1 Low-Voltage Fuse Systems

Introduction

Overview

Selectivity

Several fuses are usually connected in series in one system. And when things get serious, selectivity ensures that in the system, only the faulty electrical circuit is switched off and not the entire operational process.

Siemens fuses of utilization category gL/gG at a rated voltage of up to 230 V AC and a ratio of 1:1.25 are selective among themselves, i.e. from rated current level to rated current level. This is achieved by means of the considerably smaller spread of ±5 % of the time/current characteristics. In this case, the demand for a standard with a ratio of 1:1.6 has been more than met.

It is therefore possible to use smaller conductor cross-sections due to the lower rated currents.

Utilization categories

Fuses are divided according to their function according to utilization categories. The first letter defines the function class and the second the object to be protected:

1st letter

a ≙ Partial range protection
(accompanied fuses):
Fuse links that carry currents at least up to their rated current and can switch currents above a specific multiple of their rated current up to their rated breaking capacity.

g ≙ Full range protection
(general purpose fuses):
Fuse links that can continuously carry currents up to at least their specified rated current and can switch currents from the smallest melting current through to the breaking current. Overload and short-circuit protection.

2nd letter

G ≙ Cable and line protection (general applications)

M ≙ Switching device protection/motor protection (for protection of motor circuits)

R ≙ Semiconductor protection/thyristor protection (for protection of rectifiers)

L ≙ Cable and line protection (in compliance with DIN VDE)

B ≙ Mine equipment protection

Tr ≙ Transformer protection

The designations "slow" and "quick" still apply for DIAZED fuses. These are defined in IEC/CEE/DIN VDE.

In the case of "quick" characteristics, the fuse blows in the breaking range faster than those of utilization category gL/gG. In the case of DIAZED fuse links for DC railway network protection, the "slow" characteristic is particularly suitable for switching off direct currents with greater inductance.
Both characteristics are also suitable for the protection of cables and lines.

Full range fuses (gL/gG, gR, quick, slow) reliably break the current in the event of non-permissible overload and short-circuit currents.

Partial range fuses (aM, aR) exclusively serve short-circuit protection.

The following utilization categories are included in the product range:

gL (DIN VDE)/gG (IEC) ≙ Full range cable and line protection

aM (DIN VDE/IEC) ≙ Partial range switching device protection

aR (DIN VDE/IEC) ≙ Partial range semiconductor protection

gR (DIN VDE/IEC) ≙ Full range semiconductor protection

Quick (DIN VDE/IEC/CEE) ≙ Full range cable and line protection

Slow (DIN VDE) ≙ Full range cable and line protection

Breaking capacity

A key feature of these fuses is their high rated breaking capacity with the smallest footprint. The basic demands and circuit data for tests – voltage, power factor, actuating angle etc.– are specified in both national (DIN VDE 0636) and international (IEC 60 269) regulations.

However, for a constant failsafe rated breaking capacity, from the smallest non-permissible overload current through to the highest breaking current, a number of quality characteristics need to be taken into account when designing and manufacturing fuse links. These include the design of the fuse-element with regard to dimensions and punch dimension and its position in the fuse body, as well as its compressive strength and the thermal resistance of the body. The chemical purity, particle size and the density of the quartz sand also play a key role.

The rated breaking capacity for AC voltage for NEOZED- and the majority of DIAZED fuses - is 50 kA AC, and in the case of LV HRC fuses, it is even 120 kA AC.

Faster arcing and precise arc quenching are the requirements for a reliable breaking capacity.

Current limiting

As well as a failsafe rated breaking capacity, the current-limiting effect of a fuse link is of key importance for the cost effectiveness of a system. In the event of short-circuit breaking by a fuse, the breaking current continues to flow through the network until the fuse link is switched off. The breaking current is merely limited through the system impedance.

The simultaneous melting of all the bottlenecks of a fuse-element produce a sequence of tiny partial arcs that ensure a fast breaking operation with strong current limiting. The current limiting is also strongly influenced by the production quality of the fuse - which in the case of Siemens fuses is extremely high. For example, an LV HRC fuse link, size 2 A to 224 A, limits a breaking current with a possible r.m.s. value of approx. 50 kA to a let-through current with a peak value of approx. 18 kA. This strong current limiting provides constant protection for the system against excessive loads.

Overview

Assignment of cable and line protection

When assigning fuses to cable and line protection in the event of an overload, in compliance with DIN VDE 0100 Part 430, the following conditions must be met:

(1) $I_B \leq I_n \leq I_z$ (rated current rule)

(2) $I_2 \leq 1.45 \times I_z$ (tripping rule)

I_B: Operational current of the electrical circuit

I_n: Rated current of the selected protective device

I_z: Permissible current carrying capacity of the cable or line under specified operating conditions

I_2: Tripping current of the protective device under specified operating conditions ("conventional tripping current").

These days, the factor 1.45 has become an internationally accepted compromise of the protection and utilization ratio of a line, taking into account the breaking behavior of the protective device (e.g. fuse).

In compliance with the supplementary requirements for DIN VDE 0636, Siemens fuse links of utilization category gL/gG fulfill the following conditions:

"Load breaking switching with $I_2 = 1.45 \times I_n$ during conventional test duration under special test conditions in accordance with the supplementary requirements of DIN VDE 0636".

This therefore permits direct assignment.

Rated power dissipation

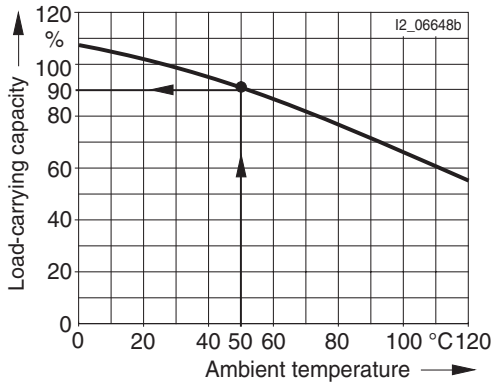
The cost effectiveness of a fuse depends largely on the rated power dissipation (power loss). This should be as low as possible and have low self-heating. However, when assessing the power loss of a fuse, it must also be taken into account that there is a physical dependence between the rated breaking capacity and the rated power dissipation. On the one hand, fuse-elements need to be thick in order to achieve the lowest possible resistance value, while a high rated breaking capacity requires the thinnest possible fuse-elements in order to achieve reliable arc quenching.

Siemens fuses have the lowest possible rated power dissipation while also providing the highest possible load breaking reliability.

These values lie far below the limit values specified in the regulations. This means low temperature rises, reliable breaking capacity and high cost effectiveness.

Load capability with increased ambient temperature

The time/current characteristics of the NEOZED/DIAZED/LV HRC fuse links refers to the ambient temperature of 20 °C ±5 °C in compliance with DIN VDE 0636. If higher ambient temperatures are used (see diagram) a lower load capability can be planned. For example, at an ambient temperature of 50 °C, an LV HRC fuse link is required that can handle 90 % of the rated current. This then means that an increase in ambient temperature will have no influence on the breaking behavior.



Test setup in compliance with DIN VDE 0636/201

NEOZED Fuse System

Product overview

Overview

Fuse links

Fuse bases

Fuse disconnectors

Switch disconnectors

Technical specifications

NEOZED fuse links		
Standards		DIN VDE 0636-301, DIN VDE 0680, IEC 60269-1, -3-1, EN 60269-1, -3-1
Dimensions		DIN 49522, DIN 49523, DIN 49524, DIN 49525
Utilization category		gL/gG
Rated voltage U_n	V AC V DC	400 250
Rated current I_n	A	2 ... 100
Rated breaking capacity	kA AC kA DC	50 8
Mounting position		any, but preferably vertical
Non-interchangeability		using adapter sleeves
Resistance to climate	°C	up to 45 at 95 % rel. humidity
Ambient temperature	°C	-5 ... +40, humidity 90 % at 20

Selection and ordering data

	Size	I_n	Identification color	Order No.	Weight 1 item	PS*/ P. unit
		A			kg	Items
Rated voltage 400 V AC/250 V DC, utilization category gL/gG						
	Consumer packing, package of 10					
	D01	2	pink	**5SE2 302**	0.006	10
		4	brown	**5SE2 304**	0.006	10
		6	green	**5SE2 306**	0.006	10
		10	red	**5SE2 310**	0.007	10
		13	black	**5SE2 013-2A**	0.007	10
		16	gray	**5SE2 316**	0.007	10
	D02	20	blue	**5SE2 320**	0.012	10
		25	yellow	**5SE2 325**	0.013	10
		32	black	**5SE2 332**	0.014	10
		35	black	**5SE2 335**	0.014	10
		40	black	**5SE2 340**	0.014	10
		50	white	**5SE2 350**	0.015	10
		63	copper	**5SE2 363**	0.016	10
	D03	80	silver	**5SE2 280**	0.039	10
		100	red	**5SE2 300**	0.042	10
	Versions for Italy only (no approvals)					
	D01	20	blue	**5SE2 820**	0.011	10
		25	yellow	**5SE2 825**	0.012	10

* You can order this quantity or a multiple thereof.

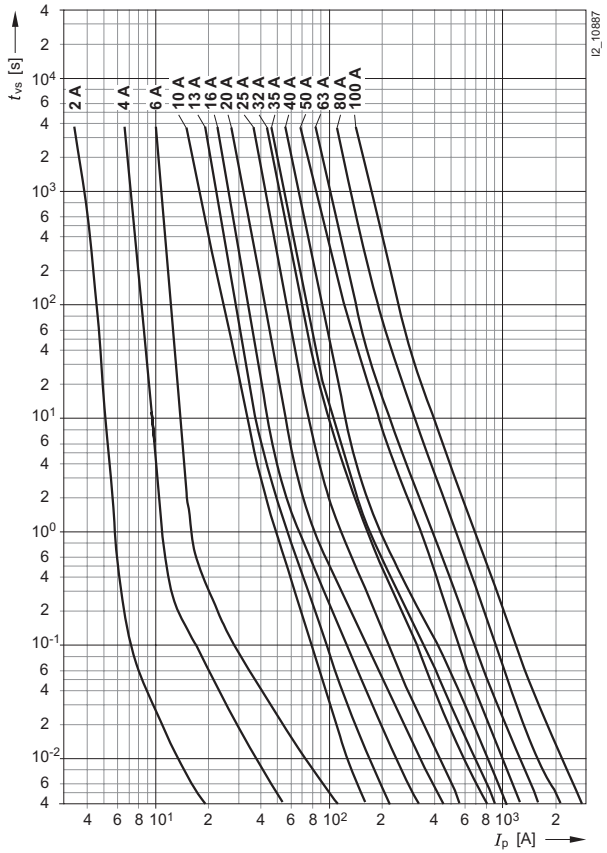
NEOZED fuse links

Characteristic curves

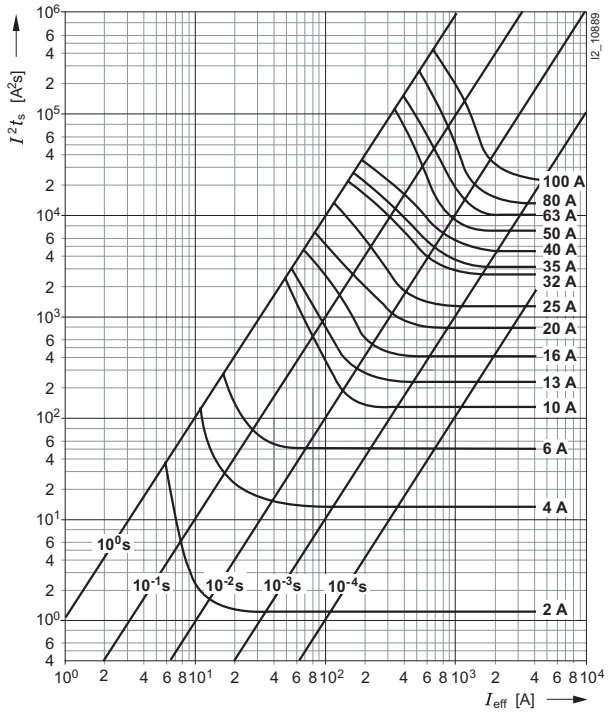
Series 5SE2

Size: D01, D02, D03
Utilization category: gL/gG
Rated voltage: 400 V AC/250 V DC
Rated current: 2 ... 100 A

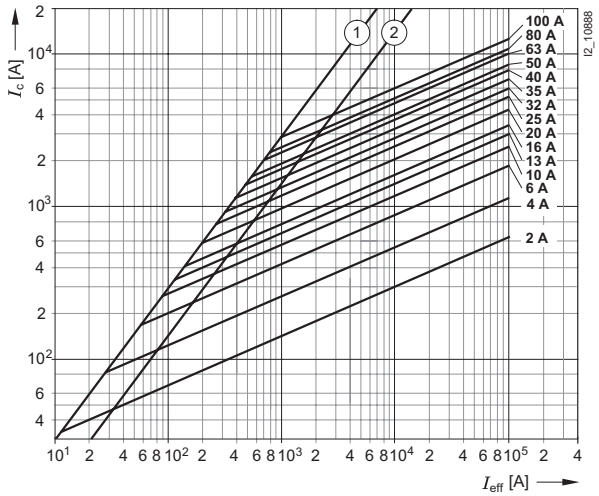
Time/current characteristics diagram



Melting I^2t_s values diagram



Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Characteristic curves

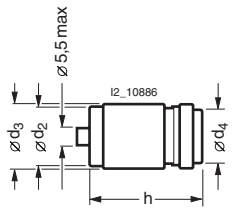
Series 5SE2

Size: D01, D02, D03
Utilization category: gL/gG
Rated voltage: 400 V AC/250 V DC
Rated current: 2 ... 100 A

Type	I_n	P_v	$\Delta\vartheta$	I^2t_s		I^2t_a	
				1 ms	4 ms	230 V AC ($t \leq 4$ ms)	400 V AC
	A	W	k	A^2s	A^2s	A^2s	A^2s
5SE2 202, 5SE2 302	2	1.6	19	1.2	1.4	2.9	3.9
5SE2 204, 5SE2 304	4	1.3	14	12.5	13.6	22	30
5SE2 206, 5SE2 306	6	1.7	19	46.7	48	58	75
5SE2 210, 5SE2 310	10	1.3	16	120	136	220	280
5SE2 013-2A	13	1.95	23	220	244	290	370
5SE2 216, 5SE2 316	16	2.1	24	375	410	675	890
5SE2 220, 5SE2 320	20	2.4	26	740	810	1250	1650
5SE2 225, 5SE2 325	25	3.2	33	1210	1300	1900	2600
5SE2 332	32	3.6	34	2560	2800	4300	5500
5SE2 235, 5SE2 335	35	3.8	36	3060	3500	5100	6500
5SE2 340	40	4	37	4320	4800	7900	9500
5SE2 250, 5SE2 350	50	4.2	38	6750	7400	10500	13000
5SE2 263, 5SE2 363	63	5.3	45	10000	10900	16000	20500
5SE2 280	80	5.3	43	13000	15400	25000	34500
5SE2 300	100	6.4	47	22100	30000	46000	60000

Dimensional drawings

5SE2



Size	I_n	Dimensions			
	A	$d_{2\ min}$	d_3	$d_{4\ max}$	h
D01	2 ... 16	9.8	11	6	36
D02	20 ... 63	13.8	15.3	10	36
D03	80 ... 100	20.8	22.5	18	43

NEOZED fuse links SILIZED (utilization category gR)

Technical specifications

NEOZED fuse links		
Standards		DIN VDE 0636-301, DIN VDE 0680, IEC 60269-1, -3-1, EN 60269-1, -3-1
Dimensions		DIN 49522, DIN 49523, DIN 49524, DIN 49525
Utilization category		gR
Rated voltage U_n	V AC V DC	400 250
Rated current I_n	A	10 ... 63
Rated breaking capacity	kA AC kA DC	50 8
Mounting position		any, but preferably vertical
Non-interchangeability		using adapter sleeves
Resistance to climate	°C	up to 45 at 95 % rel. humidity
Ambient temperature	°C	-5 ... +40, humidity 90 % at 20

Selection and ordering data

	Size	I_n	Order No.	Weight 1 item	PS*/ P. unit
		A		kg	Items
Rated voltage 400 V AC/250 V DC, utilization category gR					
	Consumer packing, package of 10				
	D01	10	**5SE1 310**	0.006	10
		16	**5SE1 316**	0.007	10
	D02	20	**5SE1 320**	0.012	10
		25	**5SE1 325**	0.012	10
		35	**5SE1 335**	0.012	10
		50	**5SE1 350**	0.013	10
		63	**5SE1 363**	0.014	10

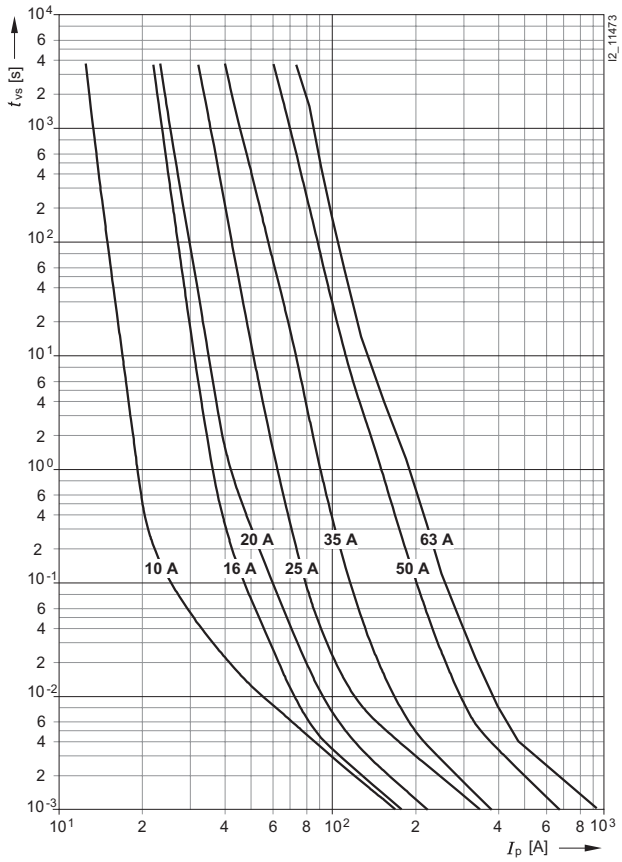
* You can order this quantity or a multiple thereof.

Characteristic curves

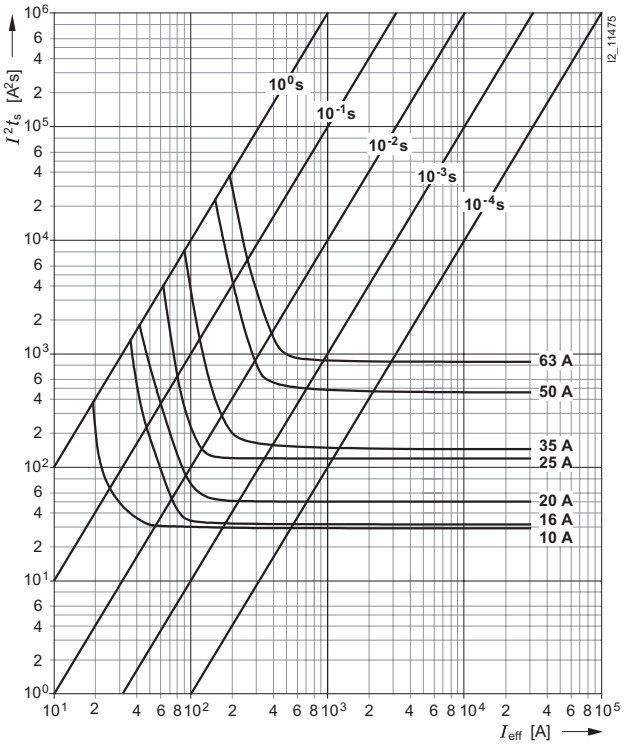
Series 5SE1 3..

Size: D01, D02
Utilization category: gR
Rated voltage: 400 V AC/250 V DC
Rated current: 10 ... 63 A

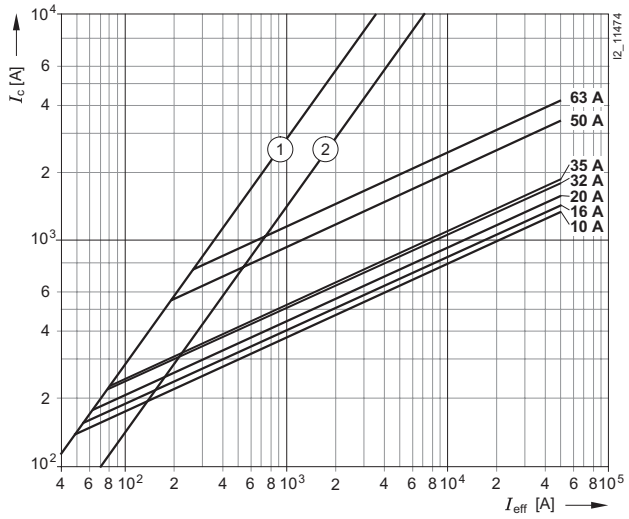
Time/current characteristics diagram



Melting I^2t_s values diagram



Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

NEOZED fuse links SILIZED (utilization category gR)

Characteristic curves

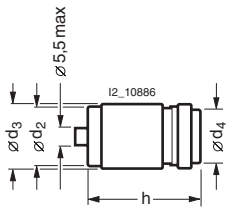
Series 5SE1

Size: D01, D02
Utilization category: gR
Rated voltage: 400 V AC/250 V DC
Rated current: 10 ... 63 A

Type	I_n	P_v	$\Delta\vartheta$	I^2t_s		I^2t_a	
				1 ms	4 ms	230 V AC	400 V AC
	A	W	k	A^2s	A^2s	A^2s	A^2s
5SE1 310	10	6.9	64	30	30	56	73
5SE1 316	16	6.2	61	31	34	92	120
5SE1 320	20	8.1	64	50	56	146	190
5SE1 325	25	8.2	63	120	120	166	215
5SE1 335	35	16.7	100	145	182	361	470
5SE1 350	50	12.0	80	460	540	1510	1960
5SE1 363	63	15.5	96	845	932	3250	4230

Dimensional drawings

5SE1



Size	I_n	Dimensions	
	A	d	h
D01	2 ... 16	11	36
D02	20 ... 63	15.3	36

Overview

Fuse bases made of molded plastic

- With protection against contact according to BGV A2 (VBG4)
- 1- and 3-pole
- Size D01 and D02
- For mounting rail
- Anti-slip terminal at ingoing and outgoing feeder
- For busbar mounting

- With protection against contact according to BGV A2 (VBG4)
- 1- and 3-pole
- Size D01 and D02
- For mounting rail
- Anti-slip terminal at ingoing and outgoing feeder
- For busbar mounting
- Available with and without cover

Fuse bases made of ceramic

- 1- and 3-pole
- Size D01, D02 and D03
- For mounting rail or screw connection
- Range of terminals available for ingoing and outgoing feeder
- Available with and without cover or alternatively with cap

Covers and caps

- Molded plastic
- Size D01, D02 and D03
- Clip-on or screw-on

Busbars and matching terminals

- Insulated/not insulated
- 1- and 3-pole
- Size D01 and D02

Screw caps

- Molded plastic or ceramic
- Size D01, D02 and D03
- Sealable or with inspection hole

NEOZED fuse bases

Design

Correct infeed

All NEOZED bases must be fed from the bottom to ensure an insulated threaded ring when the fuse link is being removed.

Types of connection

The terminals of the NEOZED bases are available in different versions to facilitate various installation methods.

Terminals

The terminals of NEOZED bases feature the following combinations: KK, SS, KS, BB and R.

The conventional designation signifies the following, e.g. "KS"= :
1st letter: screw head contact, incoming feeder, bottom terminal
2nd letter: saddle terminal, outgoing feeder, top terminal

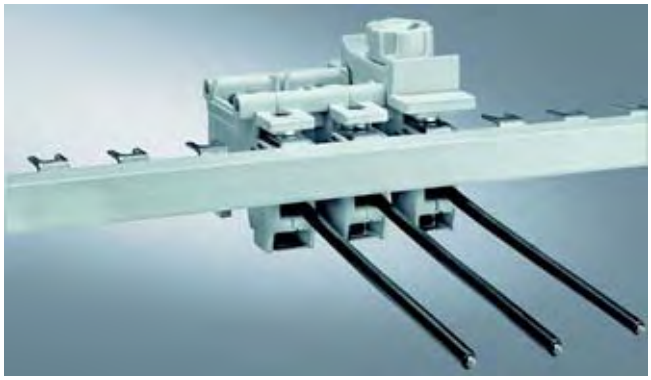
NEOZED base D01 with:
R = anti-slip terminal

NEOZED base D01 for 16 A, 5SG1 330 with terminal version "R", mounted onto a 5SH5 321 busbar in fork-type version, non-insulated. The busbar has a load capacity of up to 116 A.

NEOZED base with:
B = clamp-type terminal
F = anti-slip terminal
K = screw head contact

NEOZED base D01 for 16 A, 5SG1 330 with terminal version "R", mounted onto a 5SH5 517 busbar. The busbar has a load capacity of up to 160 A.

NEOZED base with:
K = screw head contact
S = saddle terminal



NEOZED base D01 for 16 A, 5SG5 330 with terminal version "R", mounted onto a three-phase 5SH5 320 busbar. The busbar has a load capacity of up to 120 A.

Technical specifications

Terminals										
Terminal		**B**	**K**		**S**		**R**		**FR2**	
Size		D01	D02	D03	D02	D03	D01	D02	D01	D02
Conductor cross-sections Minimum conductor cross-section of 1.5 mm² must be observed in accordance with VDE 0638										
• Rigid, minimum	mm²	1.5		10	1.5	10	1.5			
• Rigid, maximum	mm²	4	25	50	25	50	16			
• Flexible with sleeve, min.	mm²	1.5	1.5	10	1.5	10	1.5			
Tightening torque										
• Screw M4	Nm	1.2					–			
• Screw M5	Nm	2.0							–	
• Screw M6	Nm	2.5					–			
• Screw M8	Nm	3.5					–			

Terminal designations

B = clamp-type terminal
K = screw head contact
S = saddle terminal
R = anti-slip terminal
FR2 = anti-slip terminal

Anti-slip terminals differ in the
- Terminal level for the conductors
- Terminal level for the busbars
- Busbar version (fork-type or pin)
- Modular size

Different versions cannot be busbar mounted with each other. To facilitate assignment of the busbars, we have introduced the terminal marking FR2.

Selection and ordering data

	Size	I_n A	Matching cover	Terminals [1]	MW	Order No.	Weight 1 item kg	PS*/ P. unit Items
with protection against contact BGV A2 (VBG4), molded plastic								
 **1-pole**	D01	16	–	FR2	1.5	**5SG1 300**	0.150	1/6
	D02	63	_			**5SG1 700**	0.150	1/6
 **3-pole**	D01	16	–	FR2	4.5	**5SG5 300**	0.450	1/2
	D02	63	_			**5SG5 700**	0.450	1/2
 **1-pole** with cover	D01	16	(A1)	R	1.5	**5SG1 330**	0.068	1/15
	D02	63	(A1)	R	1.5	**5SG1 730**	0.087	1/15
 without cover	D01	16	A1	R	1.5	**5SG1 331**	0.056	1/15
	D02	63	A1	R	1.5	**5SG1 731**	0.080	1/15
 **3-pole** with cover	D01	16	(A2)	R	4.5	**5SG5 330**	0.216	1/5
	D02	63	(A2)	R	4.5	**5SG5 730**	0.252	1/5

(A1) means that the fuse base is supplied with cover as standard.
A1 means that the fuse base is supplied without cover, the cover can be ordered separately as a spare part.

1) For terminal version, see above and page 1/12.

*** You can order this quantity or a multiple thereof.**

NEOZED fuse bases

Selection and ordering data

		Size	I_n A	Matching cover	Terminals [1]	MW	Order No.	Weight 1 item kg	PS*/ P. unit Items
Ceramic									
	**1-pole**								
	with cover								
		D01	16	(A4)	BB	1.5	**5SG1 553**	0.083	1/15
		D02	63	(A10)	SS	1.5	**5SG1 653**	0.093	1/15
		D02	63	(A10)	KS	1.5	**5SG1 693**	0.090	1/15
	without cover								
		D01	16	A4	BB	1.5	**5SG1 595**	0.071	1/15
		D02	63	A10	SS	1.5	**5SG1 655**	0.081	1/15
		D02	63	A10	KS	1.5	**5SG1 695**	0.078	1/15
		D03	100	A6, A9	KS	2.5	**5SG1 812**	0.176	1/10
	for screw connection only, without cover								
		D01	16	A4	BB	1.5	**5SG1 590**	0.061	1/15
		D02	63	A10	SS	1.5	**5SG1 650**	0.078	1/15
		D03	100	A6, A9	KS	2.5	**5SG1 810**	0.176	1/10
	with cap								
		D01	16	(A8)	BB	1.5	**5SG1 594**	0.105	1/15
		D02	63	(A8)	SS	1.5	**5SG1 694**	0.115	1/15
		D03	100	(A9)	KS	2.5	**5SG1 813**	0.242	1/10
	**3-pole**								
	with cover								
		D01	16	(A5)	BB	4.5	**5SG5 553**	0.263	1/5
		D02	63	(A11)	SS	4.5	**5SG5 653**	0.240	1/5
		D02	63	(A11)	KS	4.5	**5SG5 693**	0.290	1/5
	without cover								
		D01	16	A5	BB	4.5	**5SG5 555**	0.228	1/5
		D02	63	A11	SS	4.5	**5SG5 655**	0.265	1/5
		D02	63	A11	KS	4.5	**5SG5 695**	0.255	1/5
	for screw connection only, without cover								
		D01	16	A5	BB	4.5	**5SG5 550**	0.228	1/5
		D02	63	A11	SS	4.5	**5SG5 650**	0.260	1/5
		D02	63	A11	KS	4.5	**5SG5 690**	0.250	1/5

(A4) means
that the fuse base is supplied with cover as standard.
A4 means
that the fuse base is supplied without cover,
the cover can be ordered separately as a spare part.

1) For terminal version, see pages 1/12 and 1/13.

* You can order this quantity or a multiple thereof.

Accessories

		MW	Order No.	Weight 1 item	PS*/ P. unit
				kg	Items
	NEOZED covers made of molded plastic				
	cover A1 (for sizes D01, D02), clip-on	1.5	**5SH5 244**	0.008	1/15
	cover A2 (for sizes D01, D02), clip-on	4.5	**5SH5 245**	0.017	1/5
	cover A4 (for size D01), clip-on	1.5	**5SH5 251**	0.012	1/15
	cover A10 (for size D02), clip-on	1.5	**5SH5 253**	0.020	1/15
	cover A5 (for size D01), clip-on	4.5	**5SH5 252**	0.035	1/5
	cover A11 (for size D02), clip-on	4.5	**5SH5 254**	0.045	1/5
	cover A6 (for size D03), screw-on	2.5	**5SH5 233**	0.021	1/20
	NEOZED caps made of molded plastic				
	cover A8, clip-on	–	**5SH5 235**	0.034	1/20
	cover A9, screw-on	–	**5SH5 234**	0.066	1/10

* You can order this quantity or a multiple thereof.

NEOZED fuse bases

Accessories

	Size	Length approx.	Conductor cross-section	Load capacity up to	For Terminals [1]	MW	Order No.	Weight 1 item	PS*/ P. unit
		mm	mm^2	A				kg	Items
	Busbars								
	the load capacity values are valid for centered infeed.								
	fork-type terminals, non-insulated								
	1-pole								
	D01	1000	20	116	R, K	1.5	**5SH5 321**	0.214	1/50
	D02	1000	36	168	R, K	1.5	**5SH5 322**	0.321	1/50
	fork-type terminals, insulated								
	1-pole								
	D01/D02	1000	24	160	R, FR2, K	1.5	**5SH5 517**	0.550	1/50
	3-pole								
	D01/D02	1000	16	120	R, K	1.5	**5SH5 320**	0.843	1/20
	D01/D02	1000	16	120	FR2, K	1.5	**5SH5 515**	0.584	1/10
	pins, insulated								
	degree of pollution 2								
	1-pole								
	D01/D02	1000	16	130	S	1.5	**5SH5 324**	0.320	1/50
	3-pole								
	D01/D02	1000	16	120	S	1.5	**5SH5 323**	0.843	1/20
	D01	1000	16	120	FR1	1	**5SH5 512**	0.630	1/15
	D01	216	16	120	FR2, K	1	**5ST2 204**	0.090	1/25
	End caps for busbars								
	for 5SH5 320, 5SH5 323, 5SH5 512, 5ST2 204						**5SH5 514**	0.001	10
	for 5SH5 515, 5SH5 517, 5SH5 324						**5ST2 156**	0.017	10
	**Busbar adapters** for clipping onto busbars 12 mm × 5 mm, with 40 mm center clearance, device width 4.5 MW, with connection cables, 3 mm × 16 mm^2 for rated current 63 A, for mounting of modular installation devices busbar adapter for clipping onto busbars with 60 mm center clearance, see SR60 busbar system						**5SH5 503**	0.280	1

1) For terminal version, see pages 1/12 and 1/13.

* You can order this quantity or a multiple thereof.

Accessories

	Version/size	Order No.	Weight 1 item	PS*/ P. unit
			kg	Items
	Busbar terminals			
	non-insulated, pin-type for conductors from 6 mm^2 ... 35 mm^2	**5ST2 203**	0.001	1/20
	insulated, for clipping onto fork-type or pin-type for conductors from 6 mm^2 ... 35 mm^2 not suitable for 55 mm mounting depth	**5ST2 157**	0.030	1
	insulated, fork-type for conductors from 6 mm^2 ... 25 mm^2	**5SH5 328**	0.014	10
	insulated, pin-type for conductors from 2 mm^2 ... 25 mm^2	**5SH5 327**	0.014	10
	non-insulated, pin-type for two conductors, each from 2 mm^2 ... 16 mm^2	**5SH5 326**	0.016	1/10
	NEOZED screw caps			
	molded plastic, with inspection hole			
	D01	**5SH4 116**	0.007	10
	D02	**5SH4 163**	0.008	10
	ceramic			
	D01, sealable	**5SH4 316**	0.014	10
	D02, sealable	**5SH4 363**	0.015	10
	D03	**5SH4 100**	0.070	3
	ceramic, with inspection hole			
	D01	**5SH4 317**	0.014	10
	D02	**5SH4 362**	0.017	10

*** You can order this quantity or a multiple thereof.**

NEOZED fuse bases

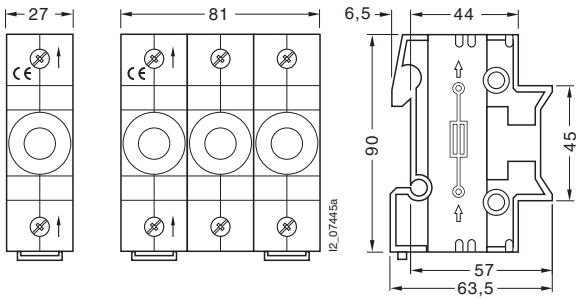
Accessories

	Size	For fuse up to A	Identification color	Order No.	Weight 1 item kg	PS*/ P. unit Items
	**NEOZED adapter sleeves**					
	D01	2	pink	**5SH5 002**	0.001	10
		4	brown	**5SH5 004**	0.001	10
		6	green	**5SH5 006**	0.001	10
		10/13	red	**5SH5 010**	0.001	10
	D02	20	blue	**5SH5 020**	0.001	10
		25	yellow	**5SH5 025**	0.001	10
		32/35/40	black	**5SH5 035**	0.001	10
		50	white	**5SH5 050**	0.001	10
	D03	80	silver	**5SH5 080**	0.001	10
	for adaptation of NEOZED fuse links D01 from 2 A ... 16 A, for insertion in NEOZED bases D02					
	D02	2	pink	**5SH5 402**	0.001	10
		4	brown	**5SH5 404**	0.001	10
		6	green	**5SH5 406**	0.001	10
		10/13	red	**5SH5 410**	0.001	10
		16	gray	**5SH5 416**	0.001	10
	**NEOZED adapter sleeve fitter**			**5SH5 100**	0.016	1
	**NEOZED retaining springs** for adaptation of NEOZED screw caps D02 to fit NEOZED fuse links D01					
	D02	2 ... 16		**5SH5 400**	0.001	25
	for application in the five new German Laender, for adaptation of DL screw caps to insert NEOZED fuse links D01 in DL bases.					
	DL	2 ... 16		**5SH5 417**	0.001	25

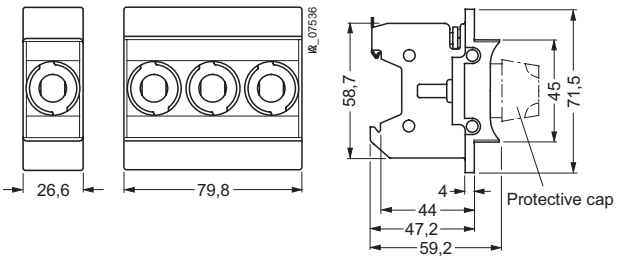
Dimensional drawings

with protection against contact BGV A2 (VBG4), molded plastic

with anti-slip terminal D01/D02
5SG1 300, 5SG1 700, 5SG5 300, 5SG5 700



with cover
5SG1 330, 5SG1 331, 5SG1 730, 5SG1 731, 5SG5 330, 5SG5 730



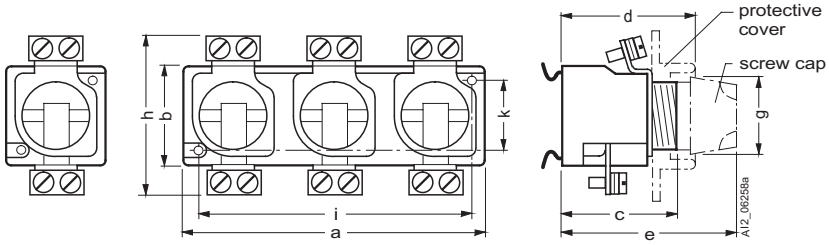
* You can order this quantity or a multiple thereof.

Dimensional drawings

Ceramic

NEOZED base

5SG1, 5SG5



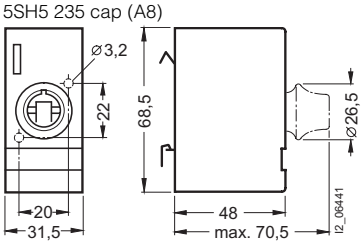
Type	Version	Size	Type of connection	Dimensions								
				a	b	c	d	e	g not sealed/ sealed	h	l	k
clip-on with cover												
5SG1 553	1-pole	D01	BB	26.8	36	40	56	70	23/26.5	54	–	–
5SG1 653		D02	SS	26.8	36	41	56	70	23/26.5	59	–	–
5SG1 693		D02	KS	26.8	36	41	56	70	23/26.5	60	–	–
5SG5 553	3-pole	D01	BB	80.8	36	40	56	70	23/26.5	54	–	–
5SG5 653		D02	SS	80.8	36	41	56	70	23/26.5	59	–	–
5SG5 693		D02	KS	80.8	36	41	56	70	23/26.5	60	–	–
clip-on without cover												
5SG1 595	1-pole	D01	BB	26.8	36	40	56	70	23/26.5	54	–	–
5SG1 655		D02	SS	26.8	36	41	56	70	23/26.5	59	–	–
5SG1 695		D02	KS	26.8	36	41	56	70	23/26.5	60	–	–
5SG1 812		D03	KS	44.9	50	44	54.5	76	44	86	–	–
5SG5 555	3-pole	D01	BB	80.8	36	40	56	70	23/26.5	54	–	–
5SG5 655		D02	SS	80.8	36	41	56	70	23/26.5	59	–	–
5SG5 695		D02	KS	80.8	36	41	56	70	23/26.5	60	–	–
screw-on without cover												
5SG1 590	1-pole	D01	BB	26.8	36	40	56	70	23/26.5	54	20	22
5SG1 650		D02	SS	26.8	36	41	56	70	23/26.5	59	20	22
5SG1 810		D03	KS	44.9	50	46	54.5	76	44	86	32	32
5SG5 550	3-pole	D01	BB	80.8	36	40	56	70	23/26.5	54	74	22
5SG5 650		D02	SS	80.8	36	41	56	70	23/26.5	59	74	22
5SG5 690		D02	KS	80.8	36	41	56	70	23/26.5	60	74	22

Connection type:
K = Screw head contact
B = Clamp-type terminal
S = Saddle terminal

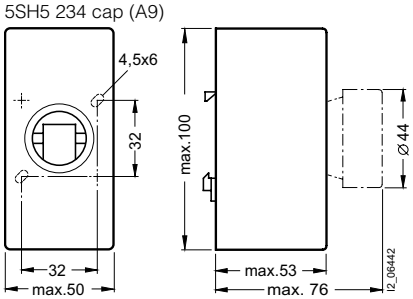
BB = Incoming feeder clamp-type terminal
Outgoing feeder clamp-type terminal
SS = Incoming feeder saddle terminal
Outgoing feeder saddle terminal
KS = Incoming feeder screw head contact
Outgoing feeder saddle terminal

NEOZED base with cap

D01/D02
5SG1 594, 5SG1 694
5SH5 235 cap (A8)



D03
5SG1 813
5SH5 234 cap (A9)

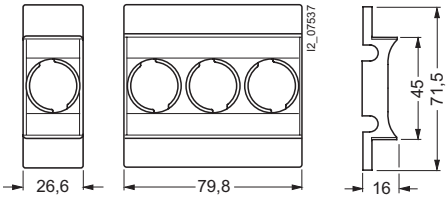


NEOZED fuse bases

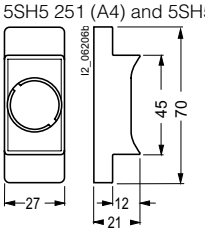
Dimensional drawings

NEOZED covers made of molded plastic

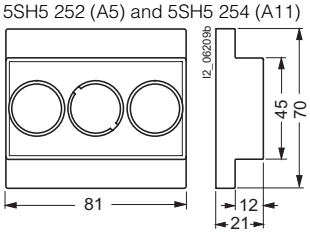
NEOZED cover for NEOZED base, made of molded plastic
5SH5 244 (A1) and 5SH5 245 (A2)



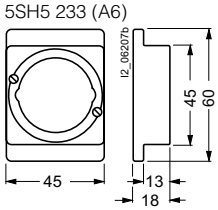
NEOZED cover
5SH5 251 (A4) and 5SH5 253 (A10)



5SH5 252 (A5) and 5SH5 254 (A11)

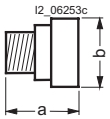


5SH5 233 (A6)



NEOZED screw caps

5SG4



Type	Size	Sealable	for mounting depth	Dimensions a	b
5SH4 116	D01	–	55/70	24.5	23
5SH4 163	D02	–	55/70	24.5	23
5SH4 316	D01	x	70	33	26.5
5SH4 363	D02	x	70	33	26.5
5SH4 100	D03	–	76	37	44
5SH4 317	D01	–	70	29.5	25
5SH4 362	D02	–	70	30.5	25

Benefits

- With draw-out type for safe, no-voltage changing of fuse links
- Rated voltage: 415 V AC/48 V DC
- No switching under load
- With anti-slip terminal according to BGV A2 (VBG4) in the incoming and outgoing cable

Technical specifications

NEOZED fuse disconnectors		
		5SG7 6
Valid standards		DIN VDE 0638/09.81, EN 60947-3
Dimensions		DIN 43880
Main switch characteristic		EN 60204-1
Dielectric characteristic		EN 60664-1
Rated voltage U_n	V V	230/400 AC, 240/415 AC 48 DC: 1-pole, 110 DC: 2-pole in series
Rated current I_n	A	16
Rated insulation voltage	V AC	400
Rated impulse withstand voltage	V AC	2500
Rated breaking capacity	kA	50 AC
Sealable when switched on		yes
Mounting position		vertical
Degree of protection according to IEC 60529 in distribution boards with section cover		IP20
Ambient temperature	°C	-5 ... +40, humidity 90 % at 20

Terminals		
Terminal		**FR1**
Size		D01
Conductor cross-sections minimum conductor cross-section of 1.5 mm^2 must be observed, in accordance with VDE 0638		
Rigid, minimum	mm^2	1.5
Rigid, maximum	mm^2	16
Flexible with sleeve, min.	mm^2	1.5

Terminal designations

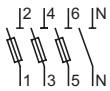
FR1 = anti-slip terminal

Anti-slip terminals differ in the
- Terminal level for the conductors
- Terminal level for the busbars
- Busbar version (fork-type or pin)
- Modular size

Different versions cannot be busbar mounted with each other. To facilitate assignment of the busbars, we have introduced the terminal marking FR1.

NEOZED fuse disconnectors

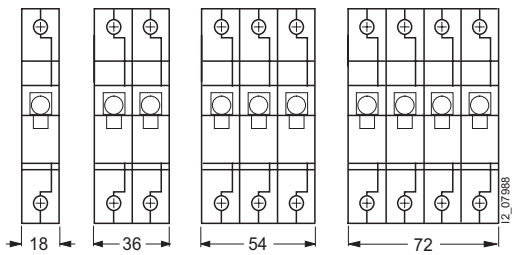
Selection and ordering data

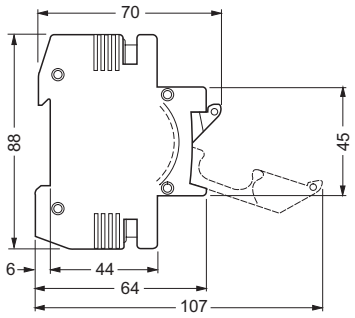
		Number of poles	I_n A	Terminals	MW	Order No.	Weight 1 item kg	PS*/ P. unit Items
D01, draw-out type								
		1	16	FR1	1	**5SG7 610**	0.070	1
		1 + N	16	FR1	2	**5SG7 650**	0.150	1
		2	16	FR1	2	**5SG7 620**	0.150	1
		3	16	FR1	3	**5SG7 630**	0.220	1
		3 + N	16	FR1	4	**5SG7 660**	0.300	1

Dimensional drawings

D01, draw-out type

5SG7 6.0

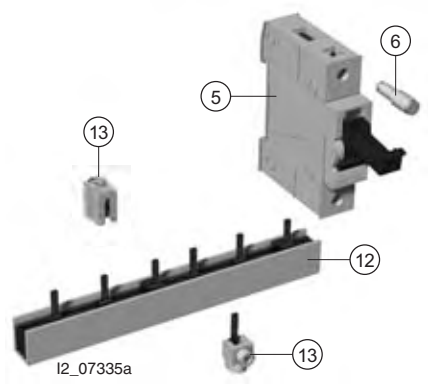




* You can order this quantity or a multiple thereof.

Overview

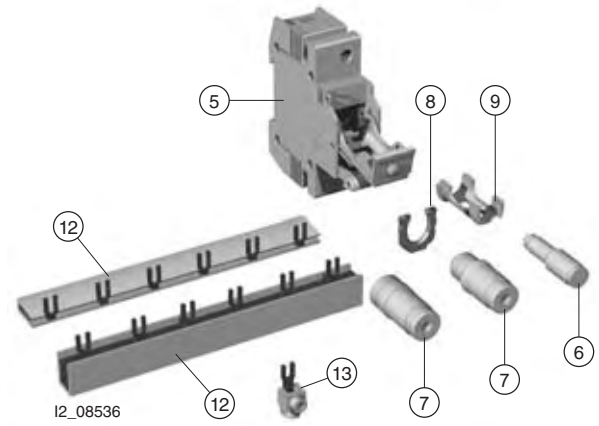
MINIZED switch disconnector D01, draw-out type



- 55 mm mounting depth
- With protection against contact according to BGV A2 (VBG4)
- Size D01
- For mounting rail
- Anti-slip terminal at ingoing and outgoing feeder
- For busbar mounting
- Knob-operated switch and screw cap can be sealed
- With draw-out type for safe, no-voltage changing of fuse links
- Special version for Italy for 25 A
- Suitable for direct starting on load

⑤ **MINIZED switch disconnector D01, draw-out type**
⑥ NEOZED fuse link D01
⑫ Busbar, insulated, pins
⑬ Terminal, not insulated or insulated, pins

MINIZED switch disconnector D02, draw-out type



- 70 mm mounting depth
- With protection against contact according to BGV A2 (VBG4)
- Size D02
- For mounting rail
- Anti-slip terminal at ingoing and outgoing feeder
- For busbar mounting
- Knob-operated switch and screw cap can be sealed
- With draw-out type for safe, no-voltage changing of fuse links
- Suitable for direct starting on load

⑤ **MINIZED switch disconnector D02, draw-out type**
⑥ NEOZED fuse link D01
⑦ NEOZED fuse link D02
⑧ NEOZED adapter sleeve
⑨ NEOZED adapter
⑫ Busbar, insulated single-phase or 3-phase, fork-type
⑬ Terminal, not insulated or insulated, fork-type

MINIZED switch disconnectors

Benefits

Function

MINIZED switch disconnectors belong to the NEOZED fuse range. They completely disconnect the phase in the incoming and outgoing cable by switching off. They are suited for NEOZED fuse links.

A mechanical interlock prevents closing if NEOZED fuse links have not been correctly screwed in or plugged in.

Universal application

The MINIZED switch disconnectors D02 can accept both D02 and D01 fuse links. For inserting D01 fuse links, a retaining spring is used in the screw cap or an adapter is plugged into the drawer, depending on the version.

Busbar mounting

For the MINIZED switch disconnector D02, the incoming and outgoing terminals are identical and can be mounted on busbars. Infeed and/or busbar mounting is possible from the top or bottom.

Technical specifications

MINIZED switch disconnectors					
			5SG7 7	**5SG7 1.2**	**5SG7 132-8BA..**
Valid standards			DIN VDE 0638/09.81, EN 60947-3		
Dimensions			DIN 43880		
Main switch characteristic			EN 60204-1		
Dielectric characteristic			EN 60664-1		
Rated voltage U_n		V V	230/400 AC, 240/415 AC 48 DC 1-pole, 110 DC 2-pole in series		
Rated current I_n		A	16	63	25, 35, 50
Rated insulation voltage		V AC	400		
Rated impulse withstand voltage		V AC	2500		
Rated breaking capacity		kA	50 AC		
Switching capacity					
Utilization category according to VDE 0638	AC-22 AC-23 DC -22	A A A	16 10 16	63 – –	
Utilization category acc. to EN 60947-3	AC-22A AC-23A DC-22A AC-22B AC-23B DC-22B	A A A A A A	– – – 16 10 16	63 35 63 – – –	
No-voltage changing of fuse links			yes		
With terminals according to BGV A2 (VGB4) in the ingoing and outgoing feeder			yes		
Tightening torque		Nm	1.2		
Sealable when switched on			yes		
Mounting position			vertical		
Mounting depth		mm	55	70	
Degree of protection according to IEC 60529 in distribution boards with section cover			IP20		
Ambient temperature		°C	-5 ... +40, humidity 90 % at 20		

Terminals				
Terminal			**FR1**	**FR2**
Size			D01	D02
Conductor cross-sections minimum conductor cross-section of 1.5 mm^2 must be observed, in accordance with VDE 0638				
Rigid, minimum Rigid, maximum		mm^2 mm^2	1.5 16	
Flexible with sleeve, min.		mm^2	1.5	

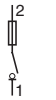
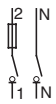
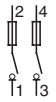
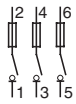
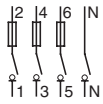
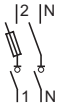
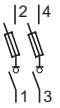
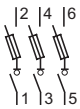
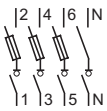
Terminal designations

FR1= anti-slip terminal
FR2= anti-slip terminal

Anti-slip terminals differ in the
- Terminal level for the conductors
- Terminal level for the busbars
- Busbar version (fork-type or pin)
- Modular size

Different versions cannot be busbar mounted with each other. To facilitate assignment of the busbars, we have introduced the terminal markings FR1 and FR2.

