

• Special Purpose Fuses

- Fuses for DC voltage applications
- Safe work fuses SWF
- Surge suppression fuses SRF
- Fuses for high voltage switchgear



ETI

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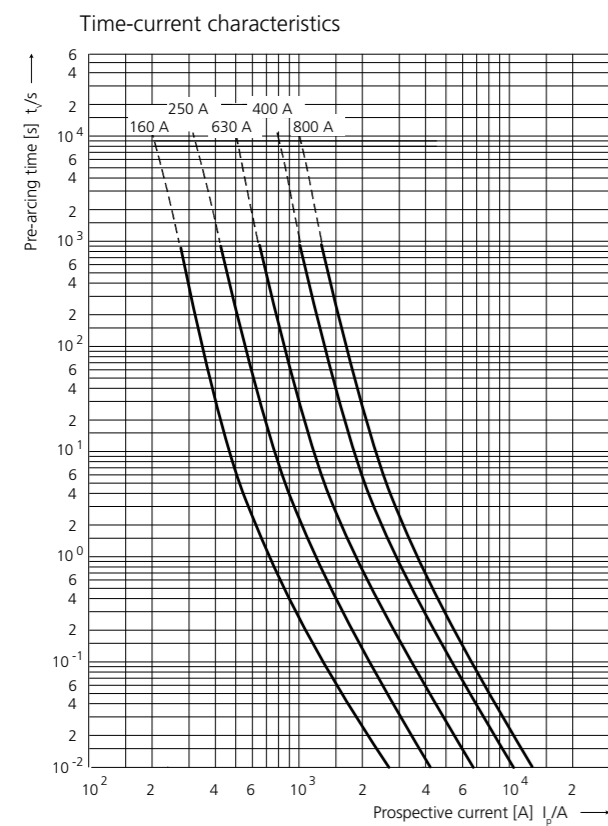
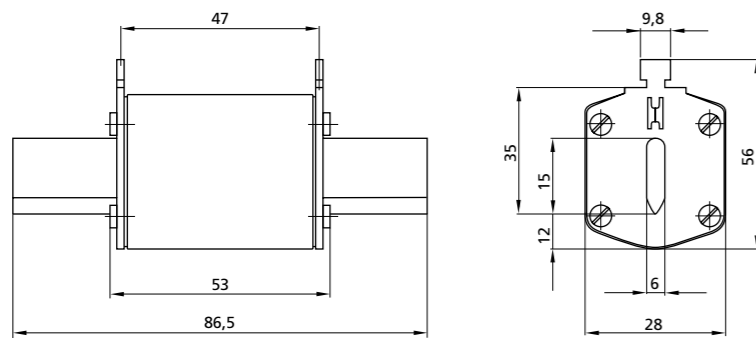
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NH DC 80 V - Telecom fuse

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.

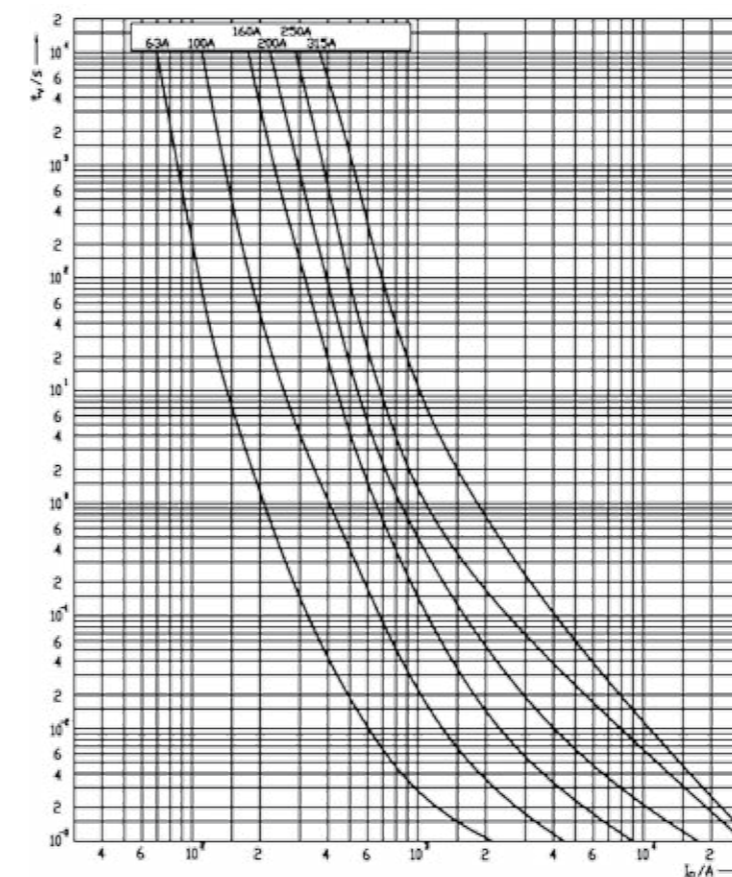
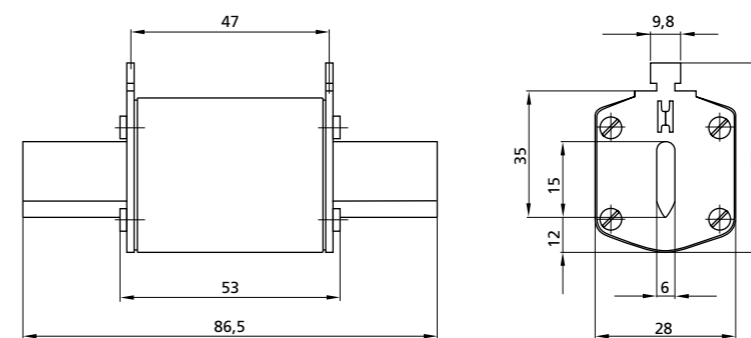
NH DC 80 V - Telecom fuse						
Size	I _n [A]	Code No.		Power dissipation [W]	Packaging [pcs]	Weight [g]
		standard indicator	striker indicator			
00	160	004110106	004110101	9,0	3/90	173
	250	004110107	004110102	12,5		
	400	004110108	004110103	17,5		
	630	004110109	004110104	28,0		
	800	004110110	004110105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



NH DC 250 V

General characteristics	
Rated voltage	250 V d.c. (L/R = 20 ms)
Breaking capacity	25 kA d.c.
Standards	IEC 60269-2
Application	Fuse-link for DC application.

