	Weight [g]	Packaging [pcs]
6,3x32 FF	1A	CH 6,3x32 FF 1A/500V	006710130	0,14	0,4	FF	10	10
	1,25A	CH 6,3x32 FF 1,25A/500V	006710131	0,22	0,44	FF		
	1,6A	CH 6,3x32 FF 1,6A/500V	006710132	0,31	0,48	FF		
	2A	CH 6,3x32 FF 2A/500V	006710133	0,64	0,75	FF		
	2,5A	CH 6,3x32 FF 2,5A/500V	006710134	1,2	0,94	FF		
	3,15A	CH 6,3x32 FF 3,15A/500V	006710135	2	1,12	FF		
	4A	CH 6,3x32 FF 4A/500V	006710136	5	1,3	FF		
	5A	CH 6,3x32 FF 4A/500V	006710137	10	1,5	FF		
	6,3A	CH 6,3x32 FF 6,3A/500V	006710138	3	1,73	FF		
	8A	CH 6,3x32 FF 8A/500V	006710139	6,5	2	FF		
	10A	CH 6,3x32 FF 10A/500V	006710140	12	2,5	FF		
	12,5A	CH 6,3x32 FF 12,5A/500V	006710141	18	2,84	FF		
16A	CH 6,3x32 FF 16A/500V	006710142	31	3,2	FF			
6,3x32 HF	315mA	CH 6,3x32 HF 315mA/500V	006710216	0,0025	0,2	HF		
	400mA	CH 6,3x32 HF 400mA/500V	006710217	0,0045	0,25	HF		
	500mA	CH 6,3x32 HF 500mA/500V	006710218	0,009	0,26	HF		
	630mA	CH 6,3x32 HF 630mA/500V	006710219	0,015	0,26	HF		
	800mA	CH 6,3x32 HF 800mA/500V	006710220	0,3	0,31	HF		
	1A	CH 6,3x32 HF 1A/500V	006710221	0,4	0,3	HF		
	1,25A	CH 6,3x32 HF 1,25A/500V	006710222	0,8	0,34	HF		
	1,6A	CH 6,3x32 HF 1,6A/500V	006710223	1,5	0,7	HF		
	2A	CH 6,3x32 HF 2A/500V	006710224	2,5	0,79	HF		
	2,5A	CH 6,3x32 HF 2,5A/500V	006710225	5	0,8	HF		
	3,15A	CH 6,3x32 HF 3,15A/500V	006710226	9	0,9	HF		
	4A	CH 6,3x32 HF 4A/500V	006710227	18	0,95	HF		
	5A	CH 6,3x32 HF 5A/500V	006710228	40	0,96	HF		
	6,3A	CH 6,3x32 HF 6,3A/500V	006710229	80	1	HF		
	8A	CH 6,3x32 HF 8A/500V	006710230	150	1	HF		
	10A	CH 6,3x32 HF 10A/500V	006710231	240	0,96	HF		
	12,5A	CH 6,3x32 HF 12,5A/500V	006710232	500	1	HF		
	16A	CH 6,3x32 HF 16A/500V	006710233	920	1	HF		
	20A	CH 6,3x32 HF 20A/500V	006710234	1500	1,1	HF		
	25A	CH 6,3x32 HF 25A/500V	006710235	3100	1,2	HF		

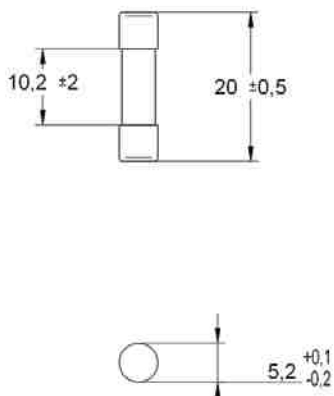
### Test currents of time

Rated current	Test current					
	2,1x $I_n$ max	2,75x $I_n$		4x $I_n$		10x $I_n$ max
		min	max	min	max	
1A ... 5A FF	<1h	4ms	100ms	1ms	25ms	<5ms
6,3A ... 16A FF	<1h	4ms	300ms	1ms	25ms	<5ms
315mA ... 800mA HF	<30min	20ms	100ms	8ms	400ms	<20ms
1A ... 25A HF	<30min	100ms	300ms	20ms	1s	<50ms



General characteristics	
Rated voltage	500V a.c.
Breaking capacity	1,5 kA
Characteristic	HT (Delayed operation)
Standard	IEC 60127-1, IEC 60127-2
Application	Miniature fuses HT are used for protection electronic devices

CH Minifuse 6,3x32 HT								
Size	$I_n$ [A]	Type	Code No	Operating Joule integral $I^2t$ [A <sup>2</sup> s]	Power dissipation $P_d$ [W]	Char.	Weight [g]	Packaging [pcs]
6,3x32	100mA	CH 6,3x32 HT 100mA/500V	006710309	0,05	0,008	HT	10	10
	125mA	CH 6,3x32 HT 125mA/500V	006710310	0,08	0,01	HT		
	160mA	CH 6,3x32 HT 160mA/500V	006710311	0,12	0,012	HT		
	200mA	CH 6,3x32 HT 200mA/500V	006710312	0,2	0,017	HT		
	250mA	CH 6,3x32 HT 250mA/500V	006710313	0,35	0,018	HT		
	315mA	CH 6,3x32 HT 315mA/500V	006710314	0,5	0,2	HT		
	400mA	CH 6,3x32 HT 400mA/500V	006710315	0,8	0,25	HT		
	500mA	CH 6,3x32 HT 500mA/500V	006710316	0,32	0,26	HT		
	630mA	CH 6,3x32 HT 630mA/500V	006710317	0,6	0,26	HT		
	800mA	CH 6,3x32 HT 800mA/500V	006710318	1	0,31	HT		
	1A	CH 6,3x32 HT 1A/500V	006710319	1,5	0,3	HT		
	1,25A	CH 6,3x32 HT 1,25A/500V	006710320	3,1	0,34	HT		
	1,6A	CH 6,3x32 HT 1,6A/500V	006710321	5,2	0,7	HT		
	2A	CH 6,3x32 HT 2A/500V	006710322	10	0,79	HT		
	2,5A	CH 6,3x32 HT 2,5A/500V	006710323	19	0,8	HT		
	3,15A	CH 6,3x32 HT 3,15A/500V	006710324	37	0,9	HT		
	4A	CH 6,3x32 HT 4A/500V	006710325	68	0,95	HT		
	5A	CH 6,3x32 HT 5A/500V	006710326	130	0,96	HT		
	6,3A	CH 6,3x32 HT 6,3A/500V	006710327	215	1	HT		
	8A	CH 6,3x32 HT 8A/500V	006710328	370	1	HT		
	10A	CH 6,3x32 HT 10A/500V	006710329	620	0,96	HT		
	12,5A	CH 6,3x32 HT 12,5A/500V	006710330	1300	1	HT		
	16A	CH 6,3x32 HT 16A/500V	006710331	2500	1	HT		
	20A	CH 6,3x32 HT 20A/500V	006710332	3400	1,1	HT		
25A	CH 6,3x32 HT 25A/500V	006710333	5600	1,2	HT			
32A	CH 6,3x32 HT 32A/500V	006710334	3900	2,2	HT			



### Test currents of time

Rated current	Test current					
	$2,1 \times I_n$ max	$2,75 \times I_n$ min max		$4 \times I_n$ min max		$10 \times I_n$ max
315mA ... 800mA	<30min	400ms	80s	95ms	5s	10ms-300ms
1A ... 25A	<30min	400ms	80s	150ms	5s	20ms-300ms





## Special Purpose Fuses