Selection and ordering data

		Number of poles	I_n A	Terminals	MW	Order No.	Weight 1 item kg	PS*/ P. unit Items
D01, draw-out type, mounting depth 55 mm								
		1	16	FR1	1	**5SG7 713**	0.080	1/3
		Version for Italy only (no approvals)						
			25			**5SG7 713-1B**	0.080	1/3
		1 + N	16	FR1	2	**5SG7 753**	0.150	1/2
		Version for Italy only (no approvals)						
			25			**5SG7 753-1B**	0.150	1/2
		2	16	FR1	2	**5SG7 723**	0.160	1/2
		Version for Italy only (no approvals)						
			25			**5SG7 723-1B**	0.160	1/2
		3	16	FR1	3	**5SG7 733**	0.254	1
		Version for Italy only (no approvals)						
			25			**5SG7 733-1B**	0.254	1
		3 + N	16	FR1	4	**5SG7 763**	0.310	1
		Version for Italy only (no approvals)						
			25			**5SG7 763-1B**	0.310	1
D02, draw-out type, mounting depth 70 mm								
		1	63	FR2	1.5	**5SG7 112**	0.132	1
		1 + N	63	FR2	3	**5SG7 152**	0.265	1
		2	63	FR2	3	**5SG7 122**	0.226	1
		3	63	FR2	4.5	**5SG7 132**	0.410	1
		Versions for Austria (KELAG) only						
		3	25			**5SG7 132-8BA25**	0.410	1
			35			**5SG7 132-8BA35**	0.410	1
			50			**5SG7 132-8BA50**	0.410	1
		3 + N	63	FR2	6	**5SG7 162**	0.520	1

* You can order this quantity or a multiple thereof.

MINIZED switch disconnectors

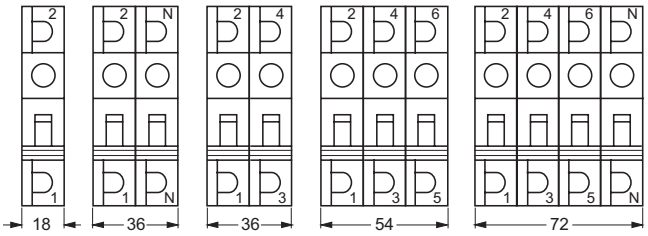
Accessories

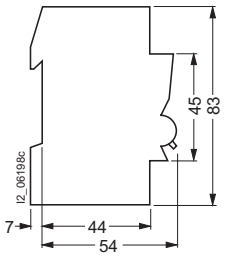
	Size	For fuse up to A	Identification color	Order No.	Weight 1 item kg	PS*/ P. unit Items
D01, draw-out type, mounting depth 55 mm						
	**Terminal** not insulated, up to 25 mm^2			**5SH5 510**	0.012	1/50
D02, draw-out type, mounting depth 70 mm						
	**Auxiliary switch** for contact position indication, for retrofitting on the right side using the factory-fitted brackets, 0.5 MW Contact: 230 V AC, 6 A 24 V AC, 50 mA 24 V DC, 50 mA 1 NO + 1 NC			**5SH5 528**	0.050	1
	**Adapter sleeve**					
	D02	20	blue	**5SH5 521**	0.001	10
		25	yellow	**5SH5 522**	0.001	10
		35/40	black	**5SH5 523**	0.001	10
		50	white	**5SH5 524**	0.001	10
	**NEOZED adapter** for insertion of NEOZED fuse links D01 in MINIZED switch disconnectors D02					
	D01	2 ... 6	green	**5SH5 530**	0.002	3
		10	red	**5SH5 531**	0.002	3
		16	gray	**5SH5 520**	0.002	3

Dimensional drawings

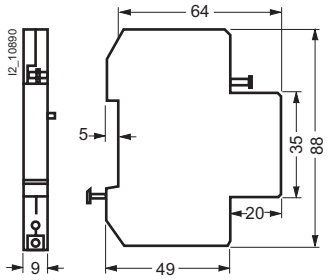
D01, draw-out type, mounting depth 55 mm

5SG7 7.3



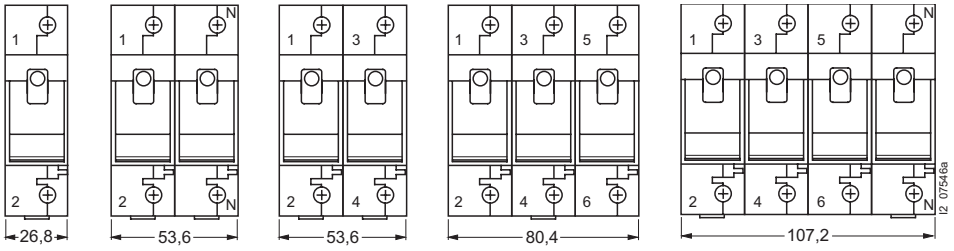


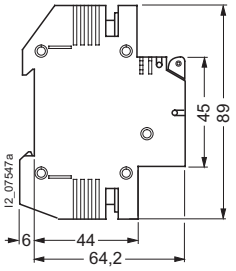
5SH5 528
auxiliary switch



D02, draw-out type, mounting depth 70 mm

5SG7 1.2, 5SG7 132-8BA..





* You can order this quantity or a multiple thereof.

Overview

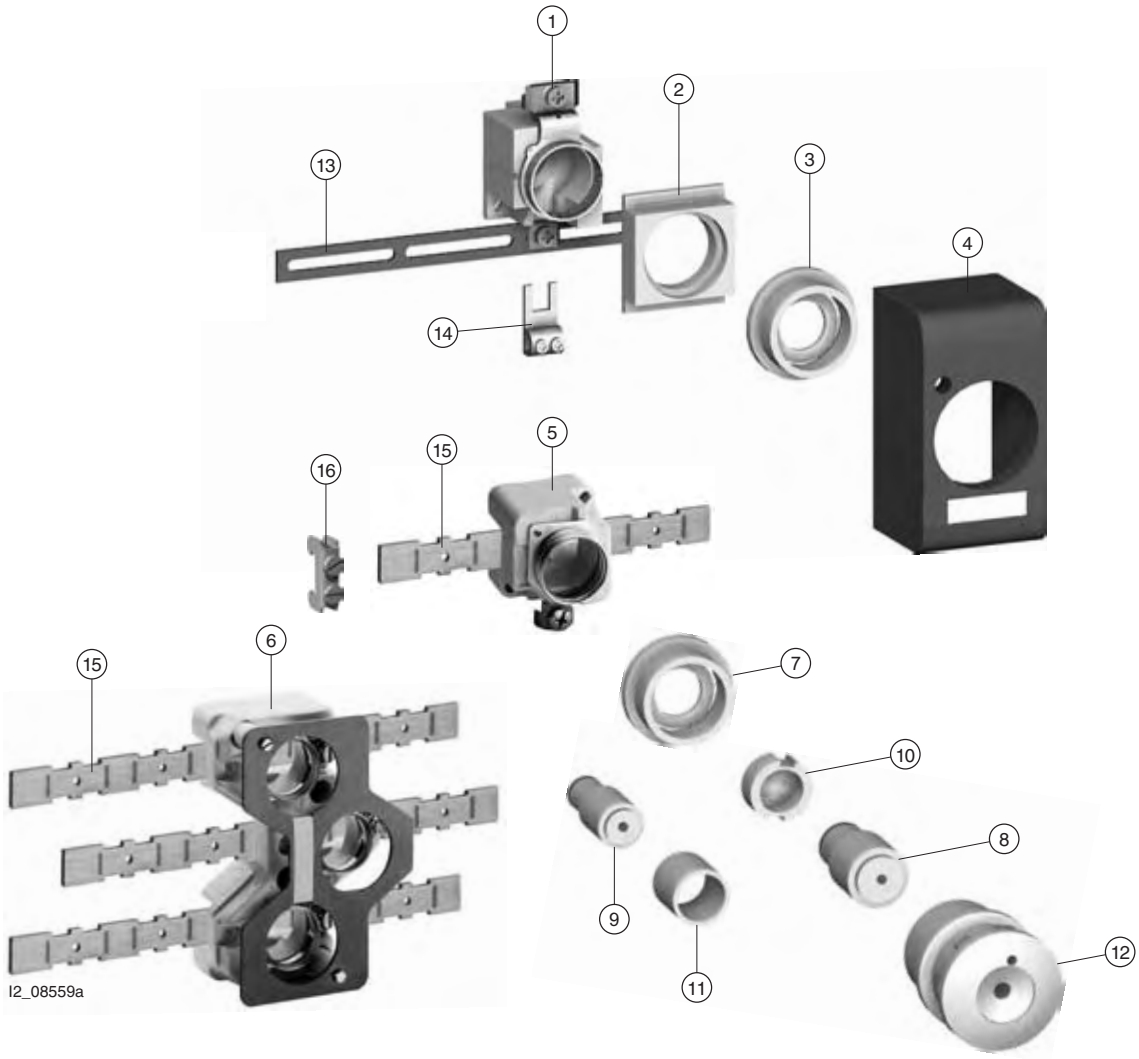
DIAZED fuse links

DIAZED fuse links SILIZED (utilization category gR)

DIAZED fuse bases and accessories

Product overview

Overview



The DIAZED component system

As a result of the well-designed modular system, the components can be combined in any way to meet the various requirements and to facilitate different installation methods.
It is particularly suitable for tough operating conditions.

As modular installation devices, the bases are mounted in distribution boards according to DIN 43880 or in switchgear cabinets on a standard mounting rail according to EN 50021. However, bases exclusively designed for screw connection are also available.

A special busbar with oblong holes and a load capacity of up to 80 A facilitates adaptation during mounting.

The EZR bus-mounting system

The high-performing EZR bus-mounting system for screw connection is an outstanding feature.

The busbars, which are particularly suited for bus-mounting bases, have a load capacity of up to 150 A with lateral infeed.

① DIAZED base
② DIAZED cover
③ DIAZED cover ring
④ DIAZED cap
⑤ DIAZED bus-mounting base, EZR
⑥ DIAZED bus-mounting base, EZR, 3-phase
⑦ DIAZED cover ring, EZR for bus-mounting base
⑧ DIAZED fuse link DII
⑨ DIAZED fuse link NDz
⑩ DIAZED screw adapter
⑪ DIAZED adapter sleeve
⑫ DIAZED screw cap
⑬ Busbar, oblong hole, single-phase
⑭ Terminal, fork-type terminal, non-insulated
⑮ EZR busbar
⑯ EZR terminal

Overview

Correct infeed

All DIAZED bases must be fed from the bottom to ensure an insulated threaded ring when the fuse link is being removed.

Contact stability

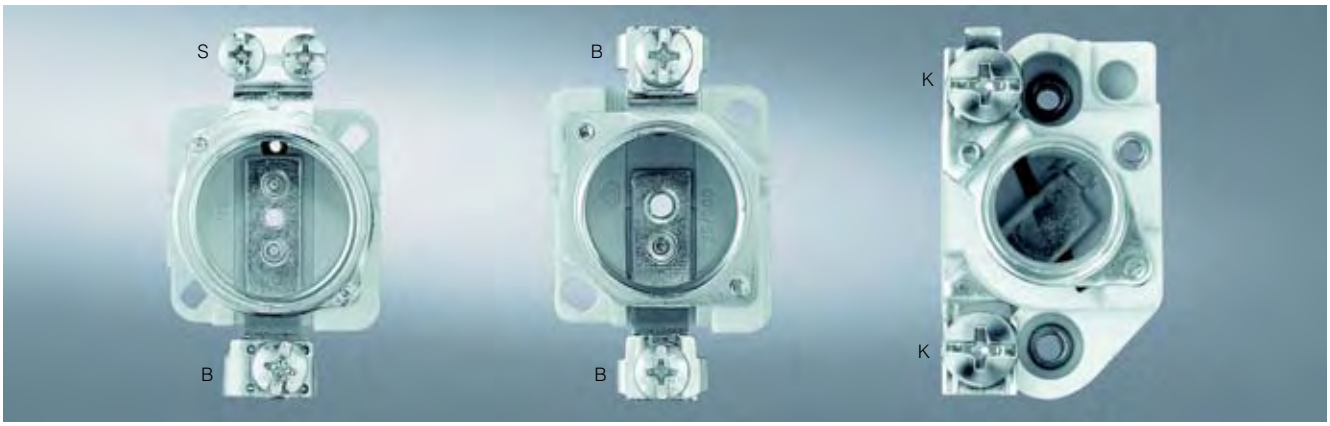
DIAZED screw adapters are essential in the DIAZED base for stable contacting.

Types of connection

B = clamp-type terminal
K = screw head contact
S = saddle terminal

Designation system

The conventional designation signifies the following, e.g. "BS" = :
1st letter: clamp-type terminal, incoming feeder, bottom terminal
2nd letter: saddle terminal, outgoing feeder, top terminal



DIAZED 5SF6 005 bus-mounting base DII for 25 A with terminal version "B" mounted onto an EZR 5SH3 54 busbar. The feeding conductors are clamped to the 8JH4 122 bus-mounting terminal. The busbar has a load capacity of up to 150 A.

DIAZED bus-mounting base DII 3-phase for 3 x 25 A, 5SF2 07 with terminal version "B" mounted onto 3 EZR 5SH3 54 busbars. The busbars have a load capacity of 150 A each respectively.

Technical specifications

DIAZED fuse links		
Standards		DIN VDE 0635, DIN VDE 0636-301, DIN VDE 0680, IEC 60269-1, -3-1, CEE 16, EN 60269-1, -3-1
Dimensions		DIN 49510, DIN 49511, DIN 49514, DIN 49515, DIN 49516
Utilization category		gL/gG
Characteristic		slow and quick
Rated voltage U_n	V AC V DC	500, 690, 750 500, 600, 750
Rated current I_n	A	2 ... 100
Rated breaking capacity	kA AC kA DC	50, 40 at E16 8, 1.6 at E16
Mounting position		any, but preferably vertical
Non-interchangeability		due to screw adapter or adapter sleeves
Degree of protection according to IEC 60529 in the distribution board		IP20
Resistance to climate	°C	up to 45 at 95 % rel. humidity
Ambient temperature	°C	-5 ... +40, humidity 90 % at 20

DIAZED fuse links

Selection and ordering data

	Size	I_n	Identification color	Thread	Order No.	Weight 1 item	PS*/ P. unit
		A				kg	Items
Rated voltage 500 V AC/500 V DC							
	DIN VDE 0635						
	slow						
	TNDz	2	pink	E16	**5SA2 11**	0.013	10
		4	brown		**5SA2 21**	0.013	10
		6	green		**5SA2 31**	0.013	10
		10	red		**5SA2 51**	0.013	10
		16	gray		**5SA2 61**	0.013	10
		20	blue		**5SA2 71**	0.015	10
		25	yellow		**5SA2 81**	0.016	10
	quick						
	NDz	2	pink	E16	**5SA1 11**	0.013	10
		4	brown		**5SA1 21**	0.013	10
		6	green		**5SA1 31**	0.013	10
		10	red		**5SA1 51**	0.013	10
		16	gray		**5SA1 61**	0.013	10
		20	blue		**5SA1 71**	0.015	10
		25	yellow		**5SA1 81**	0.016	10
	DIN VDE 0636-301, IEC 60269-3-1						
	utilization category **gL/gG**						
	DII	2	pink	E27	**5SB2 11**	0.026	5
		4	brown		**5SB2 21**	0.026	5
		6	green		**5SB2 31**	0.026	5
		10	red		**5SB2 51**	0.027	5
		16	gray		**5SB2 61**	0.028	5
		20	blue		**5SB2 71**	0.029	5
		25	yellow		**5SB2 81**	0.031	5
	DIII	32	black	E33	**5SB4 010**	0.048	5
		35	black		**5SB4 11**	0.050	5
		50	white		**5SB4 21**	0.051	5
		63	copper		**5SB4 31**	0.054	5
	DIV [1]	80	silver	R1¼"	**5SC2 11**	0.110	3
		100	red		**5SC2 21**	0.110	3
	DIN VDE 0635						
	quick for 5SB1 41 a DIAZED screw adapter for 6 A is used						
	DII	2	pink	E27	**5SB1 11**	0.026	5
		4	brown		**5SB1 21**	0.026	5
		6	green		**5SB1 31**	0.026	5
		10	red		**5SB1 41**	0.026	5
		10	red		**5SB1 51**	0.027	5
		16	gray		**5SB1 61**	0.028	5
		20	blue		**5SB1 71**	0.029	5
		25	yellow		**5SB1 81**	0.031	5
	DIII	35	black	E33	**5SB3 11**	0.050	5
		50	white		**5SB3 21**	0.051	5
		63	copper		**5SB3 31**	0.054	5
	DIV	80	silver	R1¼"	**5SC1 11**	0.110	3
		100	red		**5SC1 21**	0.110	3

1) Rated voltage 500 V AC/400 V DC

* You can order this quantity or a multiple thereof.

Selection and ordering data

	Size	I_n A	Identification color	Thread	Order No.	Weight 1 item kg	PS*/ P. unit Items
Rated voltage 690 V AC/600 V DC							
	DIN VDE 0636-301, IEC 60269-3-1						
	utilization category gL/gG, DIAZED screw adapters DII are used for fuse links 2 A ... 25 A						
	DIII	2	pink	E33	**5SD8 002**	0.068	5
		4	brown		**5SD8 004**	0.068	5
		6	green		**5SD8 006**	0.068	5
		10	red		**5SD8 010**	0.068	5
		16	gray		**5SD8 016**	0.069	5
		20	blue		**5SD8 020**	0.071	5
		25	yellow		**5SD8 025**	0.072	5
		35	black		**5SD8 035**	0.078	5
		50	white		**5SD8 050**	0.080	5
		63	copper		**5SD8 063**	0.082	5
Rated voltage 750 V AC/750 V DC							
	DIN VDE 0635						
	for direct current railway facilities, quick DIAZED screw adapters DII are used for fuse links 2 A ... 25 A						
	DIII	2	pink	E33	**5SD6 01**	0.068	5
		4	brown		**5SD6 02**	0.068	5
		6	green		**5SD6 03**	0.068	5
		10	red		**5SD6 04**	0.068	5
		16	gray		**5SD6 05**	0.069	5
		20	blue		**5SD6 06**	0.071	5
		25	yellow		**5SD6 07**	0.072	5
		35	black		**5SD6 08**	0.078	5
		50	white		**5SD6 10**	0.080	5
		63	copper		**5SD6 11**	0.082	5

* You can order this quantity or a multiple thereof.

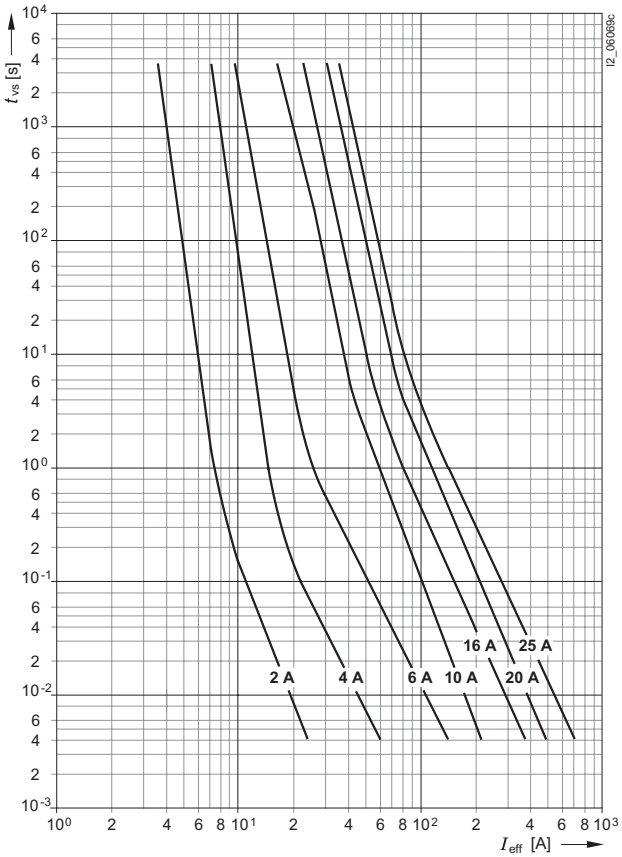
DIAZED fuse links

Characteristic curves

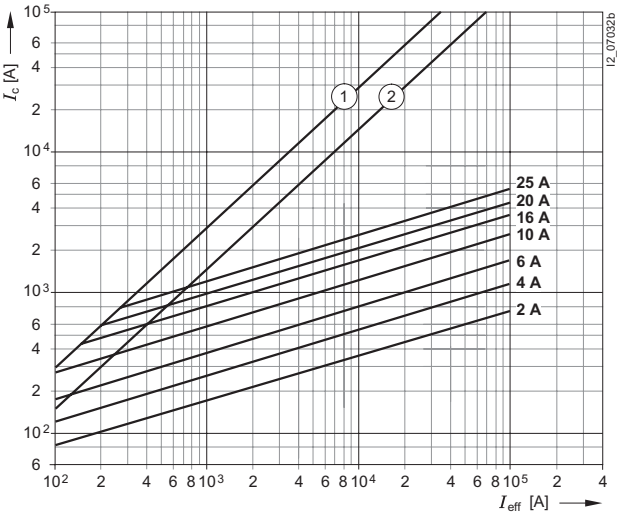
Series 5SA2

Size: E16
Characteristic: slow
Rated voltage: 500 V AC/500 V DC
Rated current: 2 ... 25 A

Time/current characteristics diagram

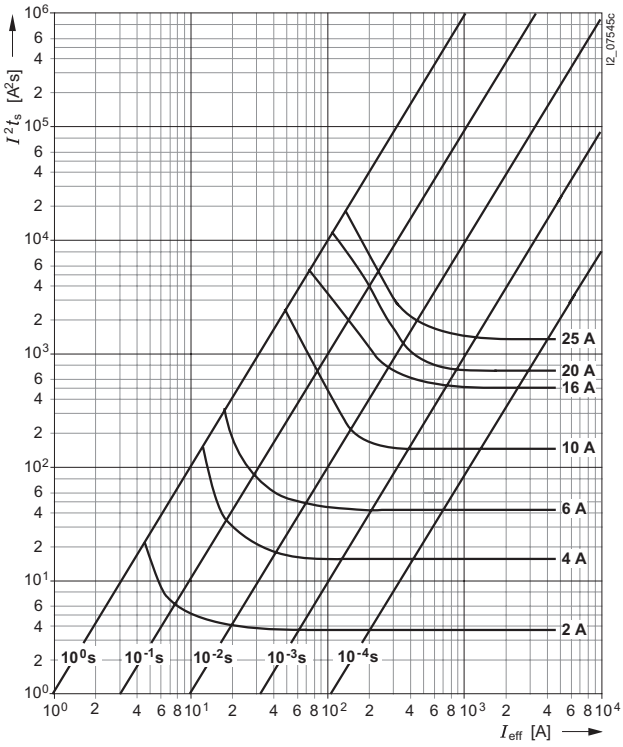


Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Melting I^2t_s values diagram



Type	I_n	P_v	$\Delta\vartheta$	I^2t_s 1 ms	I^2t_s 4 ms
	A	W	k	A²s	A²s
5SA2 11	2	0.85	15	1.2	2.3
5SA2 21	4	1.3	17	8.5	13
5SA2 31	6	1.9	14	40	80
5SA2 51	10	1.4	17	200	190
5SA2 61	16	2.4	30	290	550
5SA2 71	20	2.6	36	470	1990
5SA2 81	25	3.4	34	1000	2090

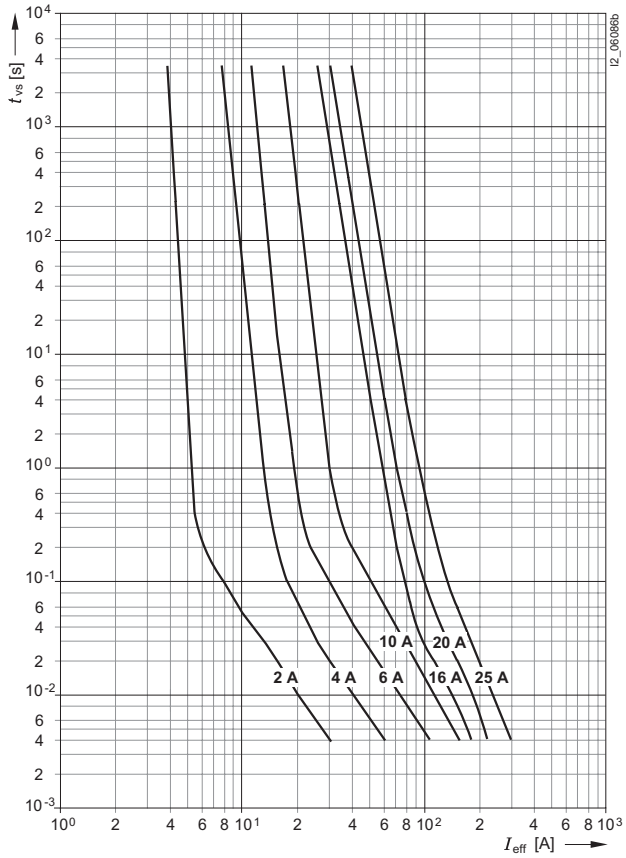
Type	I^2t_a		
	230 V AC	320 V AC	500 V AC
	A²s	A²s	A²s
5SA2 11	6.6	7.8	0.7
5SA2 21	22	26	34
5SA2 31	66	76	100
5SA2 51	240	270	340
5SA2 61	890	950	1090
5SA2 71	1200	1350	1620
5SA2 81	2400	2600	3450

Characteristic curves

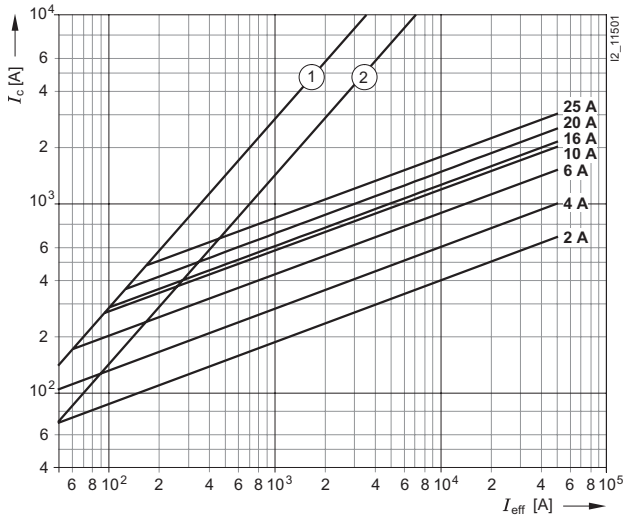
Series 5SA1

Size: E16
Characteristic: quick
Rated voltage: 500 V AC/500 V DC
Rated current: 2 ... 25 A

Time/current characteristics diagram

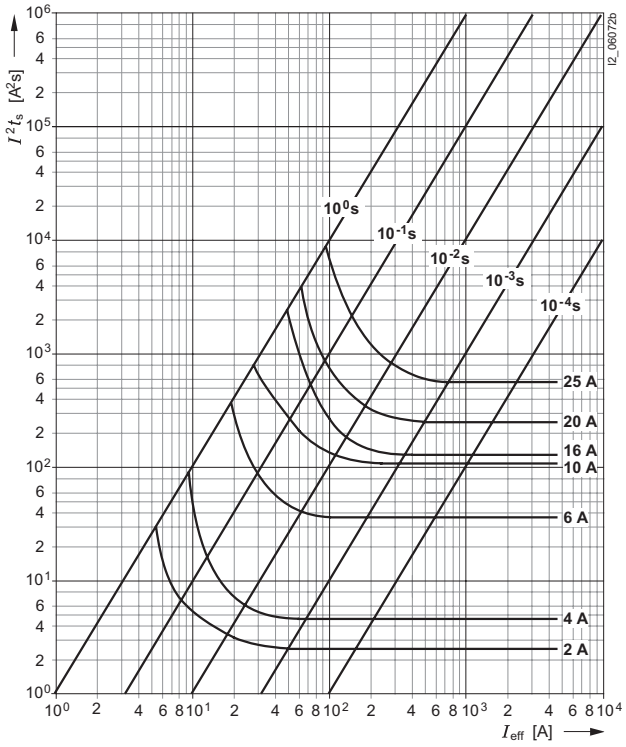


Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Melting I^2t_s values diagram



Type	I_n A	P_v W
5SA1 11	2	1.5
5SA1 21	4	1.9
5SA1 31	6	2.7
5SA1 51	10	3.4
5SA1 61	16	3.7
5SA1 71	20	4.4
5SA1 81	25	4.9

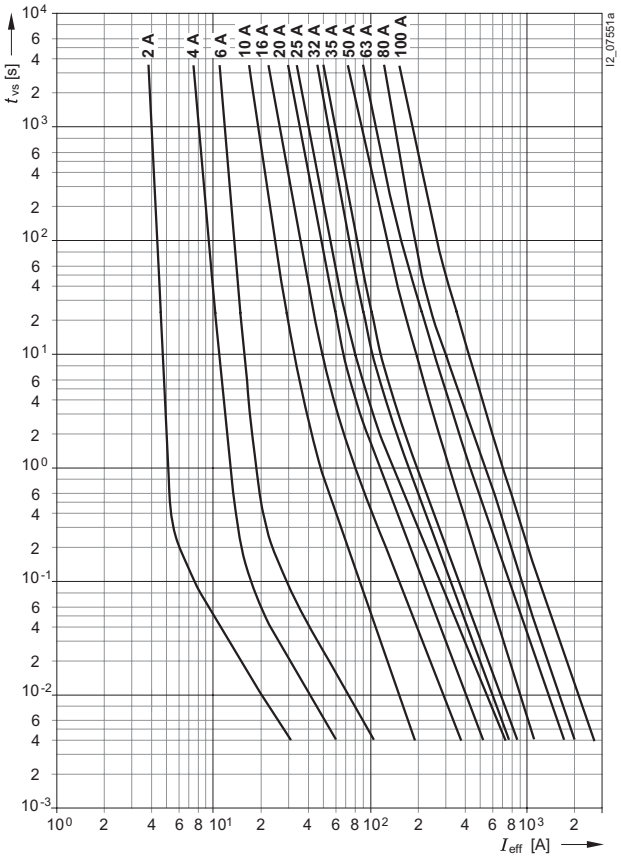
DIAZED fuse links

Characteristic curves

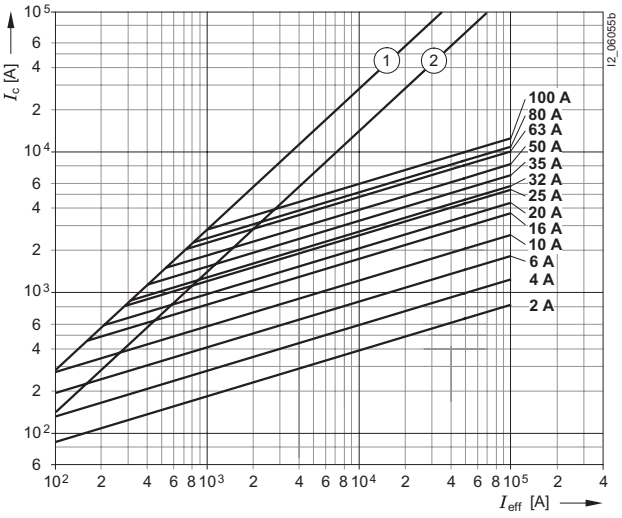
Series 5SB2, 5SB4, 5SC2

Size: DII, DIII, DIV
Utilization category: gL/gG
Rated voltage: 500 V AC/500 V DC
Rated current: 2 ... 100 A

Time/current characteristics diagram

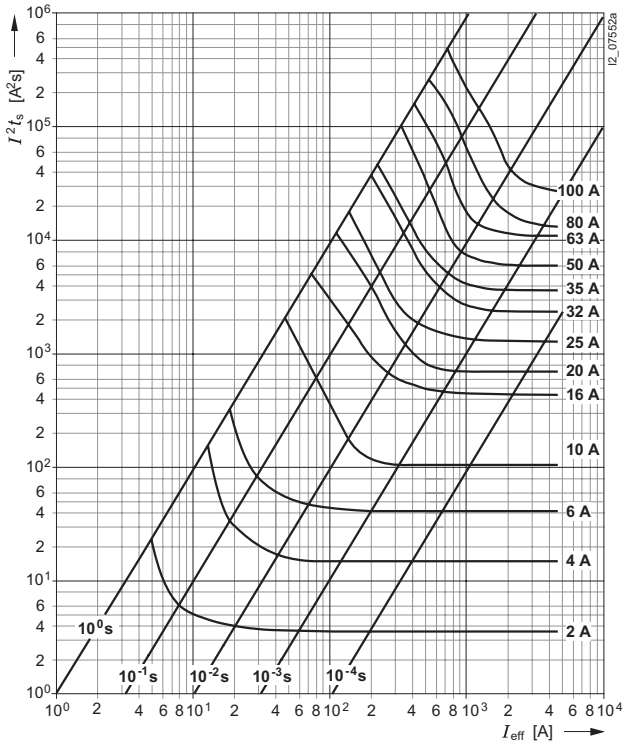


Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Melting I^2t_s values diagram



Type	I_n	P_v	$\Delta\vartheta$	I^2t_s	
				1 ms	4 ms
	A	W	k	A²s	A²s
5SB2 11	2	2.6	15	3.7	3.9
5SB2 21	4	2.0	13	15	16
5SB2 31	6	2.2	14	42	45
5SB2 51	10	1.6	20	120	140
5SB2 61	16	2.4	23	500	580
5SB2 71	20	2.6	26	750	1100
5SB2 81	25	3.4	38	1600	2000
5SB4 010	32	3.6	23	2300	2500
5SB4 11	35	3.7	25	3450	3000
5SB4 21	50	5.7	41	6500	5200
5SB4 31	63	6.9	48	11000	12000
5SC2 11	80	7.5	33	14600	16400
5SC2 21	100	8.8	46	28600	30000

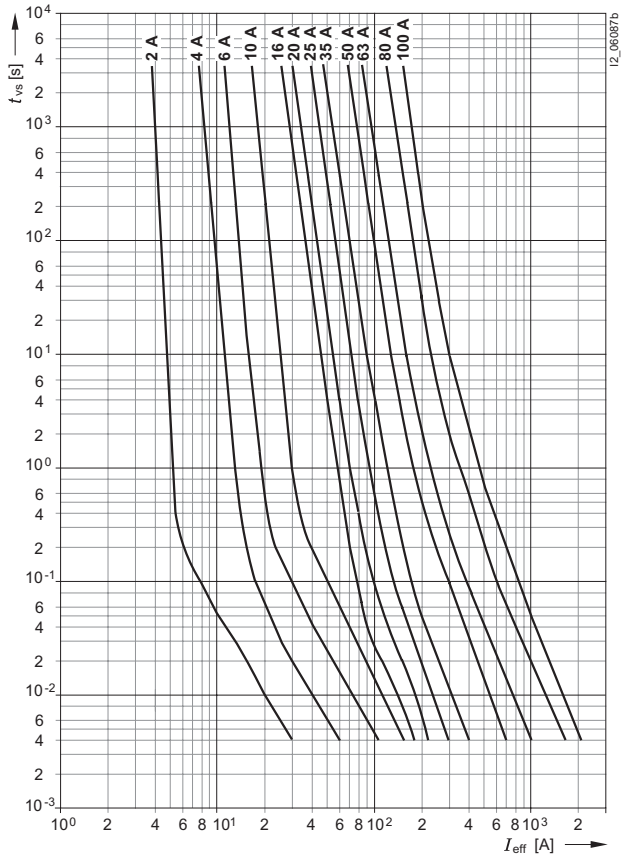
Type	I^2t_a		
	230 V AC	320 V AC	500 V AC
	A²s	A²s	A²s
5SB2 11	6.6	8.8	10.7
5SB2 21	22	28	34
5SB2 31	66	85	100
5SB2 51	240	300	340
5SB2 61	890	1060	1090
5SB2 71	1200	1450	1620
5SB2 81	2400	3150	3450
5SB4 010	3450	4150	4850
5SB4 11	5200	6200	7200
5SB4 21	9750	12350	14500
5SB4 31	16500	22200	26500
5SC2 11	23000	28500	32500
5SC2 21	44000	56000	65000

Characteristic curves

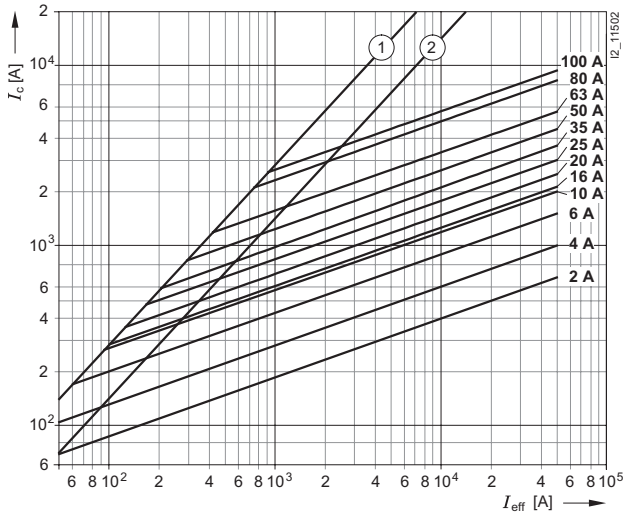
Series 5SB1, 5SB3, 5SC1

Size: DII, DIII, DIV
Utilization category: quick
Rated voltage: 500 V AC/500 V DC
Rated current: 2 ... 100 A

Time/current characteristics diagram

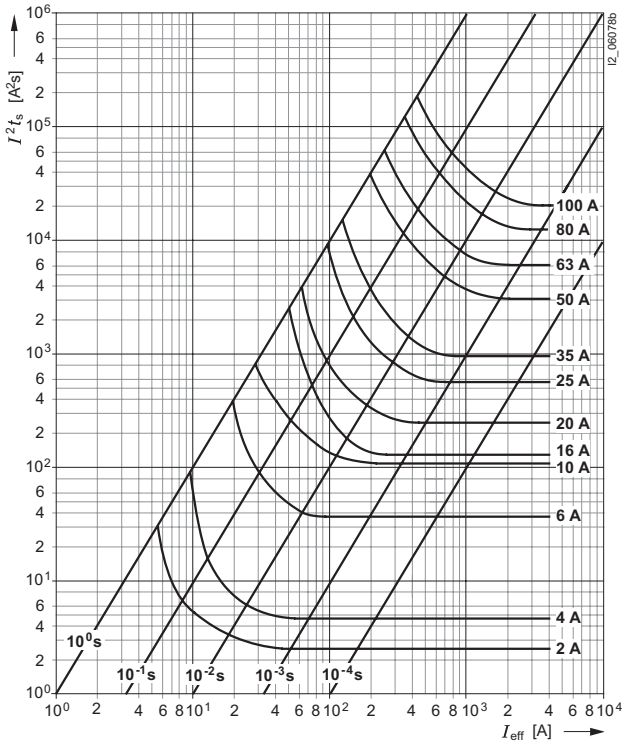


Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Melting I^2t_s values diagram



Type	I_n	P_v	$\Delta\vartheta$	I^2t_s 4 ms	I^2t_a 500 V AC
	A	W	k	A^2s	A^2s
5SB1 11	2	1.5	3	2.5	5
5SB1 21	4	1.9	13	15.6	31.2
5SB1 31	6	2.7	18	36	72
5SB1 41, 5SB1 51	10	3.4	23	102	204
5SB1 61	16	3.7	24	130	260
5SB1 71	20	4.4	31	185	370
5SB1 81	25	4.9	34	250	500
5SB3 11	35	8.3	39	640	1280
5SB3 21	50	9.9	49	1960	3920
5SB3 31	63	12.8	63	3880	7760
5SC1 11	80	12.7	45	10890	21780
5SC1 21	100	15.4	55	17400	34800

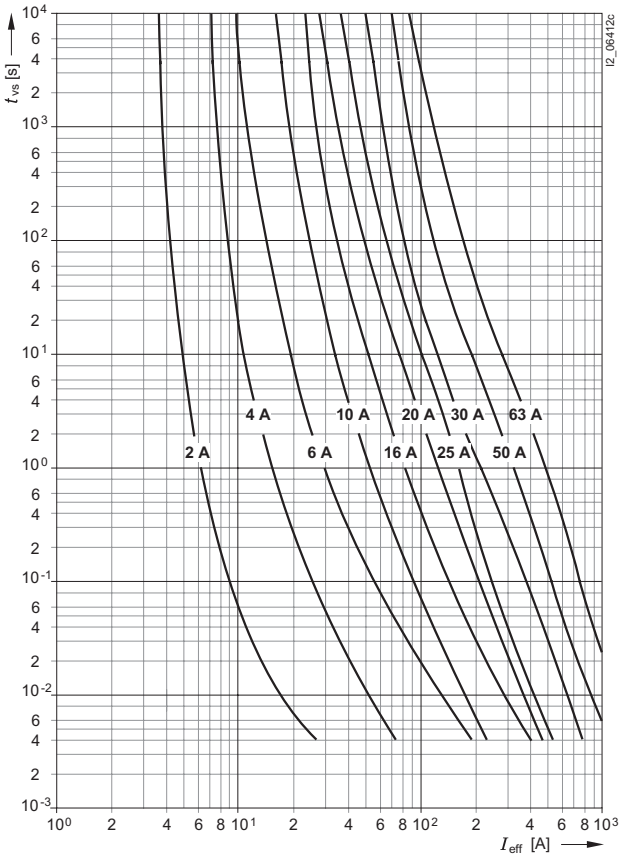
DIAZED fuse links

Characteristic curves

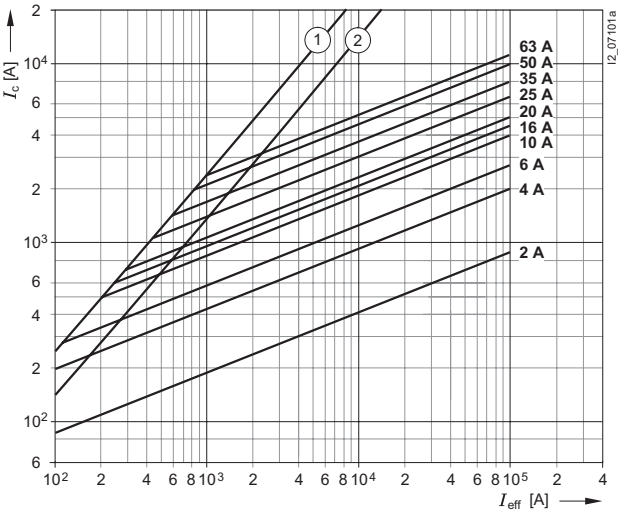
Series 5SD8

Size: DIII
Utilization category: gL/gG
Rated voltage: 690 V AC/600 V DC
Rated current: 2 ... 63 A

Time/current characteristics diagram

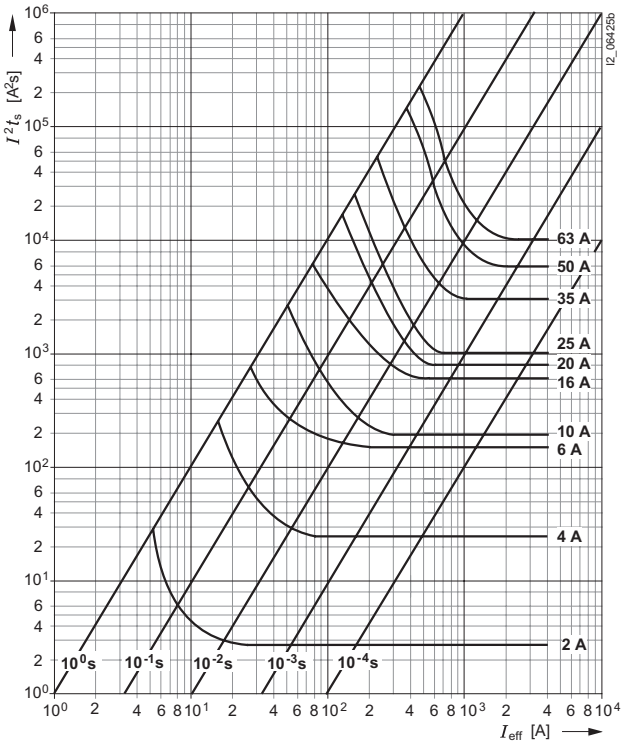


Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Melting I^2t_s values diagram



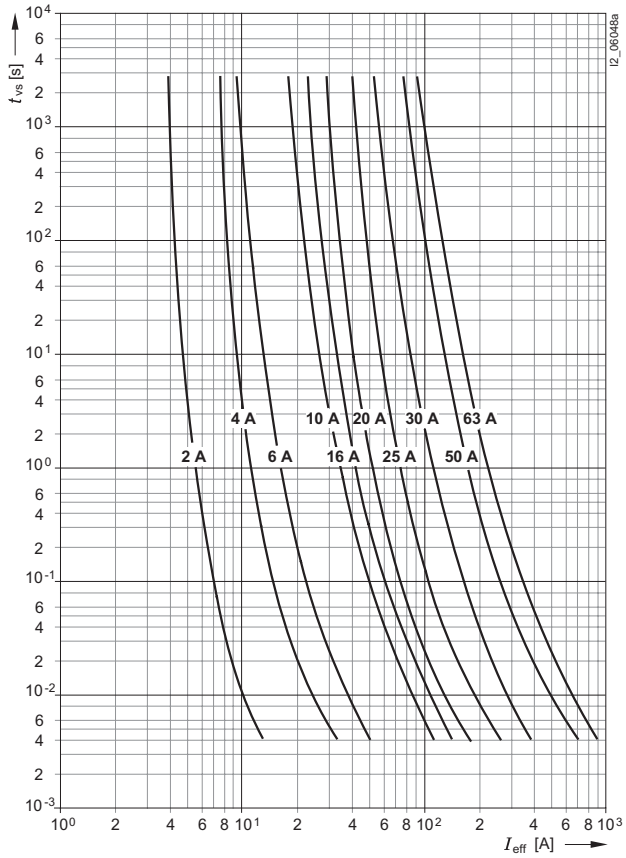
Type	I_n	P_v	I^2t_s 4 ms	I^2t_a 242 V AC
	A	W	A^2s	A^2s
5SD8 002	2	1	4.4	7
5SD8 004	4	1.2	40	62
5SD8 006	6	1.6	88	140
5SD8 010	10	1.4	240	380
5SD8 016	16	1.8	380	600
5SD8 020	20	2	750	1200
5SD8 025	25	2.3	2000	3200
5SD8 035	35	3.1	3300	5100
5SD8 050	50	4.6	7000	11000
5SD8 063	63	5.5	9500	15000

Characteristic curves

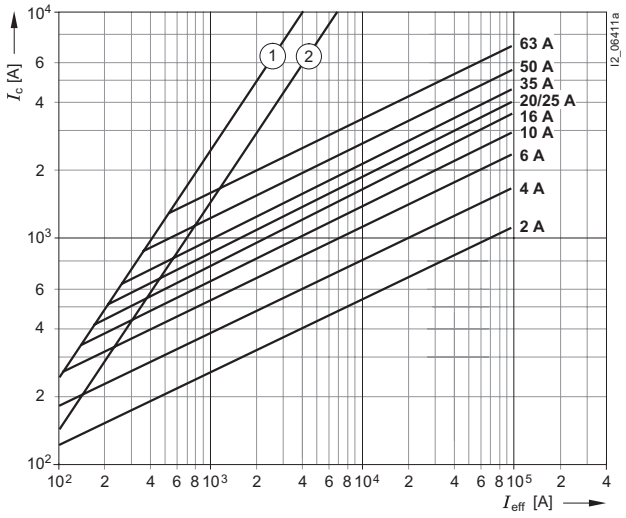
Series 5SD6

Size: DIII
Utilization category: quick (railway network protection)
Rated voltage: 750 V AC/750 V DC
Rated current: 2 ... 63 A

Time/current characteristics diagram

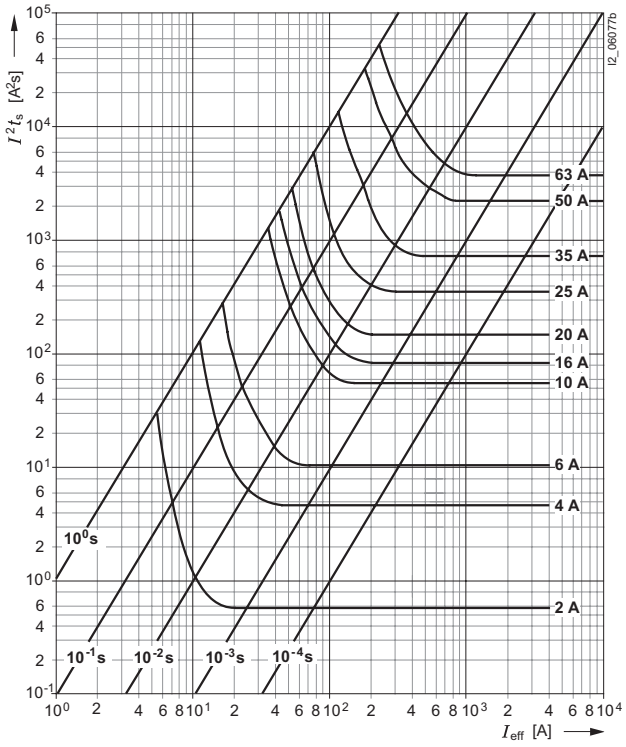


Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Melting I^2t_s values diagram



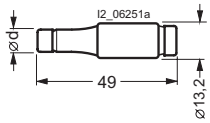
Type	I_n	P_v	I^2t_s 4 ms	I^2t_a 500 V AC
	A	W	A^2s	A^2s
5SD6 01	2	2.8	0.7	2
5SD6 02	4	4	4.5	13
5SD6 03	6	4.8	10	29
5SD6 04	10	4.8	50	135
5SD6 05	16	5.9	78	220
5SD6 06	20	6.3	125	380
5SD6 07	25	8.3	265	800
5SD6 08	35	13	550	1600
5SD6 10	50	16.5	1800	5500
5SD6 11	63	18	3100	9600

DIAZED fuse links

Dimensional drawings

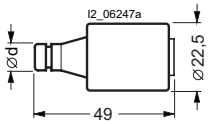
500 V DC

5SA1, 5SA2



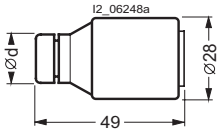
Fuse link	TNDz/E16, NDz/E16						
Rated current A	2	4	6	10	16	20	25
Dimension d	6	6	6	8	10	12	14

5SB1, 5SB2



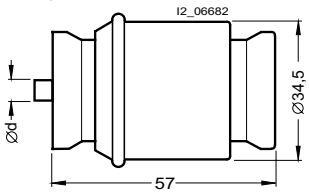
Fuse link	DII/E27						
Rated current A	2	4	6	10	16	20	25
Dimension d	6	6	6	8	10	12	14

5SB3, 5SB4



Fuse link	DIII/E33						
Rated current A	32	35	50	63			
Dimension d	16	16	18	20			

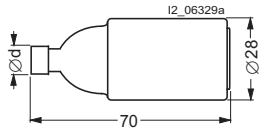
5SC1, 5SC2



Fuse link	DIV/R1¼"						
Rated current A	80	100					
Dimension d	5	7					

690 V AC/600 V DC and 750 V AC/750 V DC

5SD8, 5SD6



Fuse link	DIII/E33									
Rated current A	2	4	6	10	16	20	25	35	50	63
Dimension d	6	6	6	8	10	12	14	16	18	20

Technical specifications

Standards		DIN VDE 0635, DIN VDE 0636-301, DIN VDE 0680, IEC 60269-3-1, CEE 16, EN 60269-3-1
Dimensions		DIN VDE 49510, DIN VDE 49511, DIN VDE 49514, DIN VDE 49515, DIN VDE 49516
Utilization category		gR
Characteristic		high-speed
Rated voltage U_n	V AC	500
	V DC	500
Rated current I_n	A	16 ... 100
Rated breaking capacity	kA AC	50, 40
	kA DC	8, 1.6
Mounting position		any, but preferably vertical
Non-interchangeability		due to screw adapter or adapter sleeves
Degree of protection according to IEC 60529 in the distribution board		IP20
Resistance to climate	°C	up to 45 at 95 % rel. humidity
Ambient temperature	°C	-5 ... +40, humidity 90 % at 20

Selection and ordering data

	Size	I_n A	Identification color	Thread	Order No.	Weight 1 item kg	PS*/ P. unit Items
Rated voltage 500 V AC/500 V DC							
	DIN VDE 0636-301						
	for semiconductor protection, designation, yellow ring utilization category gR, super-quick. For 30 A fuse links the DIAZED screw adapter DII for 25 A is used						
	DII	16	gray	E27	**5SD4 20**	0.028	5
		20	blue		**5SD4 30**	0.029	5
		25	yellow		**5SD4 40**	0.031	5
		30			**5SD4 80**	0.031	5
	DIII	35	black	E33	**5SD4 50**	0.050	5
		50	white		**5SD4 60**	0.051	5
		63	copper		**5SD4 70**	0.054	5
	DIV	80	silver	R1¼"	**5SD5 10**	0.110	3
		100	red		**5SD5 20**	0.110	3

* You can order this quantity or a multiple thereof.