NH DC 250 V						
Size	I _n [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	004110138	18,5		
	250	004110133	004110139	21,2		
	315	004110134	004110141	24,0		



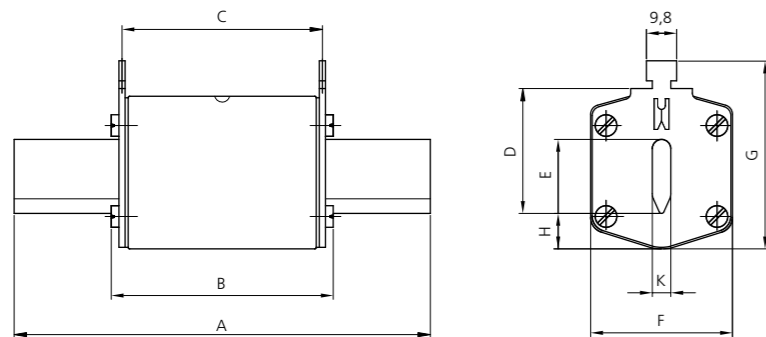
NH DC 440 V

General characteristics

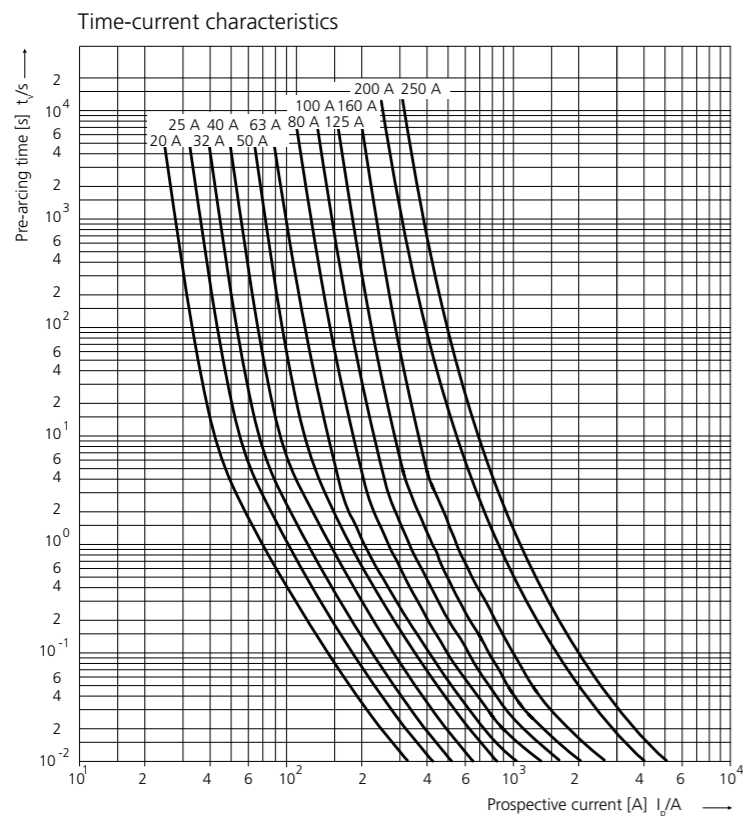
Rated voltage	440 V d.c. (L/R = 20 ms)
Breaking capacity	50 kA d.c.
Standards	IEC 60269-2
Application	Fuse-link for DC application.

NH DC 440 V

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	



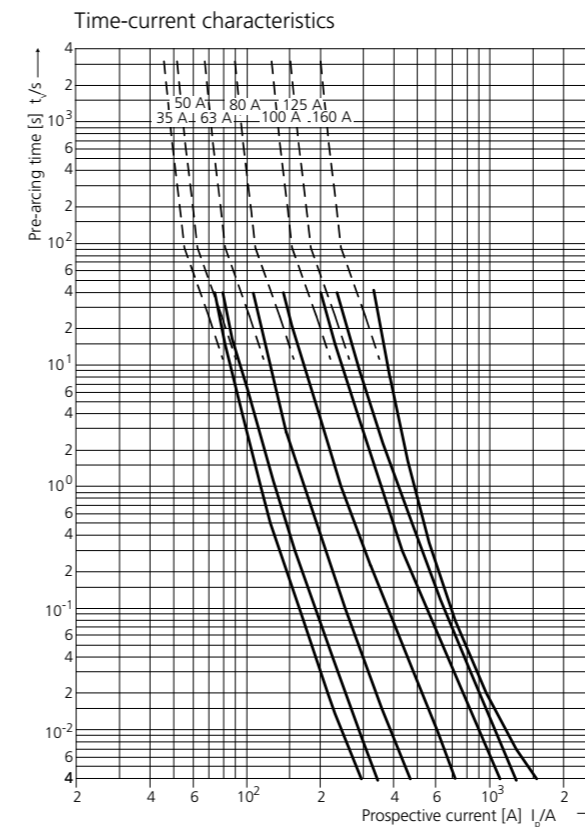
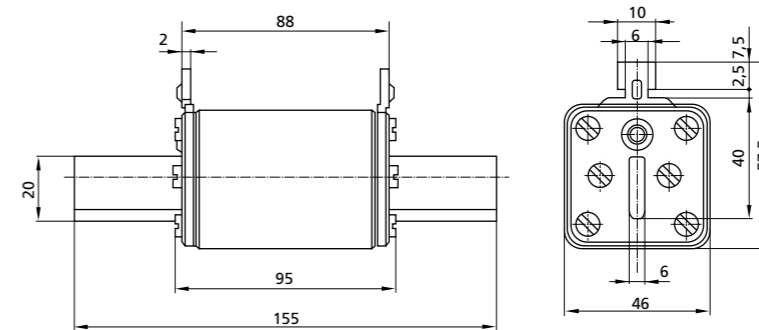
NH DC 750 V

General characteristics

Rated voltage	750 V d.c. (L/R = 5 ms)
Breaking capacity	25 kA d.c.
Standards	IEC 60269-2, IEC 60269-4
Application	Fuse-link for DC application. Applied in fuse base PK1-160 DC.

NH DC 750 V

Size	I _n [A]	Code No.	Power dissipation [W]	Pre-arcing joule integral (A ² s) (L/R=5ms)	Operating joule integral (A ² s) (L/R=5ms)	Packaging [pcs]	Weight [g]
1	35	004110331	10	45	430	3	490
	50	004110333	20	80	670		
	63	004110334	25	170	1.390		
	80	004110335	31	450	2.550		
	100	004110336	40	1.320	4.500		
	125	004110337	50	2.200	9.700		
	160	004110338	55	7.880	18.370		



NH DC 1000 V

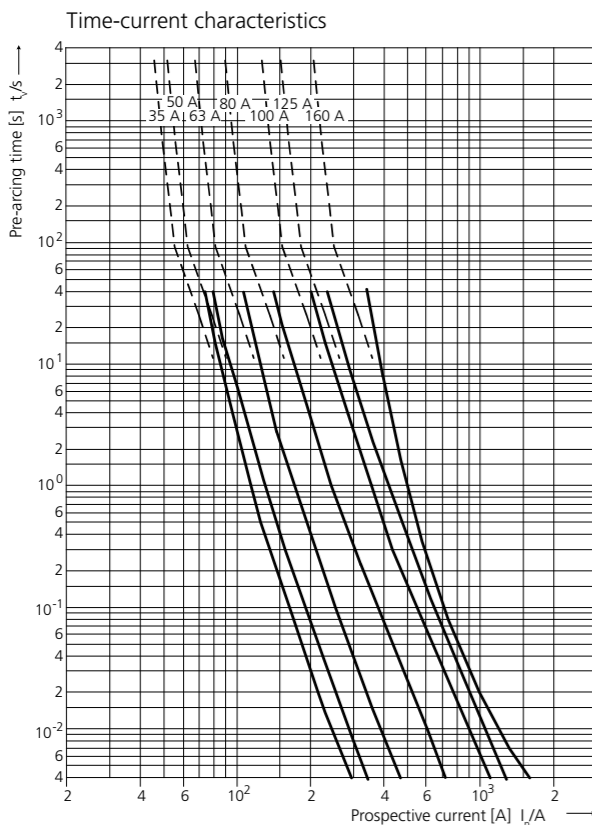
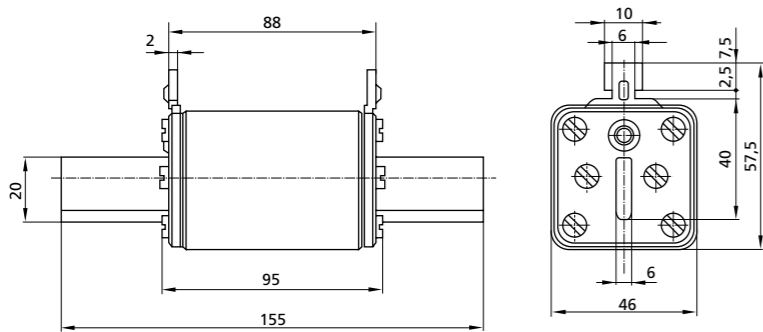
General characteristics

Rated voltage	1000 V d.c. (L/R = 2 ms)
Breaking capacity	25 kA d.c.
Standards	IEC 60269-2, IEC 60269-4
Application	Fuse-link for DC application. Applied in fuse base PK1-160 DC.

NH DC 1000 V

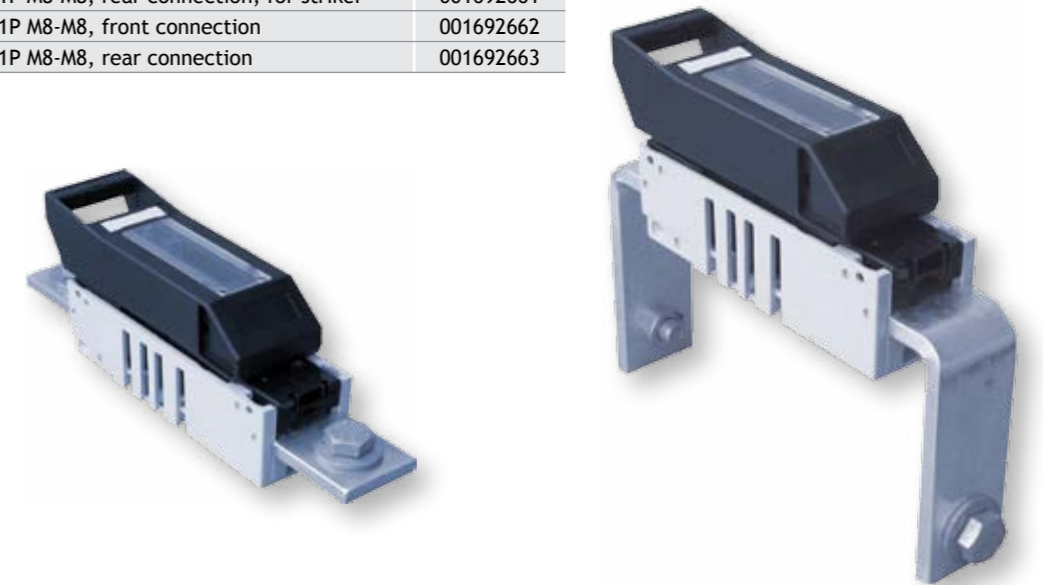
Size	I_n [A]	Code No.	Power dissipation [W]	Pre-arcing joule integral (A ² s) (L/R = 2ms)	Operating joule integral (A ² s) (L/R = 2ms)	Packaging [pcs]	Weight [g]
1	35	004110351	10	50	560	3	490
	50	004110353	20	95	880		
	63	004110354	25	200	1.800		
	80	004110355	31	530	3.340		
	100	004110356	40	1.550	5.900		
	125	004110357	50	2.570	12.700		
	160*	004110358	55	9.220	24.100		

*900 V d.c.



NV Telecom fuse disconnectors

type	Code No.
HVL 00 Telecom 1P M8-M8, front connection, for striker	001692660
HVL 00 Telecom 1P M8-M8, rear connection, for striker	001692661
HVL 00 Telecom 1P M8-M8, front connection	001692662
HVL 00 Telecom 1P M8-M8, rear connection	001692663



Technical data for NV Telecom fuse disconnectors

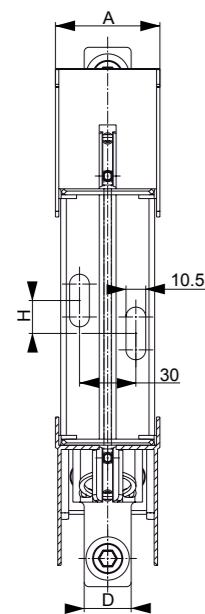
Technical Specifications		HVL 00				
Electrical Characteristics						
Rated conditional short-circuit current	I_{eff} kA	50				
Utilization category	I_e A	DC 20-B/250 A	DC 20-B/400 A	DC 20-B/630 A	DC 20-B/800 A	
Rated impulse withstand voltage	U_{imp} kV	8	8	8	8	
Operating cycles with current	-	100	100	100	100	
Total power loss at I_{th} (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	500	500	500	
Weight	kg	0,37	0,55	0,75	0,75	
Cable connection						
Flat terminal	Bolt diameter	-	s. drawings			
	Cable lug (DIN 43620)	-	150	240	240	240
	Flat bar	-	27x10	28x10	29x10	30x10
	Tightening torque	M_a Nm	12-15	30-35	30-35	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	-	up to 2000				
Pollution degree	-	3				
Overvoltage category	-	III				

Fuse base U1-3 1200V

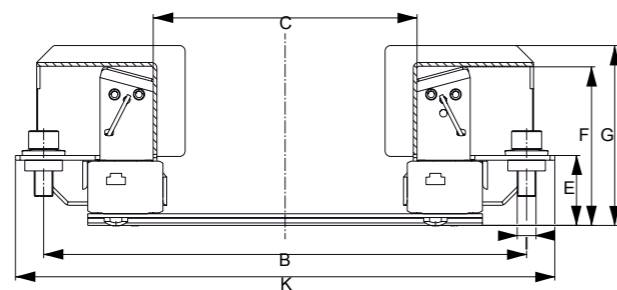
General characteristics					
Type			U1-1/1200	U2-1/1200	U3-1/1200
Rated voltage	1200V d.c. / a.c.				
Rated current			250A	400A	630A
Conv. free air thermal current with fuse-links			200A	315A	630A
Conv. free air thermal current with solid links			325A	520A	1000A
Max. permis. power dissipation per fuse-link			35W	46W	70W
Cable terminal	Flat terminal	Screw	M10	M10	M10
		Cable lug (DIN 46235)	25-150mm ²	25-240mm ²	25-300mm ²
		Flat termination	30x10mmx-mm	30x10mmx-mm	40x10mmx-mm
	Terminal	Rated torque	30-35Nm	30-35Nm	30-35Nm
		Clamping cross-section	KM2G	25-300mm ²	KM2G
		Rated torque	32Nm	32Nm	
Degree of protection - Front side, device fitted			IP00	IP00	IP00
Operating conditions	Ambient temperature*		-25°C to +55°C		
	Rated operating mode		Continuous operation		
	Actuation		-		
	Mounting position		Vertical, horizontal		
	Altitude		Up to 2000m		
	Pollution degree		3		
	Overvoltage category		III		
Insulation class			C-VDE 0110		
Standards			EN 60269, IEC 60269, DIN VDE 0636, DIN 43620, DIN 43623		