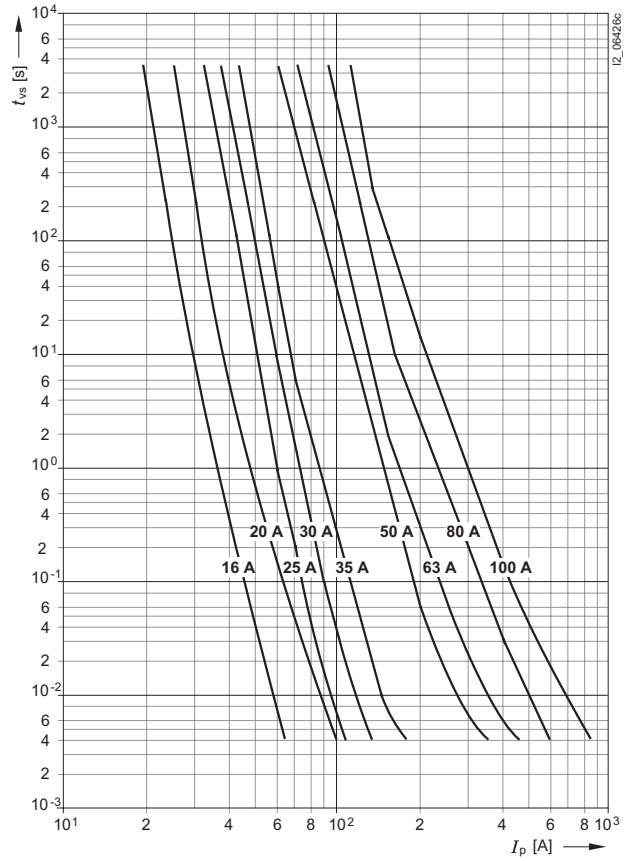
DIAZED fuse links SILIZED (utilization category gR)

Characteristic curves

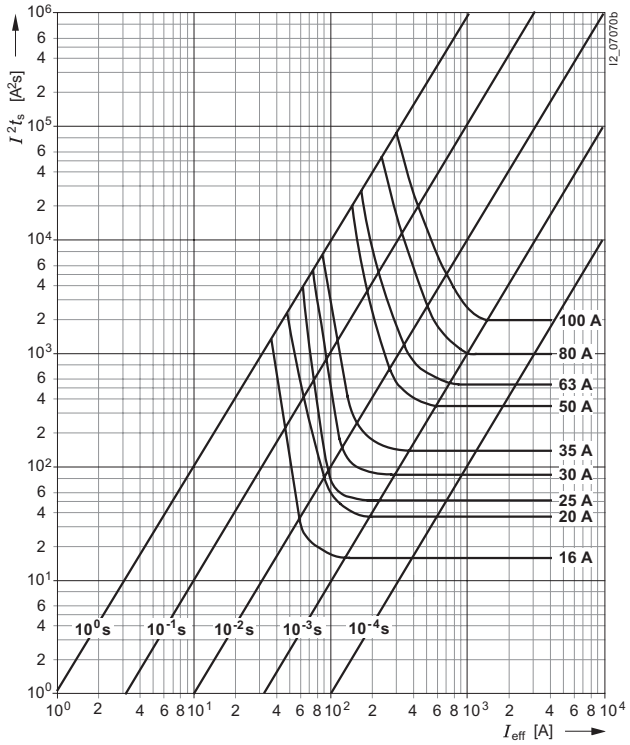
Series 5SD4, 5SD5

Size: DII, DIII, DIV
Utilization category: gR
Characteristic: super-quick
Rated voltage: 500 V AC/500 V DC
Rated current: 16 ... 100 A

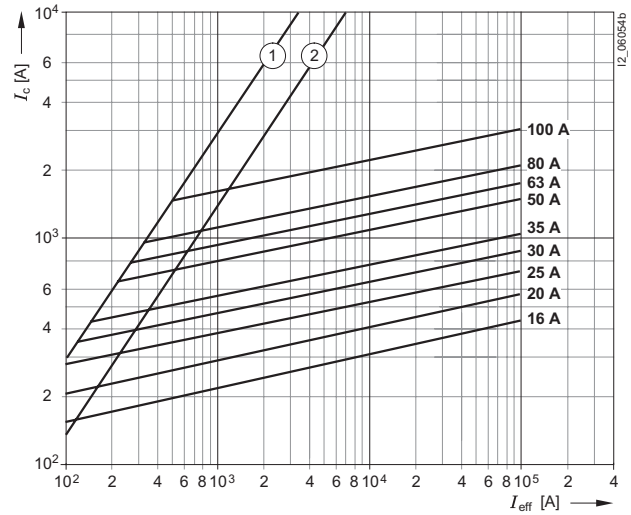
Time/current characteristics diagram



Melting I^2t_s values diagram



Current limitation diagram



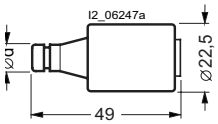
① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Type	I_n	P_v	$\Delta\vartheta$	I^2t_s 1 ms	I^2t_a 500 V AC
	A	W	k	A^2s	A^2s
5SD4 20	16	12.1	63	16.2	60
5SD4 30	20	12.3	69	35.8	139
5SD4 40	25	12.5	61	48.9	205
5SD4 80	30	13.4	65	85	310
5SD4 50	35	14.8	62	135	539
5SD4 60	50	18.5	66	340	1250
5SD4 70	63	28	84	530	1890
5SD5 10	80	34.3	77	980	4200
5SD5 20	100	41.5	83	1950	8450

Dimensional drawings

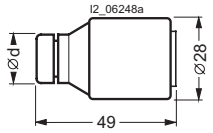
500 V AC/500 V DC

5SD4 20, 5SD4 30, 5SD4 40, 5SD4 80



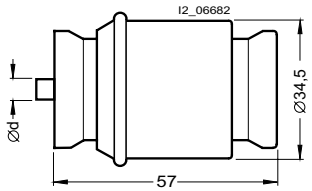
Fuse link	DII/E27			
Rated current A	16	20	25	30
Dimension d	10	12	14	14

5SD4 50, 5SD4 60, 5SD4 70



Fuse link	DIII/E33		
Rated current A	35	50	63
Dimension d	16	18	20

5SD5 10, 5SD5 20



Fuse link	DIV/R1¼"	
Rated current A	80	100
Dimension d	5	7

DIAZED fuse bases

Technical specifications

Terminals

Terminal		B		K			S		R	
Size		DII	DIII	NDz	DII	DIII	DIII	DIV	DII	DIII
Conductor cross-sections										
• Rigid, minimum	mm^2	1.5	2.5	1.0	1.5	2.5	2.5	10	1.5	1.5
• Rigid, maximum	mm^2	10	25	6	10	25	25	50	35	35
• Flexible with sleeve, max.	mm^2	10	25	6	10	25	25	50	35	35
Tightening torque										
• Screw M4	Nm	1.2							–	
• Screw M5	Nm	2.0							–	
• Screw M6	Nm	2.5							4	
• Screw M8	Nm	3.5							–	

Terminal designations

B = clamp-type terminal
K = screw head contact
S = saddle terminal
R = anti-slip terminal

Selection and ordering data

	Size	I_n A	Thread	Terminals [1]	Order No.	Weight 1 item kg	PS*/ P. unit Items
DIAZED base made of ceramic							
rated voltage 500 V AC/500 V DC (for 690 VAC/600 V DC, size DIII bases are to be used together with DIAZED 5SH1 170 screw caps and DIAZED 5SD8 fuse links)							
1-pole							
	NDz	25	E16	KK	**5SF1 012**	0.060	1/20
	DII	25	E27	BB	**5SF1 005**	0.093	1/15
	DIII	63	E33	BS	**5SF1 205**	0.191	1/15
	DIII	63	E33	SS	**5SF1 215**	0.154	1/15
for screw connection only							
	NDz	25	E16	KK	**5SF1 01**	0.055	1/20
	DII	25	E27	BB	**5SF1 024**	0.093	1/15
	DIII	63	E33	BS	**5SF1 224**	0.137	1/15
	DIII	63	E33	SS	**5SF1 214**	0.141	1/15
	DIV	100	R1¼"	flat termination	**5SF1 401**	0.380	1
 rated voltage 750 V AC/750 V DC only for DIAZED 5SH1 161 screw caps, only for DIAZED screw adapters DII and DIII, only for DIAZED 5SD6 fuse links with fine thread, with cap.							
1-pole							
	DIII	63	E33S	KK	**5SF4 230**	0.460	1
 rated voltage 500 V AC/500 V DC (for 690 VAC/600 V DC, size DIII bases are to be used together with DIAZED 5SH1 170 screw caps and DIAZED 5SD8 fuse links)							
3-pole							
with cap and N-type fixpoint terminal							
	DII	3×25	E27	BB	**5SF5 067**	0.400	1/8
	DIII	3×63	E33	BB	**5SF5 237**	0.580	1/8
for screw connection only, with cap and N-type fixpoint terminal							
	DII	3×25	E27	KB	**5SF5 066**	0.410	1/8
	DIII	3×63	E33	KB	**5SF5 236**	0.590	1/8

1) For terminal markings, see above and page 1/29.

* You can order this quantity or a multiple thereof.

Selection and ordering data

		Size	I_n	Thread	Terminals [1]	Order No.	Weight 1 item	PS*/ P. unit
			A				kg	Items
DIAZED base made of molded plastic								
	rated voltage 500 V AC/500 V DC for mounting rail or screw connection Anti-slip terminal at ingoing and outgoing feeder Casing: silicone-free halogen-free heat-resistant to 150 °C creep resistance CTI 225 self-extinguishing according to UL 94							
	1-pole	DII	25	E27	RR	**5SF1 060**	0.152	1/9
		DIII	63	E33	RR	**5SF1 260**	0.186	1/9
	3-pole	DII	3×25	E27	RR	**5SF5 068**	0.457	1/3
		DIII	3×63	E33	RR	**5SF5 268**	0.538	1/3
DIAZED bus-mounting bases, EZR								
	for clipping onto 5SH3 5 power rail only for screw connection							
	1-pole							
		DII DIII	25 63	E27 E33	B B	**5SF6 005** **5SF6 205**	0.072 0.135	1/15 1/15
	3-pole							
		DII	3×25	E27	B	**5SF2 07**	0.351	1/5

1) For terminal markings, see see page 1/29 and 1/42.

DIAZED fuse bases

Accessories

	Size	Thread	Order No.	Weight 1 item kg	PS*/ P. unit Items
Mounting parts					
	**DIAZED busbars with oblong holes** approx. 1000 mm long				
	cross-section: 12 mm × 2 mm, load capacity up to 80 A for DII, sufficient for 25 bases,		**5SH3 500**	0.095	25
	cross-section: 13 mm × 3 mm, load capacity up to 120 A for DIII, sufficient for 19 bases		**5SH3 501**	0.180	25
	**Terminals, non-insulated** pin, for two conductors from 2 ×1.5 mm^2 up to 16 mm^2		**5SH5 326**	0.016	1/10
	fork-type, for conductors up to 35 mm^2		**5SH3 502**	0.010	25
	**Busbars for DIAZED EZR bus-mounting bases** suitable for fork-type terminal connection, ready-made drilling with thread for screw adapters, approx. 2000 mm long cross-section: 16 mm x 3 mm, load capacity up to 150 A for lateral incoming supply				
	for DII	sufficient for 42 5SF6 005 bases	**5SH3 54**	0.740	1/5
	for DII and DIII	sufficient for 34 5SF6 205 bases	**5SH3 55**	0.740	1/5
	for DII	sufficient for 27 5SF2 07 bases	**5SH3 56**	0.740	1/5
	**EZR bus-mounting terminals** non-insulated				
	for conductors up to 16 mm^2		**8JH4 122**	0.012	1
	for conductors up to 35 mm^2		**8JH4 124**	0.024	1
DIAZED covers					
	**DIAZED cover** made of molded plastic not for SILIZED fuse links				
	1-pole				
	(5 DIAZED bases = 12 MW) DII	E27	**5SH2 032**	0.017	1/20
	(4 DIAZED bases = 12 MW) DIII	E33	**5SH2 232**	0.020	1/20
	**Caps** molded plastic 1-pole				
	NDz	E16	**5SH2 01**	0.028	1/10
	DII	E27	**5SH2 02**	0.038	1/20
	DIII	E33	**5SH2 22**	0.048	1/20
	DIV	R1¼"	**5SH2 40**	0.115	1/5
	**Cover rings** 1-pole				
	molded plastic also for bus-mounting base EZR				
	DII	E27	**5SH3 401**	0.013	5
	DIII	E33	**5SH3 411**	0.014	5
	ceramic DII and DIII also for bus-mounting base EZR				
	NDz	E16	**5SH3 30**	0.020	1/100
	DII	E27	**5SH3 32**	0.029	10
	DIII	E33	**5SH3 34**	0.035	10

* You can order this quantity or a multiple thereof.

Accessories

	Size	Thread	for fuse links A	Order No.	Weight 1 item kg	PS*/ P. unit Items
Screw adapters, adapter sleeves						
	DIAZED screw adapters					
	NDz	E16	2	**5SH3 28**	0.002	10
			4	**5SH3 31**	0.002	10
			6	**5SH3 05**	0.002	10
			10	**5SH3 06**	0.002	10
			16	**5SH3 07**	0.002	10
	also for mounting in DIAZED base DIII					
	DII [1]	E27	2	**5SH3 10**	0.015	10
			4	**5SH3 11**	0.015	10
			6	**5SH3 12**	0.015	10
			10	**5SH3 13**	0.015	10
			16	**5SH3 14**	0.014	10
			20	**5SH3 15**	0.012	10
			25	**5SH3 16**	0.012	10
	DIII [1]	E33	35	**5SH3 17**	0.019	10
			50	**5SH3 18**	0.018	10
			63	**5SH3 20**	0.017	10
	**DIAZED adapter sleeves** for DIV bases					
	DIV	R1¼"	80	**5SH3 21**	0.006	10
			100	**5SH3 22**	0.005	10
	**DIAZED adapter sleeves** for snapping onto DIAZED screw caps, if E16 DIAZED fuse links are inserted in DII DIAZED bases			**5SH3 01**	0.012	10
	if DII DIAZED fuse links are inserted in DIII DIAZED bases			**5SH3 02**	0.023	10
	**DIAZED adapter sleeve fitter for DII/DIII**			**5SH3 703**	0.025	1

1) Suitable for a rated voltage of up to 750 V.

DIAZED fuse bases

Accessories

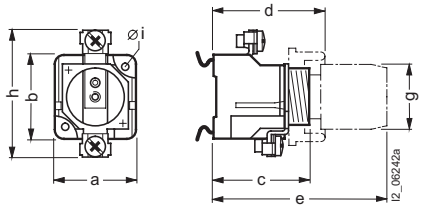
	Size	I_n A	Thread	Order No.	Weight 1 item kg	PS*/ P. unit Items
DIAZED screw caps						
	Rated voltage 500 V AC/500 V DC					
	ceramic					
	NDz	25	E16	**5SH1 11**	0.016	5
	molded plastic, with inspection hole, black, not for SILIZED fuse links					
	DII	25	E27	**5SH1 221**	0.026	5
	DIII	63	E33	**5SH1 231**	0.042	5
	narrow version, ceramic					
	DII	25	E27	**5SH1 12**	0.034	5
	DIII	63	E33	**5SH1 13**	0.059	5
	mushroom shape, ceramic, with inspection hole, sealable					
	DII	25	E27	**5SH1 22**	0.050	5
	DIII	63	E33	**5SH1 23**	0.080	5
	ceramic					
	DIV	100	R1¼"	**5SH1 141**	0.181	1
	**Rated voltage 750 V AC/750 V DC**					
	only for 5SD6 DIAZED fuse links and 5SF4 230 DIAZED fuse bases made of ceramic, with fine thread					
	DIII	63	E33S	**5SH1 161**	0.084	1
	**Rated voltage 690 V AC/600 V DC**					
	only for 5SD8 DIAZED fuse links made of ceramic, prolonged version					
	DIII	63	E33	**5SH1 170**	0.086	1

* You can order this quantity or a multiple thereof.

Dimensional drawings

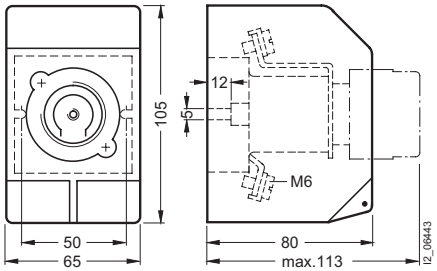
DIAZED bases made of ceramic

500 V AC/500 V DC
1-pole
5SF1

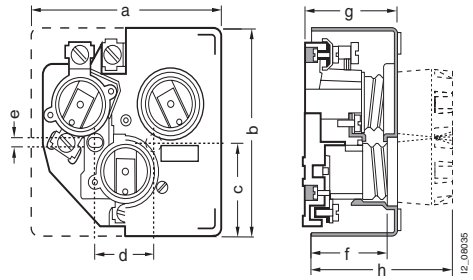


Version Type	Type of connection	Dimensions a	b	c	d	e	⌀g	h	⌀I
NDz/25 A									
5SF1 012	KK	29	49	44.6	55	75	32	49	–
5SF1 01	KK	29	49	44.6	55	75	32	49	4.2
DII/25 A									
5SF1 005	BB	38.4	41	46.6	53	83	34	63	–
5SF1 024	BB	38.4	41	46.6	53	83	34	63	4.3
DIII/63 A									
5SF1 205	BS	45.5	46	47	54	83	43	78	–
5SF1 215	SS	45.5	46	47	54	83	43	78	–
5SF1 224	BS	45.5	46	47	54	83	43	78	4.3
5SF1 214	SS	45.5	46	47	54	83	43	78	4.3
DIV/100 A									
5SF1 401	flat termination	68	68	–	79	110	65	116	6.5

750 V AC/750 V DC, for DIAZED fuse links 750 V AC
1-pole, with cap
5SF4 230



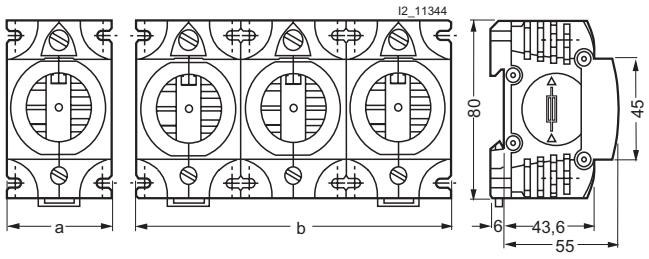
500 V AC/500 V DC
3-pole, with cap, DII/DIII
5SF5



Version Type	Dimensions a	b	c	d	e	f	g	h
DII/3 x 25 A								
5SF5 067	106	106	48	–	–	45	52	86
5SF5 066	106	106	48	32	5.2	45	52	86
DIII/3 x 63 A								
5SF5 237	127	130	54	–	–	45	52	85
5SF5 236	127	130	54	32	5.2	45	52	85

DIAZED bases made of molded plastic

5SF1 060, 5SF1 260
5SF5 068, 5SF5 268



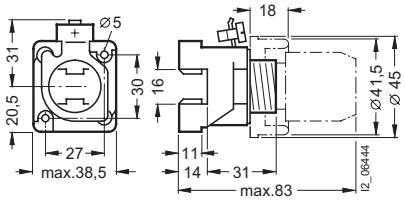
Type	Dimensions a	b
5SF1 060	40	–
5SF1 260	50	–
5SF5 068	–	120
5SF5 268	–	150

DIAZED fuse bases

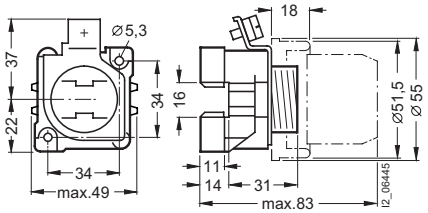
Dimensional drawings

DIAZED bus-mounting bases, EZR

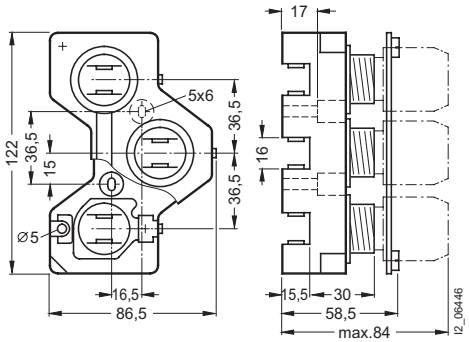
5SF6 005



5SF6 205



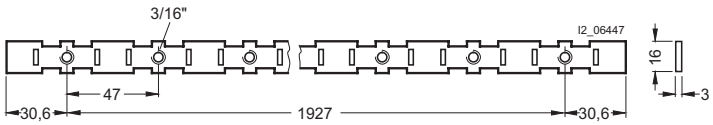
5SF2 07



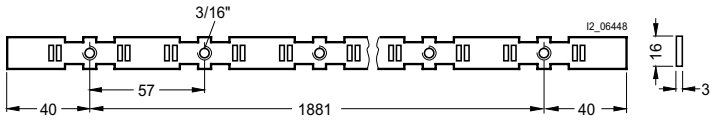
Mounting parts

Busbars for DIAZED EZR bus-mounting bases

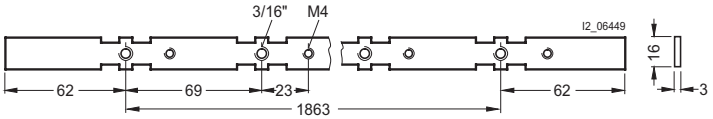
5SH3 54



5SH3 55



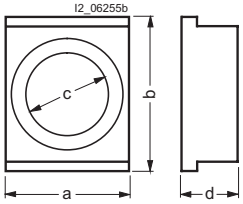
5SH3 56



Dimensional drawings

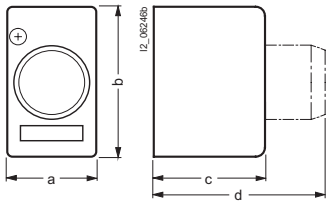
DIAZED covers

DIAZED cover made of molded plastic
5SH2



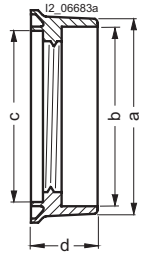
Size	Type	Dimensions a	b	∅c	d
DII/E27	5SH2 032	41	51	27.5	19
DIII/E33	5SH2 232	52	51	34.5	18.5

Cap made of molded plastic
5SH2



Size	Type	Dimensions a max.	b max.	c max.	d max.
NDz/E16	5SH2 01	33	68	51.7	75
DII/E27	5SH2 02	43	74.7	53.6	83
DIII/E33	5SH2 22	51	90.5	53.6	83
DIV/R1¼”	5SH2 40	67	118	74.5	104

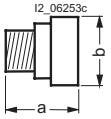
Cover rings made of molded plastic
5SH3



Size	Type	Dimensions a	b	∅c	d
DII/E27	5SH3 401	39.5	35.5	33.5	17.5
DIII/E33	5SH3 411	49.5	45.5	41.5	17.5
NDz/E16	5SH3 30	30	26	26	16.5
DII/E27	5SH3 32	41.5	35	38	17.5
DIII/E33	5SH3 34	51.5	45	44	19

DIAZED screw caps

5SH1



Size	Type	Dimensions a	∅b
NDz/E16	5SH1 11	35	28
DII/E27	5SH1 221 5SH1 12 5SH1 22	42 45.5 43	33 34 39
DIII/E33	5SH1 231 5SH1 13 5SH1 23	42 45.5 47	40 43 45
	750 V AC/750 V DC 5SH1 161	48	48
DIII/E33S	690 V AC/600 V DC 5SH1 170	68	43
DIV/R1¼”	5SH1 141	53	65

Notes

Overview

LV HRC fuse links

LV HRC SITOR fuse links

LV HRC fuse bases

LV HRC fuse switch disconnectors

Product overview

Overview

The product range

Areas of application

LV HRC fuses are used for installation systems in non-residential, commercial and industrial buildings as well as in systems of power supply companies. They therefore protect essential building parts and installations.

Non-interchangeability

LV HRC fuses are fuse systems to be operated by experts. There are no constructional requirements for a non-interchangeability of rated current and protection against contact.

The components and auxiliary equipment is designed in a way as to ensure the safe replacement of LV HRC fuses or isolation of systems.

Sizes

LV HRC fuse links are available in the sizes 000, 00, 0, 1, 2, 3, 4 and 4a.

Utilization categories

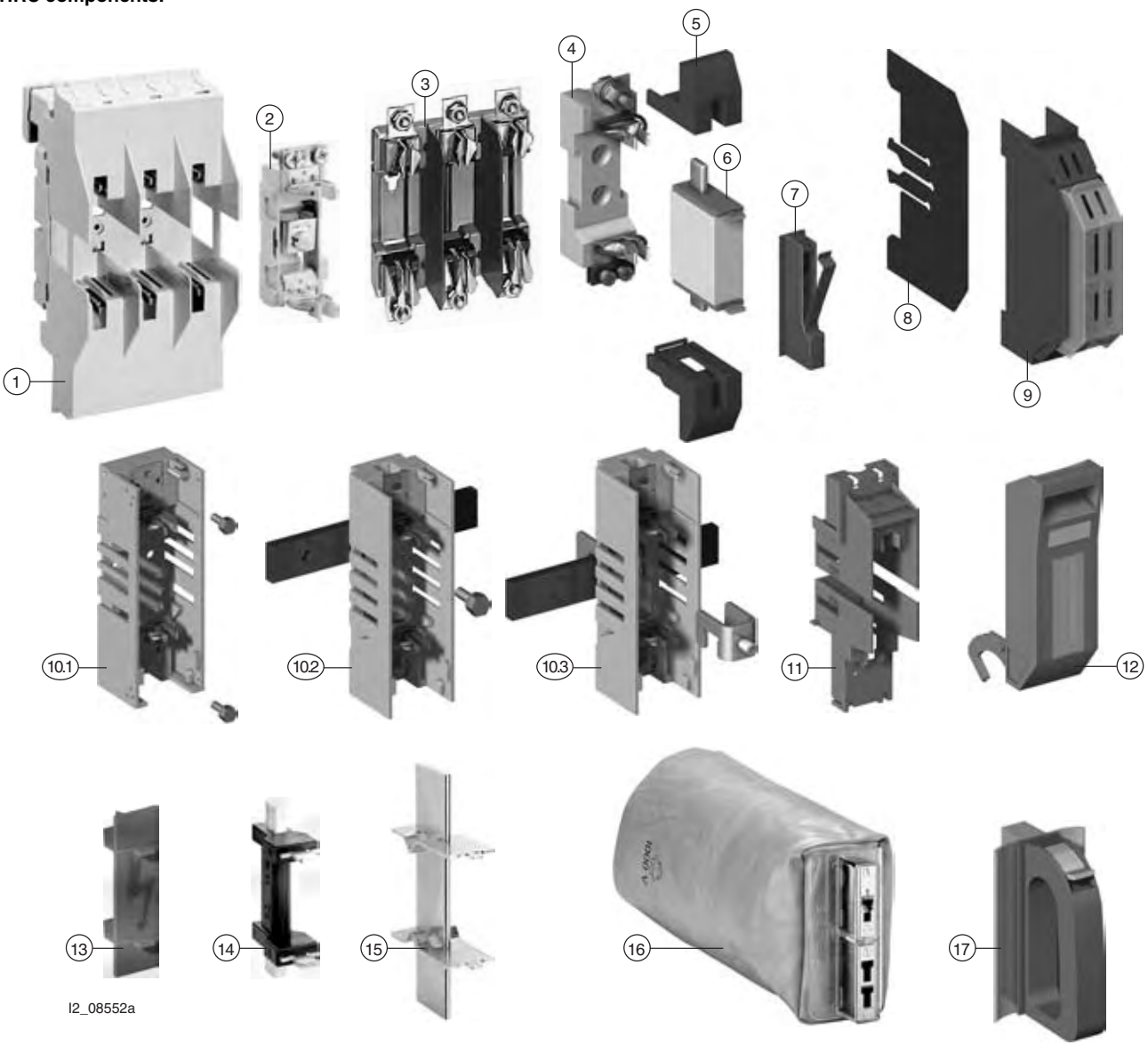
Utilization category gL/gG is available for cable and conductor protection and aM for short-circuit protection of switching devices and gR/aR.

LV HRC components

LV HRC fuse links are made up of the following components:

① LV HRC fuse base from the SR60 busbar system
② LV HRC fuse base for busbar mounting
③ LV HRC fuse base, 3-pole
④ LV HRC fuse base, 1-pole
⑤ LV HRC contact covers
⑥ LV HRC fuse link
⑦ LV HRC signal detector
⑧ LV HRC phase barrier
⑨ LV HRC protective cover
⑩ LV HRC fuse bases with slewing equipment,
⑩.1 - for screw connection on mounting plate
⑩.2 - for screw connection on busbar system
⑩.3 - for claw fixing on busbar
⑪ LV HRC protective cover for LV HRC fuse bases with slewing equipment
⑫ LV HRC slewing equipment
⑬ LV HRC fuse base cover
⑭ LV HRC isolating link with insulated grip lugs
⑮ LV HRC isolating link with non-insulated grip lugs
⑯ LCV HRC fuse puller with sleeve
⑰ LV HRC fuse puller

LV HRC components:



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Overview

LV HRC fuse links with combination alarm

Impaired view

A quick detection of failed fuse links in systems is often not possible. If they are mounted in fuse bases with slewing equipment or LV HRC switch disconnectors, the sight is often impaired.
The LV HRC fuse links have a clearly visible center indicator
red: functioning
white: not functioning

Better safe than sorry

In addition to this, the LV HRC fuse links are equipped with a front indicator on the top. This considerably improves the view of one or the other indicator.

The combination alarm

Siemens LV HRC fuse links have a combination alarm, a combination of center indicator and front indicator. Thus, a failed LV HRC fuse link can be detected from different directions.

Front indicator

For standard applications which are characterized by freely accessible fuse links allowing an easy detection of failed fuse links, product series with front and without center indicators are available.

Insulated grip lugs

Insulated grip lugs must be made of metal. They are integrated in the top and bottom covers of the fuse link and provide greater safety when replacing. The mark indicating that the grip lugs are insulated is shown below:

Silver-plated contact pin

LV HRC fuse links are always equipped with silver-plated contact pins. This means that they are non-corroding and have less power loss.

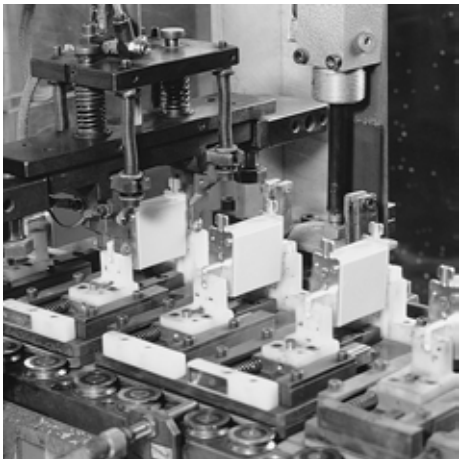
LV HRC fuse links with combination alarm

LV HRC fuse links with front indicator

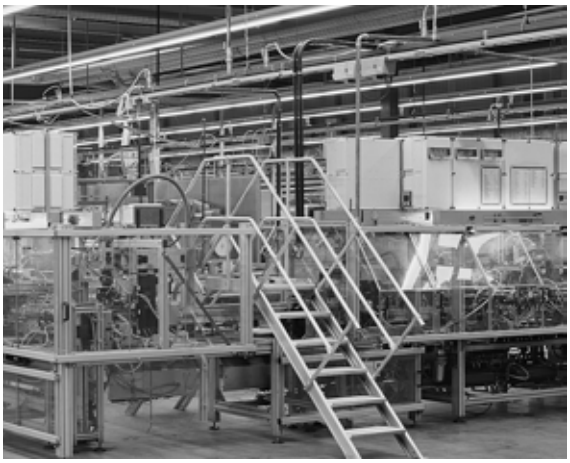
Product overview

Overview

Highly-automated manufacturing



An overview of the production line with integrated test stations



Automated manufacturing sequences guarantee quality and precision

Environmental protection is an ongoing task for today's modern industrial society and requires action!

Environmentally compatible recycling of LV HRC/HV HRC fuses

National and global environmental problems - for example global warming, the destruction of the ozone layer, the deterioration of the ground and water resources - have all proven the necessity of common action. The recycling law, which was enacted in Germany at the end of 1996, requires companies to recycle materials and thus to save resources.

Responsibility of the industry

Industry has been called upon to acknowledge its responsibility towards future generations and to take the initiative. Manufacturers of low-voltage and high-voltage fuses and high-voltage HRC fuses are very aware of this responsibility and are determined to focus more than ever on "protecting" the environment and taking care of our natural resources.

How is recycling organized?

Acting on a Siemens AG initiative, various German manufacturers of LV/HV HRC fuses have formed the non-profit association "NH/HH-Recycling e.V." Taking into account the prevailing legal regulations, the committee aims to actively contribute towards the protection of the environment and its natural resources by supporting the proper recycling of fuse links.

How are fuses recycled in Germany?

LV HRC and HV HRC fuse links without packaging will be accepted for recycling. Electrical wholesalers will provide Euro pallet boxes for this purpose. In the case of large quantities, Euro pallet boxes can also be delivered to you directly on-site. For further information, please contact our regional Siemens A&D ET sales managers.

Material recycling

The used fuses are completely melted by an officially certified recycler. The copper and silver gained are put back into the materials cycle. Residual materials, such as slag, are used in road and dam building. The "NH/HH-Recycling e.V." association plans to donate any profits arising from these processes to non-profit organizations for the purpose of environmental research.

Please help us: be a part of our initiative and ask for the signs that stand for the recycling of LV HRC fuses.

Technical specifications

LV HRC fuse links

		3NA6 ...-4/-4KK	3NA6	3NA7	3NA6... -6	3NA7... -6
Utilization category		gL/gG				
Rated voltage U_n						
Size 000 and 00	V AC	–	500		690	
	V DC	–	250			
Sizes 1 and 2	V AC	400	500		690	
	V DC	–	440			
Rated current I_n	A	10 ... 400	2 ... 400		2 ... 315	
Rated breaking capacity	kA AC	120				
	kA DC	25				
Combination alarm		yes				
Insulated grip lugs		yes		–	yes	–
Non-insulated grip lugs		–		yes	–	yes
Contact pins		non-corroding, silver-plated				
Resistance to climate at 95% relative humidity	°C	-20 ... +50				
Standards		DIN VDE 0636-201, DIN VDE 0680-4, IEC 60269-1, -2-1, EN 60269-1				
Dimensions		DIN 43620				

		3NA3	3NA3... -6	3ND1	3ND2
Utilization category		gL/gG		aM	
Rated voltage U_n					
Size 000 and 00	V AC	500	690	500	–
	V DC	250		–	
Sizes 1 and 2	V AC	500	690		
	V DC	440		–	
Size 3	V AC	500	690		
	V DC	440		–	
Size 4 (IEC design) and 4a	V AC	500	–		
	V DC	440	–		
Rated current I_n	A	2 ... 1250	2 ... 500	6 ... 160, 500, 630	63 ... 400
Rated breaking capacity	kA AC	120			
Contact pins		non-corroding, silver-plated			
Front indicator (without center indicator)		yes			
Non-insulated grip lugs		yes			
Resistance to climate at 95% relative humidity	°C	-20 ... +50			
Standards		DIN VDE 0636-201, DIN VDE 0680-4, IEC 60269-1, -2-1, EN 60269-1			
Dimensions		DIN 43620			

LV HRC fuse links

Selection and ordering data

	Size	Width	I_n	U_n	Insulated grip lugs Order No.	Weight 1 item	PS*/ P. unit
		mm	A	V		kg	Items
LV HRC fuse links with combination alarm, utilization category gL/gG							
	LV HRC fuse links of size 000 can also be used in LV HRC fuse bases, LV HRC fuse switch disconnectors, LV HRC fuse strips as well as in LV HRC in-line fuse switch disconnectors of size 00						
	**000**	21	10	400 V AC	**3NA6 803-4**	0.135	3
			16		**3NA6 805-4**	0.135	3
			20		**3NA6 807-4**	0.135	3
			25		**3NA6 810-4**	0.135	3
			32		**3NA6 812-4**	0.135	3
			35		**3NA6 814-4**	0.135	3
			40		**3NA6 817-4**	0.135	3
			50		**3NA6 820-4**	0.135	3
			63		**3NA6 822-4**	0.135	3
			80		**3NA6 824-4**	0.135	3
			100		**3NA6 830-4**	0.135	3
	**00**	30	80	400 V AC	**3NA6 824-4KK**	0.200	3
			100		**3NA6 830-4KK**	0.200	3
			125		**3NA6 832-4**	0.200	3
			160		**3NA6 836-4**	0.200	3
	**1**	30	35	400 V AC	**3NA6 114-4**	0.290	3
			40		**3NA6 117-4**	0.290	3
			50		**3NA6 120-4**	0.290	3
			63		**3NA6 122-4**	0.290	3
			80		**3NA6 124-4**	0.290	3
			100		**3NA6 130-4**	0.290	3
			125		**3NA6 132-4**	0.290	3
			160		**3NA6 136-4**	0.290	3
		47.2	200		**3NA6 140-4**	0.430	3
			224		**3NA6 142-4**	0.430	3
			250		**3NA6 144-4**	0.430	3
	**2**	47.2	50	400 V AC	**3NA6 220-4**	0.450	3
			63		**3NA6 222-4**	0.450	3
			80		**3NA6 224-4**	0.450	3
			100		**3NA6 230-4**	0.450	3
			125		**3NA6 232-4**	0.450	3
			160		**3NA6 236-4**	0.450	3
			200		**3NA6 240-4**	0.450	3
			224		**3NA6 242-4**	0.450	3
			250		**3NA6 244-4**	0.450	3
		57.8	300		**3NA6 250-4**	0.650	3
			315		**3NA6 252-4**	0.650	3
			355		**3NA6 254-4**	0.650	3
			400		**3NA6 260-4**	0.650	3

* You can order this quantity or a multiple thereof.

Selection and ordering data

	Size	Width	I_n	U_n	Non-insulated grip lugs Order No.	Insulated grip lugs Order No.	Weight 1 item	PS*/ P. unit
		mm	A	V			kg	Items
LV HRC fuse links with combination alarm, utilization category gG								
		LV HRC fuse links of size 000 can also be used in LV HRC fuse bases, LV HRC fuse switch disconnectors, LV HRC fuse strips as well as in LV HRC in-line fuse switch disconnectors of size 00						
		The 300 A and 355 A fuse links do not conform to a VDE mark. They correspond to the standard, but are not permissible.						
 	**000**	21	2	500 V AC/	**3NA7 802**	**3NA6 802**	0.135	3
			4	250 V DC	**3NA7 804**	**3NA6 804**	0.135	3
			6		**3NA7 801**	**3NA6 801**	0.135	3
			10		**3NA7 803**	**3NA6 803**	0.136	3
			16		**3NA7 805**	**3NA6 805**	0.136	3
			20		**3NA7 807**	**3NA6 807**	0.136	3
			25		**3NA7 810**	**3NA6 810**	0.136	3
			32		**3NA7 812**	**3NA6 812**	0.136	3
			35		**3NA7 814**	**3NA6 814**	0.136	3
			40		**3NA7 817**	**3NA6 817**	0.136	3
			50		**3NA7 820**	**3NA6 820**	0.136	3
			63		**3NA7 822**	**3NA6 822**	0.136	3
			80		**3NA7 824**	**3NA6 824**	0.136	3
			100		**3NA7 830**	**3NA6 830**	0.136	3
 	**00**	30	80	500 V AC/	**3NA7 824-7**	**3NA6 824-7**	0.211	3
			100	250 V DC	**3NA7 830-7**	**3NA6 830-7**	0.211	3
			125		**3NA7 832**	**3NA6 832**	0.211	3
			160		**3NA7 836**	**3NA6 836**	0.211	3
 	**1**	30	16	500 V AC/	**3NA7 105**	**3NA6 105**	0.290	3
			20	440 V DC	**3NA7 107**	**3NA6 107**	0.290	3
			25		**3NA7 110**	**3NA6 110**	0.290	3
			35		**3NA7 114**	**3NA6 114**	0.290	3
			40		**3NA7 117**	**3NA6 117**	0.290	3
			50		**3NA7 120**	**3NA6 120**	0.290	3
			63		**3NA7 122**	**3NA6 122**	0.290	3
			80		**3NA7 124**	**3NA6 124**	0.290	3
			100		**3NA7 130**	**3NA6 130**	0.290	3
			125		**3NA7 132**	**3NA6 132**	0.290	3
			160		**3NA7 136**	**3NA6 136**	0.290	3
		47.2	200		**3NA7 140**	**3NA6 140**	0.440	3
			224		**3NA7 142**	**3NA6 142**	0.440	3
			250		**3NA7 144**	**3NA6 144**	0.440	3
 	**2**	47.2	35	500 V AC/	**3NA7 214**	**3NA6 214**	0.450	3
			50	440 V DC	**3NA7 220**	**3NA6 220**	0.450	3
			63		**3NA7 222**	**3NA6 222**	0.450	3
			80		**3NA7 224**	**3NA6 224**	0.450	3
			100		**3NA7 230**	**3NA6 230**	0.450	3
			125		**3NA7 232**	**3NA6 232**	0.450	3
			160		**3NA7 236**	**3NA6 236**	0.450	3
			200		**3NA7 240**	**3NA6 240**	0.450	3
			224		**3NA7 242**	**3NA6 242**	0.450	3
			250		**3NA7 244**	**3NA6 244**	0.450	3
		57.8	300		–	**3NA6 250**	0.641	3
			315		**3NA7 252**	**3NA6 252**	0.660	3
			355		–	**3NA6 254**	0.641	3
			400		**3NA7 260**	**3NA6 260**	0.660	3

* You can order this quantity or a multiple thereof.

LV HRC fuse links

Selection and ordering data

	Size	Width	I_n	U_n	Non-insulated grip lugs Order No.	Insulated grip lugs Order No.	Weight 1 item	PS*/ P. unit
		mm	A	V			kg	Items
LV HRC fuse links with combination alarm, utilization category gG								
		LV HRC fuse links of size 000 can also be used in LV HRC fuse bases, LV HRC fuse switch disconnectors, LV HRC fuse strips as well as in LV HRC in-line fuse switch disconnectors of size 00						
		The 300 A fuse links do not conform to a VDE mark. They correspond to the standard, but are not permissible.						
 	**000**	21	2	690 V AC/ 250 V DC	**3NA7 802-6**	**3NA6 802-6**	0.136	3
			4		**3NA7 804-6**	**3NA6 804-6**	0.136	3
			6		**3NA7 801-6**	**3NA6 801-6**	0.136	3
			10		**3NA7 803-6**	**3NA6 803-6**	0.136	3
			16		**3NA7 805-6**	**3NA6 805-6**	0.136	3
			20		**3NA7 807-6**	**3NA6 807-6**	0.136	3
			25		**3NA7 810-6**	**3NA6 810-6**	0.136	3
			32		**3NA7 812-6**	**3NA6 812-6**	0.136	3
			35		**3NA7 814-6**	**3NA6 814-6**	0.136	3
 	**00**	30	40	690 V AC/ 250 V DC	**3NA7 817-6**	**3NA6 817-6**	0.211	3
			50		**3NA7 820-6**	**3NA6 820-6**	0.211	3
			63		**3NA7 822-6**	**3NA6 822-6**	0.211	3
			80		**3NA7 824-6**	**3NA6 824-6**	0.211	3
			100		**3NA7 830-6**	**3NA6 830-6**	0.211	3
 	**1**	30	50	690 V AC/, 440 V DC	**3NA7 120-6**	**3NA6 120-6**	0.290	3
			63		**3NA7 122-6**	**3NA6 122-6**	0.290	3
			80		**3NA7 124-6**	**3NA6 124-6**	0.290	3
			100		**3NA7 130-6**	**3NA6 130-6**	0.290	3
			125		**3NA7 132-6**	**3NA6 132-6**	0.290	3
			160		**3NA7 136-6**	**3NA6 136-6**	0.290	3
		47.2	200		**3NA7 140-6**	**3NA6 140-6**	0.440	3
 	**2**	47.2	80	690 V AC/ 440 V DC	**3NA7 224-6**	**3NA6 224-6**	0.450	3
			100		**3NA7 230-6**	**3NA6 230-6**	0.450	3
			125		**3NA7 232-6**	**3NA6 232-6**	0.450	3
			160		**3NA7 236-6**	**3NA6 236-6**	0.450	3
			200		**3NA7 240-6**	**3NA6 240-6**	0.450	3
		57.8	224		**3NA7 242-6**	**3NA6 242-6**	0.660	3
			250		**3NA7 244-6**	**3NA6 244-6**	0.660	3
			300		**3NA7 250-6**	**3NA6 250-6**	0.660	3
			315		**3NA7 252-6**	**3NA6 252-6**	0.660	3

Further versions on request.

* You can order this quantity or a multiple thereof.

Selection and ordering data

	Size	Width	I_n	U_n	Non-insulated grip lugs Order No.	Weight 1 item	PS*/ P. unit
		mm	A	V		kg	Items
LV HRC fuse links with front indicator, utilization category gL/gG							
	LV HRC fuse links of size 000 can also be used in LV HRC fuse bases, LV HRC fuse switch disconnectors, LV HRC fuse strips as well as in LV HRC in-line fuse switch disconnectors of size 00						
	**000**	21	2	500 V AC/ 250 V DC	**3NA3 802**	0.133	3
			4		**3NA3 804**	0.133	3
			6		**3NA3 801**	0.133	3
			10		**3NA3 803**	0.133	3
			16		**3NA3 805**	0.133	3
			20		**3NA3 807**	0.133	3
			25		**3NA3 810**	0.133	3
			32		**3NA3 812**	0.133	3
			35		**3NA3 814**	0.133	3
			40		**3NA3 817**	0.133	3
			50		**3NA3 820**	0.133	3
			63		**3NA3 822**	0.133	3
			80		**3NA3 824**	0.133	3
			100		**3NA3 830**	0.133	3
	**00**	30	35	500 V AC/ 250 V DC	**3NA3 814-7**	0.200	3
			50		**3NA3 820-7**	0.200	3
			63		**3NA3 822-7**	0.200	3
			80		**3NA3 824-7**	0.200	3
			100		**3NA3 830-7**	0.200	3
			125		**3NA3 832**	0.217	3
			160		**3NA3 836**	0.217	3
	**0**	30	6	500 V AC/ 440 V DC	**3NA3 001**	0.340	3
			10		**3NA3 003**	0.340	3
			16		**3NA3 005**	0.340	3
			20		**3NA3 007**	0.340	3
			25		**3NA3 010**	0.340	3
			32		**3NA3 012**	0.340	3
			35		**3NA3 014**	0.340	3
			40		**3NA3 017**	0.340	3
			50		**3NA3 020**	0.340	3
			63		**3NA3 022**	0.340	3
			80		**3NA3 024**	0.340	3
			100		**3NA3 030**	0.340	3
			125		**3NA3 032**	0.340	3
			160		**3NA3 036**	0.340	3
	**1**	30	16	500 V AC/ 440 V DC	**3NA3 105**	0.290	3
			20		**3NA3 107**	0.290	3
			25		**3NA3 110**	0.290	3
			35		**3NA3 114**	0.300	3
			40		**3NA3 117**	0.300	3
			50		**3NA3 120**	0.300	3
			63		**3NA3 122**	0.300	3
			80		**3NA3 124**	0.300	3
			100		**3NA3 130**	0.300	3
			125		**3NA3 132**	0.300	3
			160		**3NA3 136**	0.300	3
		47.2	200		**3NA3 140**	0.440	3
			224		**3NA3 142**	0.440	3
			250		**3NA3 144**	0.440	3

* You can order this quantity or a multiple thereof.

LV HRC fuse links

Selection and ordering data

	Size	Width	I_n	U_n	Non-insulated grip lugs Order No.	Weight 1 item	PS*/ P. unit
		mm	A	V		kg	Items
LV HRC fuse links with front indicator, utilization category gL/gG							
	The 300 A, 355 A and 425 A fuse links do not conform to a VDE mark. They correspond to the standard, but are not permissible.						
	Fuse Links, size 4a can only be installed in 3NH7 520 LV HRC fuse base,size 4a.						
	**2**	47.2	35	500 V AC/ 440 V DC	**3NA3 214**	0.453	3
			50		**3NA3 220**	0.453	3
			63		**3NA3 222**	0.453	3
			80		**3NA3 224**	0.453	3
			100		**3NA3 230**	0.453	3
			125		**3NA3 232**	0.453	3
			160		**3NA3 236**	0.453	3
			200		**3NA3 240**	0.453	3
			224		**3NA3 242**	0.453	3
			250		**3NA3 244**	0.453	3
		57.8	300		**3NA3 250**	0.647	3
			315		**3NA3 252**	0.647	3
			355		**3NA3 254**	0.647	3
			400		**3NA3 260**	0.647	3
	**3**	57.8	200	500 V AC/ 440 V DC	**3NA3 340**	0.647	3
			224		**3NA3 342**	0.640	3
			250		**3NA3 344**	0.647	3
			300		**3NA3 350**	0.647	3
			315		**3NA3 352**	0.647	3
			355		**3NA3 354**	0.647	3
			400		**3NA3 360**	0.647	3
		71.2	425		**3NA3 362**	1.000	3
			500		**3NA3 365**	1.000	3
			630		**3NA3 372**	1.000	3
	**4** (IEC design)	101.8	630	500 V AC/ 440 V DC	**3NA3 472**	2.500	1
			800		**3NA3 475**	2.500	1
			1000		**3NA3 480**	2.500	1
			1250		**3NA3 482**	2.500	1
	**4 A**	101.8	500	500 V AC/ 440 V DC	**3NA3 665**	2.700	1
			630		**3NA3 672**	2.700	1
			800		**3NA3 675**	2.700	1
			1000		**3NA3 680**	2.840	1
			1250		**3NA3 682**	2.840	1

* You can order this quantity or a multiple thereof.