Fuse base U1-3 1200V						
Type	I _n [A]	Code No.	Max. connection [mm ²]	Mechanical fuse monitor	Weight [g]	Packaging [pcs]
U1-232/1200/H	250	004122034	150	without	500	2
U1-1/1200/H	250	004122027	150	without	550	
U1-1/1200/H/K	250	004122028	150	with	600	
U2-1/1200/H	400	004122029	240	without	930	1
U2-1/1200/H/K	400	004122030	240	with	1000	
U3-1/1200	630	004122031	300	without	1200	
U3-1/1200/K	630	004122032	300	with	1250	

* size 3 without insulating contact (H)
 ** type designation H means version with insulating contacts



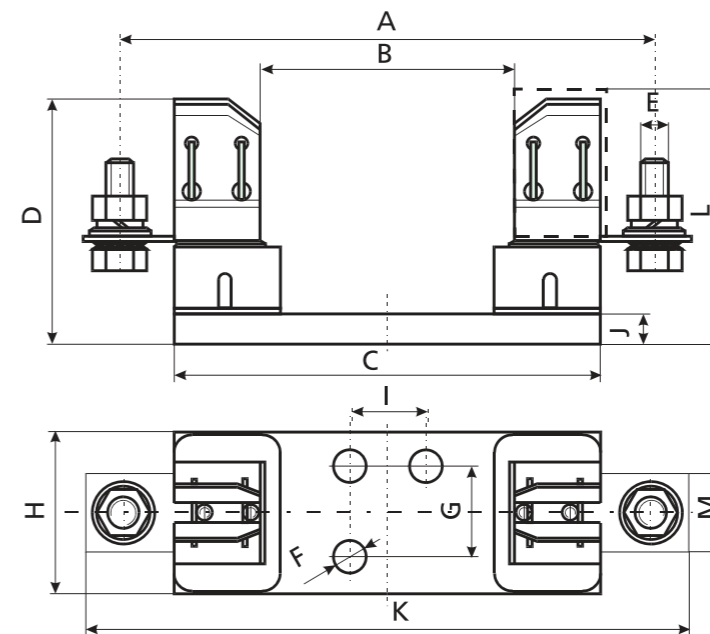
Type	Dimensions [mm]									
	A	B	C	D	E	F	G	H	I	K
U1-232/1200/H	56	232	140	25	37	84,5	96	17,5	M10	262
U1-1/1200/H	56	257	140	25	37	84,5	96	17,5	M10	287
U2-1/1200/H	64	257	140	30	37	100	103	17,5	M10	287
U3-1/1200	68	270	140	40	38	103	-	25	M12	307



Fuse base PK1

General characteristics	
Rated voltage	1000V d.c.
Rated current	250A
Insulation class	C-VDE 0110
Standards	EN 60269, IEC 60269, DIN VDE 0636, DIN 43620, DIN 43623

Fuse base PK1				
Type	I _n [A]	Code No.	Weight [g]	Packaging [pcs]
PK1 DC	250	004122025	598	3/42
PK1 160 DC	250	004122026	665	3/30



Type	Dimensions [mm]											
	A	B	C	D	E	F	G	H	I	J	K	M
PK1 DC	175	80	141	81	M10	∅10,5	30	55	25	10	200	26
PK1 160 DC	193	100	160	81	M10	∅10,5	30	55	25	10	220	26

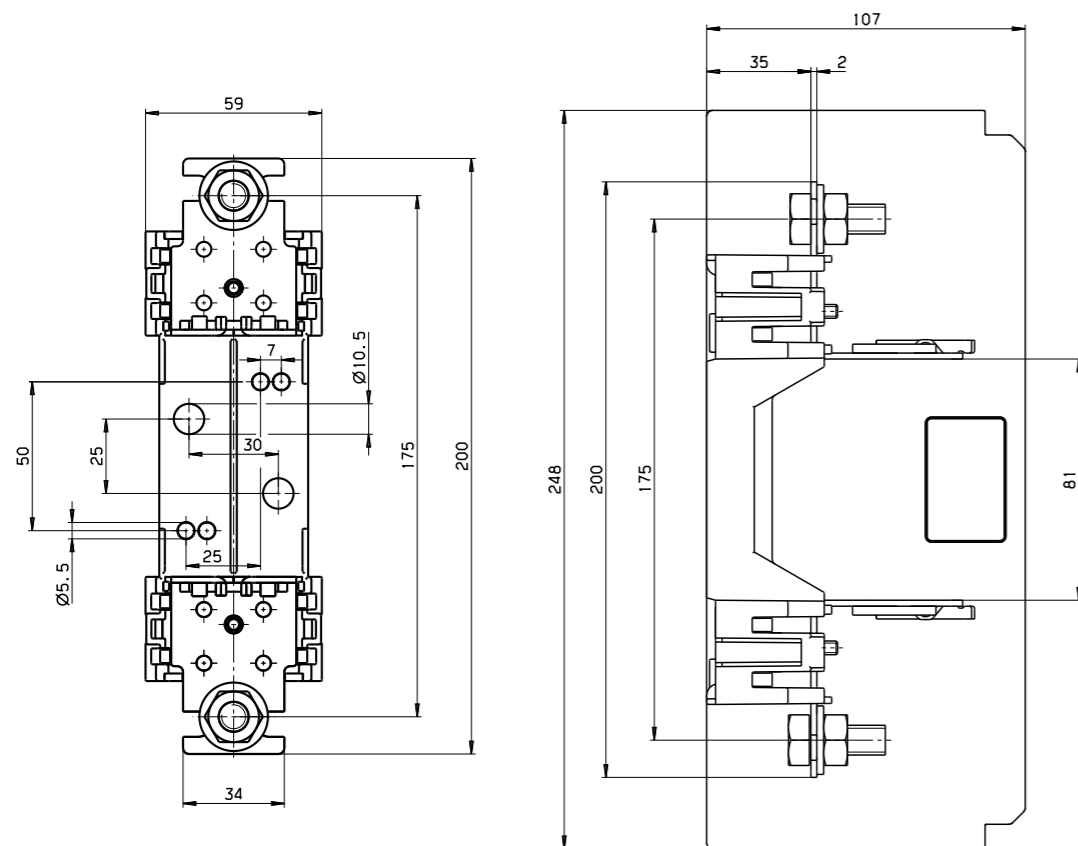
Fuse base U1-1 1000V

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 ²
	Flat termination	30x10 mmx-mm
	Rated torque	30-35 Nm

Fuse base U1-1 1000V

Type	I _n [A]	Code No.	Max. Connection (mm ²)	Weight [g]	Packaging [pcs]
U1-1 1000V	160	004122035	150	387	1



Fuse disconnecter TL1-1/9/1000V

General characteristics

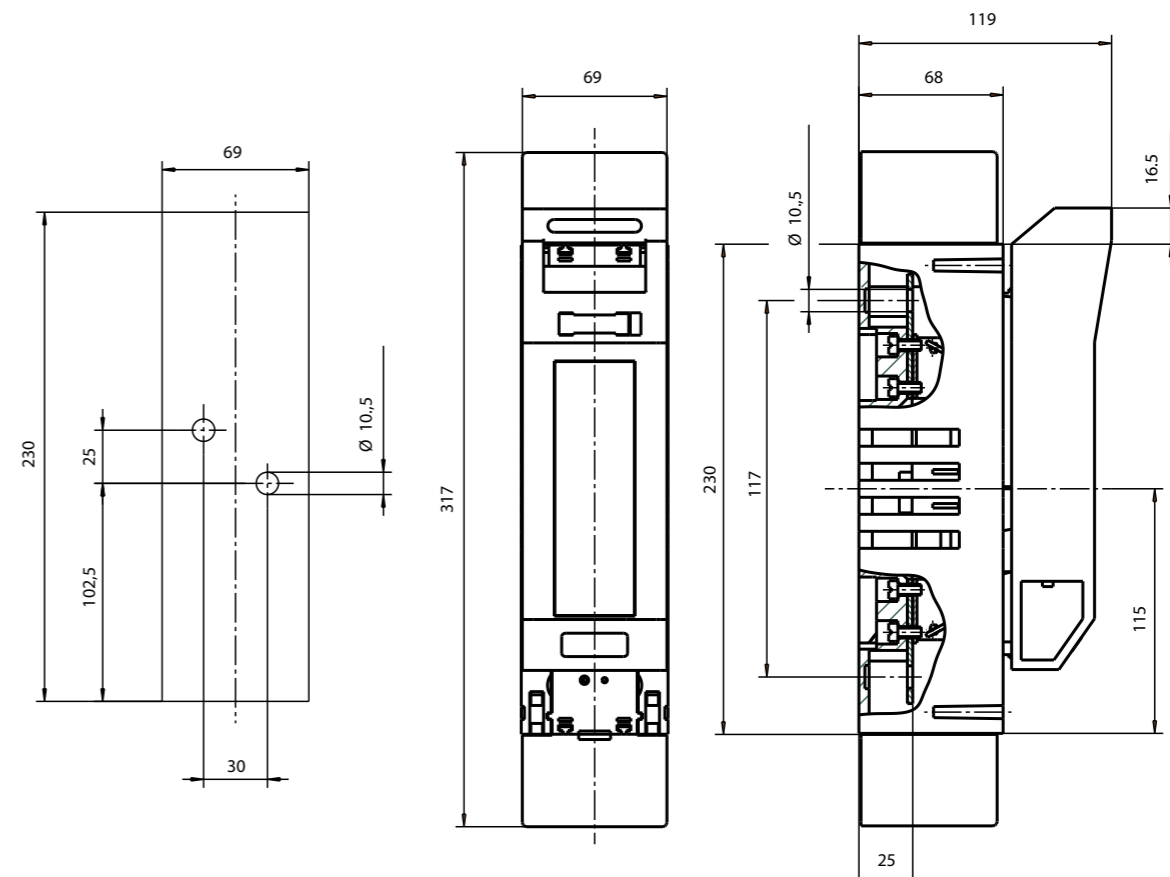
Number of poles	1	
Rated voltage	1000V d.c.	
Rated current	160A	
Conv. free air thermal current with fuse-links	160A	
Utilization category	DC-20B	
Fuse-links	Size to DIN 43620	1
	Max. rated current (gL/gG)	160A
	Max. permis. power loss per fuse-link	25W
Cable terminal - Flat terminal	Screw	M10
	Cable lug (DIN 46235)	25-240 mm ²
	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 _n [A]	Code No.	Max. Connection (mm ²)	Terminal	Weight [g]	Packaging [pcs]
TL1-1/9/1000V	160	004122038	150	M10	1070	1



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

General characteristics

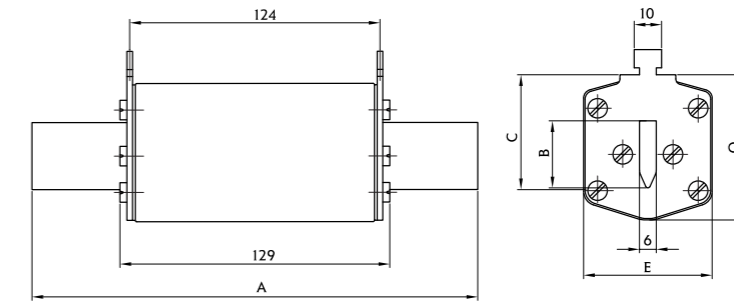
Rated voltage	1200V a.c.
Breaking capacity	50 kA a.c.
Standards	IEC 60269
Characteristic	gG

1200V a.c. gG

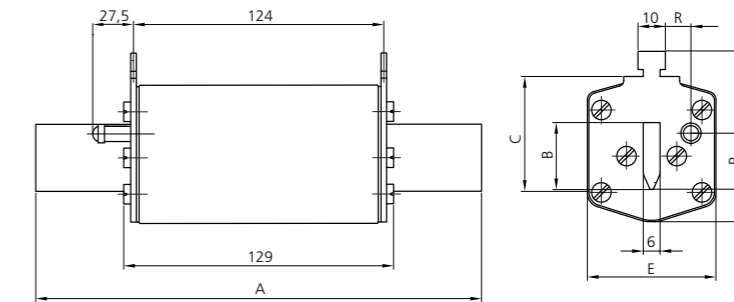
Size	I_n [A]	Standard indicator (pic.1)	Trip indicator - K (pic.2)	Power dissipation [W]	Weight [g]	Packaging [pcs]
1	6	004113721	004113796	3,2	750	1
	10	004113722	004113797	3,7		
	16	004113723	004113798	4,1		
	20	004113724	004113799	5,0		
	25	004113725	004113800	5,0		
	32	004113726	004113801	5,8		
	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		
2	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		
3	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		
	400	004113793	004113830	40,0		
500	004113794	004113831	50,0			
630	004113795	004113832	70,0			