Selection and ordering data

	Size	Width	I_n	U_n	Non-insulated grip lugs Order No.	Weight 1 item	PS*/ P. unit
		mm	A	V		kg	Items
LV HRC fuse links with front indicator, utilization category gL/gG							
		The 300 A and 425 A fuse links do not conform to a VDE mark. They correspond to the standard, but are not permissible.					
	**000**	21	2	690 V AC/	**3NA3 802-6**	0.135	3
			4	250 V DC	**3NA3 804-6**	0.135	3
			6		**3NA3 801-6**	0.135	3
			10		**3NA3 803-6**	0.135	3
			16		**3NA3 805-6**	0.135	3
			20		**3NA3 807-6**	0.135	3
			25		**3NA3 810-6**	0.135	3
			32		**3NA3 812-6**	0.135	3
			35		**3NA3 814-6**	0.135	3
	**00**	30	40	690 V AC/	**3NA3 817-6**	0.200	3
			50	250 V DC	**3NA3 820-6**	0.200	3
			63		**3NA3 822-6**	0.200	3
			80		**3NA3 824-6**	0.200	3
			100		**3NA3 830-6**	0.200	3
	**1**	30	50	690 V AC/	**3NA3 120-6**	0.290	3
			63	440 V DC	**3NA3 122-6**	0.290	3
			80		**3NA3 124-6**	0.290	3
			100		**3NA3 130-6**	0.290	3
			125		**3NA3 132-6**	0.290	3
			160		**3NA3 136-6**	0.290	3
		47.2	200		**3NA3 140-6**	0.426	3
	**2**	47.2	80	690 V AC/	**3NA3 224-6**	0.426	3
			100	440 V DC	**3NA3 230-6**	0.426	3
			125		**3NA3 232-6**	0.426	3
			160		**3NA3 236-6**	0.426	3
			200		**3NA3 240-6**	0.426	3
		57.8	224		**3NA3 242-6**	0.660	3
			250		**3NA3 244-6**	0.680	3
			300		**3NA3 250-6**	0.660	3
			315		**3NA3 252-6**	0.680	3
	**3**	57.8	250	690 V AC/	**3NA3 344-6**	0.660	3
			315	440 V DC	**3NA3 352-6**	0.660	3
		71.2	355		**3NA3 354-6**	1.000	3
			400		**3NA3 360-6**	1.000	3
			425		**3NA3 362-6**	1.000	3
			500		**3NA3 365-6**	1.000	3

* You can order this quantity or a multiple thereof.

LV HRC fuse links

Selection and ordering data

	Size	Width	I_n	U_n	Non-insulated grip lugs Order No.	Weight 1 item	PS*/ P. unit
		mm	A	V		kg	Items
LV HRC fuse links with front indicator, utilization category aM							
	**000**	21	6	500 V AC	**3ND1 801**	0.130	3
			10		**3ND1 803**	0.130	3
			16		**3ND1 805**	0.130	3
			20		**3ND1 807**	0.130	3
			25		**3ND1 810**	0.130	3
			32		**3ND1 812**	0.130	3
			35		**3ND1 814**	0.130	3
			40		**3ND1 817**	0.130	3
			50		**3ND1 820**	0.130	3
			63		**3ND1 822**	0.130	3
			80		**3ND1 824**	0.130	3
	**00**	30	100	500 V AC	**3ND1 830**	0.192	3
			125		**3ND1 832**	0.192	3
			160		**3ND1 836**	0.192	3
	**1**	30	63	690 V AC	**3ND2 122**	0.290	3
			80		**3ND2 124**	0.290	3
			100		**3ND2 130**	0.440	3
		47.2	125		**3ND2 132**	0.440	3
			160		**3ND2 136**	0.440	3
			200		**3ND2 140**	0.440	3
			250		**3ND2 144**	0.440	3
	**2**	47.2	125	690 V AC	**3ND2 232**	0.440	3
			160		**3ND2 236**	0.440	3
			200		**3ND2 240**	0.440	3
			250		**3ND2 244**	0.440	3
		57.8	315		**3ND2 252**	0.650	3
			355		**3ND2 254**	0.650	3
			400		**3ND2 260**	0.650	3
	**3**	57.8	315	690 V AC	**3ND2 352**	0.650	3
			355		**3ND2 354**	0.650	3
			400		**3ND2 360**	0.650	3
		71.2	500		**3ND1 365**	1.030	3
			630		**3ND1 372**	1.000	3

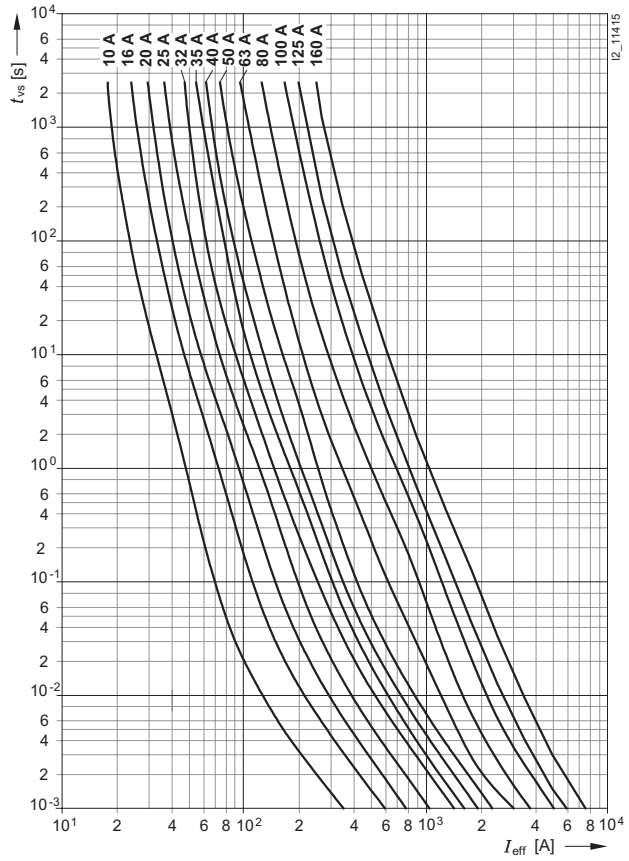
* You can order this quantity or a multiple thereof.

Characteristic curves

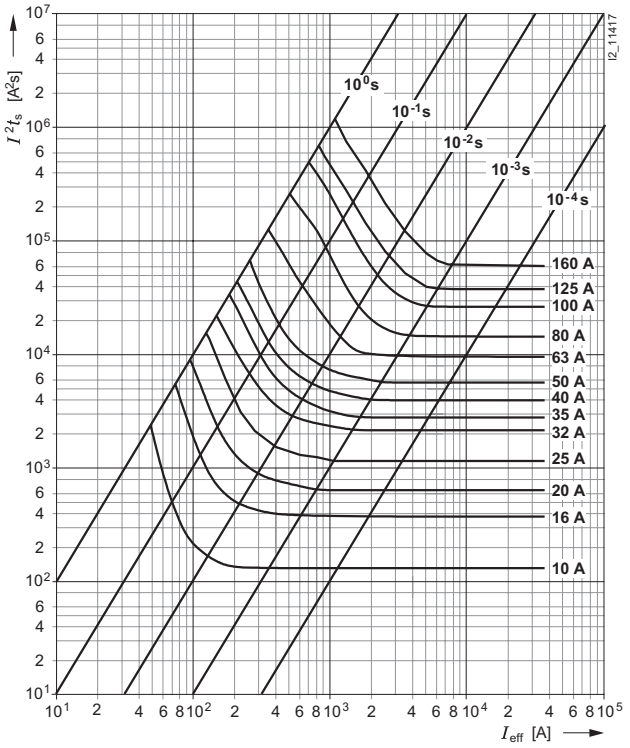
Series 3NA6 8..-4/-4KK

Size: 000, 00
Utilization category: gL/gG
Rated voltage: 400 V AC
Rated current: 10 ... 160 A

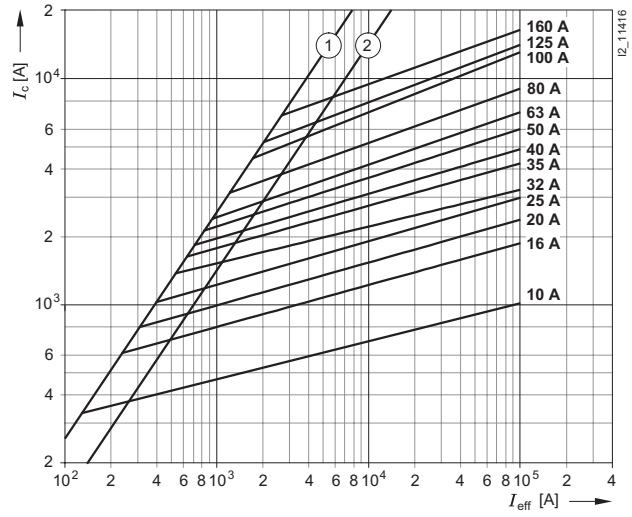
Time/current characteristics diagram



Melting/I^2t_s values diagram



Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Type	I_n	P_v	$\Delta\vartheta$	I^2t_s	
				1 ms	4 ms
	A	W	K	A^2s	A^2s
3NA6 803-4	10	1.0	8	120	130
3NA6 805-4	16	1.7	11	370	420
3NA6 807-4	20	2.0	15	670	750
3NA6 810-4	25	2.3	17	1200	1380
3NA6 812-4	32	2.6	18	2200	2500
3NA6 814-4	35	2.7	21	3000	3300
3NA6 817-4	40	3.1	24	4000	4500
3NA6 820-4	50	3.8	25	6000	6800
3NA6 822-4	63	3.9	23	9300	10250
3NA6 824-4, 3NA6 824-4KK	80	4.9	26	14200	18300
3NA6 830-4, 3NA6 830-4KK	100	5.4	29	25600	33600
3NA6 832-4	125	8.9	44	36000	50000
3NA6 836-4	160	11.3	52	58000	85000

Type	I^2t_a	
	230 V AC	400 V AC
	A^2s	A^2s
3NA6 803-4	180	265
3NA6 805-4	580	750
3NA6 807-4	1000	1370
3NA6 810-4	1800	2340
3NA6 812-4	3400	4550
3NA6 814-4	4900	6750
3NA6 817-4	6100	8700
3NA6 820-4	9100	11600
3NA6 822-4	12400	17900
3NA6 824-4, 3NA6 824-4KK	27000	38000
3NA6 830-4, 3NA6 830-4KK	48300	69200
3NA6 832-4	70000	91300
3NA6 836-4	120000	158000

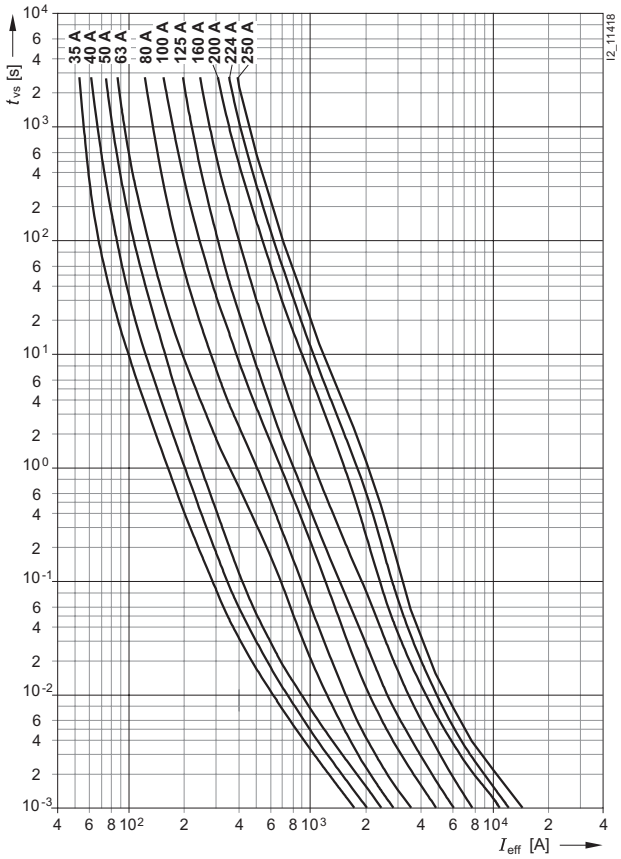
LV HRC fuse links

Characteristic curves

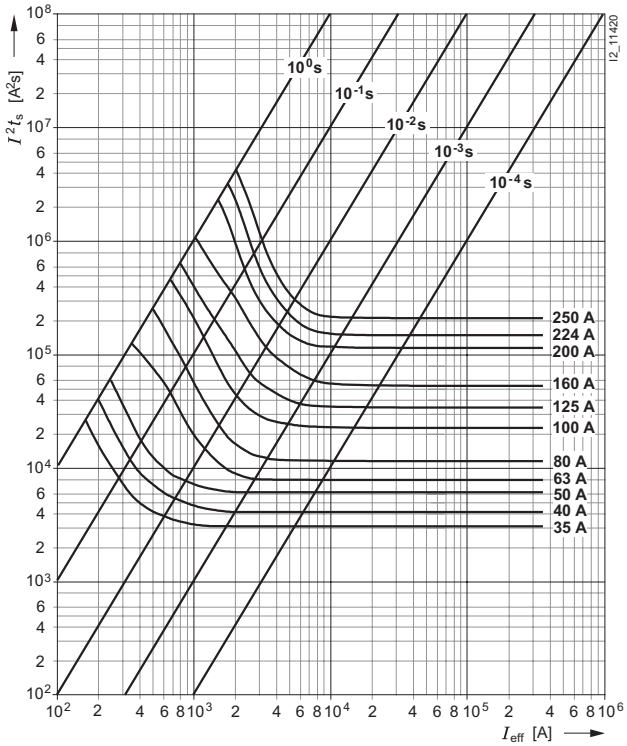
Series 3NA6 1..-4

Size: 1
Utilization category: gL/gG
Rated voltage: 400 V AC
Rated current: 35 ... 250 A

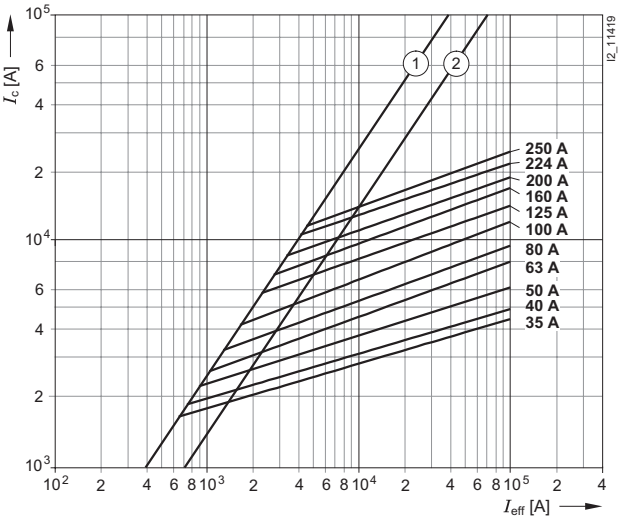
Time/current characteristics diagram



Melting/I^2t_s values diagram



Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Type	I_n	P_v	$\Delta\vartheta$
	A	W	K
3NA6 114-4	35	3.2	16
3NA6 117-4	40	3.6	16
3NA6 120-4	50	4.6	20
3NA6 122-4	63	6.0	21
3NA6 124-4	80	7.5	29
3NA6 130-4	100	8.9	30
3NA6 132-4	125	10.7	31
3NA6 136-4	160	13.9	34
3NA6 140-4	200	15.0	36
3NA6 142-4	224	16.1	37
3NA6 144-4	250	17.3	39

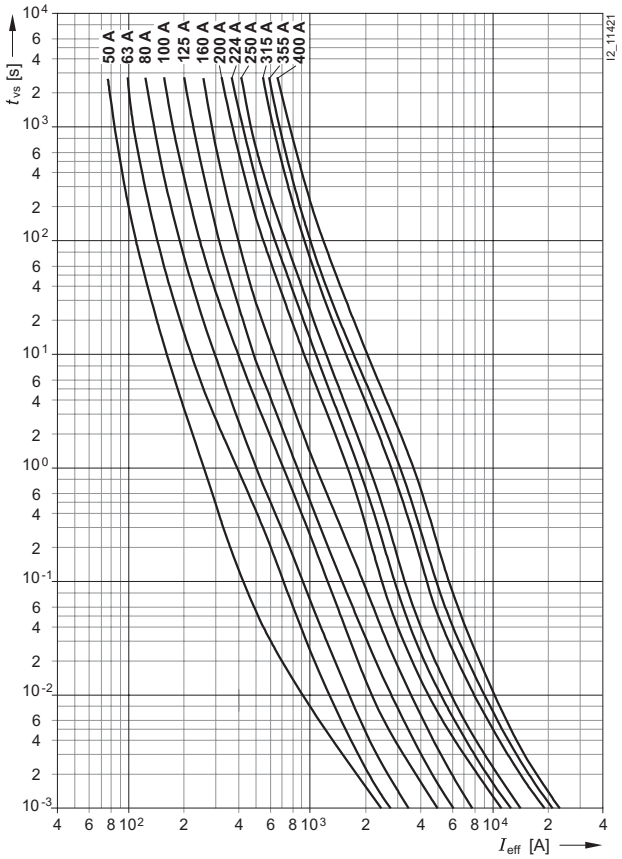
Type	I^2t_s		I^2t_a	
	1 ms	4 ms	230 V AC	400 V AC
	A^2s	A^2s	A^2s	A^2s
3NA6 114-4	3000	3300	4900	6750
3NA6 117-4	4000	4500	6100	8700
3NA6 120-4	6000	6800	9100	11600
3NA6 122-4	7700	9800	14200	19000
3NA6 124-4	12000	16000	23100	30700
3NA6 130-4	24000	30600	40800	56200
3NA6 132-4	36000	50000	70000	91300
3NA6 136-4	58000	85000	120000	158000
3NA6 140-4	115000	135000	218000	285000
3NA6 142-4	145000	170000	299000	392000
3NA6 144-4	205000	230000	420000	551000

Characteristic curves

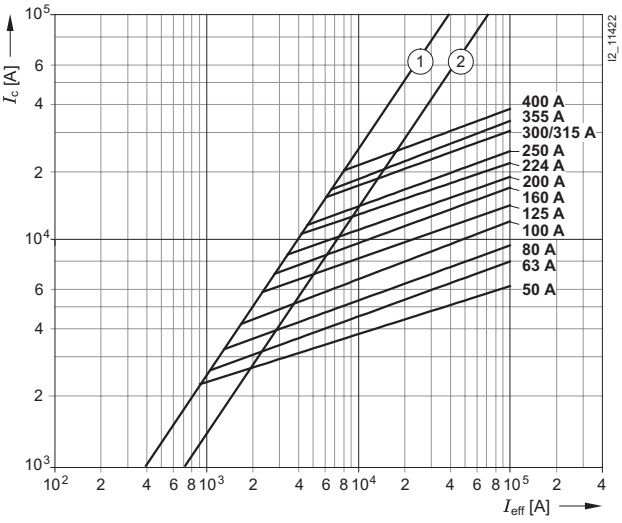
Series 3NA6 2..-4

Size: 2
Utilization category: gL/gG
Rated voltage: 400 V AC
Rated current: 50 ... 400 A

Time/current characteristics diagram

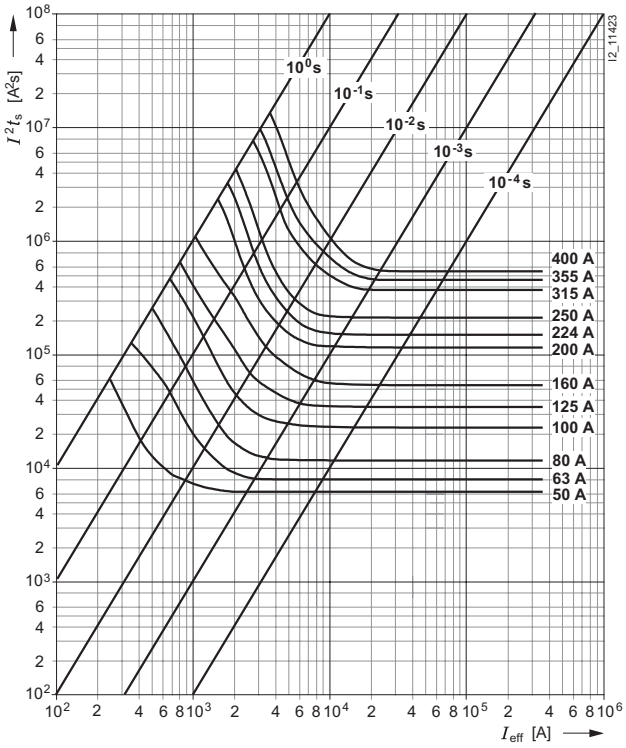


Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Melting/I^2t_s values diagram



Type	I_n	P_v	$\Delta\vartheta$
	A	W	K
3NA6 220-4	50	4.7	16
3NA6 222-4	63	5.9	16
3NA6 224-4	80	6.8	21
3NA6 230-4	100	7.4	22
3NA6 232-4	125	9.8	27
3NA6 236-4	160	12.6	34
3NA6 240-4	200	14.9	33
3NA6 242-4	224	15.4	31
3NA6 244-4	250	17.9	38
3NA6 250-4	300	19.4	34
3NA6 252-4	315	21.4	35
3NA6 254-4	355	26.0	49
3NA6 260-4	400	27.5	52

Type	I^2t_s		I^2t_a	
	1 ms	4 ms	230 V AC	400 V AC
	A^2s	A^2s	A^2s	A^2s
3NA6 220-4	6000	6800	9100	11600
3NA6 222-4	7700	9800	14200	19000
3NA6 224-4	12000	16000	23100	30700
3NA6 230-4	24000	30600	40800	56200
3NA6 232-4	36000	50000	70000	91300
3NA6 236-4	58000	85000	120000	158000
3NA6 240-4	115000	135000	218000	285000
3NA6 242-4	145000	170000	299000	392000
3NA6 244-4	205000	230000	420000	551000
3NA6 250-4	361000	433000	670000	901000
3NA6 252-4	361000	433000	670000	901000
3NA6 254-4	441000	538000	800000	1060000
3NA6 260-4	529000	676000	1155000	1515000

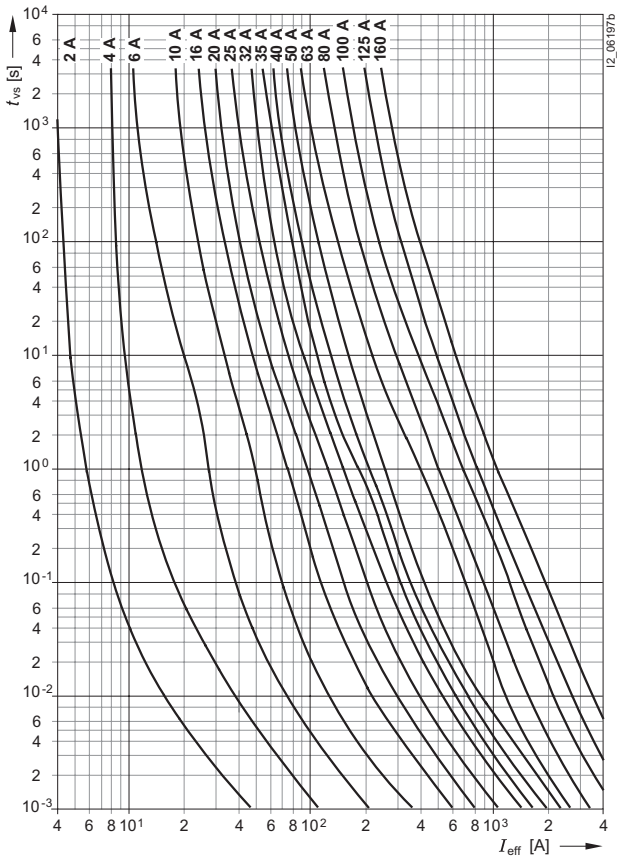
LV HRC fuse links

Characteristic curves

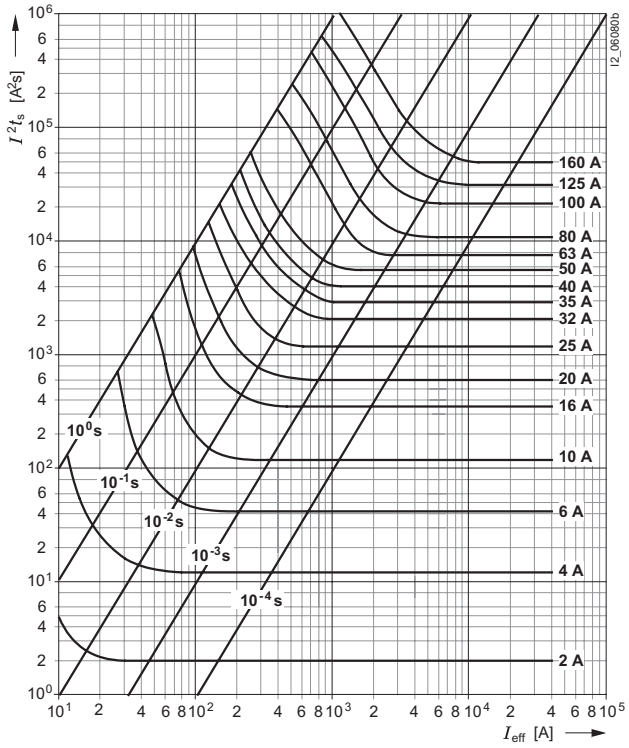
Series 3NA3 8, 3NA6 8, 3NA7 8

Size: 000, 00
Utilization category: gL/gG
Rated voltage: 500 V AC/250 V DC
Rated current: 2 ... 160 A

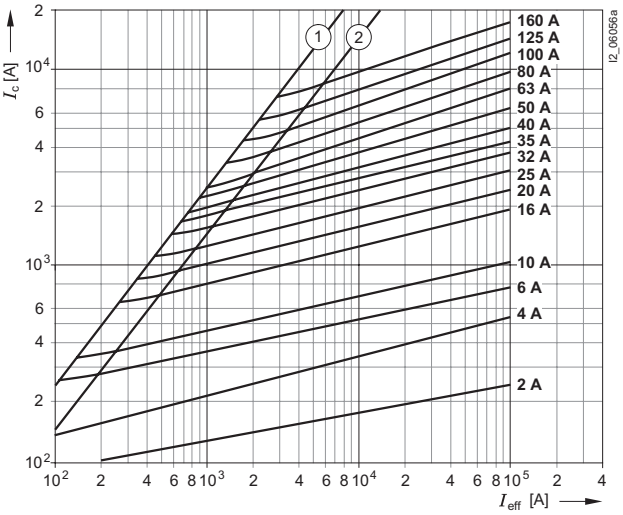
Time/current characteristics diagram



Melting/I^2t_s values diagram



Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Characteristic curves

Series 3NA3 8, 3NA6 8, 3NA7 8

Size: 000, 00
Utilization category: gL/gG
Rated voltage: 500 V AC/250 V DC
Rated current: 2 ... 160 A

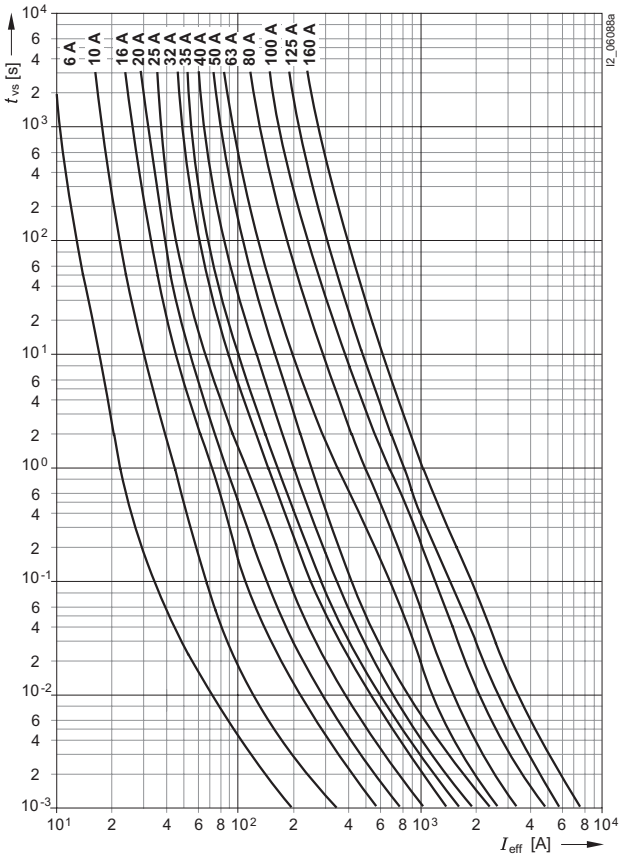
Type	I_n	P_v	$\Delta\vartheta$	I^2t_s		I^2t_a		
				1 ms	4 ms	230 V AC	400 V AC	500 V AC
	A	W	K	A^2s	A^2s	A^2s	A^2s	A^2s
3NA3 802, 3NA6 802, 3NA7 802	2	1.3	8	2	2	4	6	9
3NA3 804, 3NA6 804, 3NA7 804	4	0.9	6	11	13	18	22	27
3NA3 801, 3NA6 801, 3NA7 801	6	1.3	8	46	50	80	110	150
3NA3 803, 3NA6 803, 3NA7 803	10	1	8	120	130	180	265	370
3NA3 805, 3NA6 805, 3NA7 805	16	1.7	11	370	420	580	750	1000
3NA3 807, 3NA6 807, 3NA7 807	20	2	15	670	750	1000	1370	1900
3NA3 810, 3NA6 810, 3NA7 810	25	2.3	17	1200	1380	1800	2340	3300
3NA3 812, 3NA6 812, 3NA7 812	32	2.6	18	2200	2400	3400	4550	6400
3NA3 814, 3NA3 814-7, 3NA6 814, 3NA7 814	35	2.7	21	3000	3300	4900	6750	9300
3NA3 817, 3NA6 817, 3NA7 817	40	3.1	24	4000	4500	6100	8700	12100
3NA3 820, 3NA3 820-7, 3NA6 820, 3NA7 820	50	3.8	25	6000	6800	9100	11600	16000
3NA3 822, 3NA3 822-7, 3NA6 822, 3NA7 822	63	4.6	28	7700	9800	14200	19000	26500
3NA3 824, 3NA3 824-7, 3NA6 824, 3NA6 824-7, 3NA7 824, 3NA7 824-7	80	5.8	33	12000	16000	23100	30700	43000
3NA3 830, 3NA3 830-7, 3NA6 830, 3NA6 830-7, 3NA7 830, 3NA7 830-7	100	6.6	34	24000	30600	40800	56200	80000
3NA3 832, 3NA6 832, 3NA7 832	125	8.9	44	36000	50000	70000	91300	130000
3NA3 836, 3NA6 836, 3NA7 836	160	11.3	52	58000	85000	120000	158000	223000

Characteristic curves

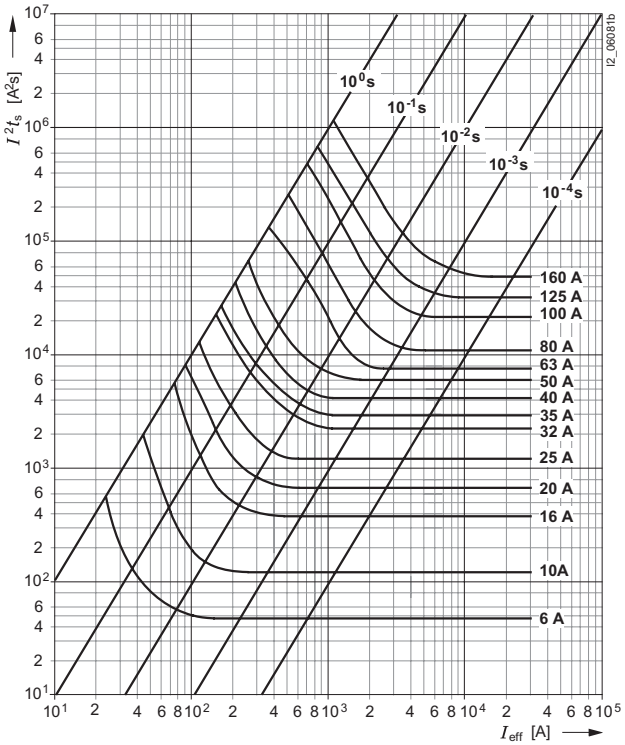
Series 3NA3 0

Size: 0
Utilization category: gL/gG
Rated voltage: 500 V AC/440 V DC
Rated current: 6 ... 160 A

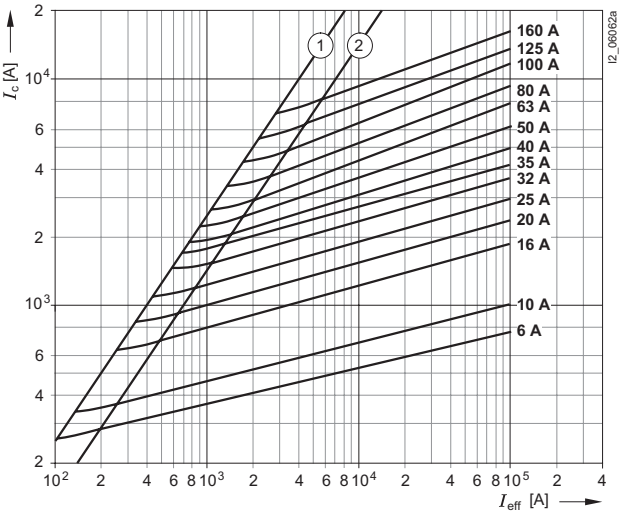
Time/current characteristics diagram



Melting/I^2t_s values diagram



Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Type	I_n	P_v	$\Delta\vartheta$	I^2t_s	
				1 ms	4 ms
	A	W	K	A^2s	A^2s
3NA3 001	6	1.5	6	46	50
3NA3 003	10	1	9	120	130
3NA3 005	16	1.9	11	370	420
3NA3 007	20	2.3	13	670	750
3NA3 010	25	2.7	15	1200	1380
3NA3 012	32	3	13	2200	2400
3NA3 014	35	3	17	3000	3300
3NA3 017	40	3.4	17	4000	4500
3NA3 020	50	4.5	24	6000	6800
3NA3 022	63	5.8	27	7700	9800
3NA3 024	80	7	34	12000	16000
3NA3 030	100	8.2	37	24000	30600
3NA3 032	125	10.2	38	36000	50000
3NA3 036	160	13.5	44	58000	85000

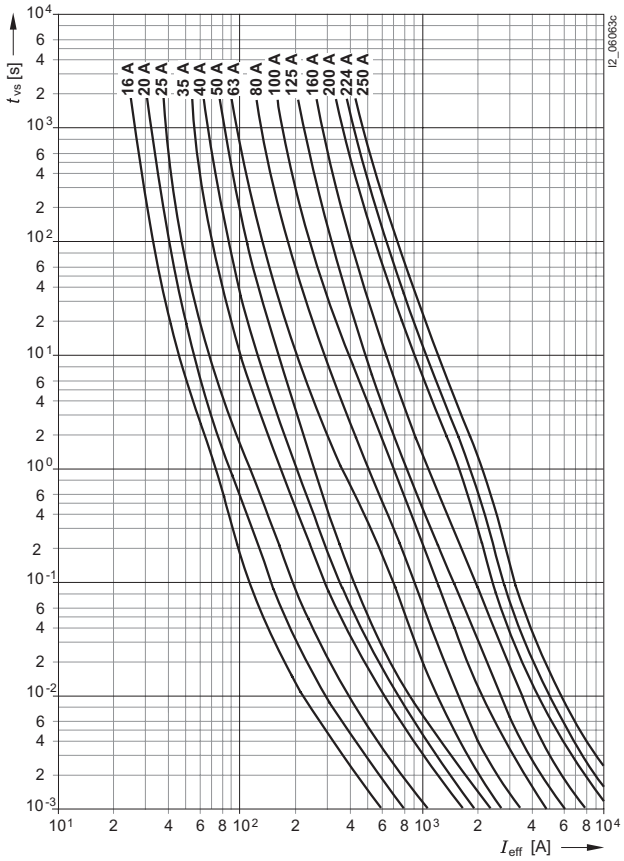
Type	I^2t_a		
	230 V AC	400 V AC	500 V AC
	A^2s	A^2s	A^2s
3NA3 001	80	110	150
3NA3 003	180	265	370
3NA3 005	580	750	1000
3NA3 007	1000	1370	1900
3NA3 010	1800	2340	3300
3NA3 012	3400	4550	6400
3NA3 014	4900	6750	9300
3NA3 017	6100	8700	12100
3NA3 020	9100	11600	16000
3NA3 022	14200	19000	26500
3NA3 024	23100	30700	43000
3NA3 030	40800	56200	80000
3NA3 032	70000	91300	130000
3NA3 036	120000	158000	223000

Characteristic curves

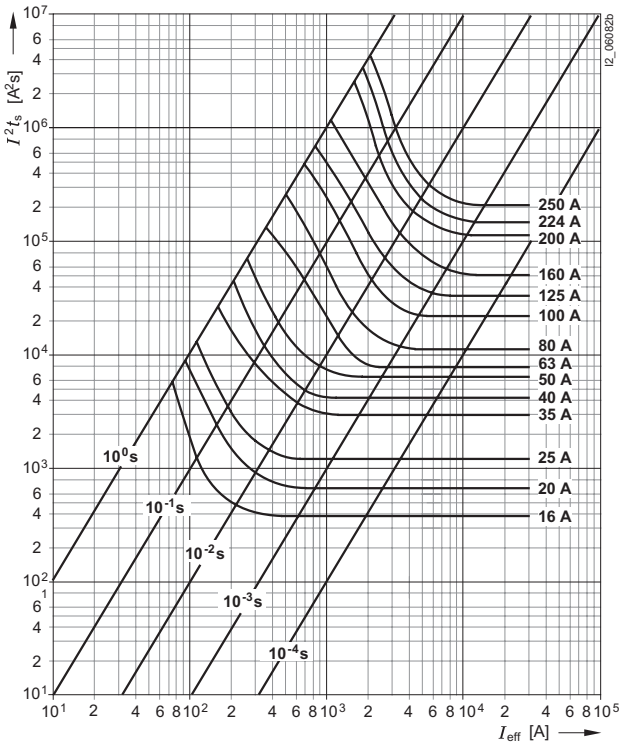
Series 3NA3 1, 3NA6 1, 3NA7 1

Size: 1
Utilization category: gL/gG
Rated voltage: 500 V AC/440 V DC
Rated current: 16 ... 250 A

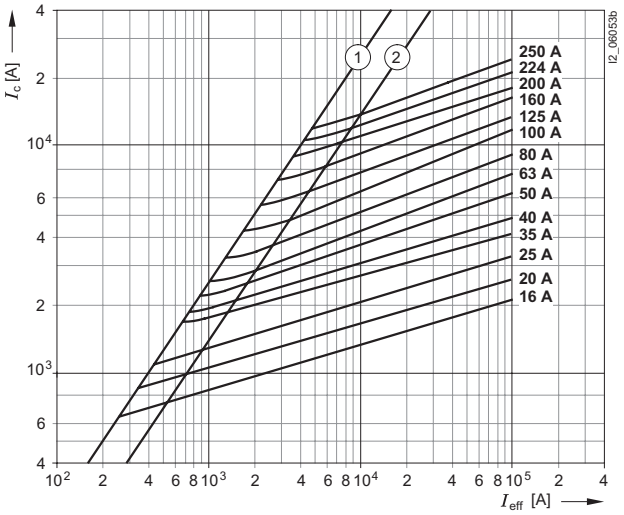
Time/current characteristics diagram



Melting/I^2t_s values diagram



Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Type	I_n	P_v	$\Delta\vartheta$	I^2t_s	
				1 ms	4 ms
	A	W	K	A^2s	A^2s
3NA3 105, 3NA6 105, 3NA7 105	16	2.1	8	370	420
3NA3 107, 3NA6 107, 3NA7 107	20	2.4	10	670	750
3NA3 110, 3NA6 110, 3NA7 110	25	2.8	11	1200	1380
3NA3 114, 3NA6 114, 3NA7 114	35	3.2	16	3000	3300
3NA3 117, 3NA6 117, 3NA7 117	40	3.6	16	4000	4500
3NA3 120, 3NA6 120, 3NA7 120	50	4.6	20	6000	6800
3NA3 122, 3NA6 122, 3NA7 122	63	6	21	7700	9800
3NA3 124, 3NA6 124, 3NA7 124	80	7.5	29	12000	16000
3NA3 130, 3NA6 130, 3NA7 130	100	8.9	30	24000	30600
3NA3 132, 3NA6 132, 3NA7 132	125	10.7	31	36000	50000
3NA3 136, 3NA6 136, 3NA7 136	160	13.9	34	58000	85000
3NA3 140, 3NA6 140, 3NA7 140	200	15	36	115000	135000
3NA3 142, 3NA6 142, 3NA7 142	224	16.1	37	145000	170000
3NA3 144, 3NA6 144, 3NA7 144	250	17.3	39	205000	230000

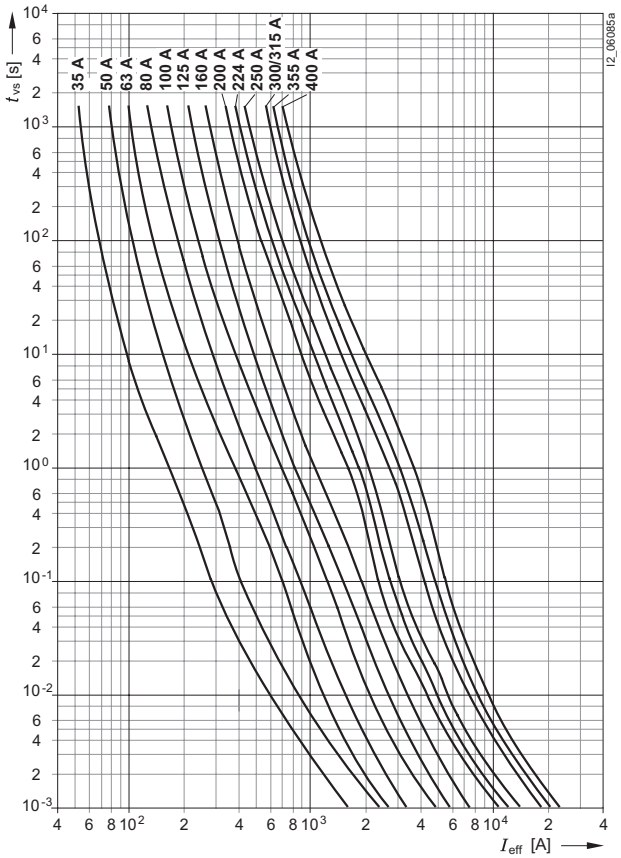
Type	I^2t_a		
	230 V AC	400 V AC	500 V AC
	A^2s	A^2s	A^2s
3NA3 105, 3NA6 105, 3NA7 105	580	750	1000
3NA3 107, 3NA6 107, 3NA7 107	1000	1370	1900
3NA3 110, 3NA6 110, 3NA7 110	1800	2340	3300
3NA3 114, 3NA6 114, 3NA7 114	4900	6750	9300
3NA3 117, 3NA6 117, 3NA7 117	6100	8700	12100
3NA3 120, 3NA6 120, 3NA7 120	9100	11600	16000
3NA3 122, 3NA6 122, 3NA7 122	14200	19000	26500
3NA3 124, 3NA6 124, 3NA7 124	23100	30700	43000
3NA3 130, 3NA6 130, 3NA7 130	40800	56200	80000
3NA3 132, 3NA6 132, 3NA7 132	70000	91300	130000
3NA3 136, 3NA6 136, 3NA7 136	120000	158000	223000
3NA3 140, 3NA6 140, 3NA7 140	218000	285000	400000
3NA3 142, 3NA6 142, 3NA7 142	299000	392000	550000
3NA3 144, 3NA6 144, 3NA7 144	420000	551000	780000

Characteristic curves

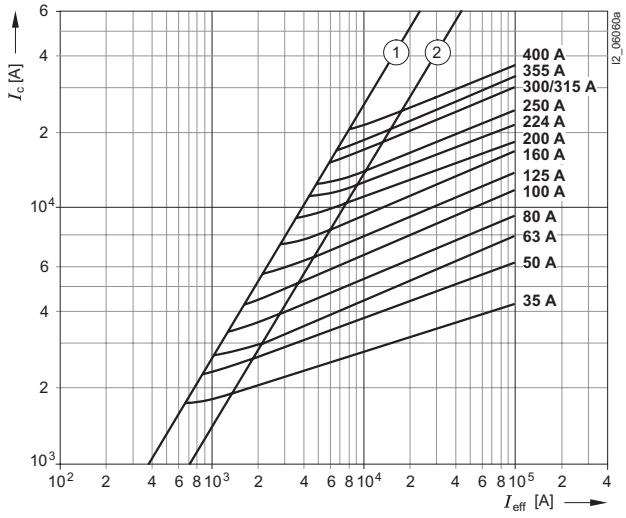
Series 3NA3 2, 3NA6 2, 3NA7 2

Size: 2
Utilization category: gL/gG
Rated voltage: 500 V AC/440 V DC
Rated current: 35 ... 400 A

Time/current characteristics diagram

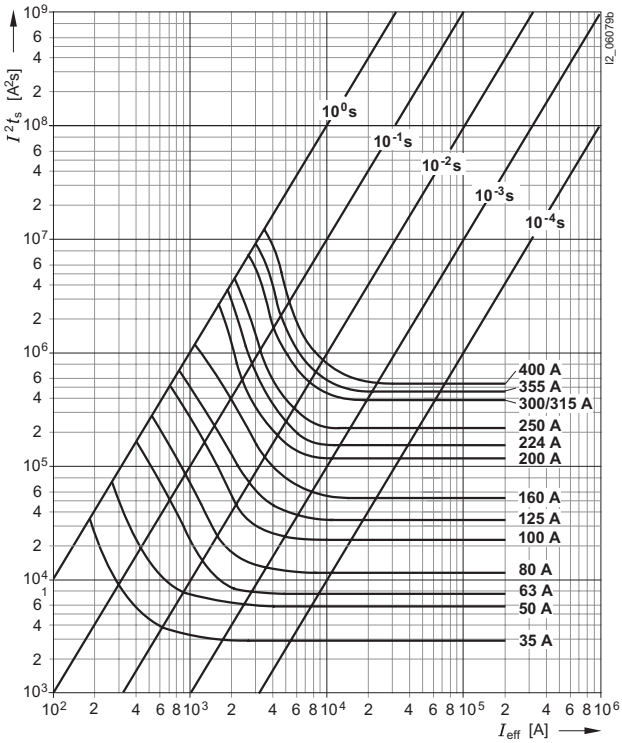


Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Melting/I^2t_s values diagram



Type	I_n	P_v	$\Delta\vartheta$	I^2t_s	
				1 ms	4 ms
	A	W	K	A^2s	A^2s
3NA3 214, 3NA6 214, 3NA7 214	35	3.2	12	3000	3300
3NA3 220, 3NA6 220, 3NA7 220	50	4.7	16	6000	6800
3NA3 222, 3NA6 222, 3NA7 222	63	5.9	16	7700	9800
3NA3 224, 3NA6 224, 3NA7 224	80	6.8	21	12000	16000
3NA3 230, 3NA6 230, 3NA7 230	100	7.4	22	24000	30600
3NA3 232, 3NA6 232, 3NA7 232	125	9.8	27	36000	50000
3NA3 236, 3NA6 236, 3NA7 236	160	12.6	34	58000	85000
3NA3 240, 3NA6 240, 3NA7 240	200	14.9	33	115000	135000
3NA3 242, 3NA6 242, 3NA7 242	224	15.4	31	145000	170000
3NA3 244, 3NA6 244, 3NA7 244	250	17.9	38	205000	230000
3NA3 250, 3NA6 250	300	19.4	34	361000	433000
3NA3 252, 3NA6 252, 3NA7 252	315	21.4	35	361000	433000
3NA3 254, 3NA6 254	355	26.0	49	441000	538000
3NA3 260, 3NA6 260, 3NA7 260	400	27.5	52	529000	676000

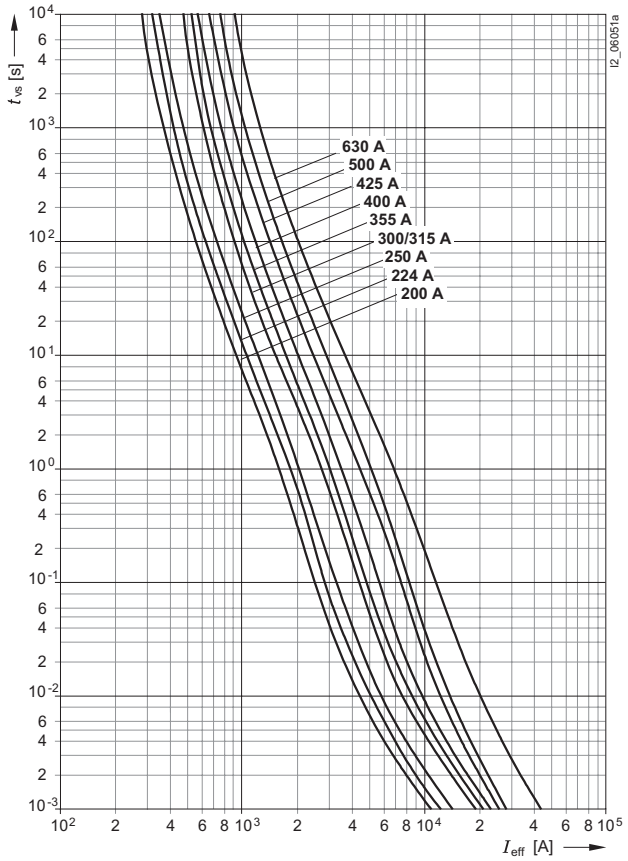
Type	I^2t_a		
	230 V AC	400 V AC	500 V AC
	A^2s	A^2s	A^2s
3NA3 214, 3NA6 214, 3NA7 214	4900	6750	9300
3NA3 220, 3NA6 220, 3NA7 220	9100	11600	16000
3NA3 222, 3NA6 222, 3NA7 222	14200	19000	26500
3NA3 224, 3NA6 224, 3NA7 224	23100	30700	43000
3NA3 230, 3NA6 230, 3NA7 230	40800	56200	80000
3NA3 232, 3NA6 232, 3NA7 232	70000	91300	130000
3NA3 236, 3NA6 236, 3NA7 236	120000	158000	223000
3NA3 240, 3NA6 240, 3NA7 240	218000	285000	400000
3NA3 242, 3NA6 242, 3NA7 242	299000	392000	550000
3NA3 244, 3NA6 244, 3NA7 244	420000	551000	780000
3NA3 250, 3NA6 250	670000	901000	1275000
3NA3 252, 3NA6 252, 3NA7 252	670000	901000	1275000
3NA3 254, 3NA6 254	800000	1060000	1500000
3NA3 260, 3NA6 260, 3NA7 260	1155000	1515000	2150000