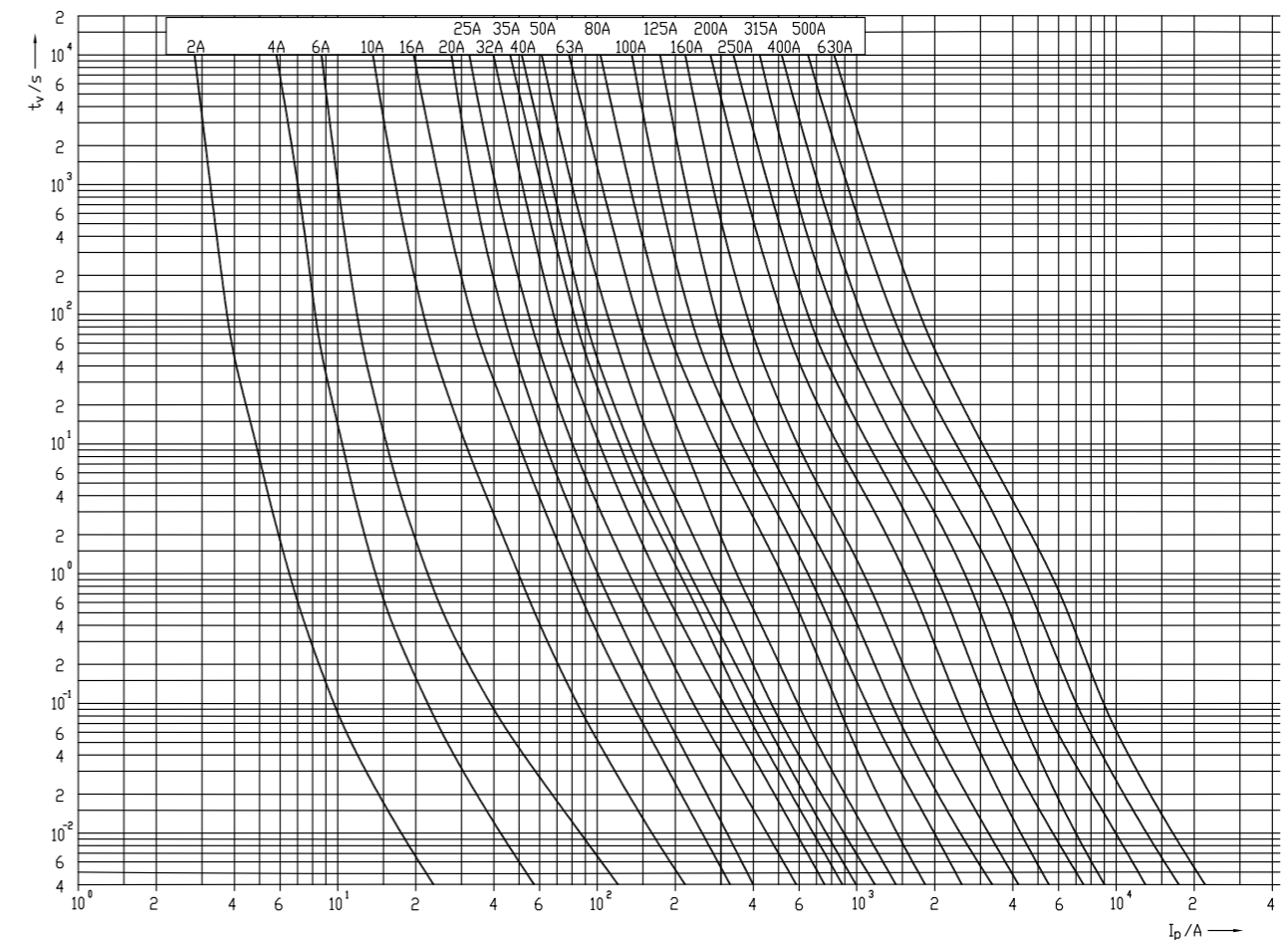
Picture 1



Picture 2



Size	Dimensions [mm]								
	A	B	C	E	G	P	R	M	O
1	194	24	40	46	61,5	20,5	13,7	50	52
2	209	30	48	54	71	27,3	16,2	59	61
3	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 with faster fuse link type SWF acc. to VDE 0636-23, 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:

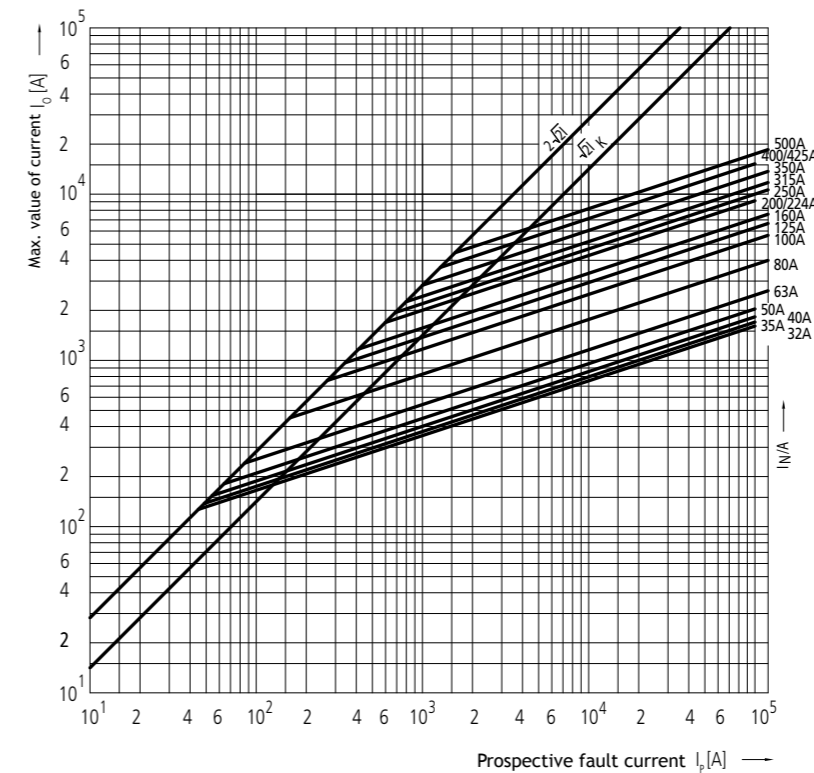
$$I_n (SWF) = I_n (gG)$$



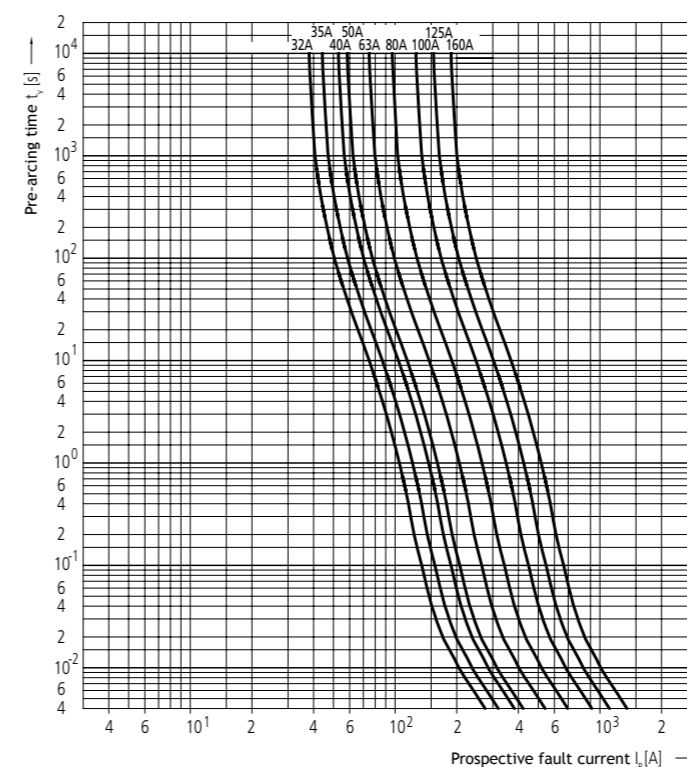
SWF fuse links					
Size	I [A]	Type	Code Nr.	Packaging [pcs]	Weight [g]
00 C	32	M00C/SWF/32A/500V	004711220	3	130
	35	M00C/SWF/35A/500V	004711221		
	40	M00C/SWF/40A/500V	004711222		
	50	M00C/SWF/50A/500V	004711223		
	63	M00C/SWF/63A/500V	004711224		
	80	M00C/SWF/80A/500V	004711225		
	100	M00C/SWF/100A/500V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

Dimensions according to IEC 62269-2, see also ETI general catalogue

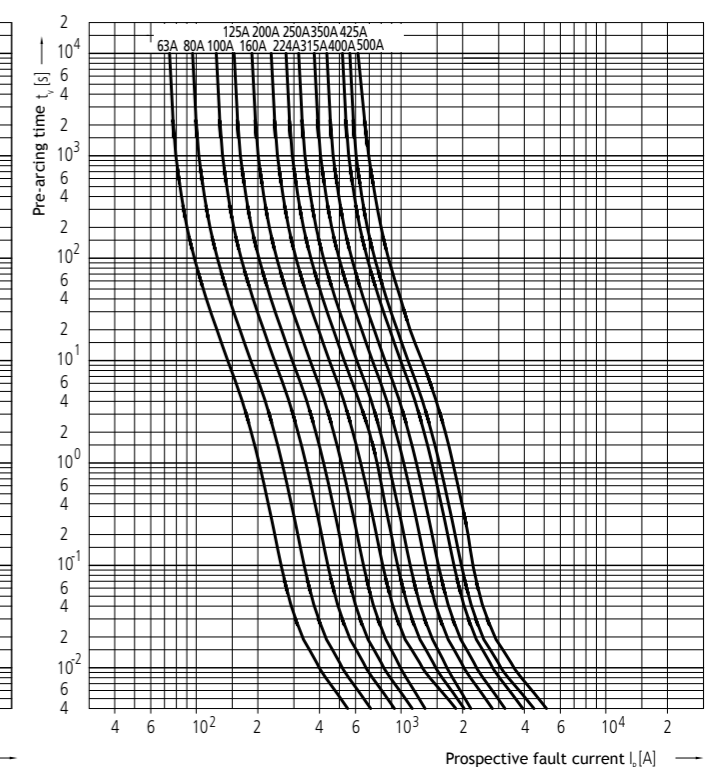
Cut-off characteristics SWF fuse links-size 00C,1,2,3



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



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



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 μ s lighting surge pulses without operating, allowing the TVSS system to react to the surge. All surge fuses have 8/20 μ 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.,
- Breaking capacity 200 kA,
- Available in Surge Ratings from 10 kA to 40 kA (8/20 μ s),
- Designed to meet UL1449 Second Edition requirements,
- Comply with the applicable requirements in UL 248-1 Low Voltage Fuses – Part 1, General Requirements.

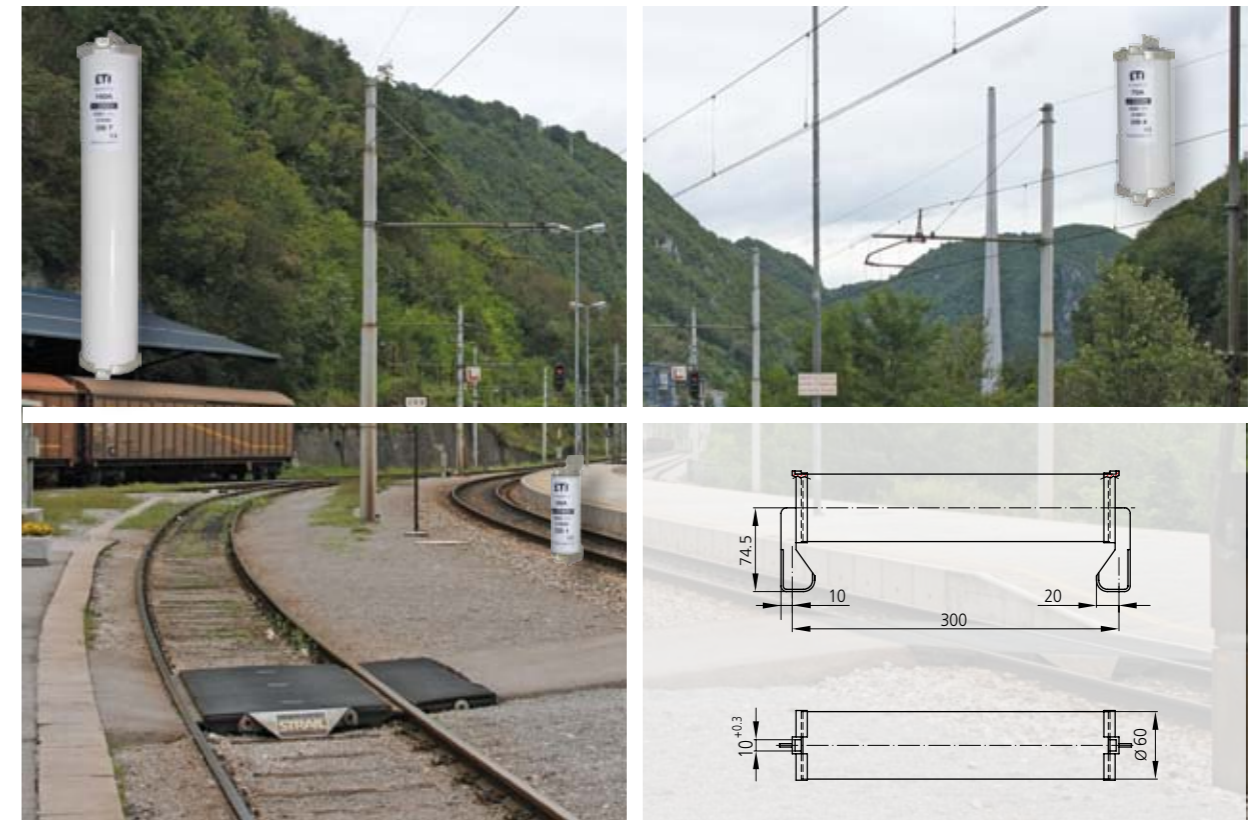
Approvals

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



Technical data						
Type	Code No.	8x20 μ sec Surge rating [A]	Size	Melting I ² t [A ² s]	Total I ² t [A ² s]	I _{PEAK} at 130 kA
SRF10	002636004	10.000	14x51	2.360	10.370	8.320
SRF20	002636005	20.000		5.490	17.700	10.430
SRF30	002636006	30.000		16.750	39.880	13.540
SRF40	002636007	40.000		33.680	72.800	17.480
SRF60	002646006	60.000	22x58	133.630	247.180	21.260

Fuses for high-voltage switchgear



Fuses for high-voltage switchgear DB, S₃₆₈ 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 ($5xI_n$).

DB, S₃₆₈ series fuses are main fuses designed for nominal currents of 7,5 A to 125 A.