Characteristic curves

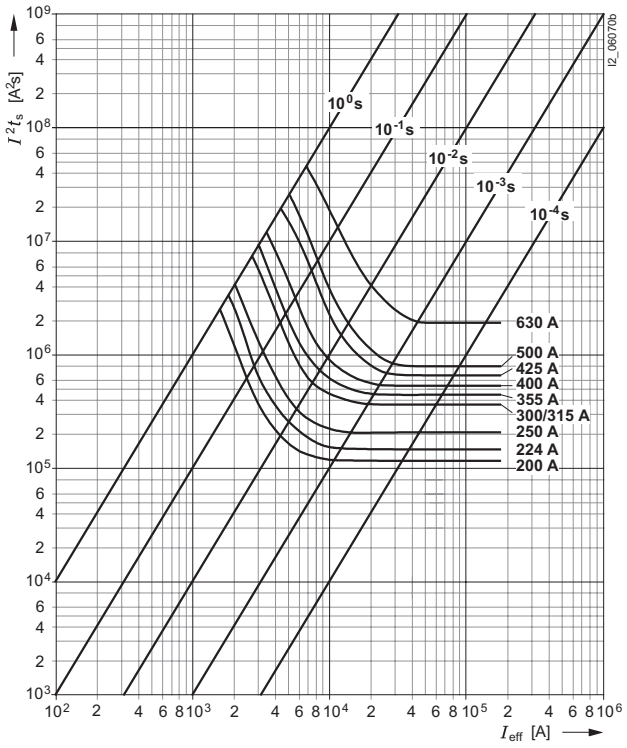
Series 3NA3 3

Size: 3
Utilization category: gL/gG
Rated voltage: 500 V AC/440 V DC
Rated current: 200 ... 630 A

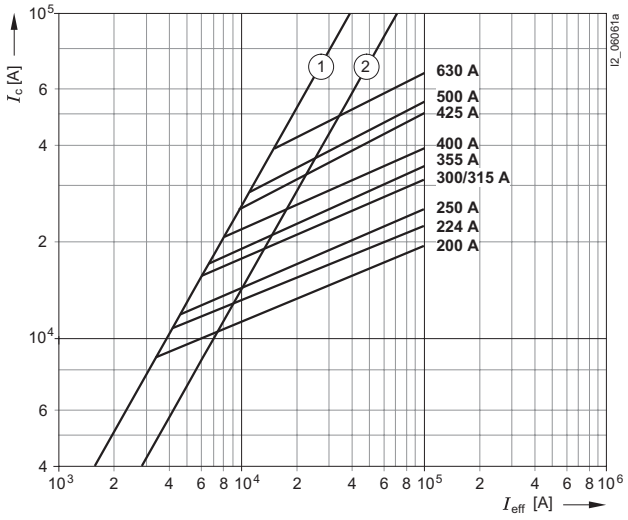
Time/current characteristics diagram



Melting/I^2t_s values diagram



Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Type	I_n	P_v	$\Delta\vartheta$	I^2t_s	
				1 ms	4 ms
	A	W	K	A^2s	A^2s
3NA3 340	200	14.9	32	115000	135000
3NA3 342	224	15.4	31	145000	170000
3NA3 344	250	17.9	36	205000	230000
3NA3 350	300	19.4	19	361000	433000
3NA3 352	315	21.4	22	361000	433000
3NA3 354	355	26.0	26	441000	538000
3NA3 360	400	27.5	28	529000	676000
3NA3 362	425	26.5	34	650000	970000
3NA3 365	500	36.5	41	785000	1270000
3NA3 372	630	44.0	50	1900000	2700000

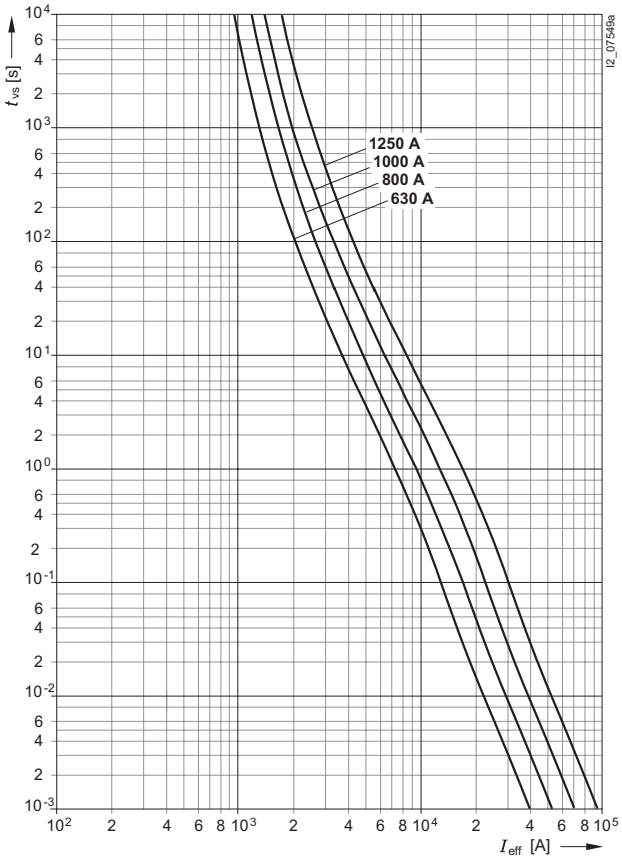
Type	I^2t_a		
	230 V AC	400 V AC	500 V AC
	A^2s	A^2s	A^2s
3NA3 340	218000	285000	400000
3NA3 342	299000	392000	550000
3NA3 344	420000	551000	780000
3NA3 350	670000	901000	1275000
3NA3 352	670000	901000	1275000
3NA3 354	800000	1060000	1500000
3NA3 360	1155000	1515000	2150000
3NA3 362	1515000	1856000	2270000
3NA3 365	1915000	2260000	2700000
3NA3 372	3630000	4340000	5400000

Characteristic curves

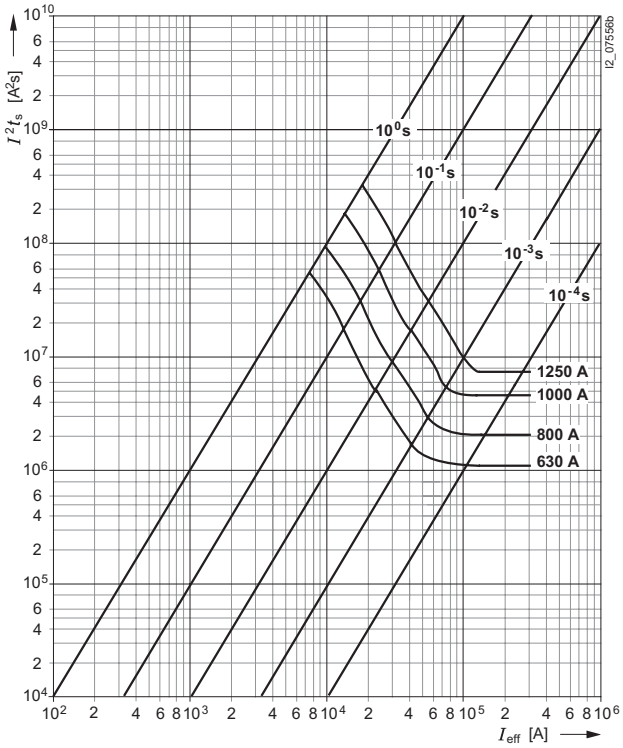
Series 3NA3 4

Size: 4 (IEC design)
Utilization category: gL/gG
Rated voltage: 500 V AC/440 V DC
Rated current: 630 ... 1000 A

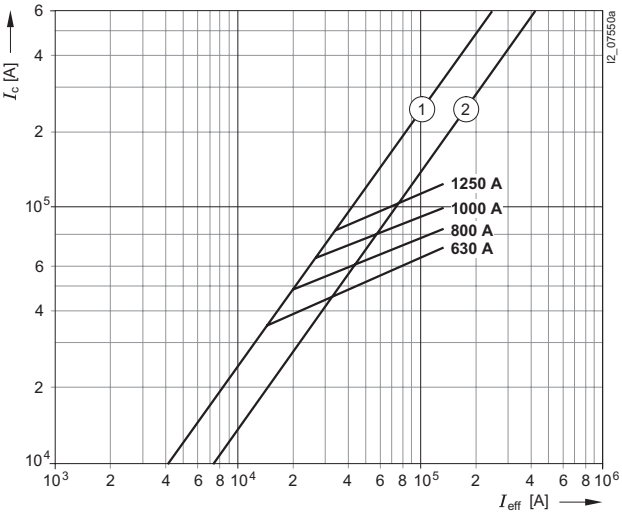
Time/current characteristics diagram



Melting/I^2t_s values diagram



Current limitation diagram



Type	I_n	P_v	$\Delta\vartheta$	I^2t_s	
				1 ms	4 ms
	A	W	K	A^2s	A^2s
3NA3 472	630	47	37	1900000	2700000
3NA3 475	800	59	43	3480000	5620000
3NA3 480	1000	74	56	7920000	10400000
3NA3 482	1250	99	65	11880000	18200000

Type	I^2t_a		
	230 V AC	400 V AC	500 V AC
	A^2s	A^2s	A^2s
3NA3 472	3630000	4340000	5400000
3NA3 475	7210000	8510000	10400000
3NA3 480	13600000	16200000	19000000
3NA3 482	23900000	29100000	34800080

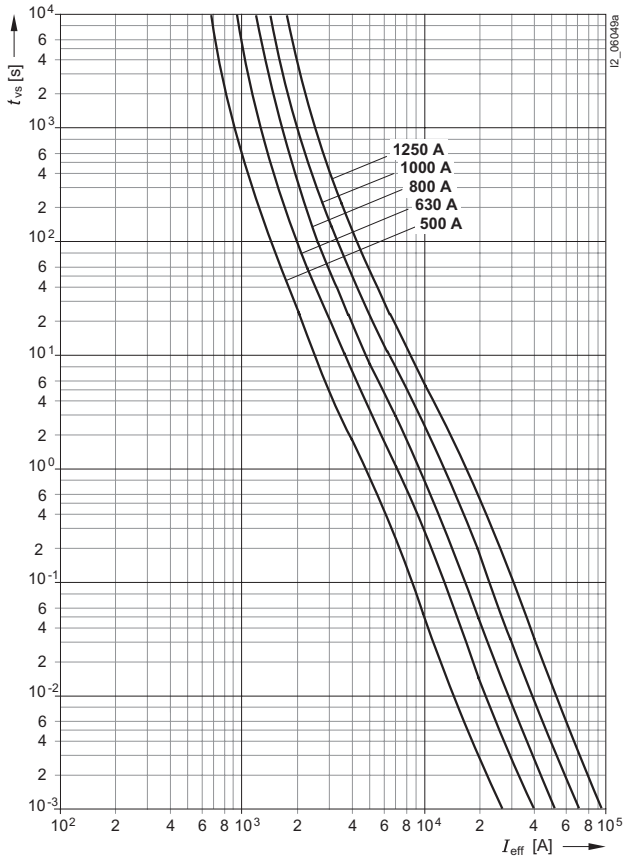
① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Characteristic curves

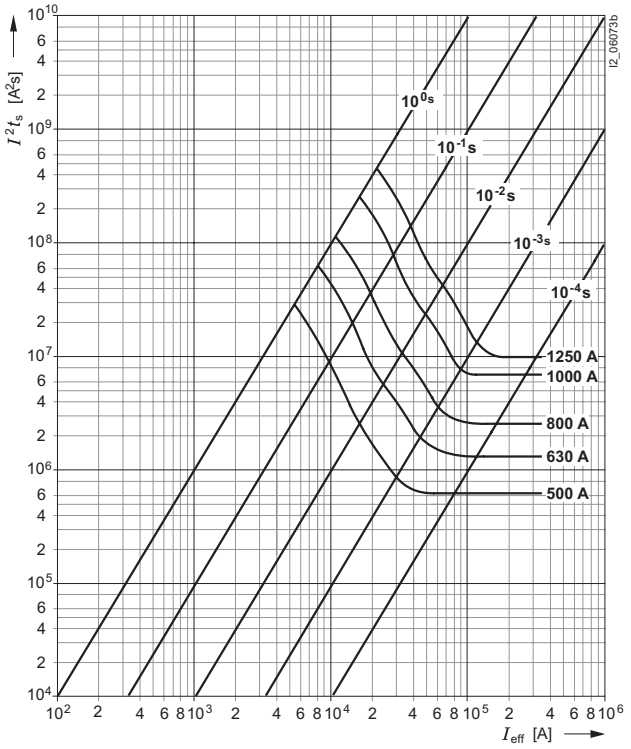
Series 3NA3 6

Size: 4a
Utilization category: gL/gG
Rated voltage: 500 V AC/440 V DC
Rated current: 500 ... 1250 A

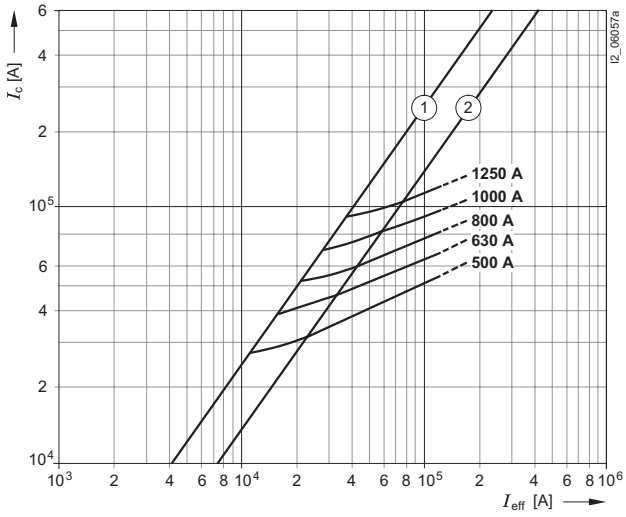
Time/current characteristics diagram



Melting/I^2t_s values diagram



Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Type	I_n	P_v	$\Delta\vartheta$	I^2t_s	
				1 ms	4 ms
	A	W	K	A^2s	A^2s
3NA3 665	500	43	30	785000	1270000
3NA3 672	630	47	37	1900000	2700000
3NA3 675	800	59	43	3480000	5620000
3NA3 680	1000	74	56	7920000	10400000
3NA3 682	1250	99	65	11880000	18200000

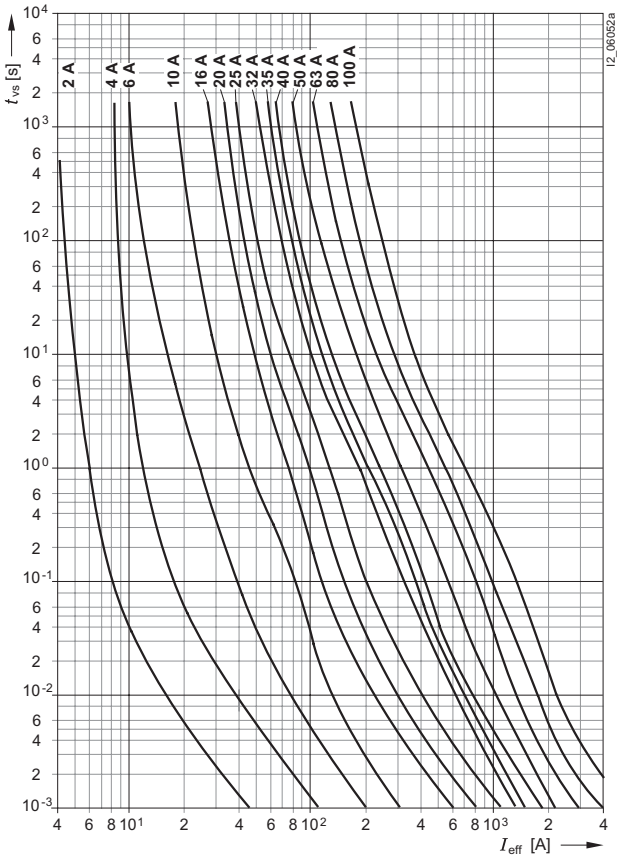
Type	I^2t_a		
	230 V AC	400 V AC	500 V AC
	A^2s	A^2s	A^2s
3NA3 665	1915000	2260000	2700000
3NA3 672	3630000	4340000	5400000
3NA3 675	7210000	8510000	10400000
3NA3 680	13600000	16200000	19000000
3NA3 682	23900000	29100000	34800000

Characteristic curves

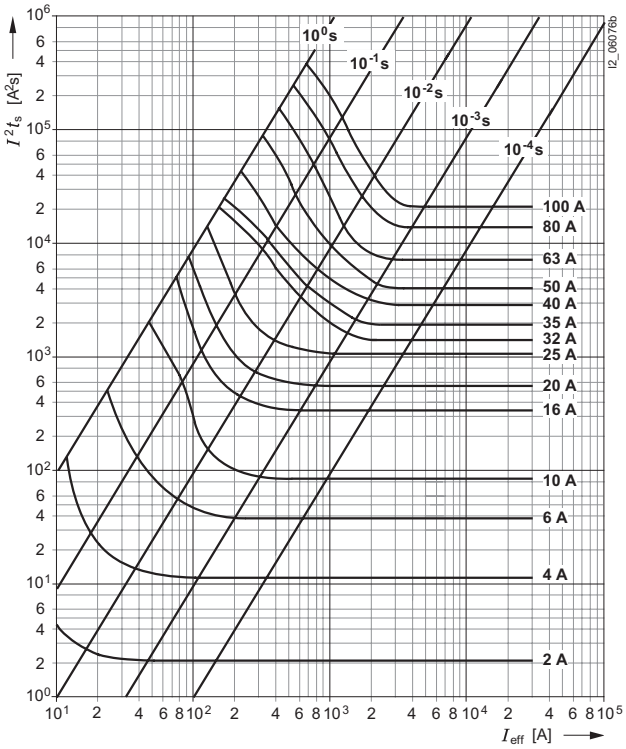
Series 3NA3 8..-6, 3NA6 8..-6, 3NA7 8..-6

Size: 000, 00
Utilization category: gL/gG
Rated voltage: 690 V AC/250 V DC
Rated current: 2 ... 100 A

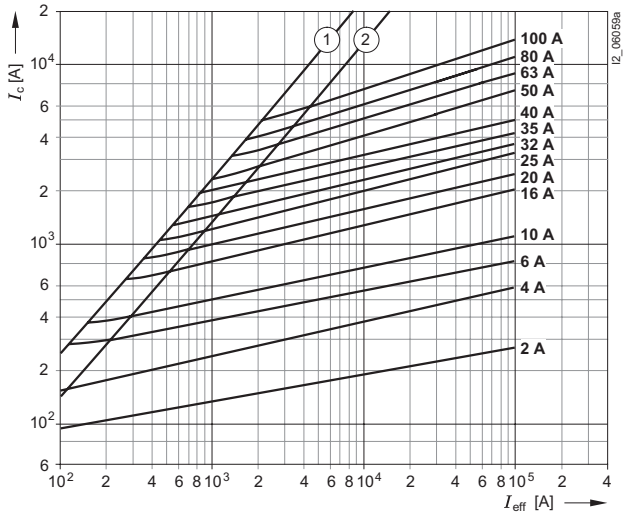
Time/current characteristics diagram



Melting/I^2t_s values diagram



Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Type	I_n	P_v	$\Delta\vartheta$	I^2t_s	
				1 ms	4 ms
	A	W	K	A^2s	A^2s
3NA3 802-6, 3NA6 802-6, 3NA7 802-6	2	1.3	8	2	2
3NA3 804-6, 3NA6 804-6, 3NA7 804-6	4	0.9	6	11	13
3NA3 801-6, 3NA6 801-6, 3NA7 801-6	6	1.3	8	36	44
3NA3 803-6, 3NA6 803-6, 3NA7 803-6	10	1	8	90	120
3NA3 805-6, 3NA6 805-6, 3NA7 805-6	16	1.7	11	330	360
3NA3 807-6, 3NA6 807-6, 3NA7 807-6	20	2	15	570	690
3NA3 810-6, 3NA6 810-6, 3NA7 810-6	25	2.3	17	1200	1380
3NA3 812-6, 3NA6 812-6, 3NA7 812-6	32	3.1	19	1600	2600
3NA3 814-6, 3NA6 814-6, 3NA7 814-6	35	3.6	23	2100	3100
3NA3 817-6, 3NA6 817-6, 3NA7 817-6	40	3.6	18	3200	4700
3NA3 820-6, 3NA6 820-6, 3NA7 820-6	50	4.9	28	4400	7400
3NA3 822-6, 3NA6 822-6, 3NA7 822-6	63	5.7	33	7600	10100
3NA3 824-6, 3NA6 824-6, 3NA7 824-6	80	6.7	38	13500	17000
3NA3 830-6, 3NA6 830-6, 3NA7 830-6	100	9.1	40	21200	30500

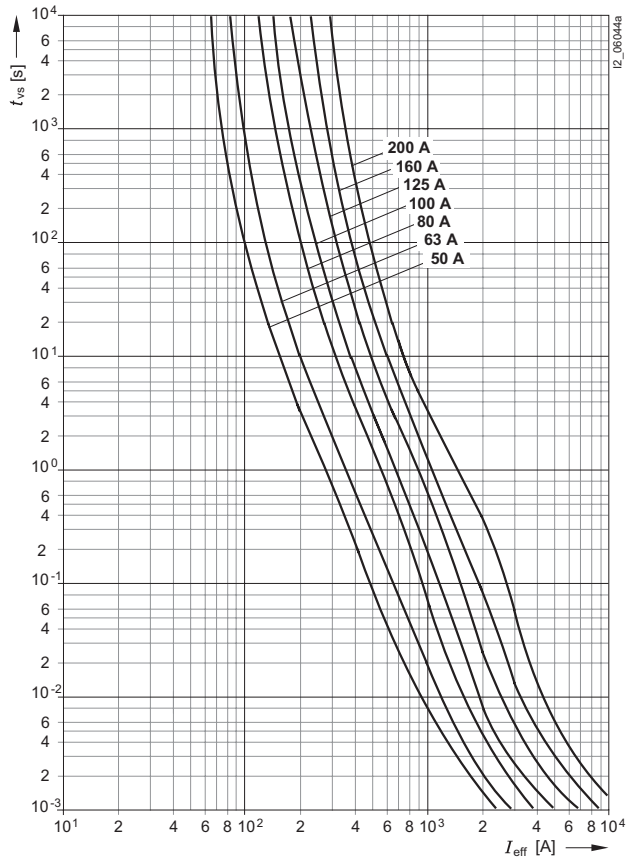
Type	I^2t_a		
	230 V AC	400 V AC	690 V AC
	A^2s	A^2s	A^2s
3NA3 802-6, 3NA6 802-6, 3NA7 802-6	4	6	9
3NA3 804-6, 3NA6 804-6, 3NA7 804-6	18	22	27
3NA3 801-6, 3NA6 801-6, 3NA7 801-6	80	110	150
3NA3 803-6, 3NA6 803-6, 3NA7 803-6	180	265	370
3NA3 805-6, 3NA6 805-6, 3NA7 805-6	580	750	1000
3NA3 807-6, 3NA6 807-6, 3NA7 807-6	1000	1370	1900
3NA3 810-6, 3NA6 810-6, 3NA7 810-6	1800	2340	3300
3NA3 812-6, 3NA6 812-6, 3NA7 812-6	3100	4100	5800
3NA3 814-6, 3NA6 814-6, 3NA7 814-6	4000	5000	7800
3NA3 817-6, 3NA6 817-6, 3NA7 817-6	6000	8600	12000
3NA3 820-6, 3NA6 820-6, 3NA7 820-6	9100	11200	19000
3NA3 822-6, 3NA6 822-6, 3NA7 822-6	13600	17000	24000
3NA3 824-6, 3NA6 824-6, 3NA7 824-6	24300	32000	55000
3NA3 830-6, 3NA6 830-6, 3NA7 830-6	42400	52000	75000

Characteristic curves

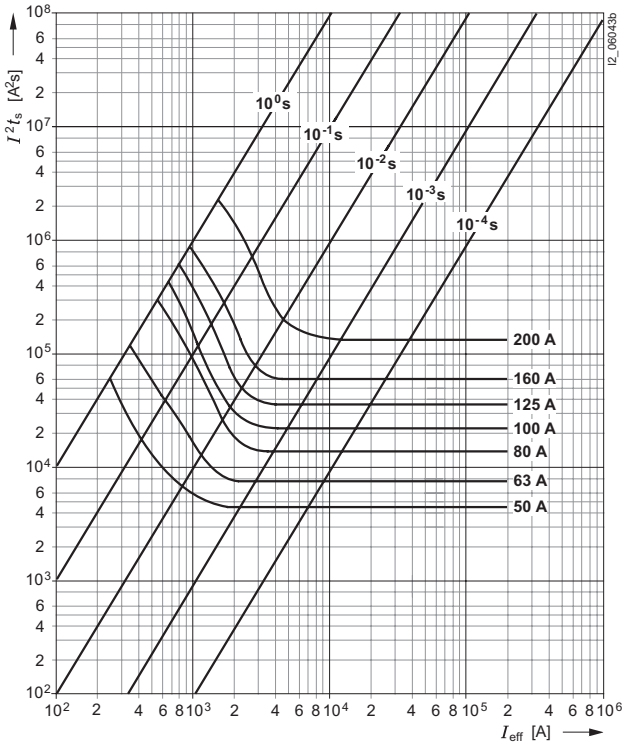
Series 3NA3 1..-6, 3NA6 1..-6, 3NA7 1..-6

Size: 1
Utilization category: gL/gG
Rated voltage: 690 V AC/440 V DC
Rated current: 50 ... 200 A

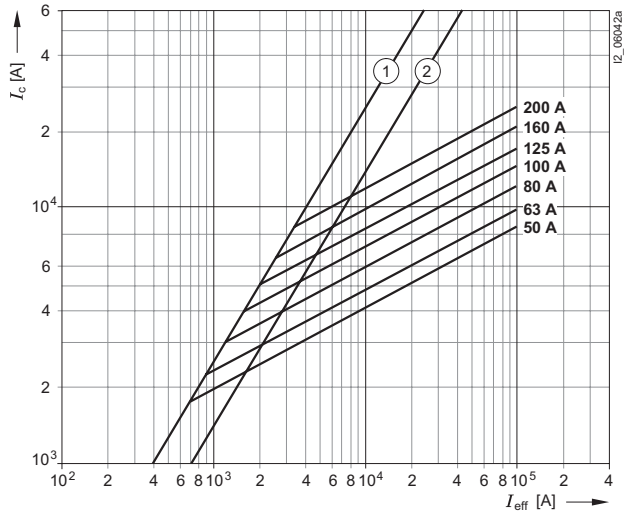
Time/current characteristics diagram



Melting/I^2t_s values diagram



Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Type	I_n	P_v	$\Delta\vartheta$	I^2t_s	
				1 ms	4 ms
	A	W	K	A²s	A²s
3NA3 120-6, 3NA6 120-6, 3NA7 120-6	50	6.7	21	440	7400
3NA3 122-6, 3NA6 122-6, 3NA7 122-6	63	7.6	22	7600	10100
3NA3 124-6, 3NA6 124-6, 3NA7 124-6	80	6.7	22	13500	17000
3NA3 130-6, 3NA6 130-6, 3NA7 130-6	100	8.7	28	21200	30500
3NA3 132-6, 3NA6 132-6, 3NA7 132-6	125	10.5	29	36000	50000
3NA3 136-6, 3NA6 136-6, 3NA7 136-6	160	13.8	33	58000	85000
3NA3 140-6, 3NA6 140-6, 3NA7 140-6	200	16.6	35	132000	144000

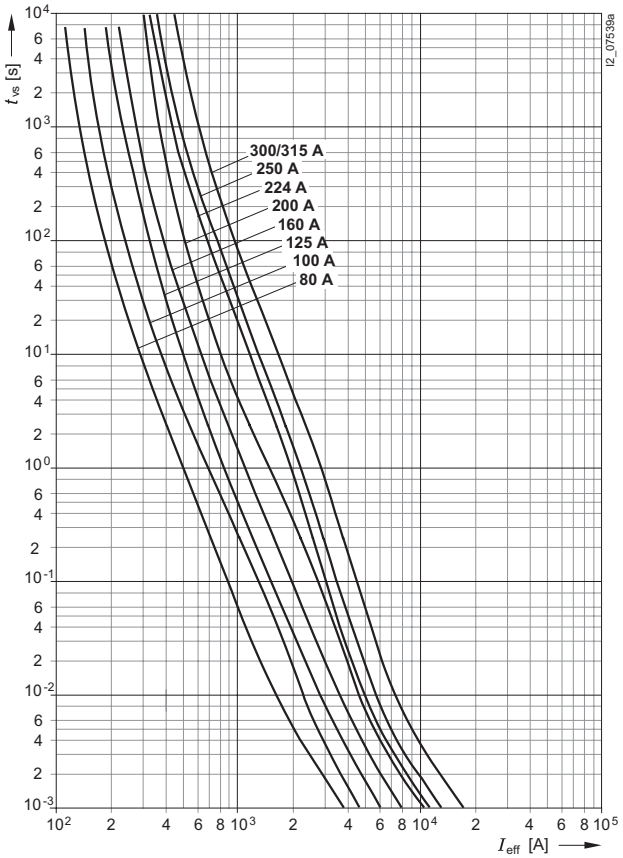
Type	I^2t_a		
	230 V AC	400 V AC	690 V AC
	A²s	A²s	A²s
3NA3 120-6, 3NA6 120-6, 3NA7 120-6	9100	11200	1900
3NA3 122-6, 3NA6 122-6, 3NA7 122-6	13600	17000	24000
3NA3 124-6, 3NA6 124-6, 3NA7 124-6	24300	32000	55000
3NA3 130-6, 3NA6 130-6, 3NA7 130-6	42400	52000	75000
3NA3 132-6, 3NA6 132-6, 3NA7 132-6	69500	82200	130000
3NA3 136-6, 3NA6 136-6, 3NA7 136-6	120000	155000	223000
3NA3 140-6, 3NA6 140-6, 3NA7 140-6	211000	240000	360000

Characteristic curves

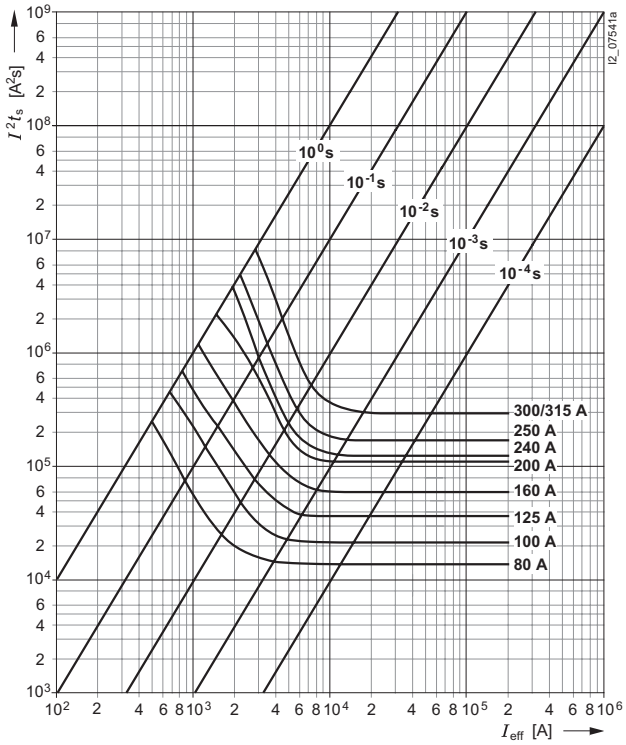
Series 3NA3 2..-6, 3NA6 2..-6, 3NA7 2..-6

Size: 2
Utilization category: gL/gG
Rated voltage: 690 V AC/440 V DC
Rated current: 80 ... 315 A

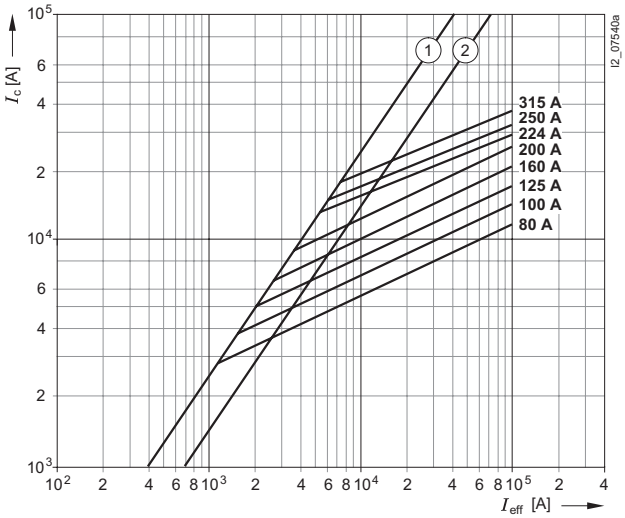
Time/current characteristics diagram



Melting/I^2t_s values diagram



Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Type	I_n	P_v	$\Delta\vartheta$	I^2t_s	
				1 ms	4 ms
	A	W	K	A²s	A²s
3NA3 224-6, 3NA6 224-6, 3NA7 224-6	80	6.6	22	13500	17000
3NA3 230-6, 3NA6 230-6, 3NA7 230-6	100	8.5	26	21200	30500
3NA3 232-6, 3NA6 232-6, 3NA7 232-6	125	9.8	29	36000	50000
3NA3 236-6, 3NA6 236-6, 3NA7 236-6	160	13.3	31	58000	85000
3NA3 240-6, 3NA6 240-6, 3NA7 240-6	200	16.1	33	132000	144000
3NA3 242-6, 3NA6 242-6, 3NA7 242-6	224	19.9	38	125000	162000
3NA3 244-6, 3NA6 244-6, 3NA7 244-6	250	23	44	180000	215000
3NA3 250-6, 3NA6 250-6, 3NA7 250-6	300	25.6	38	300000	380000
3NA3 252-6, 3NA6 252-6, 3NA7 252-6	315	28.2	42	300000	380000

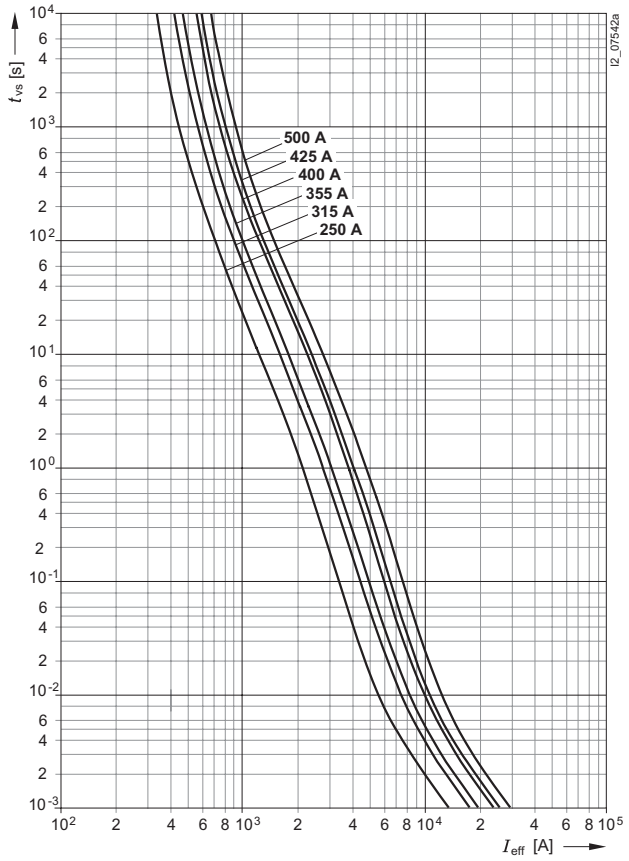
Type	I^2t_a		
	230 V AC	400 V AC	690 V AC
	A²s	A²s	A²s
3NA3 224-6, 3NA6 224-6, 3NA7 224-6	24300	32000	55000
3NA3 230-6, 3NA6 230-6, 3NA7 230-6	42400	52000	75000
3NA3 232-6, 3NA6 232-6, 3NA7 232-6	69500	82200	130000
3NA3 236-6, 3NA6 236-6, 3NA7 236-6	120000	155000	223000
3NA3 240-6, 3NA6 240-6, 3NA7 240-6	211000	240000	360000
3NA3 242-6, 3NA6 242-6, 3NA7 242-6	300000	300000	450000
3NA3 244-6, 3NA6 244-6, 3NA7 244-6	453000	350000	525000
3NA3 250-6, 3NA6 250-6, 3NA7 250-6	480000	625000	940000
3NA3 252-6, 3NA6 252-6, 3NA7 252-6	480000	625000	940000

Characteristic curves

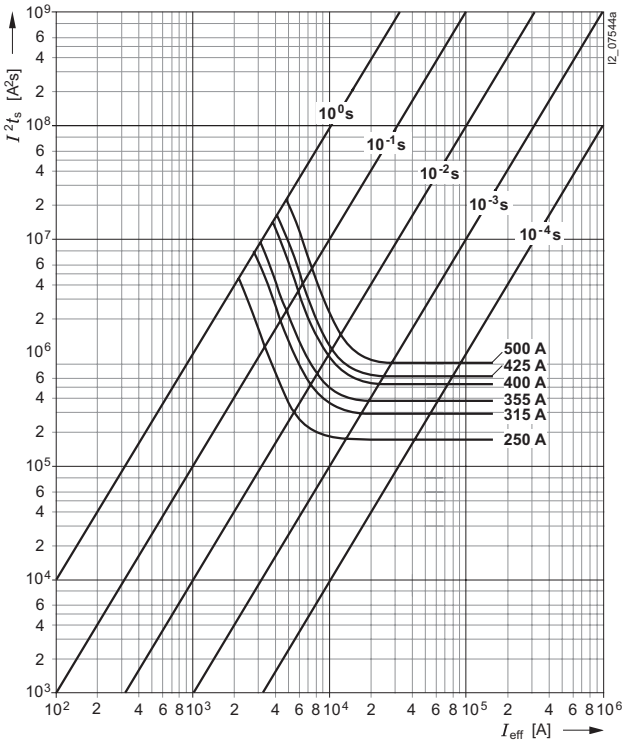
Series 3NA3 3..-6

Size: 3
Utilization category: gL/gG
Rated voltage: 690 V AC/440 V DC
Rated current: 250 ... 500 A

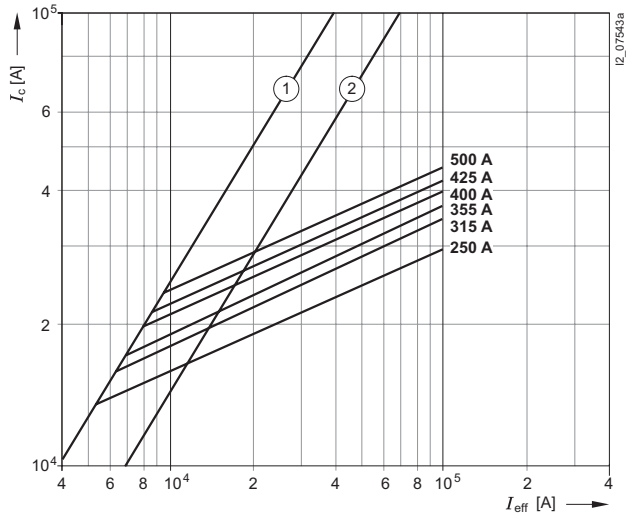
Time/current characteristics diagram



Melting/I^2t_s values diagram



Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Type	I_n	P_v	$\Delta\vartheta$	I^2t_s	
				1 ms	4 ms
	A	W	K	A²s	A²s
3NA3 344-6	250	23	44	180000	215000
3NA3 352-6	315	28.2	42	300000	380000
3NA3 354-6	355	32.5	40	380000	470000
3NA3 360-6	400	33.2	42	540000	675000
3NA3 362-6	425	35.3	44	625000	765000
3NA3 365-6	500	43.5	52	810000	1000000

Type	I^2t_a		
	230 V AC	400 V AC	690 V AC
	A²s	A²s	A²s
3NA3 344-6	453000	350000	525000
3NA3 352-6	480000	625000	940000
3NA3 354-6	585000	760000	1150000
3NA3 360-6	847000	1100000	1650000
3NA3 362-6	925000	1200000	1800000
3NA3 365-6	1300000	1700000	2500000

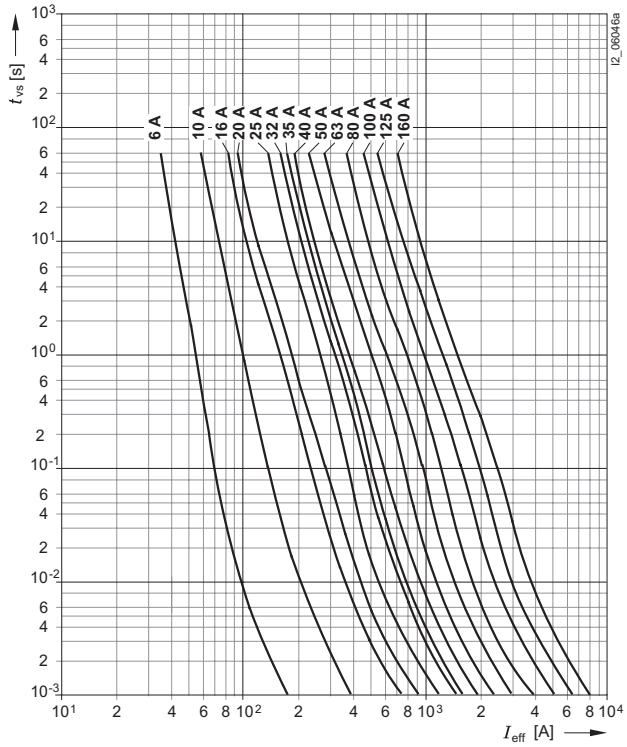
LV HRC fuse links

Characteristic curves

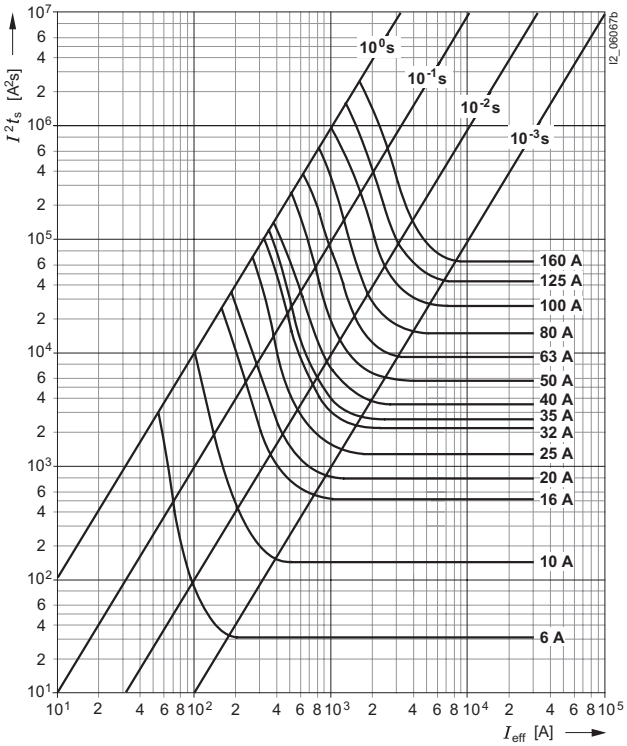
Series 3ND1 8

Size: 000, 00
Utilization category: aM
Rated voltage: 500 V AC
Rated current: 6 ... 160 A

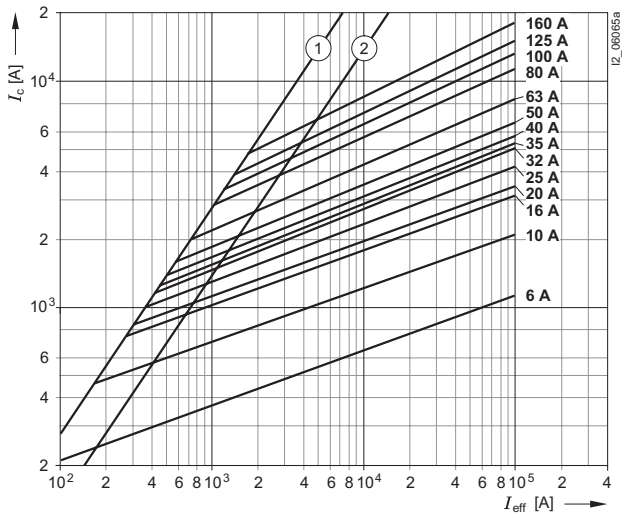
Time/current characteristics diagram



Melting/I^2t_s values diagram



Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Type	I_n	P_v	$\Delta\vartheta$	I^2t_s	
				1 ms	4 ms
	A	W	K	A^2s	A^2s
3ND1 801	6	0.8	7	32	55
3ND1 803	10	0.5	5	150	260
3ND1 805	16	0.8	7	570	800
3ND1 807	20	1	8	830	1200
3ND1 810	25	1.2	9	1400	2000
3ND1 812	32	1.5	10	2300	3300
3ND1 814	35	1.8	11	2600	3800
3ND1 817	40	2	12	3700	5500
3ND1 820	50	2.4	14	5800	8400
3ND1 822	63	3.3	17	9300	13000
3ND1 824	80	4.5	20	15000	21000
3ND1 830	100	4.9	18	26000	37000
3ND1 832	125	6.3	22	41000	60000
3ND1 836	160	9.3	31	64000	92000

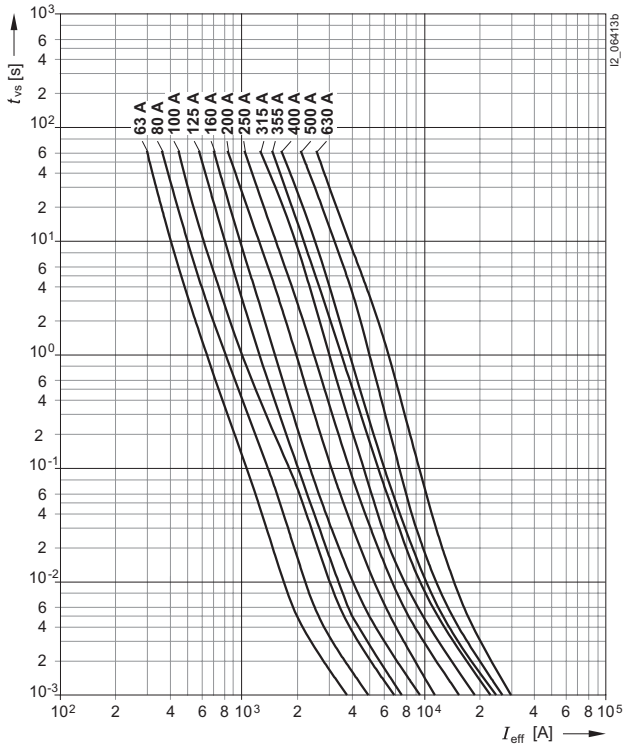
Type	I^2t_a		
	230 V AC	400 V AC	500 V AC
	A^2s	A^2s	A^2s
3ND1 801	60	75	110
3ND1 803	280	320	430
3ND1 805	1000	1300	1600
3ND1 807	1300	1600	2200
3ND1 810	2200	2800	3300
3ND1 812	3800	4500	5400
3ND1 814	4200	5100	6300
3ND1 817	5700	7200	9300
3ND1 820	5200	10500	12500
3ND1 822	15000	16500	21000
3ND1 824	21500	27000	34000
3ND1 830	44000	56000	76000
3ND1 832	76000	98000	135000
3ND1 836	105000	130000	170000

Characteristic curves

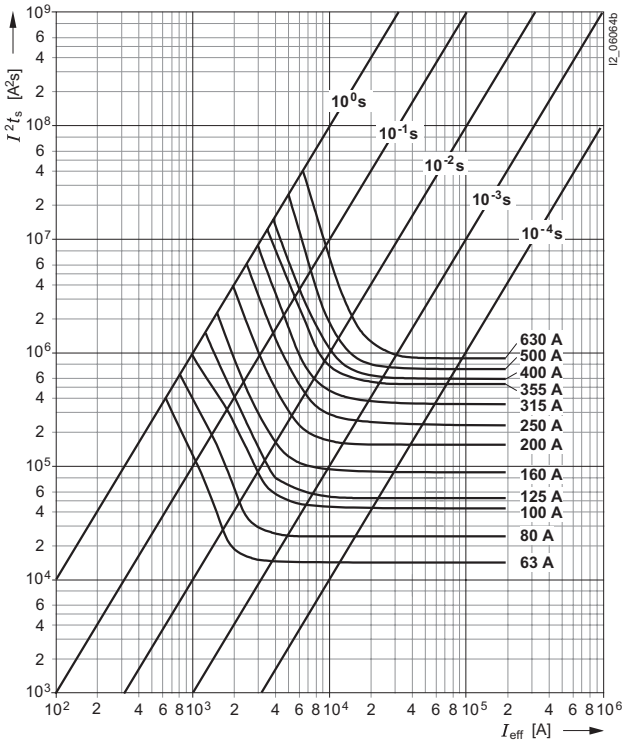
Series 3ND1 3.., 3ND2

Size: 1, 2, 3
Utilization category: aM
Rated voltage: 690 V AC
Rated current: 63 ... 630 A

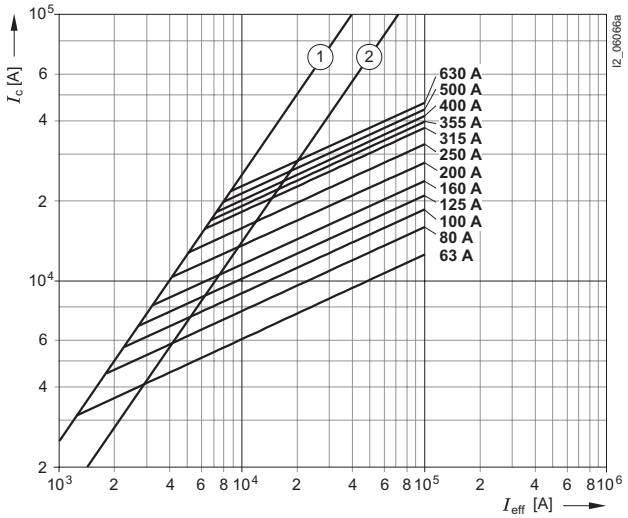
Time/current characteristics diagram



Melting/I^2t_s values diagram



Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

LV HRC fuse links

Characteristic curves

Series 3ND1 3.., 3ND2

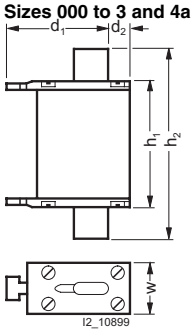
Size: 1, 2, 3
Utilization category: aM
Rated voltage: 690 V AC
Rated current: 63 ... 630 A

Type	I_n	P_v	$\Delta\vartheta$	I^2t_s		I^2t_a		
				1 ms	4 ms	230 V AC	400 V AC	690 V AC
	A	W	K	A^2s	A^2s	A^2s	A^2s	A^2s
3ND2 122	63	4	12.2	14000	17700	19300	25600	42000
3ND2 124	80	4.9	13	24200	30800	36500	48000	80000
3ND2 130	100	5.8	15	45600	59000	65000	85000	140000
3ND2 132	125	8.1	16.5	57000	74300	73000	97000	160000
3ND2 136	160	11.4	18	90000	114000	107000	142000	235000
3ND2 140	200	14.1	19.5	150000	198000	172000	228000	375000
3ND2 144	250	18	22	250000	313000	260000	340000	565000
3ND2 232	125	8.1	16.5	57000	74300	73000	97000	160000
3ND2 236	160	11.4	18	90000	114000	107000	142000	235000
3ND2 240	200	14.1	19.5	150000	198000	172000	228000	375000
3ND2 244	250	18	22	250000	313000	260000	340000	565000
3ND2 252	315	22.6	30	370000	450000	460000	610000	1000000
3ND2 254	355	24.7	29	540000	643000	645000	855000	1400000
3ND2 260	400	30.8	35	615000	750000	688000	910000	1500000
3ND2 352	315	22.6	30	370000	450000	460000	610000	1000000
3ND2 354	355	24.7	29	540000	643000	645000	855000	1400000
3ND2 360	400	30.8	26	615000	750000	688000	910000	1500000
3ND1 365	500	47	40	730000	933000	876000	1095000	1825000
3ND1 372	630	50	43	920000	1375000	1300000	1800000	2600000

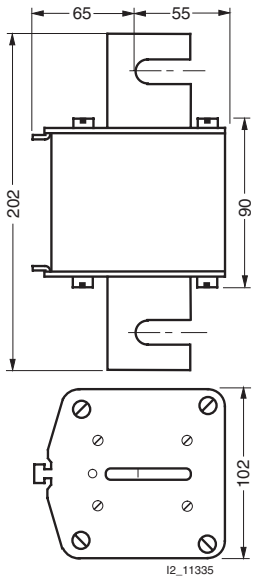
Dimensional drawings

LV HRC fuse links

Sizes 000 to 3 and 4a



Size 4 (IEC design)



Size	Utilization category	I_n A	U_n V	Type	Dimensions w	h_1	h_2	d_1	d_2
000	gL/gG	2 ... 100	500 AC/250 DC	3NA3 8..	21	54	80	45	8
		2 ... 35	690 AC/250 DC	3NA3 8..-6					
		2 ... 100	500 AC/250 DC	3NA6 8..					
		10 ... 100	400 AC	3NA6 8..-4					
		2 ... 35	690 AC/250 DC	3NA6 8..-6					
		10 ... 100	500 AC/250 DC	3NA7 8..					
		2 ... 35	690 AC/250 DC	3NA7 8..-6					
	aM	6 ... 80	500 AC	3ND1 8..					
00	gL/gG	35 ... 160	500 AC/250 DC	3NA3 8..	30	54	80	45	14
		40 ... 100	690 AC/250 DC	3NA3 8..-6					
		80 ... 160	500 AC/250 DC	3NA6 8..					
		80 ... 160	400 AC	3NA6 8..-4					
		40 ... 100	690 AC/250 DC	3NA6 8..-6					
		80 ... 160	500 AC/250 DC	3NA7 8..					
		40 ... 100	690 AC/250 DC	3NA7 8..-6					
	aM	100 ... 160	500 AC	3ND1 8..					
0	gL/gG	6 ... 160	500 AC/440 DC	3NA3 0..	30	67	126	45	14
1	gL/gG	16 ... 160	500 AC/440 DC	3NA3 1..	30	75	137	50	15
		50 ... 160	690 AC/440 DC	3NA3 1..-6					
		16 ... 160	500 AC/440 DC	3NA6 1..					
		35 ... 160	400 AC	3NA6 1..-4					
		50 ... 160	690 AC/440 DC	3NA6 1..-6					
		16 ... 160	500 AC/440 DC	3NA7 1..					
		50 ... 160	690 AC/440 DC	3NA7 1..-6					
	aM	63 ... 100	690 AC	3ND2 1..					
	gL/gG	200 ... 250	500 AC/440 DC	3NA3 1..	47	75	137	51	9
		200	690 AC/440 DC	3NA3 1..-6					
		200 ... 250	500 AC/440 DC	3NA6 1..					
		200 ... 250	400 AC	3NA6 1..-4					
		200	690 AC/440 DC	3NA6 1..-6					
		200 ... 250	500 AC/440 DC	3NA7 1..					
		200	690 AC/440 DC	3NA7 1..-6					
	aM	125 ... 250	690 AC	3ND2 1..					
2	gL/gG	35 ... 250	500 AC/440 DC	3NA3 2..	47	75	151	58	10
		80 ... 200	690 AC/440 DC	3NA3 2..-6					
		35 ... 250	500 AC/440 DC	3NA6 2..					
		50 ... 300	400 AC	3NA6 2..-4					
		80 ... 200	690 AC/440 DC	3NA6 2..-6					
		35 ... 300	500 AC/440 DC	3NA7 2..					
		80 ... 200	690 AC/440 DC	3NA7 2..-6					
	aM	125 ... 250	690 AC	3ND2 2..					
	gL/gG	300 ... 400	500 AC/440 DC	3NA3 2..	58	74	151	59	13
		224 ... 315	690 AC/440 DC	3NA3 2..-6					
		300 ... 400	500 AC/440 DC	3NA6 2..					
		315 ... 400	400 AC	3NA6 2..-4					
		224 ... 315	690 AC/440 DC	3NA6 2..-6					
		315 ... 400	500 AC/440 DC	3NA7 2..					
		224 ... 315	690 AC/440 DC	3NA7 2..-6					
	aM	315 ... 400	690 AC	3ND2 2..					
3	gL/gG	200 ... 400	500 AC/440 DC	3NA3 3..	58	74	151	71	13
		250, 315	690 AC/440 DC	3NA3 3..-6					
	aM	315 ... 400	690 AC	3ND2 3..					
	gL/gG	425 ... 630	500 AC/440 DC	3NA3 3..	71	74	151	70	13
		355 ... 500	690 AC/440 DC	3NA3 3..-6					
	aM	500, 630	690 AC	3ND1 3..					
4	gL/gG	630 ... 1250	500 AC/440 DC	3NA3 4..	see adjacent drawing				
4 A	gL/gG	500 ... 1250	500 AC/440 DC	3NA3 6..	102	97	201	95	20

LV HRC SITOR fuse links

Application

Properties

SITOR fuse links protect converter equipment against short-circuits.