DB, S₃₆₈ 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		
		35	004735561		
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
		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		

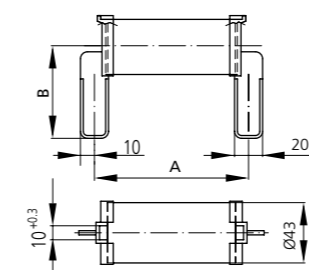


Size	U _n [V]	I _n [A]	Code No.	Packaging [pcs]	Weight [g]
DB 7	3000	100	004735593	1	2250

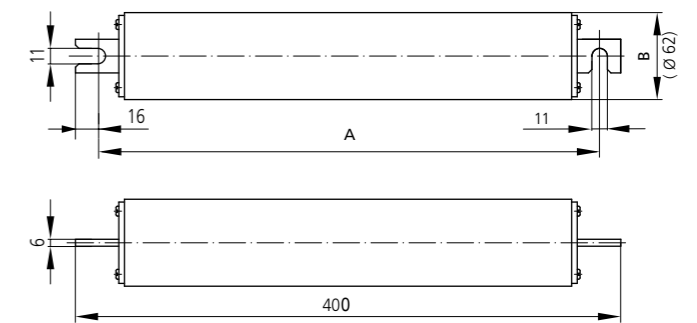
Size	U _n [V]	I _n [A]	Code No.	Packaging [pcs]	Weight [g]
S ₃₆₈	5000	20	004735594	1	3000
		30	004735595		
		40	004735596		
		50	004735597		
		60	004735598		
		70	004735599		
100	004735600				



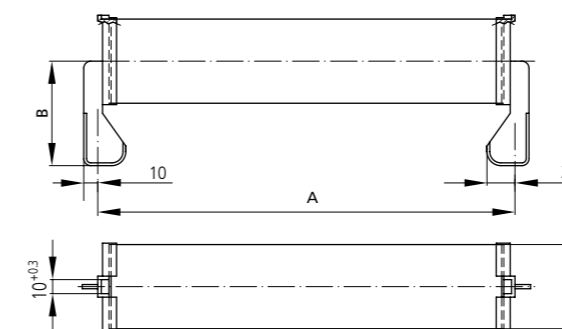
Size 1, 2, 3 and 5: Main fuses DB 1/2/3/5



Size 8: Main fuses S₃₆₈

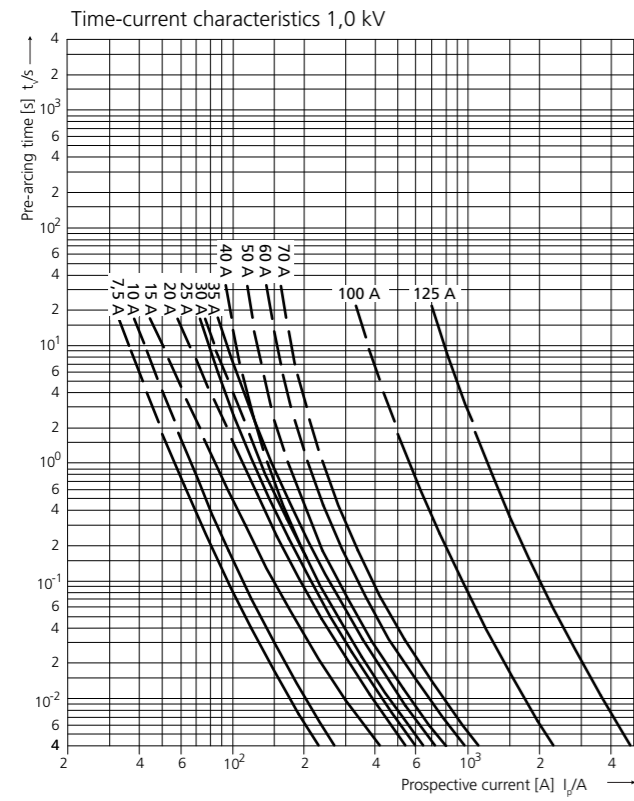


Size 4, 6 and 7: Main fuses DB 4/6/7

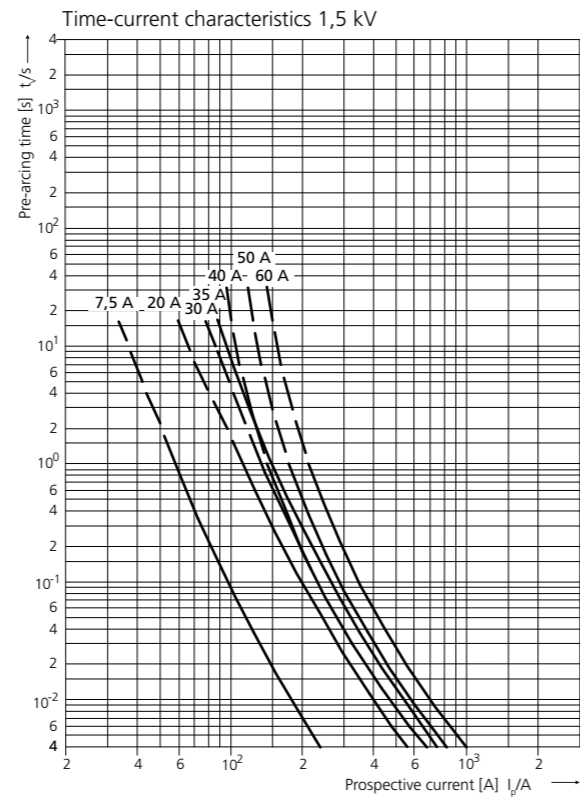


size	dimensions [mm]	
	A	B
DB 1	110	61,0
DB 2	110	61,0
DB 3	170	66,0
DB 4	170	74,5
DB 5	260	66,0
DB 6	300	74,5
DB 7	350	74,5
S ₃₆₈	368	62,0

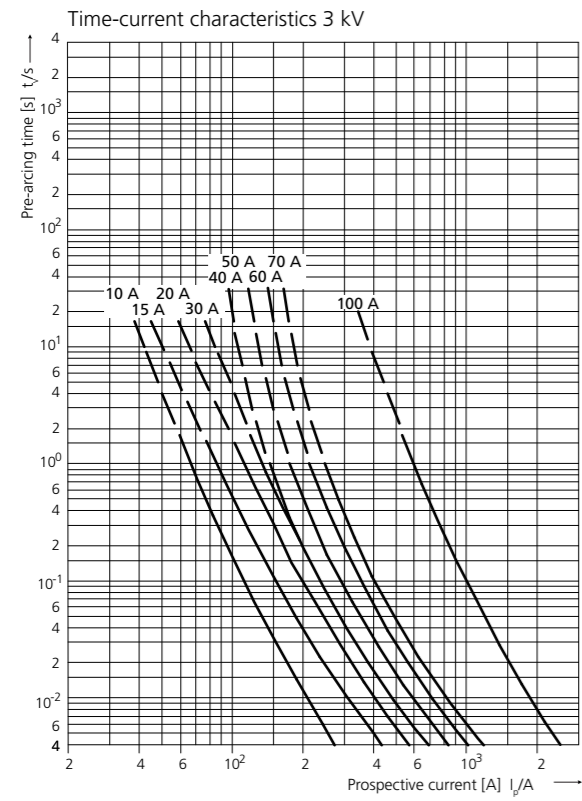
DB series 1.0 kV



DB series 1.5 kV



DB series 3.0 kV



S₃₆₈ series 5 kV