The power semiconductors used in these devices (diodes, thyristors, GTOs and others) require high-speed elements for protection due to their low thermal capacity. SITOR fuse links (high-speed fuse links for semiconductor protection).

The following types of short-circuit faults can occur:

- Internal short circuit:
  A faulty semiconductor device causes a short circuit within the chassis converter
- External short circuit:
  A fault in the load causes a short circuit on the output side of the chassis converter
- Shoot-throughs:
  In the event of a failure of the chassis converter control system during inverter operation (commutation failure), the converter connection forms a short-circuit type connection between the DC and AC power supply system.

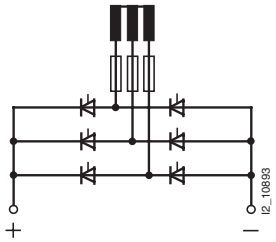
Fuse links can be arranged in a number of ways within the converter connection. A distinction is made between phase fuses in three-phase current incoming feeders and, if applicable, DC fuses and arm fuses in the arms of the converter connections (see adjacent graphs). In the case of center tap connections, fuse links can only be arranged as phase fuses in three-phase current incoming feeders.

When using SITOR fuse links of utilization category aR, the overload protection of converter equipment, up to approx. 3.5 times the rated current of the fuse link, is taken from conventional protective devices (for example, thermal-delayed overload relays) or, in the case of controlled power converters, from the current limiter (exception: general purpose fuses).

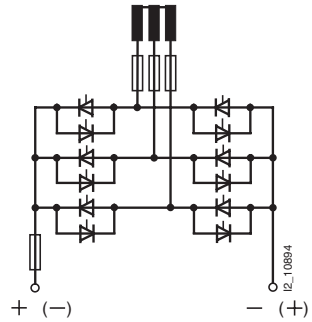
As semiconductor protection, SITOR fuse links of the series 3NE1 ...-0 with utilization category gS are also suitable for the overload and short-circuit protection of cables, lines and power rails.
All other dual-function fuses of the SITOR series have a gR characteristic. Overload protection is ensured as long as the rated current of the SITOR fuse links of the series 3NE1 ..-0 is selected as $I_n \leq I_z$ (DIN VDE 0100 Part 430).

The rules of DIN VDE 0100 Part 430 must be applied when rating short-circuit protection for cables, lines and power rails.

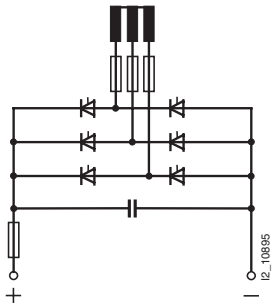
Arrangement options



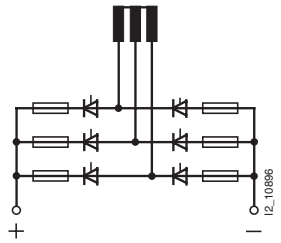
Six-pulse bridge converter B6 with phase fuses



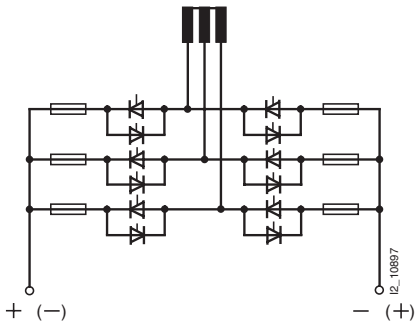
Six-pulse bridge converter B6 with phase fuses and DC fuse (reversible connection)



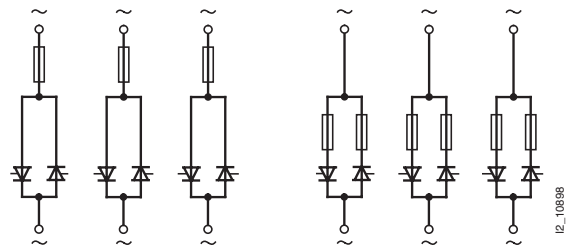
Six-pulse bridge converter B6 with phase fuses and DC fuse (switching for converter)



Six-pulse bridge converter B6 with arm fuses



Six-pulse bridge converter B6 with arm fuses (reversible connection)



Three-phase bidirectional connection W3 with phase fuses

with arm fuses

Technical specifications

Type		3NC2 423 3NC2 423-3	3NC2 425 3NC2 425-3	3NC2 427 3NC2 427-3	3NC2 428 3NC2 428-3	3NC2 431 3NC2 431-3	3NC2 432 3NC2 432-3
Utilization category (IEC 60269)		gR					aR
Rated voltage U_n	V AC	500					
Rated current I_n	A	150 [1]	200 [1]	250 [1]	300 [1]	350 [1]	400 [1]
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	7000	13600	21000	28000	53000	83000
Breaking I^2t value I^2t_A at U_n	A^2s	33000	64000	99000	132000	249000	390000
Temperature rise at I_n (body center)	K	26	25	30	40	35	30
Power dissipation at I_n	W	35	40	50	65	60	50
Varying load factor WL		0.85					
Weight approx.	kg	0.95					
Accessories							
Fuse base, 1-pole		3NH3 430					
Fuse puller		3NX1 011					
Fuse switch disconnectors		3NP54					
Switch disconnector with fuses		3KL61 30-1.B0					

Type		3NE8 714-1	3NE8 715-1	3NE8 701-1	3NE8 702-1	3NE8 717-1	3NE8 718-1
Utilization category (IEC 60269)		gR					aR
Rated voltage U_n	V	690 AC/700 DC					
Rated current I_n	A	20	25	32	40	50	63
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	12	19	40	69	115	215
Breaking I^2t value I^2t_A at U_n	A^2s	83	140	285	490	815	1550
Temperature rise at I_n (body center)	K	40		45	55	60	70
Power dissipation at I_n	W	7	9	10	12	15	16
Varying load factor WL							
Approval		according to UL 248-13					
Weight approx.	kg	0.13					

Type		3NE8 720-1	3NE8 721-1	3NE8 722-1	3NE8 724-1	3NE8 725-1	3NE8 727-1	3NE8 731-1
Utilization category (IEC 60269)		aR						
Rated voltage U_n	V	690 AC/700 DC						
Rated current I_n	A	80	100	125	160	200	250	315
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	380	695	1250	2350	4200	7750	12000
Breaking I^2t value I^2t_A at U_n	A^2s	2700	4950	9100	17000	30000	55000	85500
Temperature rise at I_n (body center)	K	80	75	80	100	120	125	150
Power dissipation at I_n	W	18	19	23	31	36	42	54
Varying load factor WL		0.9	0.95		0.9			0.85
Approval		according to UL 248-13						
Weight approx.	kg	0.13						

Type		3NC8 423 3NC8 423-3	3NC8 425 3NC8 425-3	3NC8 427 3NC8 427-3	3NC8 431 3NC8 431-3	3NC8 434 3NC8 434-3	3NC8 444-3
Utilization category (IEC 60269)		gR					aR
Rated voltage U_n	V AC	660					600
Rated current I_n	A	150 [1]	200 [1]	250	350 [1]	500 [1]	1000 [1]
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	1100	2400	4400	11000	28000	400000
Breaking I^2t value I^2t_A at U_n	A^2s	17600	38400	70400	176000	448000	2480000
Temperature rise at I_n (body center)	K	33	46	95	65	75	110
Power dissipation at I_n	W	40	55	72	95	130	140
Varying load factor WL		0.85					0.9
Weight approx.	kg	0.95					
Accessories							
Fuse base, 1-pole		3NH3 430					–
Fuse puller		3NX1 011					
Fuse switch disconnectors		3NP54					–
Switch disconnector with fuses		3KL61 30-1AB0					–

1) Cooling air speed 1 m/s. In case of natural air cooling, reduction of 5 %.

LV HRC SITOR fuse links

Technical specifications

Type		3NE1 813-0	3NE1 814-0	3NE1 815-0	3NE1 803-0	3NE1 802-0	3NE1 817-0	3NE1 818-0	3NE1 820-0
Utilization category (IEC 60269)		gR/gS							
Rated voltage U_n	V AC	690							
Rated current I_n	A	16	20	25	35	40	50	63	80
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	18	41	74	166	295	461	903	1843
Breaking I^2t value I^2t_A at U_n	A^2s	200	430	780	1700	3000	4400	9000	18000
Temperature rise at I_n (body center) 1)	K	25		30	35	30	35	40	
Power dissipation at I_n 1)	W	3.0	3.5	4.0	5.0		6.0	7.0	8.0
Varying load factor WL		1.0							
Approval		according to UL 248-13							
Weight approx.	kg	0.13							
Accessories									
Fuse base, 1-pole 3-pole		3NH3 030 3NH4 030							
Fuse puller		3NX1 011							
Fuse switch disconnectors		3NP40/3NP50							
Switch disconnector with fuses		3KL50 30-1.B00 3KM50 30-1.B00							3KL52 30-1.B00 3KM52 30-1.B00

Type		3NE1 021-0	3NE1 022-0	3NE1 224-0	3NE1 225-0	3NE1 227-0	3NE1 230-0
Utilization category (IEC 60269)		gR/gS					
Rated voltage U_n	V AC	690					
Rated current I_n	A	100	125	160	200	250	315
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	3100	6000	7400	14500	29500	46100
Breaking I^2t value I^2t_A at U_n	A^2s	33000	63000	60000	100000	200000	310000
Temperature rise at I_n (body center) 1)	K	36	40	60	65	75	80
Power dissipation at I_n 1)	W	10	11	24	27	30	38
Varying load factor WL		1.0					
Approval		according to UL 248-13					
Weight approx.	kg	0.20		0.55			
Accessories							
Fuse base, 1-pole		3NH3 030		3NH3 230			3NH3 330
3-pole		3NH4 030		3NH4 230			3NH4 330
Fuse puller		3NX1 011					
Fuse switch disconnectors		3NP40 3NP50		3NP42 3NP52			3NP53
Switch disconnector with fuses		3KL52 30-1.B00 3KM52 30-1.B00		3KL55 30-1.B00 3KM55 30-1.B00			3KL57 30-1.B00 3KM57 30-1.B00

Type		3NE1 331-0	3NE1 332-0	3NE1 333-0	3NE1 334-0	3NE1 435-0	3NE1 436-0	3NE1 437-0	3NE1 438-0
Utilization category (IEC 60269)		gR/gS							
Rated voltage U_n	V AC	690							
Rated current I_n	A	350	400	450	500	560	630	710	800
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	58000	84000	104000	149000	215000	293000	437000	723000
Breaking I^2t value I^2t_A at U_n	A^2s	430000	590000	750000	950000	1700000	2350000	3400000	5000000
Temperature rise at I_n (body center) 1)	K	75	85		90	65	70	68	70
Power dissipation at I_n 1)	W	42	45	53	56	50	55	60	59
Varying load factor WL		1.0							
Approval		according to UL 248-13							
Weight approx.	kg	0.7				0.95			
Accessories									
Fuse base, 1-pole		3NH3 330		3NH3 430					
Fuse puller		3NX1 011							
Fuse switch disconnectors		3NP53		3NP54					
Switch disconnector with fuses		3KL57 30-1.B00 3KM57 30-1.B00		3KL61 30-1AB0					3KL62

1) Temperature rise and power dissipation for operation in LV HRC fuse base.

Technical specifications

Type		3NE1 437-1	3NE1 438-1
Utilization category (IEC 60269)		gR	
Rated voltage U_n	V AC	600	
Rated current I_n	A	710	800
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	321000	437000
Breaking I^2t value I^2t_A at U_n	A^2s	2460000	3350000
Temperature rise at I_n (body center) 1)	K	85	95
Power dissipation at I_n 1)	W	65	72
Varying load factor WL		1.0	
Approval		according to UL 248-13	
Weight approx.	kg	0.95	
Accessories			
Fuse base, 1-pole		3NH3 430	
Fuse puller		3NX1 011	
Fuse switch disconnectors		3NP54	
Switch disconnector with fuses		3KL62 30	

Type		3NE1 022-2	3NE1 224-2	3NE1 225-2	3NE1 227-2	3NE1 230-2	3NE1 331-2	3NE1 333-2	3NE1 334-2
Utilization category (IEC 60269)		gR							
Rated voltage U_n	V AC	690							
Rated current I_n	A	125	160	200	250	315	350	450	500
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	3115	2650	5645	11520	22580	29500	46100	66400
Breaking I^2t value I^2t_A at U_n	A^2s	23000	15840	44000	68800	135500	177000	276000	398000
Temperature rise at I_n (body center) 1)	K	55	70	62	70	75	82	100	
Power dissipation at I_n 1)	W	13.5	30	28	35	42	44	62	65
Varying load factor WL		1.0							
Approval		according to UL 248-13							
Weight approx.	kg	0.2	0.55				0.7		
Accessories									
Fuse base, 1-pole		3NH3 030	3NH3 230					3NH3 340	
Fuse puller		3NX1 011							
Fuse switch disconnectors		3NP50	3NP52			3NP53		3NP54	
Switch disconnector with fuses		3KL52	3KL55			3KL57		3KL61	

Type		3NE1 435-2	3NE1 436-2	3NE1 447-2	3NE1 437-2	3NE1 438-2	3NE1 448-2
Utilization category (IEC 60269)		gR					
Rated voltage U_n	V AC	690					
Rated current I_n	A	560	630	670	710	800	850
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	130000	203000	240000	265000	361000	520000
Breaking I^2t value I^2t_A at U_n	A^2s	845000	1320000	1557000	1725000	2348000	3810000
Temperature rise at I_n (body center) 1)	K	80	82	90		95	
Power dissipation at I_n 1)	W	60	62	65	72	82	76
Varying load factor WL		1.0					
Approval		according to UL 248-13					
Weight approx.	kg	1.0					
Accessories							
Fuse base, 1-pole		3NH3 340					
Fuse puller		3NX1 011					
Fuse switch disconnectors		3NP54		3NP54			
Switch disconnector with fuses		3KL61		3KL62			

1) Temperature rise and power dissipation for operation in LV HRC fuse base.

LV HRC SITOR fuse links

Technical specifications

Type		3NE8 015-1	3NE8 003-1	3NE8 017-1	3NE8 018-1	3NE8 020-1	3NE8 021-1	3NE8 022-1	3NE8 024-1
Utilization category (IEC 60269)		gR				aR			
Rated voltage U_n	V AC	690							
Rated current I_n	A	25	35	50	63	80	100	125	160
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	30	70	120	260	450	850	1400	2800
Breaking I^2t value I^2t_A at U_n	A^2s	180	400	700	1400	2400	4200	6500	1300
Temperature rise at I_n (body center)	K	35	45	65	70	80	90	110	130
Power dissipation at I_n	W	7	9	14	16	19	22	28	38
Varying load factor WL		0.95							
Approval		according to UL 248-13							
Weight approx.	kg	0.20							
Accessories									
Fuse base, 1-pole 3-pole		3NH3 030 3NH4 030							
Fuse puller		3NX1 011							
Fuse switch disconnectors		3NP40 3NP50							
Switch disconnector with fuses		3KL50 30-1.B00 3KM50 30-1.B00				3KL52 30-1.B00 3KM52 30-1.B00			

Type		3NE4 327-0B	3NE4 330-0B	3NE4 333-0B	3NE4 334-0B	3NE4 337
Utilization category (IEC 60269)		aR				
Rated voltage U_n	V AC	800				
Rated current I_n	A	250	315	450	500	710
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	3600	7400	29400	42500	142000
Breaking I^2t value I^2t_A at U_n	A^2s	29700	60700	191000	276000	923000
Temperature rise at I_n (body center)	K	175	170	190	195	170
Power dissipation at I_n	W	105	120	140	155	
Varying load factor WL		0.85				0.95
Weight approx.	kg	0.7				
Accessories						
Fuse base, 1-pole		3NH3 330		3NH3 430		
Fuse puller		3NX1 011				
Fuse switch disconnectors		3NP53		3NP54		
Switch disconnector with fuses		3KL57 30-1.B00 3KM57 30-1.B00		3KL61		3KL62

Type		3NE4 101	3NE4 102	3NE4 117	3NE4 118	3NE4 120	3NE4 121	3NE4 122	3NE4 124
Utilization category (IEC 60269)		gR			aR				
Rated voltage U_n	V AC	1000							
Rated current I_n	A	32	40	50	63	80	100	125	160
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	40	75	120	230	450	900	1800	3600
Breaking I^2t value I^2t_A at U_n	A^2s	280	500	800	1500	3000	6000	14000	29000
Temperature rise at I_n (body center)	K	45	50	65	78	82	85	100	120
Power dissipation at I_n	W	12	13	16	20	22	24	30	35
Varying load factor WL		0.9							
Approval		according to UL 248-13							
Weight approx.	kg	0.27							
Accessories									
Fuse base, 1-pole 3-pole		3NH3 120 3NH4 230							
Fuse puller		3NX1 011							
Fuse switch disconnectors		3NP42, 3NP52							
Switch disconnector with fuses		3KL55 30-1.B00 3KM55 30-1.B00							

Technical specifications

Type		3NE3 221	3NE3 222	3NE3 224	3NE3 225	3NE3 227
Utilization category (IEC 60269)		aR				
Rated voltage U_n	V AC	1000				
Rated current I_n	A	100	125	160	200	250
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	665	1040	1850	4150	6650
Breaking I^2t value I^2t_A at U_n	A^2s	4800	7200	13000	30000	48000
Temperature rise at I_n (body center)	K	65	70	90	80	90
Power dissipation at I_n	W	28	36	42		50
Varying load factor *WL*		0.95		1.0		
Approval		according to UL 248-13				
Weight approx.	kg	0.55				
Accessories						
Fuse base, 1-pole 3-pole		3NH3 230 3NH4 230				
Fuse puller		3NX1 011				
Fuse switch disconnectors		3NP42, 3NP52				
Switch disconnector with fuses		3KL55 30-1.B00 3KM55 30-1.B00				

Type		3NE3 230-0B	3NE3 231	3NE3 232-0B	3NE3 233
Utilization category (IEC 60269)		aR			
Rated voltage U_n	V AC	1000			
Rated current I_n	A	315	350	400	450
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	13400	16600	22600	29500
Breaking I^2t value I^2t_A at U_n	A^2s	80000	100000	135000	175000
Temperature rise at I_n (body center)	K	100	120	140	130
Power dissipation at I_n	W	65	75	85	95
Varying load factor *WL*		0.95	0.9		
Approval		according to UL 248-13			
Weight approx.	kg	0.55			
Accessories					
Fuse base, 1-pole		3NH3 330			
Fuse puller		3NX1 011			
Fuse switch disconnectors		3NP53			
Switch disconnector with fuses		3KL57 30-1.B00 3KM57 30-1.B00			

Type		3NE3 332-0B	3NE3 333	3NE3 334-0B	3NE3 335	3NE3 336	3NE3 337-8	3NE3 338-8	3NE3 340-8
Utilization category (IEC 60269)		aR							
Rated voltage U_n	V AC	1000					900	800	690
Rated current I_n	A	400	450	500	560	630	710	800	900
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	22600	29500	46100	66400	104000	149000	184000	223000
Breaking I^2t value I^2t_A at U_n	A^2s	135000	175000	260000	360000	600000	800000	850000	1300000
Temperature rise at I_n (body center)	K	120	125	115	120	110	125	140	160
Power dissipation at I_n	W	85	90		95	100	105	130	165
Varying load factor *WL*		0.7						0.95	
Approval		according to UL 248-13							
Weight approx.	kg	0.7							
Accessories									
Fuse base, 1-pole		3NH3 430							
Fuse puller		3NX1 011							
Fuse switch disconnectors		3NP54							
Switch disconnector with fuses		3KL61 30-1AB0				3KL62			

LV HRC SITOR fuse links

Technical specifications

Type		3NE3 421	3NE3 626	3NE3 430	3NE3 432	3NE3 635 3NE3 635-6	3NE3 434	3NE3 636	3NE3 637 3NE3 637-1 [1]
Utilization category (IEC 60269)		aR							
Rated voltage U_n	V AC	1000							
Rated current I_n	A	100	224	315	400	450	500	630	710
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	1800	7200	29000	48500	65000	116000	170000	260000
Breaking I^2t value I^2t_A at U_n	A^2s	13500	54000	218000	364000	488000	870000	1280000	1950000
Temperature rise at I_n (body center)	K	45	140	120	130	150	120	136	170
Power dissipation at I_n	W	25	85	80	110		95	132	145
Varying load factor WL		1.0							
Weight approx.	kg	1.15							

Type		3NE5 424	3NE5 426	3NE5 430	3NE5 431	3NE5 433 3NE5 433-1
Utilization category (IEC 60269)		aR				
Rated voltage U_n	V AC	1500				
Rated current I_n	A	160	224	315	350	450
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	7200	18400	41500	57000	116000
Breaking I^2t value I^2t_A at U_n	A^2s	54000	138000	311000	428000	870000
Temperature rise at I_n (body center)	K	75	100	125	150	150
Power dissipation at I_n	W	56	80	115	135	145
Varying load factor WL		1.0				0.95
Weight approx.	kg	1.95				

Type		3NE5 627	3NE5 633	3NE5 643
Utilization category (IEC 60269)		aR		
Rated voltage U_n	V AC	1500		
Rated current I_n	A	250	450	600
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	11200	78500	260000
Breaking I^2t value I^2t_A at U_n	A^2s	84000	590000	1950000
Temperature rise at I_n (body center)	K	170		160
Power dissipation at I_n	W	130	160	145
Varying load factor WL		1.0		
Weight approx.	kg	1.6		

Type		3NE7 425	3NE7 427	3NE7 431	3NE7 432	3NE7 633 3NE7 633-1 [2]	3NE7 648-1 [2]	3NE7 636 3NE7 636-1 [2]	3NE7 637-1 [2]
Utilization category (IEC 60269)		aR							
Rated voltage U_n	V AC	2000							
Rated current I_n	A	200	250	350	400	450	525	630	710
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	18400	29000	74000	116000	128000	149000	260000	415000
Breaking I^2t value I^2t_A at U_n	A^2s	138000	218000	555000	870000	960000	1120000	1950000	3110000
Temperature rise at I_n (body center)	K	85	110	105	130	165	210	200	230
Power dissipation at I_n	W	75	110	120	150	160	210	220	275
Varying load factor WL		1.0							
Weight approx.	kg	1.95							

Type		3NE9 632-1	3NE9 634-1	3NE9 636-1A
Utilization category (IEC 60269)		aR		
Rated voltage U_n	V AC	2500		
Rated current I_n	A	400	500	630
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	81000	170000	385000
Breaking I^2t value I^2t_A at U_n	A^2s	620000	1270000	2800000
Temperature rise at I_n (body center)	K	160	180	198
Power dissipation at I_n	W	205	235	275
Varying load factor WL		1.0		
Weight approx.	kg	2.5		

1) Gauge 140 mm, M12 screw connection.
2) M12 screw connection

Selection and ordering data

	Size	I_n	Utilization category	Order No.	Weight 1 item	PS*/ P. unit
		A			kg	Items
	**Rated voltage 500 V AC**					
	with bolt-on links					
	mounting dimensions: 110 mm					
	3 [1]	150	gR	**3NC2 423-3**	1.060	3
		200	gR	**3NC2 425-3**	1.050	3
		250	gR	**3NC2 427-3**	1.060	3
		300	gR	**3NC2 428-3**	1.070	3
		350	aR	**3NC2 431-3**	1.050	3
		400	aR	**3NC2 432-3**	1.060	3
	special design with 2 oblong slots					
	3	150	gR	**3NC2 423**	1.050	3
		200	gR	**3NC2 425**	1.070	3
		250	gR	**3NC2 427**	1.050	3
		300	gR	**3NC2 428**	1.050	3
		350	aR	**3NC2 431**	1.060	3
		400	aR	**3NC2 432**	1.050	3
	**Rated voltage 690 V AC/700 V DC**					
	with bolt-on links					
	mounting dimensions: 80 mm					
	000	20	gR	**3NE8 714-1**	0.130	10
		25	gR	**3NE8 715-1**	0.130	10
		32	gR	**3NE8 701-1**	0.131	10
		40	gR	**3NE8 702-1**	0.131	10
		50	gR	**3NE8 717-1**	0.132	10
		63	aR	**3NE8 718-1**	0.132	10
		80	aR	**3NE8 720-1**	0.131	10
		100	aR	**3NE8 721-1**	0.130	10
		125	aR	**3NE8 722-1**	0.131	10
		160	aR	**3NE8 724-1**	0.132	10
		200	aR	**3NE8 725-1**	0.130	10
		250	aR	**3NE8 727-1**	0.133	10
		315	aR	**3NE8 731-1**	0.134	10
	**Rated voltage 660 V AC**					
	with bolt-on links					
	mounting dimensions: 110 mm					
	3	150	gR	**3NC8 423-3**	1.060	3
		200	gR	**3NC8 425-3**	1.060	3
		250	gR	**3NC8 427-3**	1.060	3
		350	gR	**3NC8 431-3**	1.070	3
		500	gR	**3NC8 434-3**	1.060	3
		1000	aR	**3NC8 444-3**	1.080	3
	Special design with 2 oblong slots					
	3 [1]	150	gR	**3NC8 423**	1.040	3
		200	gR	**3NC8 425**	1.060	3
		250	gR	**3NC8 427**	1.070	3
		350	gR	**3NC8 431**	1.060	3
		500	gR	**3NC8 434**	1.090	3

1) Cladding dimensions and grip lugs according to IEC 60269-2-1; but blade slotted according to IEC 60269-4-1.

* You can order this quantity or a multiple thereof.

LV HRC SITOR fuse links

Selection and ordering data

	Size	I_n A	Utilization category	Order No.	Weight 1 item kg	PS*/ P. unit Items
	Rated voltage 690 V AC					
	for mounting in LV HRC fuse bases					
	**000**	16	gR/gS	**3NE1 813-0**	0.127	3
		20	gR/gS	**3NE1 814-0**	0.128	3
		25	gR/gS	**3NE1 815-0**	0.127	3
		35	gR/gS	**3NE1 803-0**	0.128	3
		40	gR/gS	**3NE1 802-0**	0.127	3
		50	gR/gS	**3NE1 817-0**	0.128	3
		63	gR/gS	**3NE1 818-0**	0.128	3
		80	gR/gS	**3NE1 820-0**	0.129	3
	**00**	100	gR/gS	**3NE1 021-0**	0.202	3
		125	gR/gS	**3NE1 022-0**	0.202	3
	**1**	160	gR/gS	**3NE1 224-0**	0.580	3
		200	gR/gS	**3NE1 225-0**	0.582	3
		250	gR/gS	**3NE1 227-0**	0.580	3
		315	gR/gS	**3NE1 230-0**	0.581	3
	**2**	350	gR/gS	**3NE1 331-0**	0.766	3
		400	gR/gS	**3NE1 332-0**	0.743	3
		450	gR/gS	**3NE1 333-0**	0.760	3
		500	gR/gS	**3NE1 334-0**	0.766	3
	**3**	560	gR/gS	**3NE1 435-0**	1.110	3
		630	gR/gS	**3NE1 436-0**	1.110	3
		710	gR/gS	**3NE1 437-0**	1.110	3
		800	gR/gS	**3NE1 438-0**	1.120	3
	Rated voltage 600 V AC					
	for mounting in LV HRC fuse bases					
	3	710	gR	**3NE1 437-1**	1.120	3
		800	gR	**3NE1 438-1**	1.110	3

* You can order this quantity or a multiple thereof.

Selection and ordering data

	Size	I_n	Utilization category	Order No.	Weight 1 item	PS*/ P. unit
		A			kg	Items
	Rated voltage 690 V AC					
	for mounting in LV HRC fuse bases					
	**00**	125	gR	**3NE1 022-2**	0.203	3
	**1**	160	gR	**3NE1 224-2**	0.613	3
		200	gR	**3NE1 225-2**	0.612	3
		250	gR	**3NE1 227-2**	0.626	3
		315	gR	**3NE1 230-2**	0.615	3
	**2**	350	gR	**3NE1 331-2**	0.754	3
		450	gR	**3NE1 333-2**	0.768	3
		500	gR	**3NE1 334-2**	0.768	3
	**3**	560	gR	**3NE1 435-2**	1.140	3
		630	gR	**3NE1 436-2**	1.170	3
		670	gR	**3NE1 447-2**	1.170	3
		710	gR	**3NE1 437-2**	1.150	3
		800	gR	**3NE1 438-2**	1.180	3
		850	gR	**3NE1 448-2**	1.200	3
	**00**	25	gR	**3NE8 015-1**	0.205	3
		35	gR	**3NE8 003-1**	0.204	3
		50	gR	**3NE8 017-1**	0.203	3
		63	gR	**3NE8 018-1**	0.205	3
		80	aR	**3NE8 020-1**	0.203	3
		100	aR	**3NE8 021-1**	0.205	3
		125	aR	**3NE8 022-1**	0.213	3
		160	aR	**3NE8 024-1**	0.207	3
	Rated voltage 800 V AC					
	with bolt-on links					
	mounting dimensions: 110 mm					
	2 [1]	250	aR	**3NE4 327-0B**	0.753	3
		315	aR	**3NE4 330-0B**	0.760	3
		450	aR	**3NE4 333-0B**	0.760	3
		500	aR	**3NE4 334-0B**	0.754	3
		710	aR	**3NE4 337**	0.771	3

1) Cladding dimensions and grip lugs according to IEC 60269-2-1; but blade slotted according to IEC 60269-4-1.

* You can order this quantity or a multiple thereof.

LV HRC SITOR fuse links

Selection and ordering data

	Size	I_n A	Utilization category	Order No.	Weight 1 item kg	PS*/ P. unit Items
	**Rated voltage 1000 V AC**					
	for mounting in LV HRC fuse bases					
	0	32	gR	**3NE4 101**	0.278	3
		40		**3NE4 102**	0.277	3
		50		**3NE4 117**	0.276	3
		63	aR	**3NE4 118**	0.279	3
		80		**3NE4 120**	0.276	3
		100		**3NE4 121**	0.278	3
		125		**3NE4 122**	0.279	3
		160		**3NE4 124**	0.279	3
	with bolt-on links					
	mounting dimensions: 110 mm					
	1 [1]	100	aR	**3NE3 221**	0.580	3
		125		**3NE3 222**	0.568	3
		160		**3NE3 224**	0.573	3
		200		**3NE3 225**	0.570	3
		250		**3NE3 227**	0.580	3
		315		**3NE3 230-0B**	0.585	3
		350		**3NE3 231**	0.590	3
		400		**3NE3 232-0B**	0.576	3
		450		**3NE3 233**	0.720	3
	**2** [1]	400	aR	**3NE3 332-0B**	0.759	3
		450		**3NE3 333**	0.748	3
		500		**3NE3 334-0B**	0.753	3
		560		**3NE3 335**	0.756	3
		630		**3NE3 336**	0.760	3
		710 [2]		**3NE3 337-8**	0.762	3
		800 [3]		**3NE3 338-8**	0.764	3
		900 [4]		**3NE3 340-8**	0.753	3
	mounting dimensions: 130 mm					
	3	100	aR	**3NE3 421**	1.150	3
		224		**3NE3 626**	1.300	3
		315		**3NE3 430**	1.240	3
		400		**3NE3 432**	1.240	3
		450		**3NE3 635**	1.170	3
		450 [5]		**3NE3 635-6**	1.180	3
		500		**3NE3 434**	1.490	3
		630		**3NE3 636**	1.210	3
		710		**3NE3 637**	1.190	3
	mounting dimensions: 140 mm, M12 screw connection					
	3	710	aR	**3NE3 637-1**	1.240	3
	**Rated voltage 1500 V AC**					
	with bolt-on links					
	mounting dimensions: 210 mm					
	3	160	aR	**3NE5 424**	1.950	2
		224		**3NE5 426**	1.960	2
		315		**3NE5 430**	1.950	2
		350		**3NE5 431**	1.950	2
		450		**3NE5 433**	1.950	2
		450 [6]		**3NE5 433-1**	1.960	2
		250		**3NE5 627**	1.560	3
		450		**3NE5 633**	1.580	3
		600		**3NE5 643**	1.580	3

1) Cladding dimensions and grip lugs according to IEC 60269-2-1; but blade slotted according to IEC 60269-4-1.
2) Rated voltage 900 V AC.
3) Rated voltage 800 V AC.
4) Rated voltage 690 V AC.
5) Design corresponds to 3NE6 4.. and 3NE9 4...
6) M12 screw connection

* You can order this quantity or a multiple thereof.

Selection and ordering data

	Size	I_n A	Utilization category	Order No.	Weight 1 item kg	PS*/ P. unit Items
	**Rated voltage 2000 V AC**					
	with bolt-on links					
	mounting dimensions: 210 mm					
	3	200	aR	**3NE7 425**	1.950	2
		250		**3NE7 427**	1.970	2
		350		**3NE7 431**	1.980	2
		400		**3NE7 432**	1.970	2
		450		**3NE7 633**	1.960	2
		450 1)		**3NE7 633-1**	1.980	2
		525 1)		**3NE7 648-1**	1.970	2
		630		**3NE7 636**	1.990	2
		630 1)		**3NE7 636-1**	2.020	2
		710 1)		**3NE7 637-1**	1.990	2
	**Rated voltage 2500 V AC**					
	with bolt-on links					
	mounting dimensions: 260 mm					
	3	400 1)	aR	**3NE9 632-1**	2.540	1
		500 1)		**3NE9 634-1**	2.550	1
		630 1)		**3NE9 636-1A**	2.550	1

1) M12 screw connection

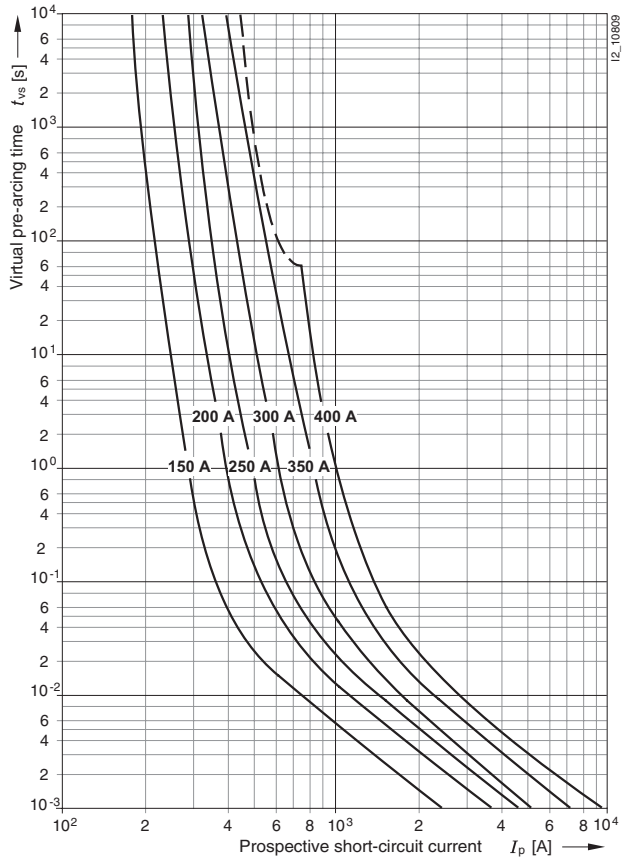
LV HRC SITOR fuse links

Characteristic curves

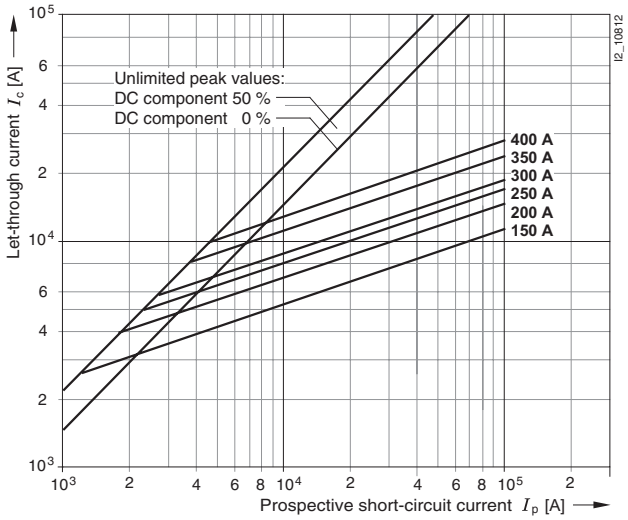
Series 3NC2 4..

Size: 3
Utilization category: gR or aR
Rated voltage: 500 V AC
Rated current: 150 ... 400 A

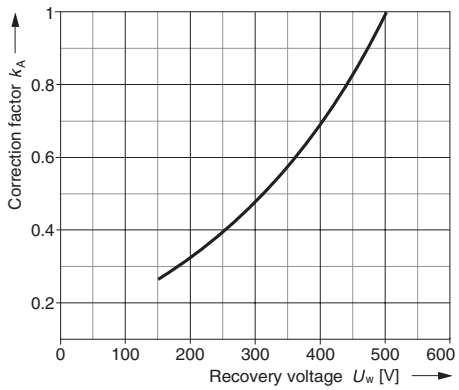
Time/current characteristics diagram



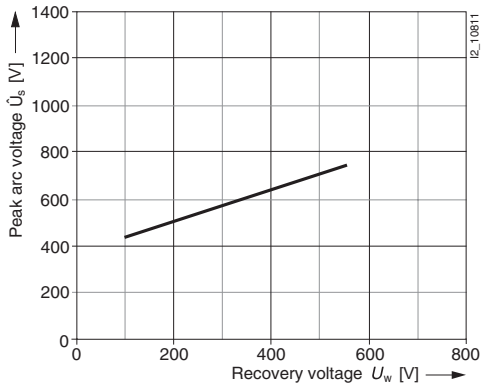
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage

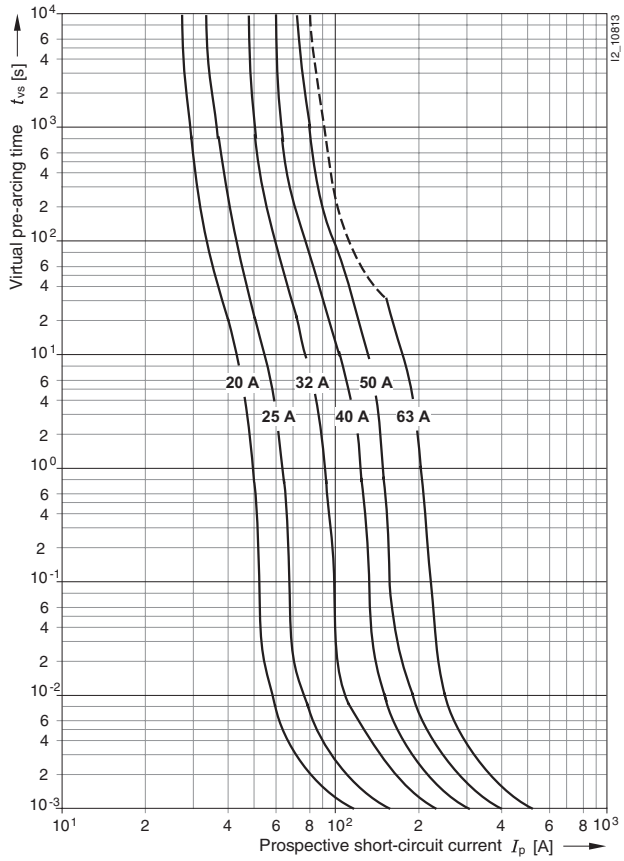


Characteristic curves

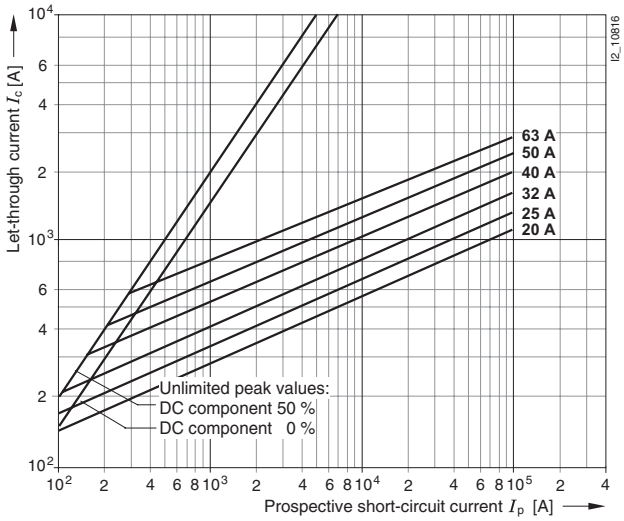
Series 3NE8 71.-1, 3NE8 70.-1

Size: 000
Utilization category: gR or aR
Rated voltage: 690 V AC/700 V DC
Rated current: 20 ... 63 A

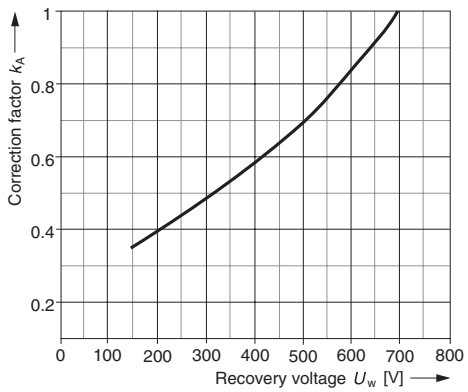
Time/current characteristics diagram



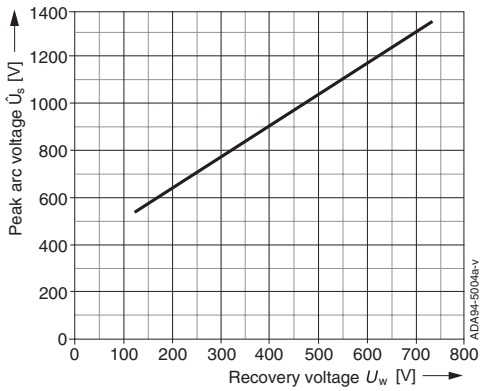
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage



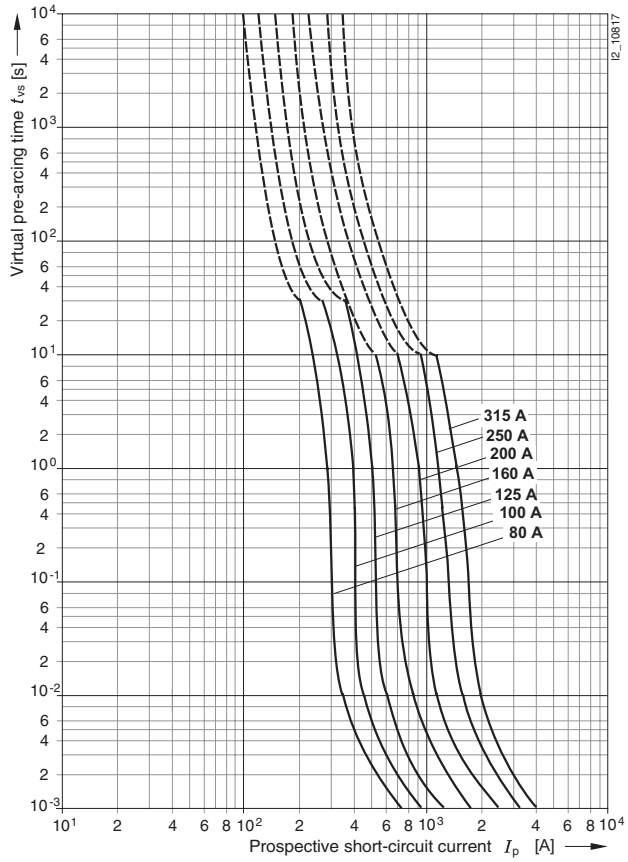
LV HRC SITOR fuse links

Characteristic curves

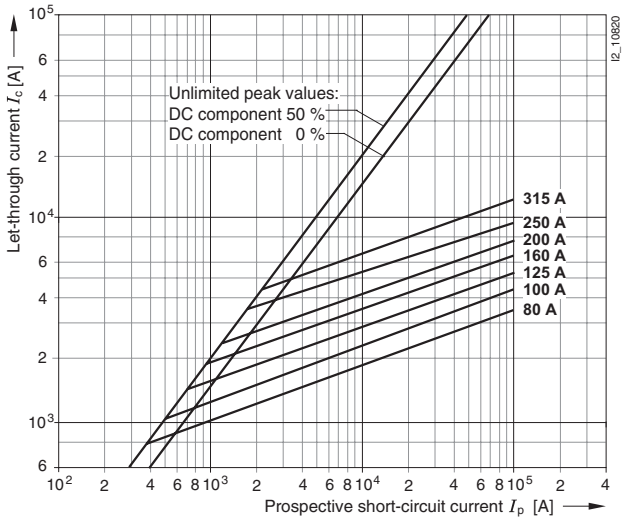
Series 3NE8 72.-1, 3NE8 731-1

Size: 000
Utilization category: aR
Rated voltage: 690 V AC/700 V DC
Rated current: 80 ... 315 A

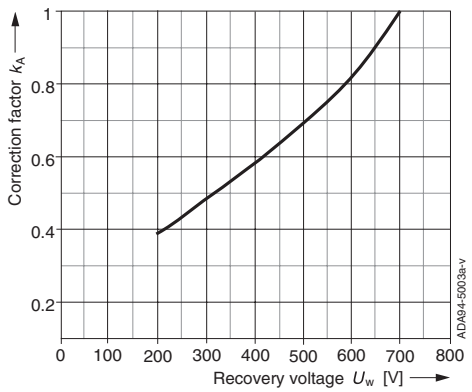
Time/current characteristics diagram



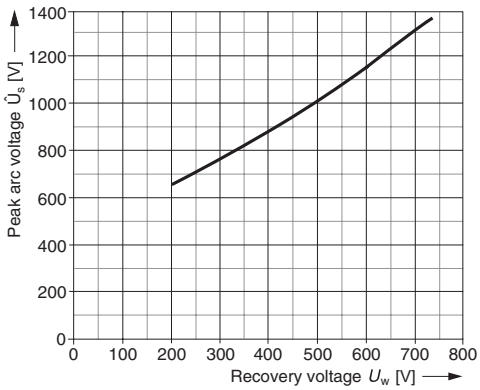
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage

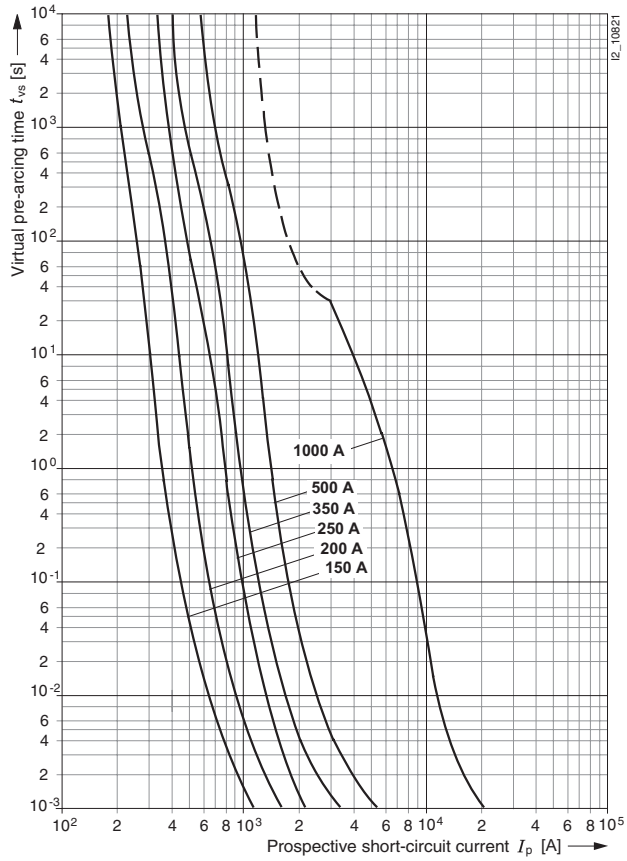


Characteristic curves

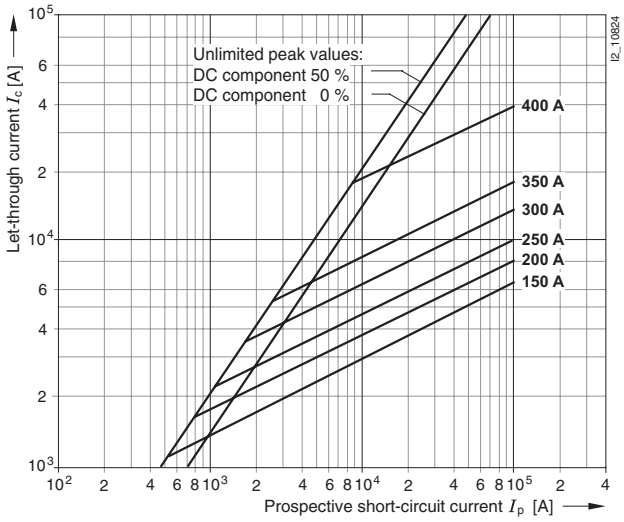
Series 3NC8 4..

Size: 3
Utilization category: gR or aR
Rated voltage: 660 V AC
Rated current: 150 ... 1000 A

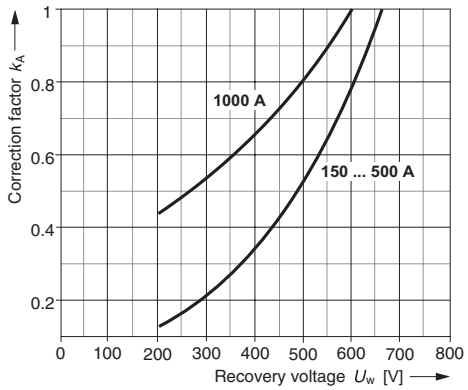
Time/current characteristics diagram



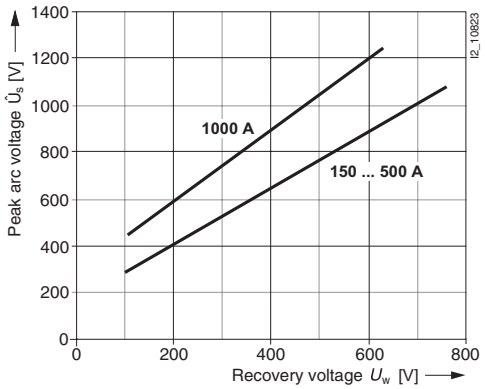
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage



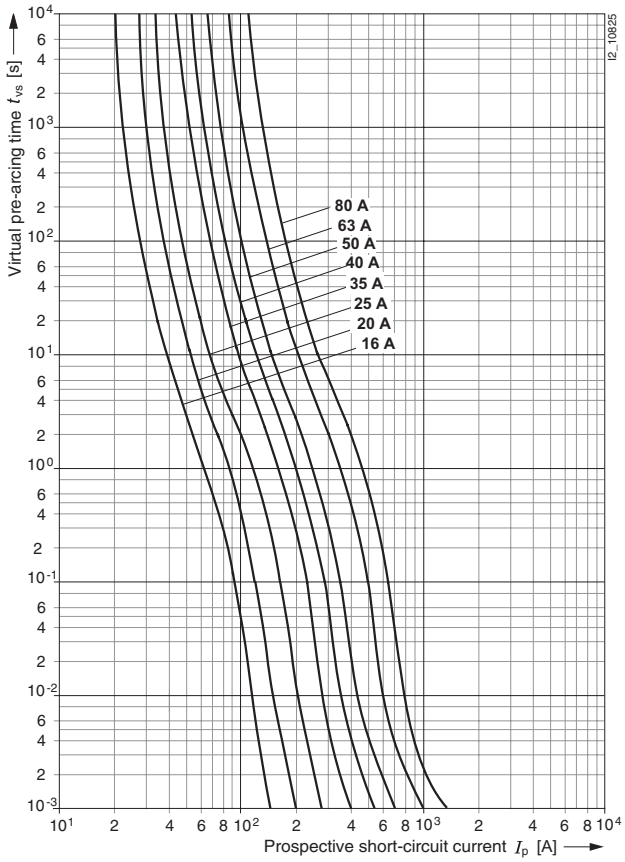
LV HRC SITOR fuse links

Characteristic curves

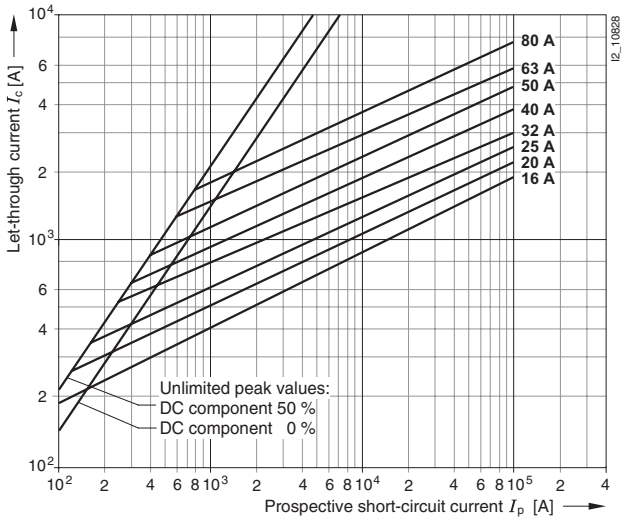
Series 3NE1 8..-0

Size: 000
Utilization category: gR/gS
Rated voltage: 690 V AC
Rated current: 16 ... 80 A

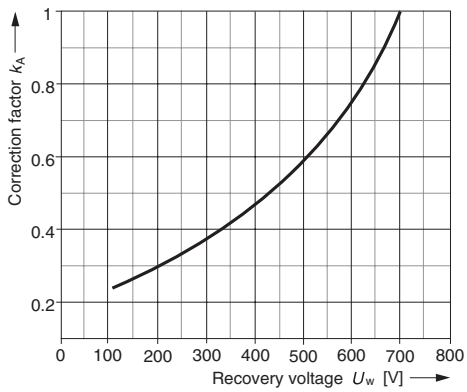
Time/current characteristics diagram



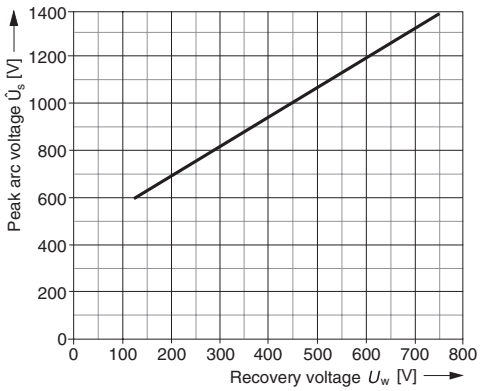
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage

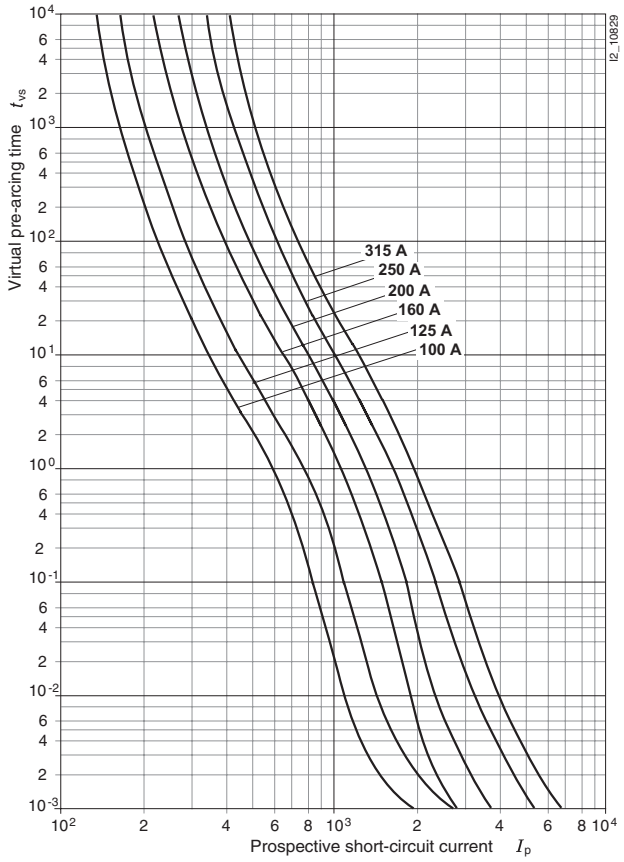


Characteristic curves

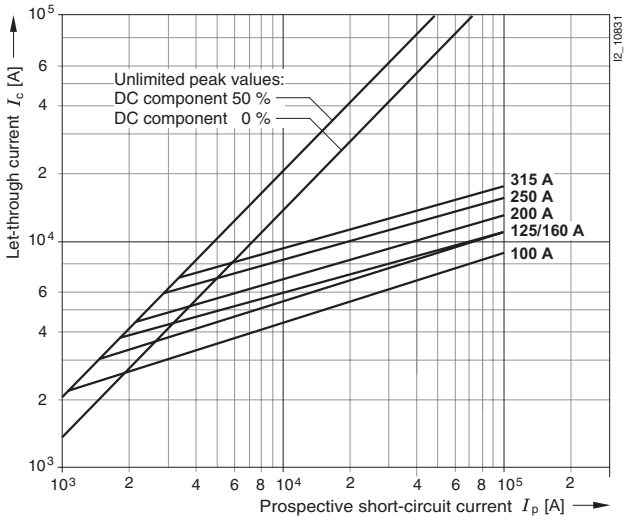
Series 3NE1 02.-0, 3NE1 2..-0

Size: 00, 1
Utilization category: gR/gS
Rated voltage: 690 V AC
Rated current: 100 ... 315 A

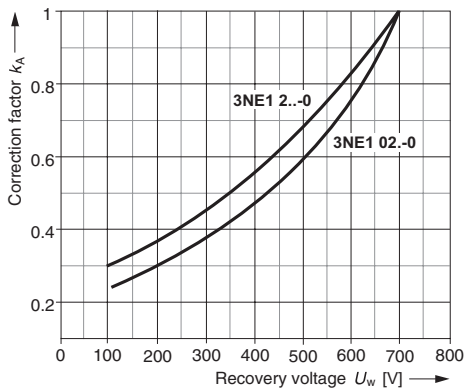
Time/current characteristics diagram



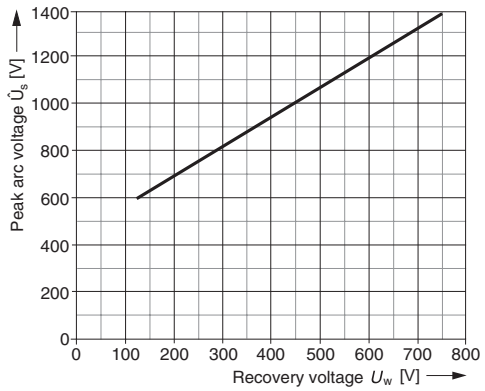
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage



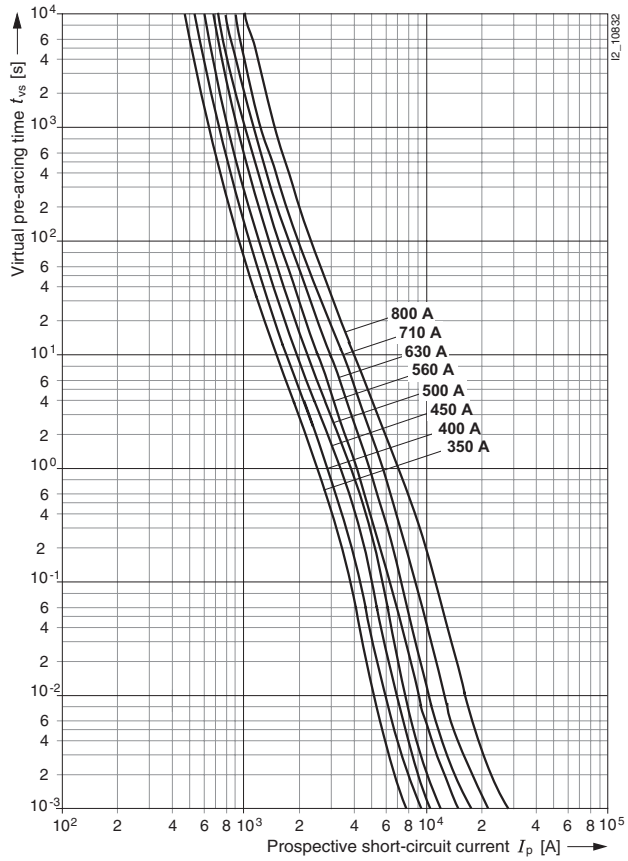
LV HRC SITOR fuse links

Characteristic curves

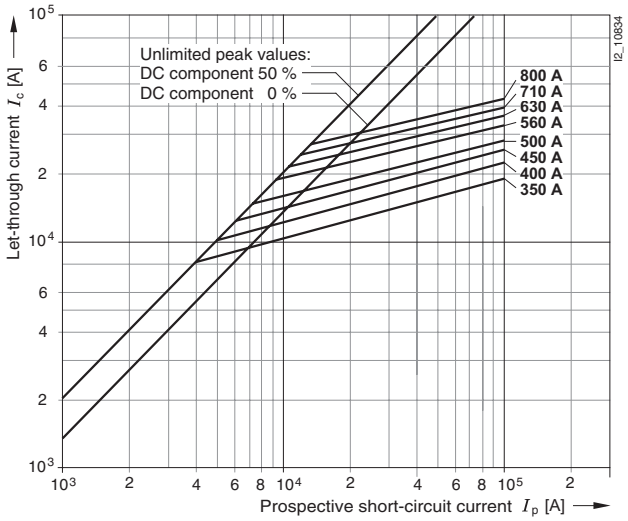
Series 3NE1 33.-0, 3NE1 43.-0

Size: 2, 3
Utilization category: gR/gS
Rated voltage: 690 V AC
Rated current: 350 ... 800 A

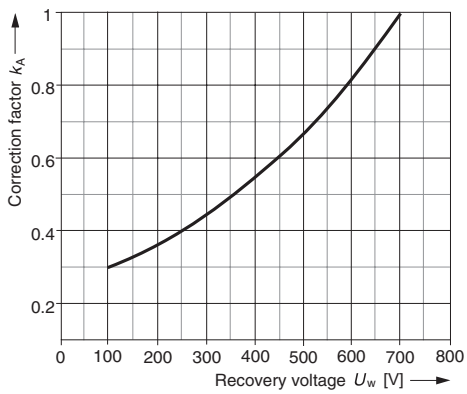
Time/current characteristics diagram



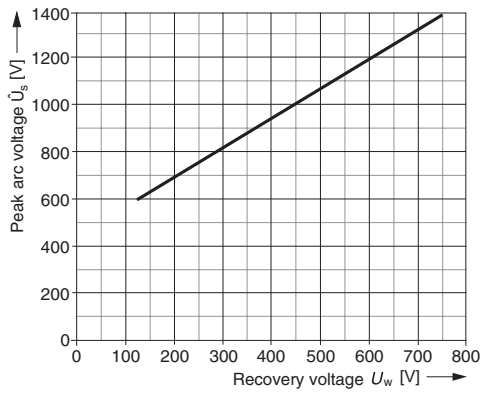
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage

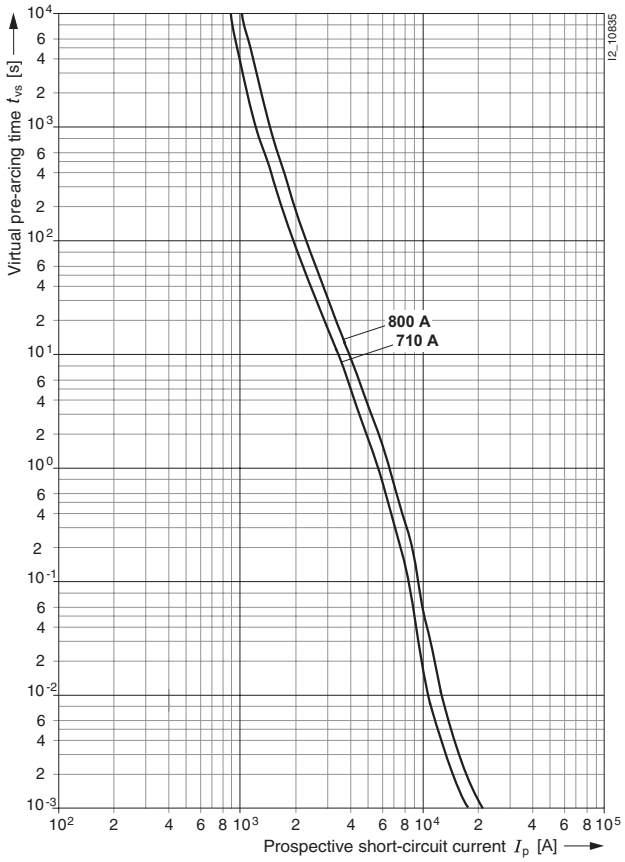


Characteristic curves

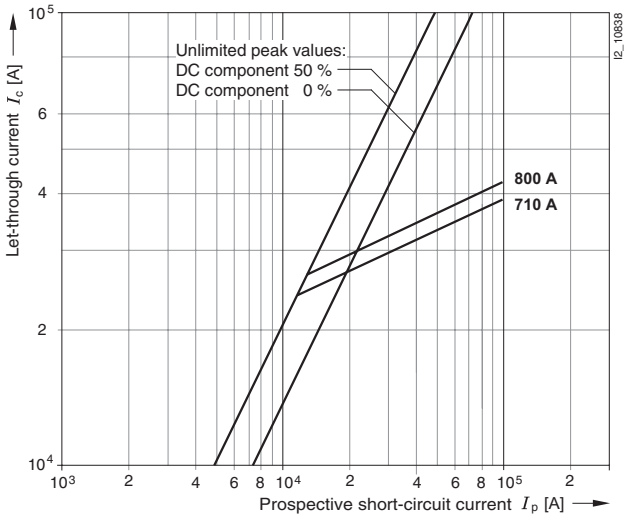
Series 3NE1 437.-1, 3NE1 438.-1

Size: 3
Utilization category: gR
Rated voltage: 600 V AC
Rated current: 710 and 800 A

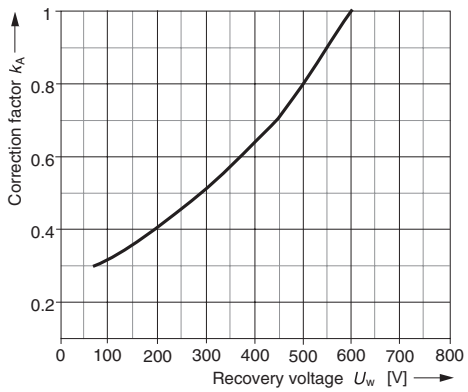
Time/current characteristics diagram



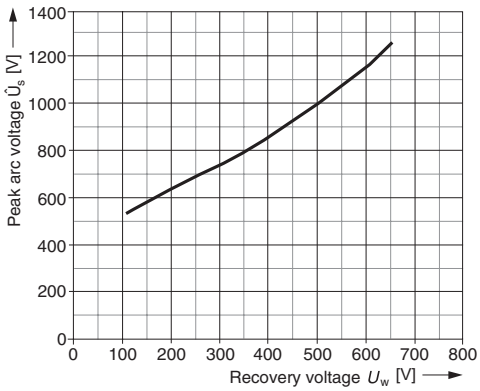
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage



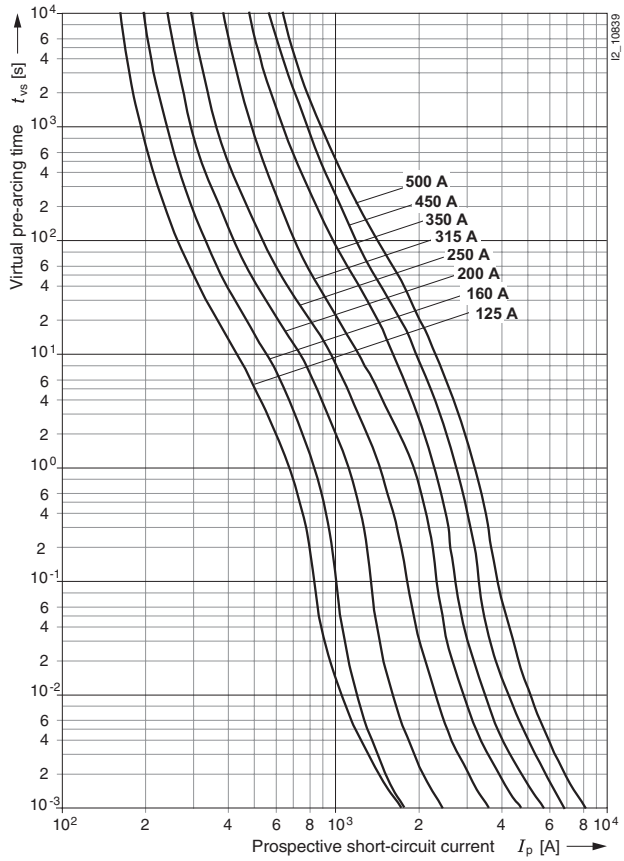
LV HRC SITOR fuse links

Characteristic curves

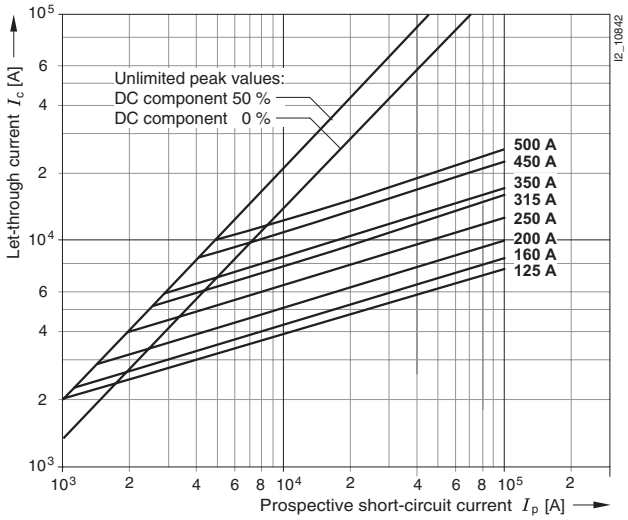
Series 3NE1 022-2, 3NE1 2..-2, 3NE1 33.-2

Size: 00, 1
Utilization category: gR
Rated voltage: 690 V AC
Rated current: 125 ... 500 A

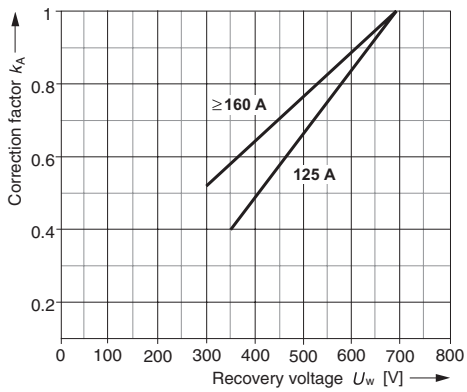
Time/current characteristics diagram



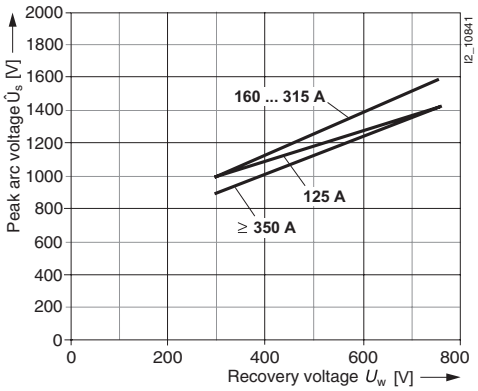
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage

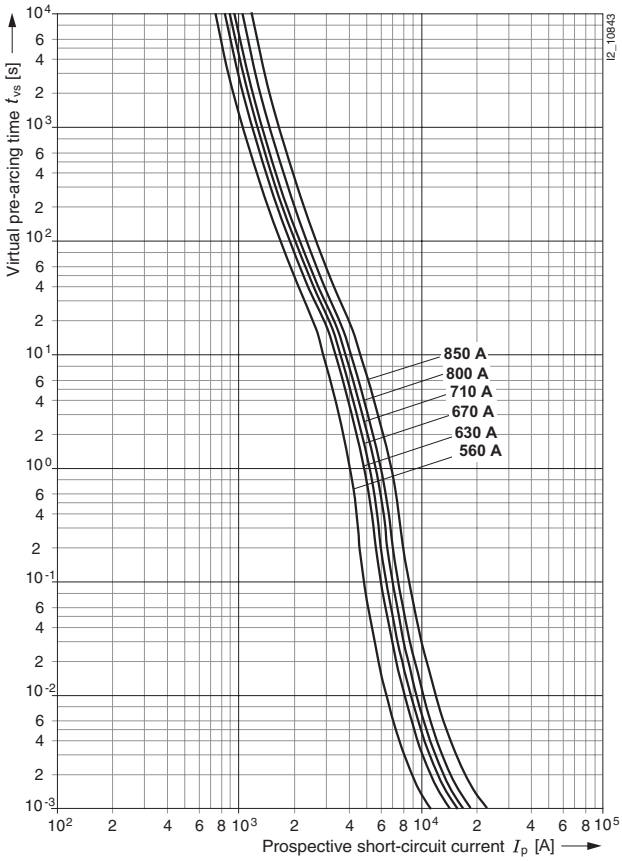


Characteristic curves

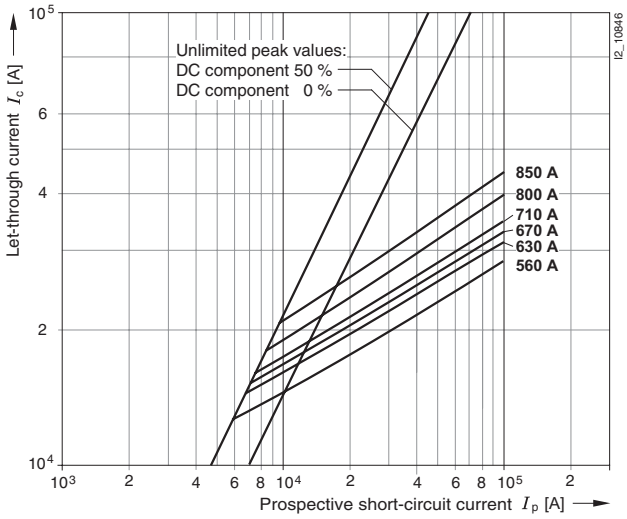
Series 3NE1 4..-2

Size: 3
Utilization category: gR
Rated voltage: 690 V AC
Rated current: 560 ... 850 A

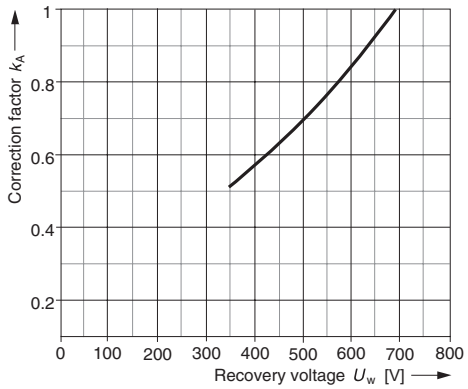
Time/current characteristics diagram



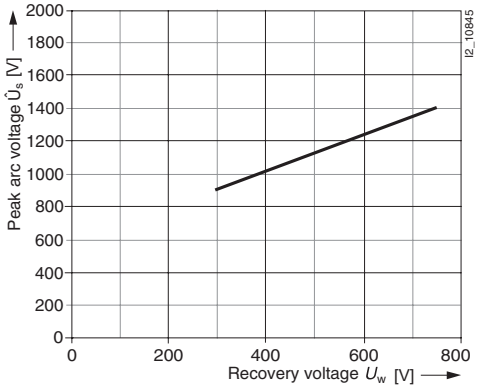
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage



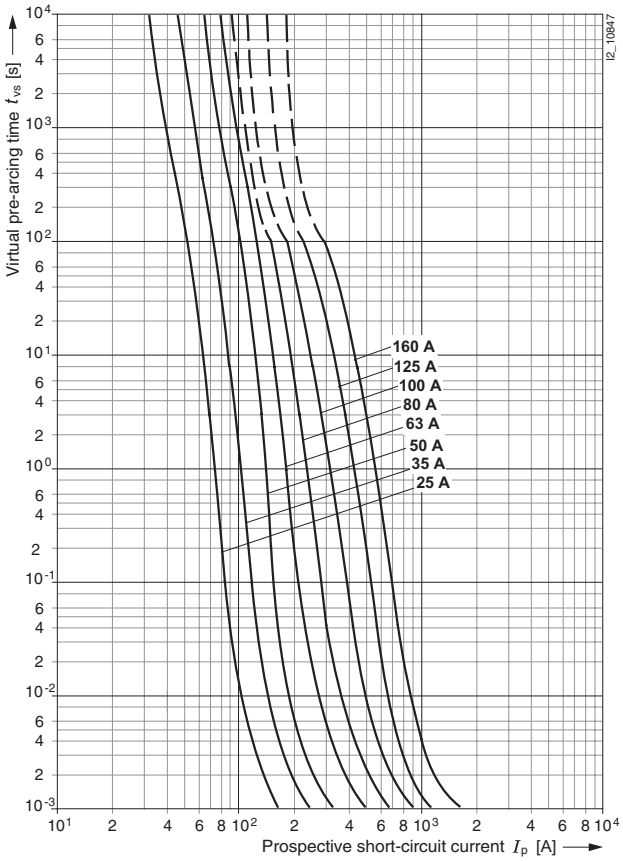
LV HRC SITOR fuse links

Characteristic curves

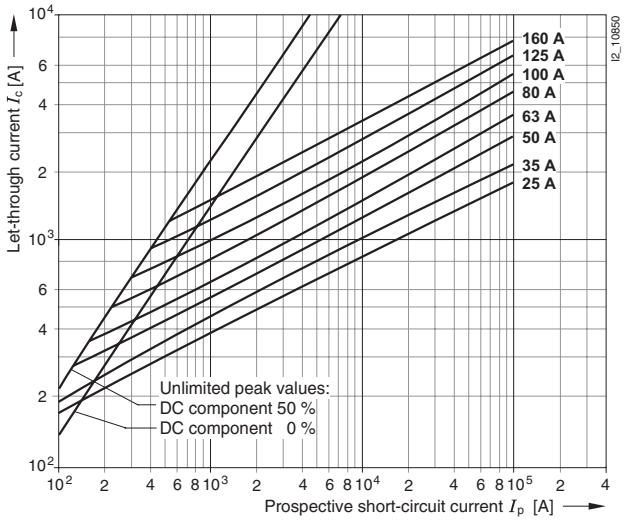
Series 3NE8 0..-1

Size: 00
Utilization category: gR or aR
Rated voltage: 690 V AC
Rated current: 25 ... 160 A

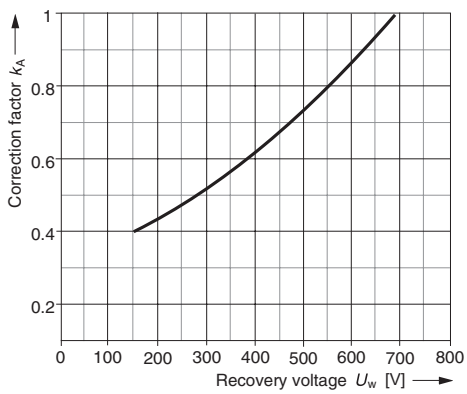
Time/current characteristics diagram



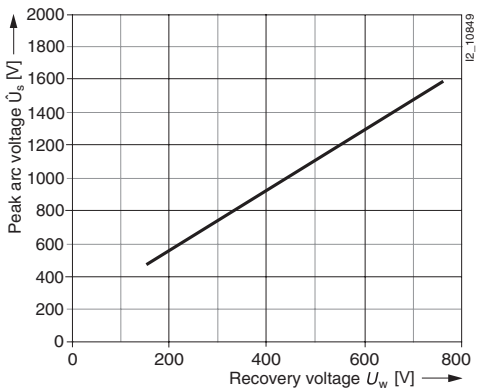
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage

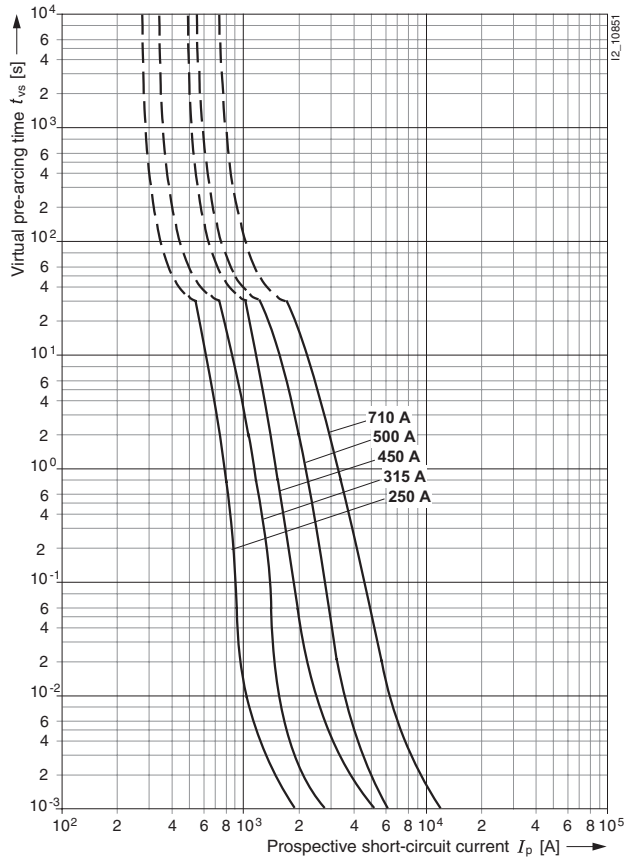


Characteristic curves

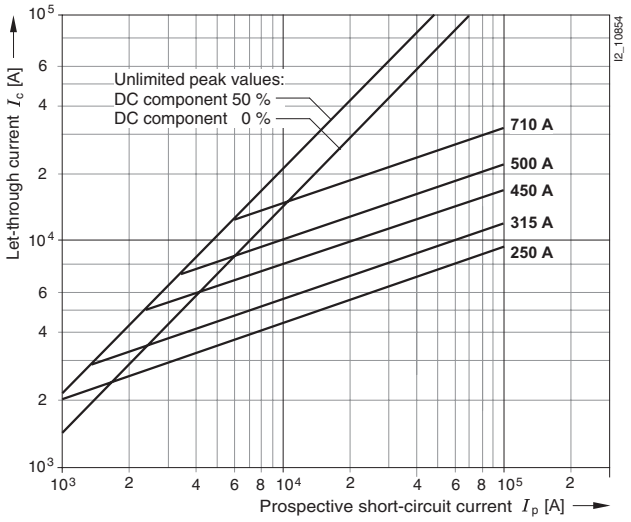
Series 3NE4 3..-0B, 3NE4 337

Size: 2
Utilization category: aR
Rated voltage: 800 V AC
Rated current: 250 ... 710 A

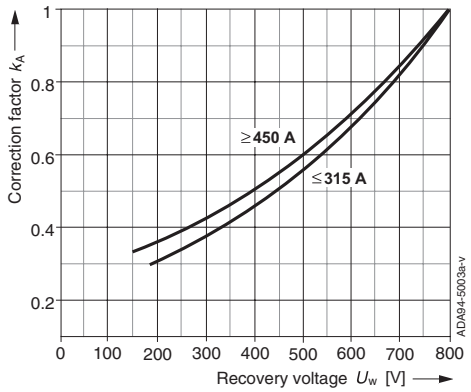
Time/current characteristics diagram



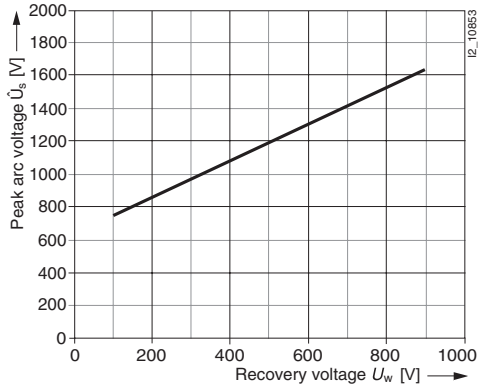
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage



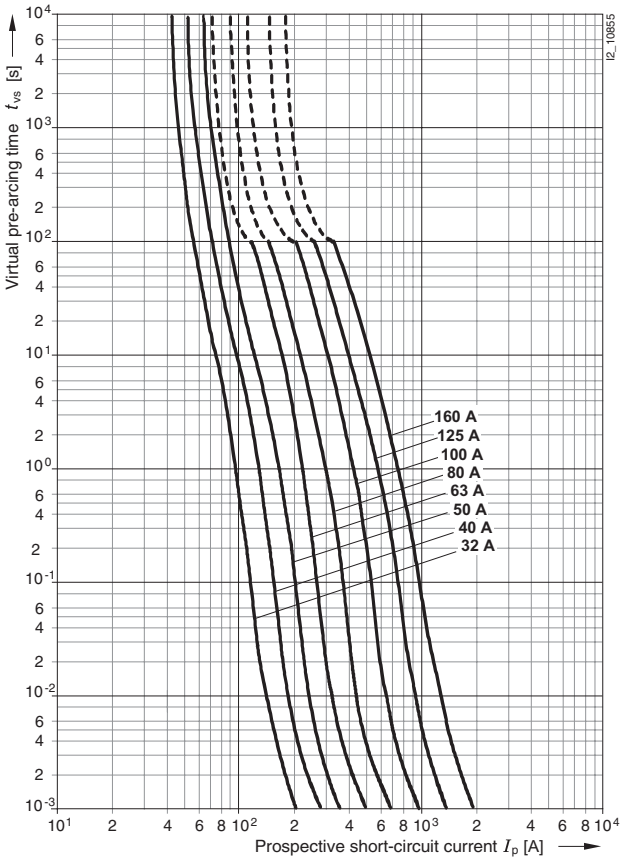
LV HRC SITOR fuse links

Characteristic curves

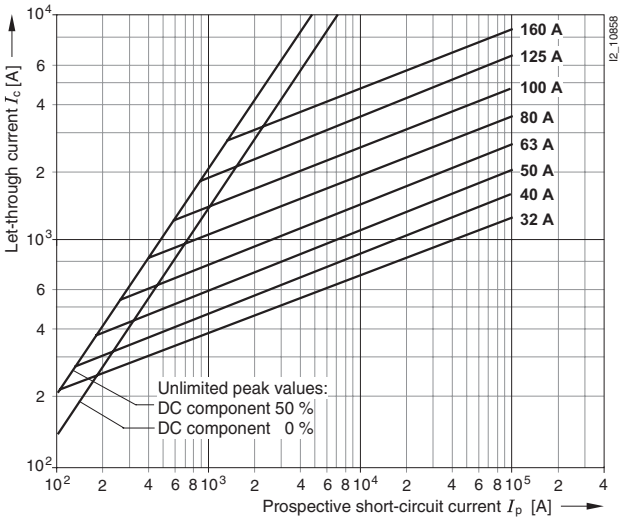
Series 3NE4 1..

Size: 0
Utilization category: gR or aR
Rated voltage: 1000 V AC
Rated current: 32 ... 160 A

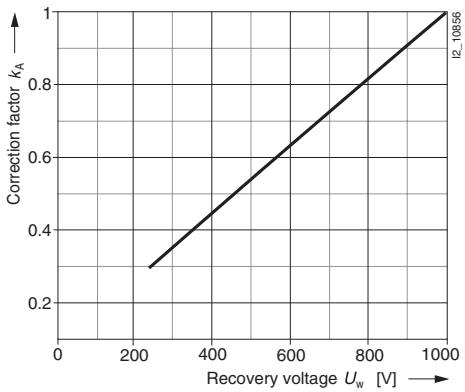
Time/current characteristics diagram



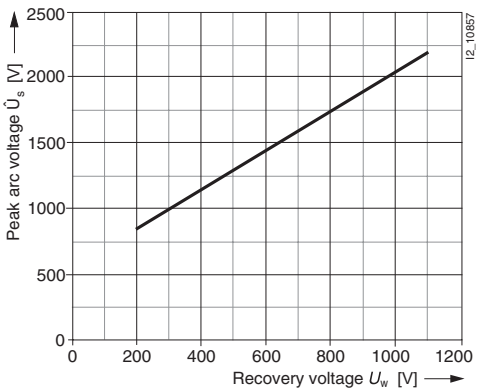
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage

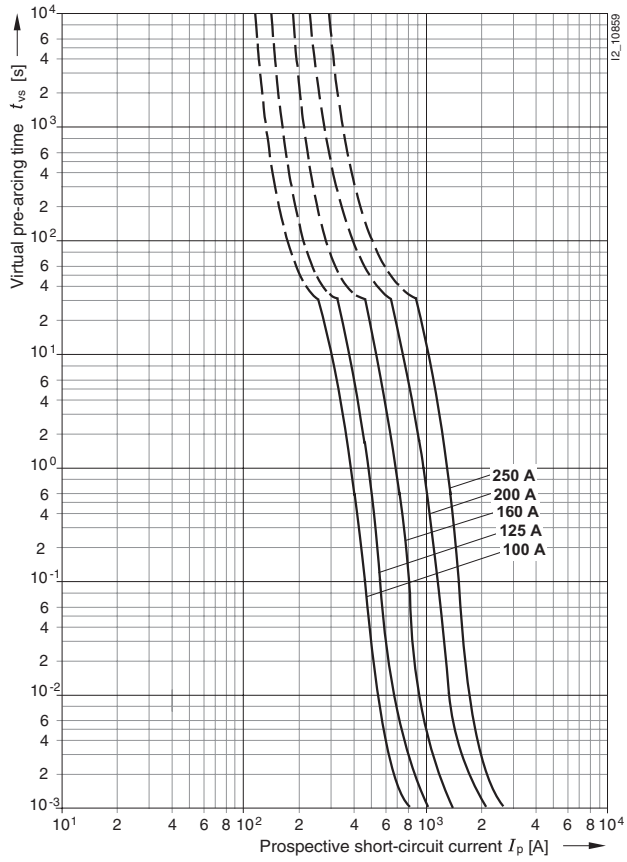


Characteristic curves

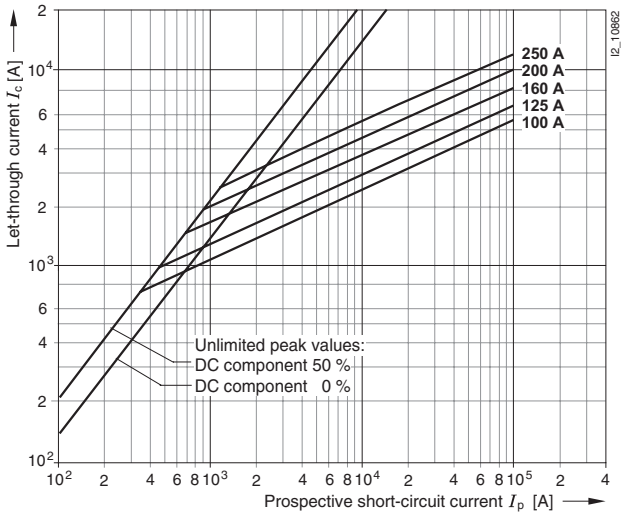
Series 3NE3 22.

Size: 1
Utilization category: aR
Rated voltage: 1000 V AC
Rated current: 100 ... 225 A

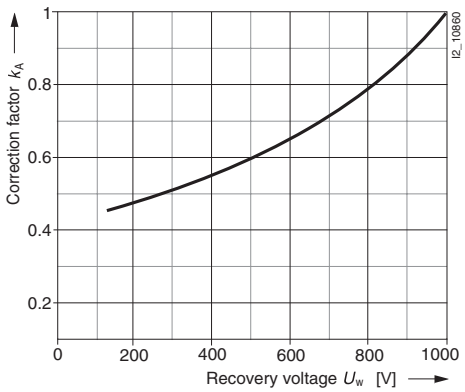
Time/current characteristics diagram



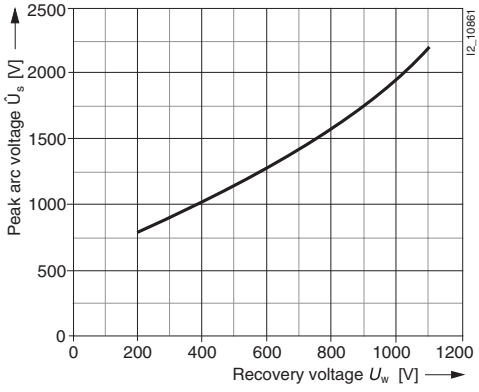
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage



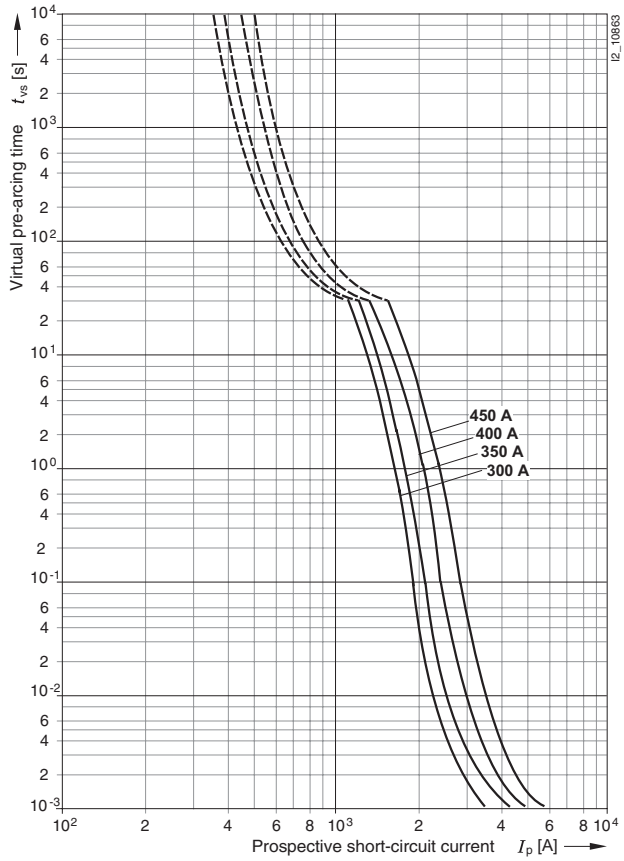
LV HRC SITOR fuse links

Characteristic curves

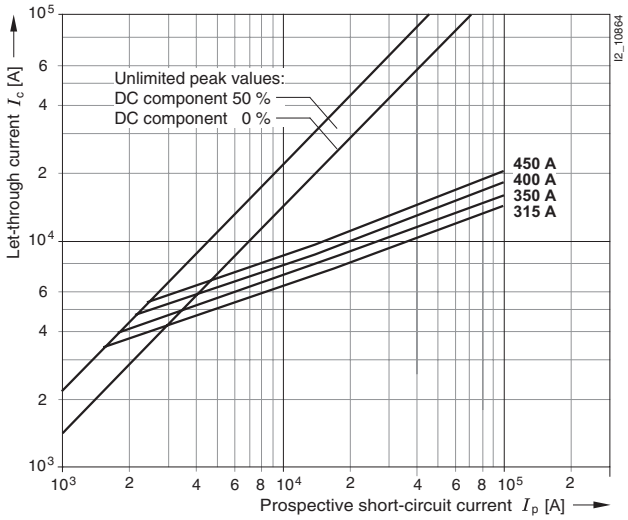
Series 3NE3 23.

Size: 1
Utilization category: aR
Rated voltage: 1000 V AC
Rated current: 315 ... 450 A

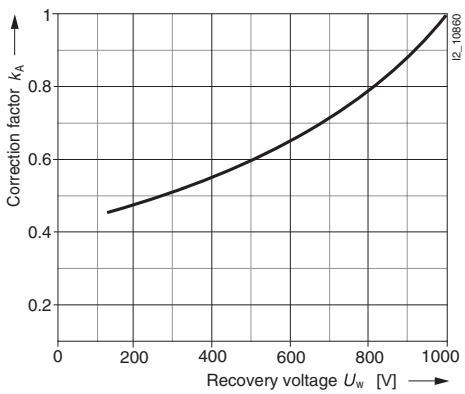
Time/current characteristics diagram



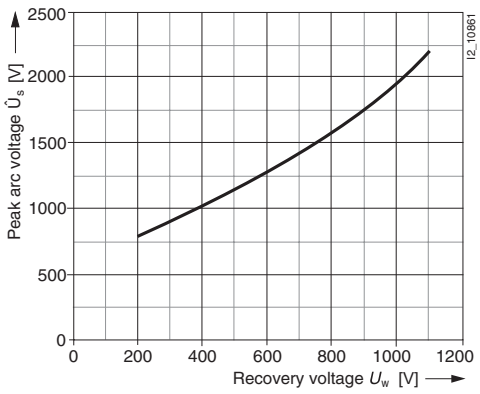
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage

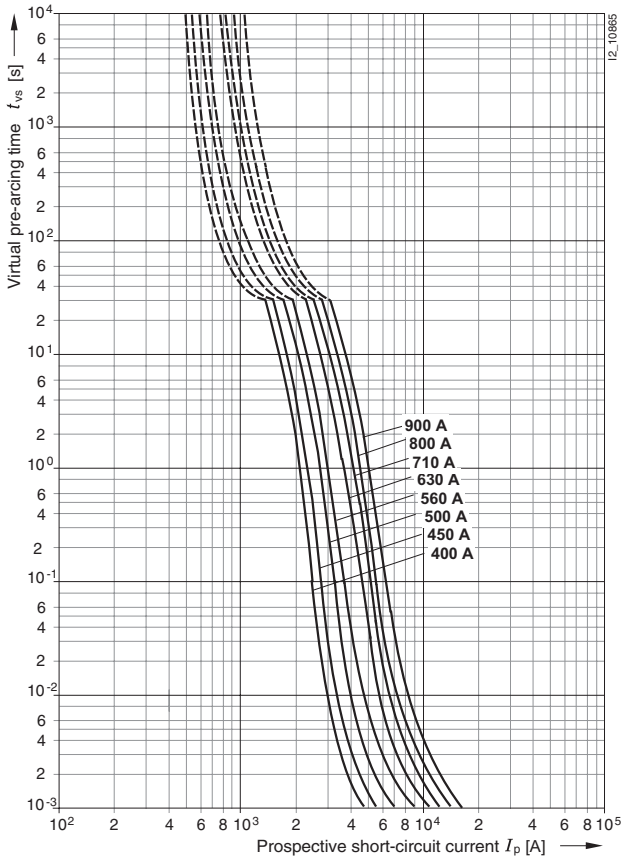


Characteristic curves

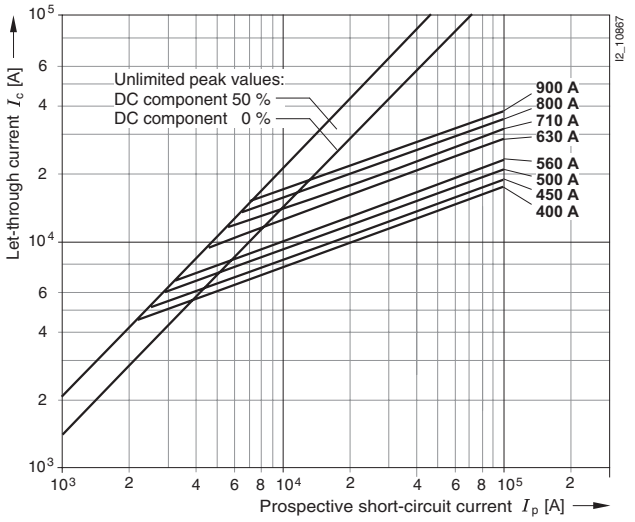
Series 3NE3 3..

Size:	2
Utilization category:	aR
Rated voltage:	1000 V AC (up to 630 A) 900 V AC (710 A) 800 V AC (800 A) 690 V AC (900 A)
Rated current:	400 ... 900 A

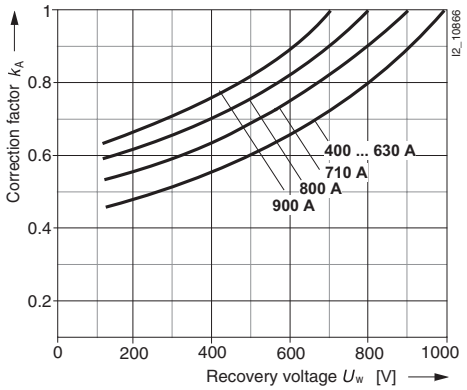
Time/current characteristics diagram



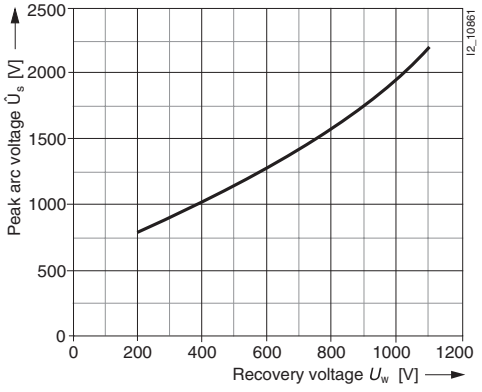
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage



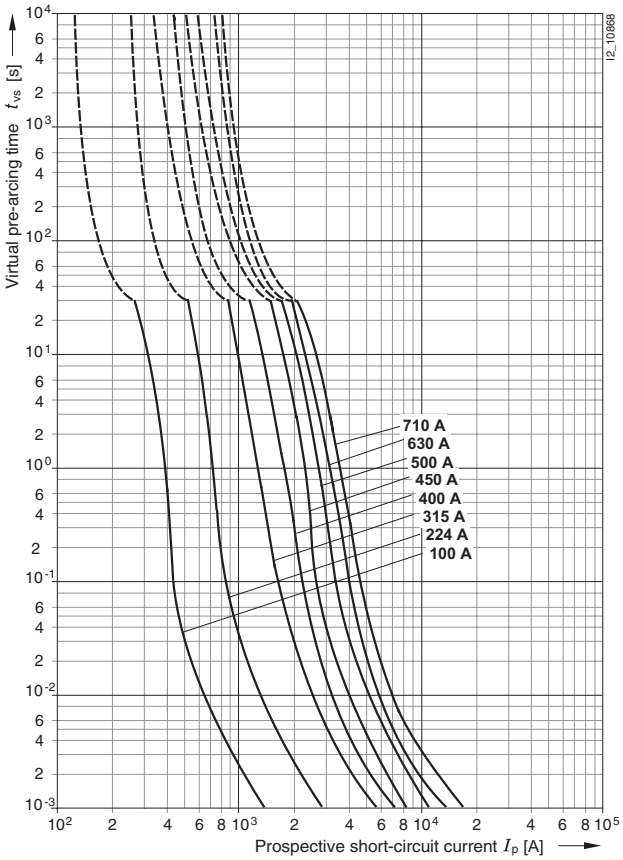
LV HRC SITOR fuse links

Characteristic curves

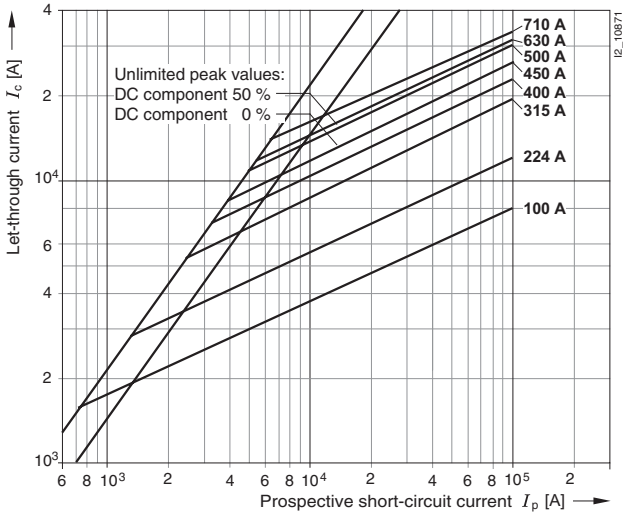
Series 3NE3 4.., 3NE3 6..

Size: 3
Utilization category: aR
Rated voltage: 1000 V AC
Rated current: 100 ... 710 A

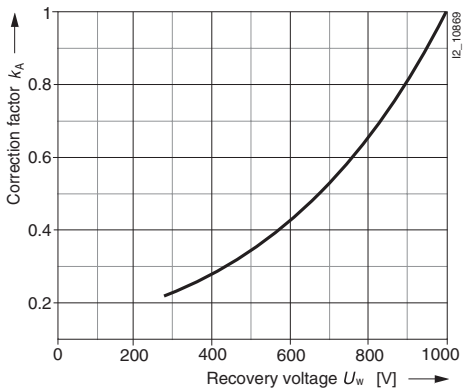
Time/current characteristics diagram



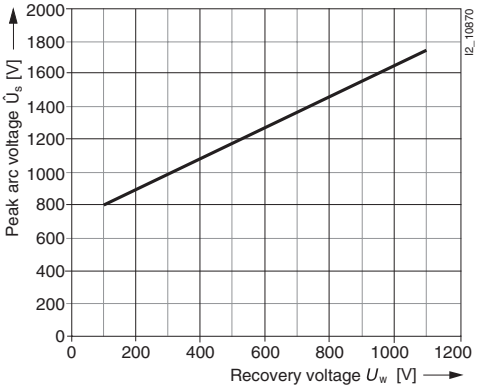
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage

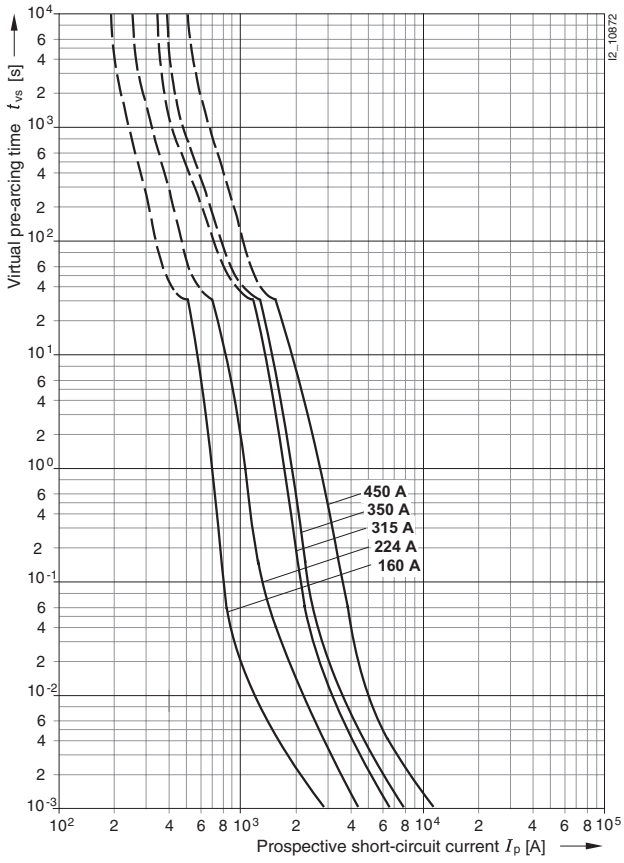


Characteristic curves

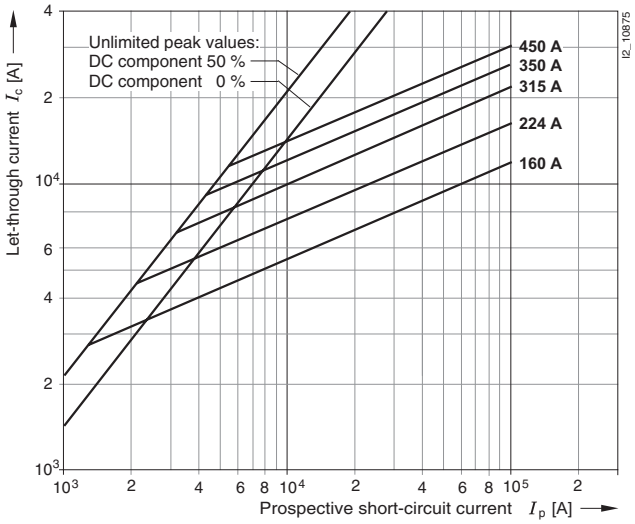
Series 3NE5 4..

Size: 3
Utilization category: aR
Rated voltage: 1500 V AC
Rated current: 160 ... 600 A

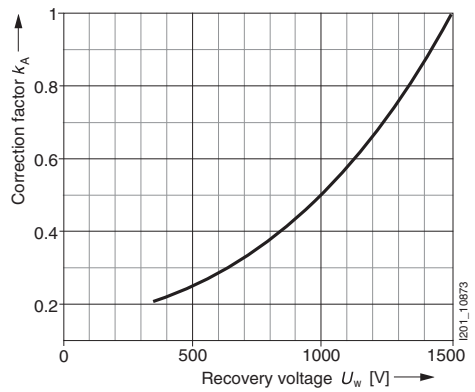
Time/current characteristics diagram



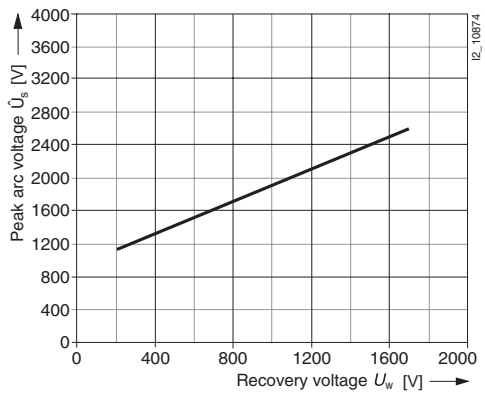
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage



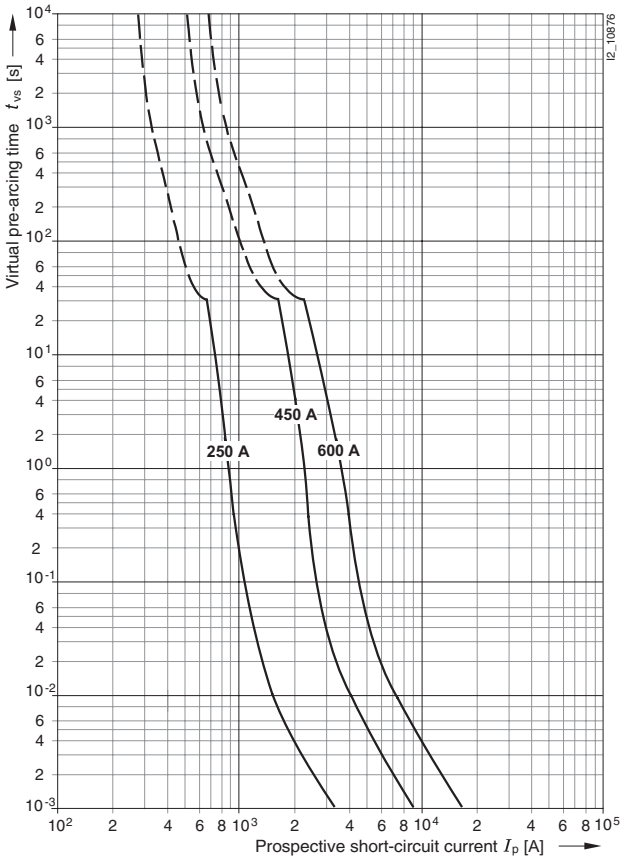
LV HRC SITOR fuse links

Characteristic curves

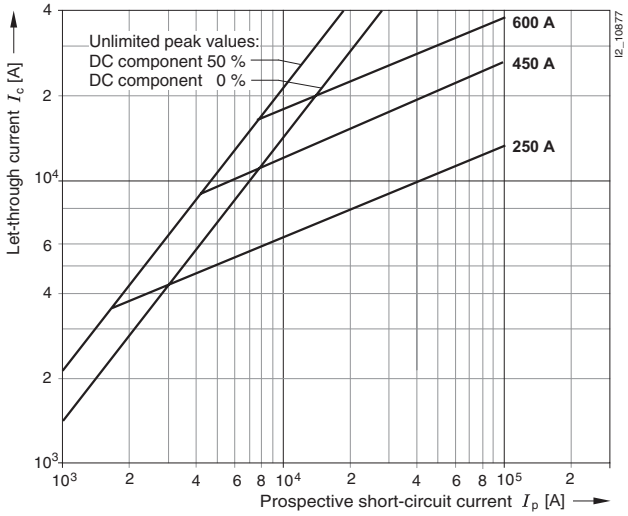
Series 3NE5 6..

Size: 3
Utilization category: aR
Rated voltage: 1500 V AC
Rated current: 250 ... 600 A

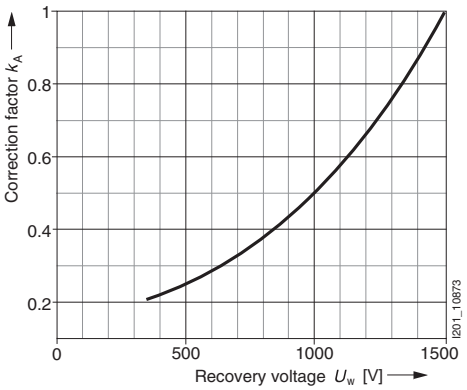
Time/current characteristics diagram



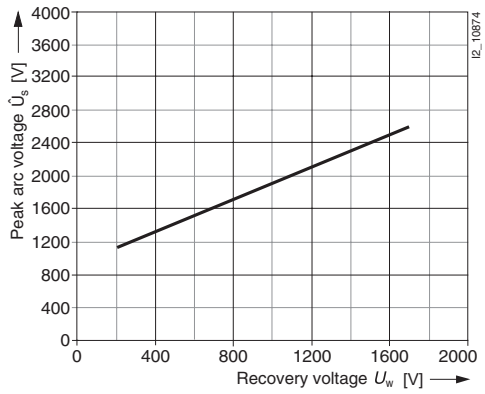
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage

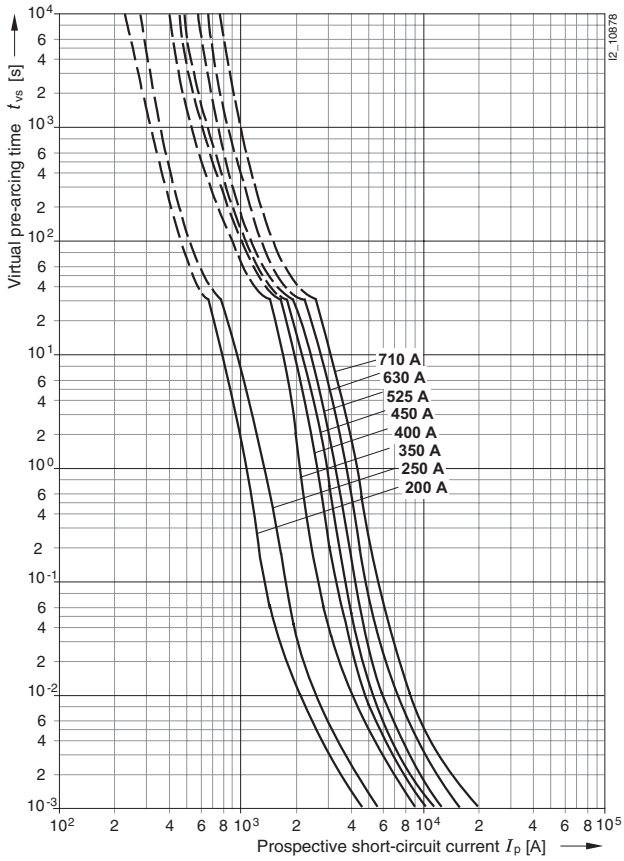


Characteristic curves

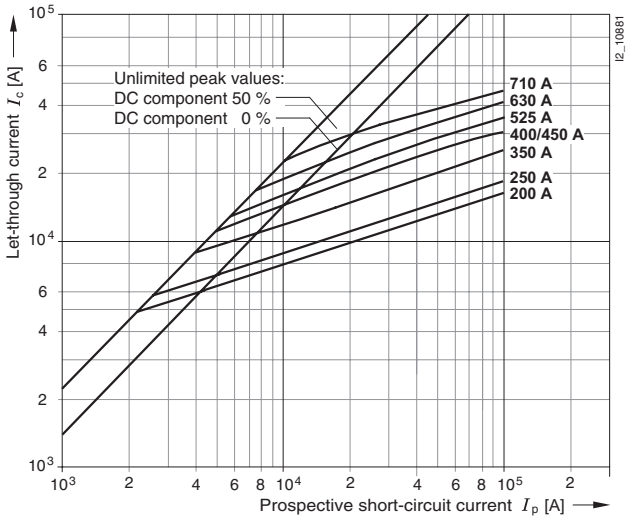
Series 3NE7 4.., 3NE7 6..

Size: 3
Utilization category: aR
Rated voltage: 2000 V AC
Rated current: 200 to 710 A

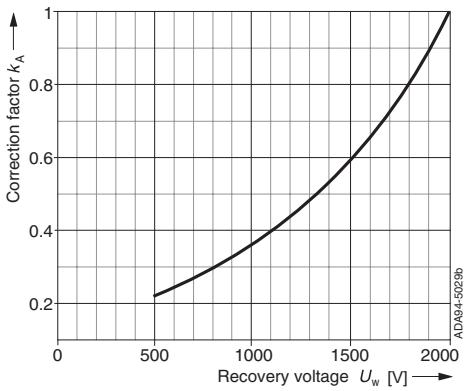
Time/current characteristics diagram



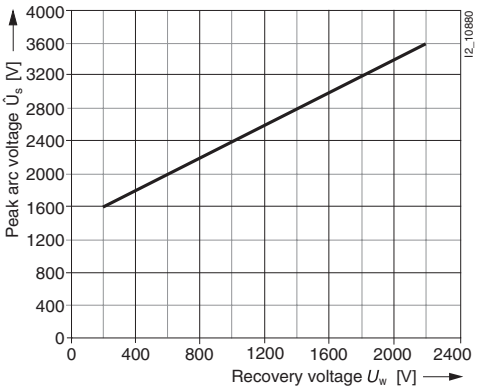
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage



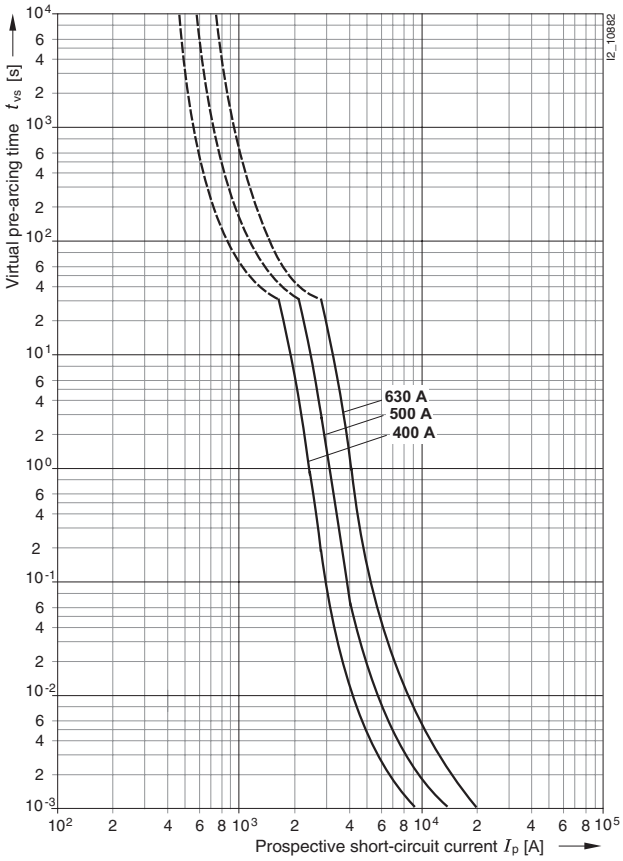
LV HRC SITOR fuse links

Characteristic curves

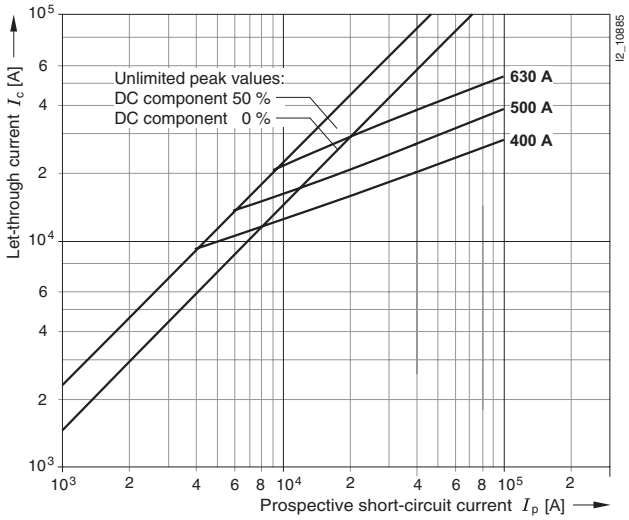
Series 3NE9 63.

Size: 3
Utilization category: aR
Rated voltage: 2500 V AC
Rated current: 400 ... 630 A

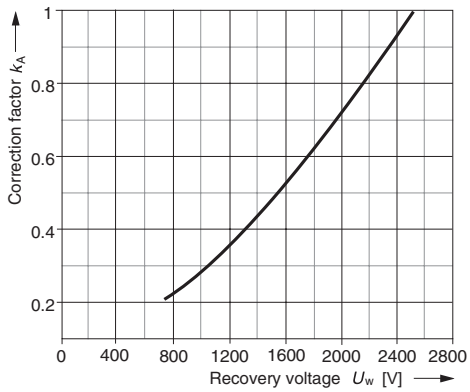
Time/current characteristics diagram



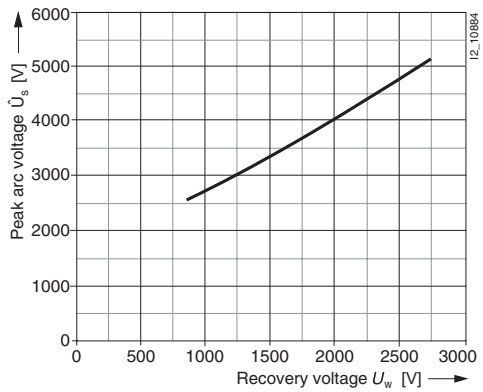
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value

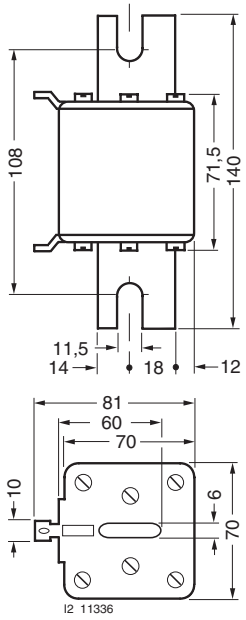


Peak arc voltage

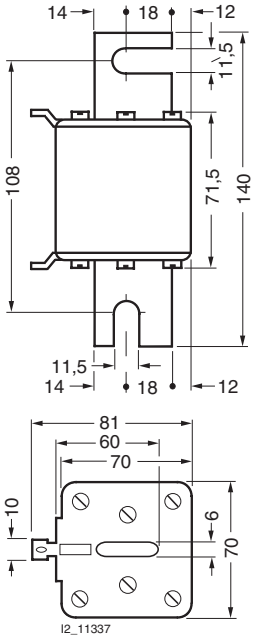


Dimensional drawings

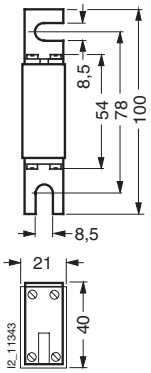
3NC2 4.., 3NC8 4..



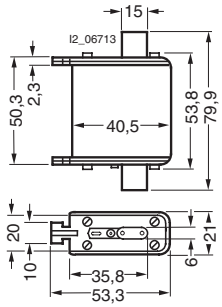
3NC2 4..-3, 3NC8 4..-3



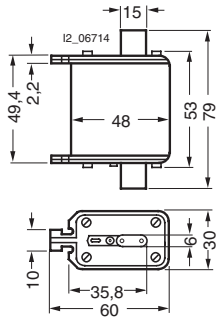
3NE8 7..-1



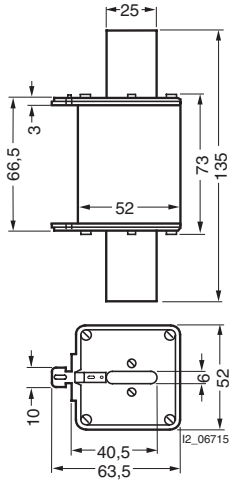
3NE1 8..-0



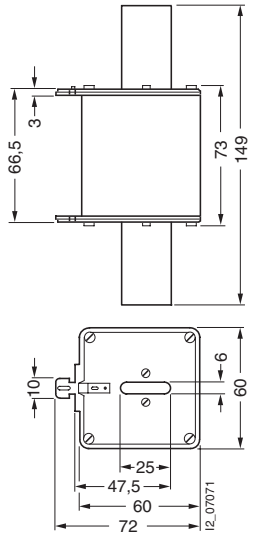
3NE1 02.-0, 3NE1 022-2, 3NE8 0..-1



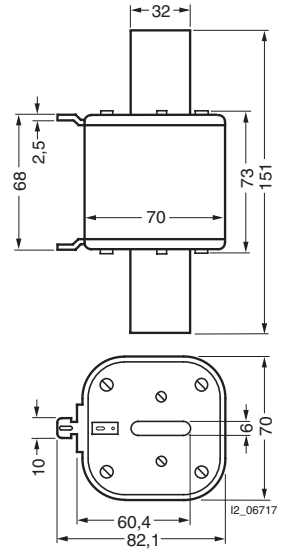
3NE1 2..-0, 3NE1 2..-2



3NE1 33.-0, 3NE1 33.-2



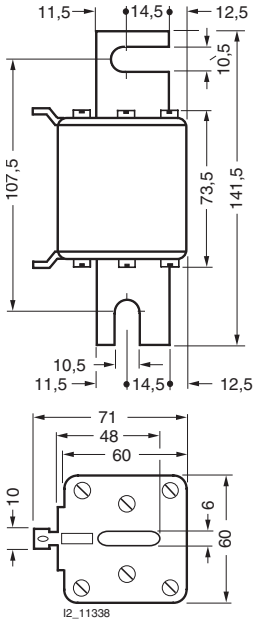
3NE1 43.-0, 3NE1 43.-1, 3NE1 4..-2



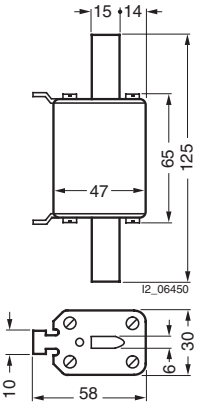
LV HRC SITOR fuse links

Dimensional drawings

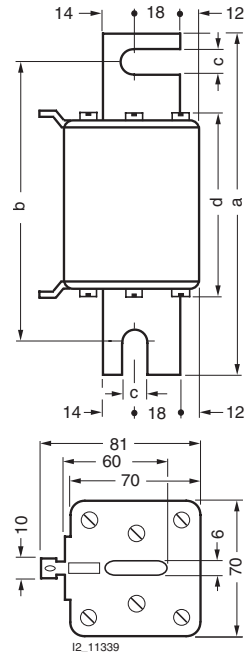
3NE4 3..-0B, 3NE4 337



3NE4 1..

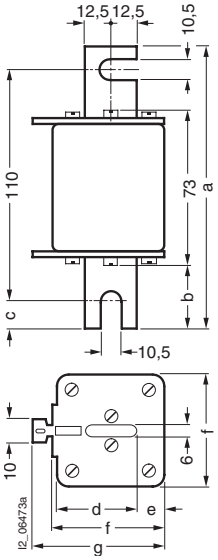


3NE3 4.., 3NE3 6.., 3NE3 637-1,
3NE5 4.., 3NE5 433-1, 3NE5 6..,
3NE7 4.., 3NE7 6.., 3NE9 63.-1



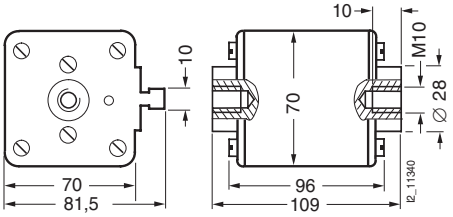
Type	Dimensions			
	a	b	c	d
3NE3 4.., 3NE3 6..	160	128	11.5	91.5
3NE3 635-6	see adjacent drawing			
3NE3 637-1	170	138	13	91.5
3NE5 4.., 3NE7 4.., 3NE7 6..	240	208	11.5	171.5
3NE5 433-1, 3NE7 6..-1	240	208	13	171.5
3NE5 6..	200	168	11.5	131.5
3NE9 63.-1	287	255	13	220

3NE3 22., 3NE3 23., 3NE3 3..



Type	Dimensions						
	a	b	c	d	e	f	g
3NE3 22., 3NE3 23.	135	31	12.5	40.5	13.5	52	63.5
3NE3 3..	149	38	19.5	47.5	15	60	72

3NE3 635-6



More information

Standards

The SITOR fuse links comply with the following standards:

- IEC 60269-4
- EN 60269-4

If noted in the selection and ordering data and characteristic curves, the SITOR fuse links also comply with the following standards and regulations:

- IEC 60269-2-1
  DIN VDE 0636-201
  (for installation in LV HRC fuse bases according to VDE 0636/201, as well as in fuse switch disconnectors and switch disconnectors with fuses)
- ㊊
  The following SITOR fuse links and LV HRC fuse bases are also ㊊ recognized:

Series	Registration number	Reference
3NC1 0.. **3NC1 4..** **3NC2 2..** **3NE1 ...** **3NE3 2..** **3NE3 3..** **3NE4 1..** **3NE8 0..-1** **3NE8 7..-1**	JFHR2	E167357
3NC1 1..	JDDZ	E223216
3NC1 038-. **3NC1 09.** **3NC1 49.** **3NC2 29.**	IZLT2	E220063
3NH3 030 **3NH3 120** **3NH3 230** **3NH3 330** **3NH3 430**	(JFHR2)	(E171267)

- IEC 60269-4-1
  DIN VDE 0636-401
  (for screwing onto power rail). SITOR fuse links of size 1 to 3 with gauge 110 mm are also suitable for installation in LV HRC fuse bases according to IEC 60269-2-1 and in fuse switch disconnectors and switch disconnectors with fuses.
- CE
  All SITOR fuse links with rated voltage $U_n \leq 1000$ V are CE-marked according to the low-voltage Directive 73/23/EWG. The CE marking confirms conformance of the products with the requirements of the Directive.

Environment-friendly recycling

In 1995, seven German manufacturers of LV HRC/HV HRC fuse links founded a non-profit association.

LV HRC/HV HRC Recycling

The objective is to provide a useful recycling option for used fuse links and determine an acceptable disposal concept that meets all the requirements of modern environment protection.

Used fuse links are sorted according to product type and are accepted back without packaging for recycling, melted down and the recovered materials are fed back into the material cycle.

In accordance with the regulations, statutes and articles of the association, any surplus from the recycling process is donated to a university in order to encourage research in the area of fuse link technology.

For further information, please visit our Web site at:

http://www.nh-hh-recycling.de

Disclaimer

The products described here were developed as part of an overall plant or machine to perform safety-related functions. A complete failsafe system usually contains sensors, evaluation units, signaling units and concepts for failsafe disconnection. It is the responsibility of the manufacturer of a plant or machine to ensure the correct overall function. Siemens AG, its branches and affiliated companies (hereafter "Siemens"), is not in a position to guarantee the function of an overall plant or machine that was not designed by Siemens.

Siemens can accept no liability for recommendations, either explicit or implicit, contained in the following description. Furthermore, no warranty or liability claims above and beyond those provided for in the Siemens General Terms and Conditions can be derived from the description.

Caution

Fuses must always be fitted by a qualified technician.

LV HRC fuse bases

Overview

Terminals for all applications

Terminals are as different as the requirements of individual systems.

Flat termination with screw

Flat termination with screw is suitable for connecting busbars or cable lugs. It contains a torsion-proof screw connection with shim, spring washer and nut. When tightening the nut, the torque must be observed because of the considerable leverage effect.

Double busbar connection

This connection differs from flat terminations in so far as one busbar each can be led over and under the flat termination.

Siemens Lyra contact

The silver-plated Lyra contact provides a large contact area for the pin of the LV HRC fuse link. This limits heat transmission, thus reducing oxidation, which in turn reduces power loss. The large contact area also facilitates replacement of LV HRC fuse links.
The contact is charged by the spring washer, which has been mechanically galvanized. This will prevent hydrogen embrittlement. The contact is resistant to aging and there will be no dreaded annealing of contacts, which considerably improves operational reliability.

Flat termination with with nut

With the flat termination with nut, connection of the nut is torsion-proof. When tightening the nut, the torque must be observed because of the considerable leverage effect.

Terminal strip

Up to three conductors can be clamped to the terminal strip.

Clamp-type terminal connection

The clamp-type terminal connection is prepared for connecting two conductors.

Saddle-type terminal connection

One conductor can be clamped to the saddle-type terminal connection.

Technical specifications

LV HRC bases, LV HRC bus-mounting bases								
Size		**000/00**	**0**	**1**	**2**	**3**	**4**	**4 A**
Rated current I_n	A	160	160	250	400	630	1250	1250
Rated voltage U_n	V AC	690 [1]	690 [1]					
	V DC	250	440					
Rated breaking capacity	kA AC	120						
	kA DC	25						
Flat terminations								
screw		M8		M10		M12		M16
nut		M8	–					
max. tightening torque	Nm	14		38			65	
Clamp-type terminal connection								
conductor cross-section	mm^2	2.5 ... 50		–				
Saddle-type terminal connection								
conductor cross-section	mm^2	6 ... 70	–					
Box terminal								
conductor cross-section	mm^2	2.5 ... 50						
Terminal strip								
conductor cross-section, 3-wire	mm^2	1.5 ... 16	–					
max. torque for attachment of LV HRC base	Nm	2		2.5			–	

LV HRC fuse bases with slewing equipment					
Size		**000/00**	**1**	**2/3**	**4 A**
Rated voltage U_n	V AC	690			
	V DC	440			
Power loss	W	4	5	20	32
Flat terminations					
screw		M8	M10	M12	M16
nut		M8	–		
max. tightening torque	Nm	14	38		65

1) Also suitable for 1000-V SITOR fuse links.

LV HRC fuse bases

Selection and ordering data

	Size	I_n	Design	Order No.	Weight 1 item	PS*/ P. unit
		A			kg	Items
LV HRC fuse bases						
	**000/00**	160	1-pole			
			with flat terminations, screw	**3NH3 030**	0.235	3
			with clamp-type terminal connections	**3NH3 031**	0.230	3
			with saddle-type terminal connections	**3NH3 032**	0.266	3
		160	with flat terminations and terminal strip	**3NH3 035**	0.230	3
			with flat terminations, nut	**3NH3 038**	0.207	3
			with flat and saddle-type terminal connection	**3NH3 050**	0.227	3
			made of molded plastic, for mounting rail and screw fixing			
		160	with flat terminations, screw	**3NH3 051**	0.160	1
			with saddle-type terminal connections	**3NH3 052**	0.190	1
		125	with box terminal, up to 50 mm^2	**3NH3 053**	0.155	1
		160	3-pole, with phase barriers			
			with flat terminations	**3NH4 030**	0.700	1
			with clamp-type terminal connections	**3NH4 031**	0.800	1
			with saddle-type terminal connections	**3NH4 032**	0.800	1
			with flat terminations and terminal strip	**3NH4 035**	0.750	1
	**0**	160	1-pole			
			with flat terminations	**3NH3 120**	0.460	3
			with clamp-type terminal connections	**3NH3 122**	0.460	3
	**1**	250	1-pole			
			with flat terminations	**3NH3 230**	0.789	3
			with double busbar connections	**3NH3 220**	0.789	3
		250	3-pole			
			with screw-type terminal connections	**3NH4 230**	2.100	1
	**2**	400	1-pole			
			with flat terminations	**3NH3 330**	0.843	1
			with double busbar connections	**3NH3 320**	1.000	1
	**3**	630	1-pole			
			with flat terminations	**3NH3 430**	1.100	1
			with double busbar connections	**3NH3 420**	1.100	1
	**4** (IEC design)	1250	1-pole			
			with flat terminations	**3NH3 530**	3.000	1

* You can order this quantity or a multiple thereof.

Selection and ordering data

	Size	I_n	Design	Order No.	Weight 1 item kg	PS*/ P. unit Items
LV HRC bus-mounting bases for busbars						
	for busbars 12 mm x 5 mm to 12 mm x 10 mm busbar clearance 40 mm					
	**000/00**	160	1-pole			
			with saddle-type terminal connection, top	**3NH3 036**	0.150	1/3
			bottom	**3NH3 037**	0.150	1/3
			terminal strip, top	**3NH3 048**	0.150	1
	**000/00**	80	3-pole, tandem design 3 outgoing feeders, top and bottom with saddle-type terminal connection			
			with 4 phase barriers	**3NH4 037**	0.800	1
			with 2 non-interrupted phase barriers	**3NH4 045**	0.800	1
LV HRC fuse bases with slewing equipment						
	Degree of soiling 3 **Degree of protection: open IP10, closed IP20** **1-pole, with flat termination**					
	**000/00**	160	supplied with additional saddle-type terminal connections			
			with screw connection for mounting plate	**3NH7 030**	1.000	1/3
			with claw fixing for non-perforated busbar	**3NH7 031**	1.000	1/3
			with screw connection for perforated busbar	**3NH7 032**	1.000	1/3
	**1**	250	with screw connection for mounting plate	**3NH7 230**	2.500	1
			with claw fixing for non-perforated busbar	**3NH7 231**	2.500	1
			with screw connection for perforated busbar	**3NH7 232**	2.500	1
	**2/3**	400 and 630	with screw connection for mounting plate	**3NH7 330**	4.800	1
			with claw fixing for non-perforated busbar	**3NH7 331**	4.800	1
			with screw connection for perforated busbar, can be used as disconnector	**3NH7 332**	4.800	1
	**4 A**	1250	with screw connection for mounting plate	**3NH7 520**	5.200	1

* You can order this quantity or a multiple thereof.

LV HRC fuse bases

Selection and ordering data

		Size	Order No.	Weight 1 item kg	PS*/ P. unit Items
Mounting parts for LV HRC fuse bases					
	**LV HRC contact cover**				
	protection against contact for contact pieces	000/00	**3NX3 105**	0.013	2
		0	**3NX3 114**	0.010	2
		1	**3NX3 106**	0.027	2
		2	**3NX3 107**	0.031	2
		3	**3NX3 108**	0.038	2
	**LV HRC partitions** for side-by-side mounting of LV HRC fuse bases and as end barrier for side-by-side arrangement				
	Type				
	3NH3 0/3NH4 0	000/00	**3NX2 023**	0.025	2
	3NH3 1	0	**3NX2 030**	0.050	2
	3NH3 2	1	**3NX2 024**	0.053	2
	3NH3 3	2	**3NX2 025**	0.066	2
	3NH3 4	3	**3NX2 026**	0.101	2
	**LV HRC protective cover IP2X** for LV HRC fuse bases, size 000/00 1 and 3-pole		**3NX3 115**	0.039	1/10
	**LV HRC cover IP2X** for LV HRC protective cover IP2X		**3NX3 116**	0.014	1/10
Mounting parts for LV HRC bus-mounting bases					
	**LV HRC contact covers** for mounting onto contacts to ensure protection against contact				
	outgoing terminal		**3NX3 105**	0.013	2
	incoming terminal		**3NX3 113**	0.006	2
	**LV HRC phase barriers** for 3NH3 0 LV HRC bus-mounting bases phase barrier		**3NX2 027**	0.017	2
	end barrier		**3NX2 028**	0.020	2
	for 3NH4 0 LV HRC bus-mounting base in tandem design non-interrupted phase barrier		**3NX2 031**	0.050	2

* You can order this quantity or a multiple thereof.

Selection and ordering data

		Size	Order No.	Weight 1 item	PS*/ P. unit
				kg	Items
Mounting parts for LV HRC fuses					
	**Fuse puller** for LV HRC fuse links	000 ... 4			
	without sleeve		**3NX1 013**	0.280	1
	with sleeve		**3NX1 014**	0.480	1
	**Isolating link** for LV HRC fuse bases and fuse switch disconnectors				
	with insulated grip lugs				
	silver-plated	000/00	**3NG1 002**	0.080	1/6
		0	**3NG1 102**	0.110	1/6
		1	**3NG1 202**	0.170	1/3
		2	**3NG1 302**	0.240	1/3
		3	**3NG1 402**	0.290	1/3
	with non-insulated grip lugs				
	tinned	4	**3NG1 503**	0.708	1/6
	nickel-plated	4a	**3NG1 505**	0.730	1/3
	**Fuse base cover**				
	for LV HRC fuse bases according to DIN 43620 red with yellow information label "power supply isolating point"	000/00 1, 2, 3	**3NX1 003** **3NX1 004**	0.050 0.100	3 3

* You can order this quantity or a multiple thereof.

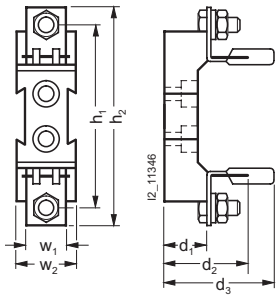
LV HRC fuse bases

Dimensional drawings

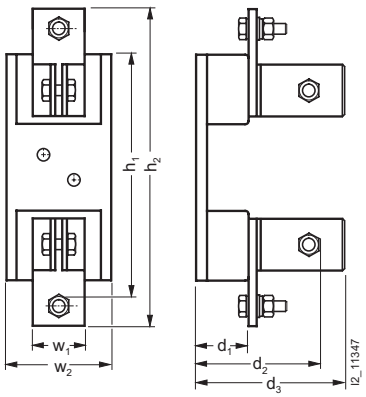
LV HRC fuse bases

1- and 3-pole

Size 000/00 to 3

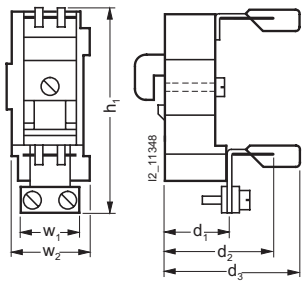


Size 4 [1]



LV HRC bus-mounting base [2]

1-pole



Size	I_n	Number of poles	Connection	Type	Dimensions						
	A				w_1	w_2	h_1	h_2	d_1	d_2	d_3
000/00	160	1	M8 plug connection	3NH3 0..	30	34	102	122	24	40	60
			Saddle-type terminal connection		29						
			Flat termination		23						
		3	M8 plug connection	3NH4 0..	30	102					
			Saddle-type terminal connection		29						
			Flat termination		23						
		1	Saddle-type terminal connection	LV HRC bus mounting base [2] 3NH3 0..	29	37	–	95	28	44	64
			Terminal strip		26			102			
0	160	1	Flat termination	3NH3 1..	23	38	150	173	24	39	60
			Clamp-type terminal connection		30						
1	250	1	M10 flat termination	3NH3 2..	35	49	177	201	35	55	84
			Double busbar connection								
		3	M10 flat termination	3NH4 2..		163					
2	400	1	M10 flat termination	3NH3 3..	35	49	202	226	35	55	90
			Double busbar connection								
3	630	1	M12 flat termination	3NH3 4..	35	49	212	241	35	55	101
			Double busbar connection								
4	1250	1	M12 flat termination	3NH3 5..	50	102	270	max. 307	51	116 [1]	144
4 A	Can only be used in bases with slewing equipment										

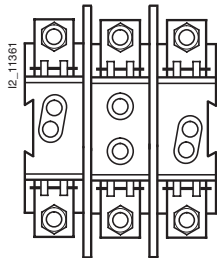
1) Size 4 LV HRC fuse links are also screwed onto the base.

2) LV HRC bus-mounting bases are only connected on one side using terminals, the second connection is made through the bottom of the base.

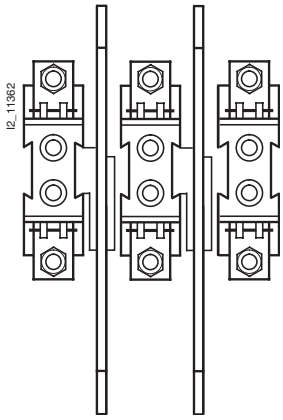
Dimensional drawings

Space requirements when installing LV HRC fuse bases

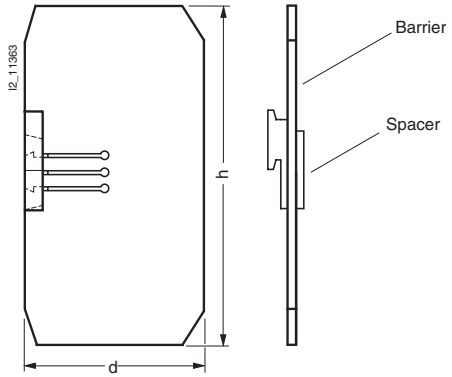
1-piece LV HRC fuse base, 3-pole



3-piece LV HRC fuse base, 1-pole



LV HRC phase barrier



Size	Mounting width (mm) of LV HRC fuse bases					Mounting height (mm)	Mounting depth (mm)
	1-piece, 3-pole		3-piece, 1-pole		Distance through spacer	3NX2 0.. phase barriers with respective bases [2]	
	Base with intermediate phase barrier, without side phase barrier	Base with intermediate and 2 side phase barriers	Base with intermediate phase barrier, without side phase barrier	Base with intermediate and 2 side phase barriers		h	d
000/00	102	106	100	104 [1]	2	138	86
	LV HRC bus-mounting base see page 1/124 and 1/128.				–	114	90
0	–	–	128	142	7	178	90
1	163	177	158	172	7	202	110
2	–	–	184	224	20	227	118
3	–	–	208	272	32	242	132
4	Installation without barriers; for mounting see page 1/126 and 1/127.					n/a	
4 A	Can only be used in bases with slewing equipment					n/a	

1) Placing an additional base on the barrier and plug-on part does not increase the distance, rather the bases lie flat directly on top of one another.

2) This measurement specifies the required overall mounting depth with base t and the overall mounting height h.

3) If the bases are installed directly on a side wall in the distribution board, one spacer part can be broken off. This would reduce the distance measurement.

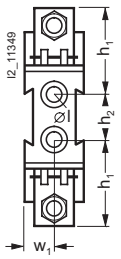
LV HRC fuse bases

Dimensional drawings

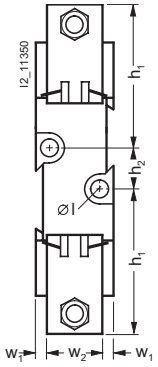
Drill hole dimensions for base plate mounting

LV HRC bases 1-pole

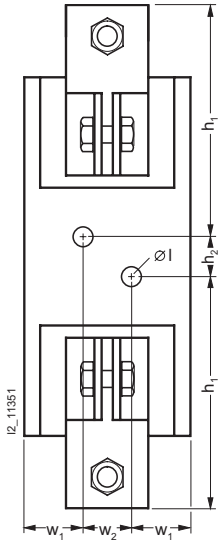
Sizes 000/00 and 0



Sizes 1 to 3



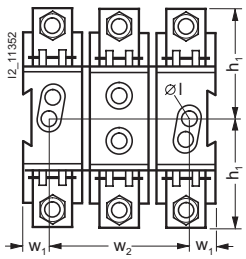
Size 4



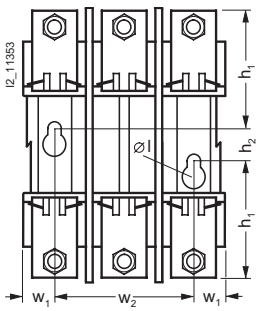
Size	Type	Dimensions				
		w_1	w_2	h_1	h_2	l
000/00	3NH3 0..	17	–	48	25.5	7.5
0	3NH3 1..	19	–	74	25	7.5
1	3NH3 2..	9	31	88	26	10.5
2	3NH3 3..	9	31	100	26	10.5
3	3NH3 4..	9	31	108	26	10.5
4	3NH3 530	36	30	141	25	13

LV HRC bases 3-pole

Size 000/00



Size 1



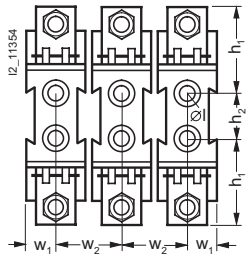
Size	Type	Dimensions				
		w_1	w_2	h_1	h_2	l
000/00	3NH4 0..	15	70	46	–	7.5
1	3NH4 230	26	110.5	88	25	10

Dimensional drawings

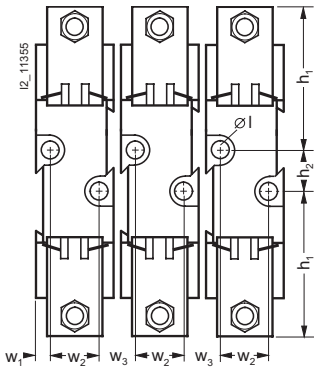
Drill hole dimensions for base plate mounting

LV HRC bases, 3-piece, 1-pole

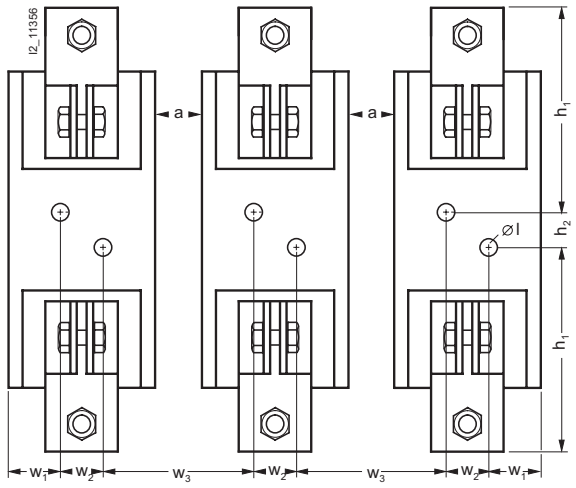
Sizes 000/00 and 0



Sizes 1, 2 and 3



Size 4



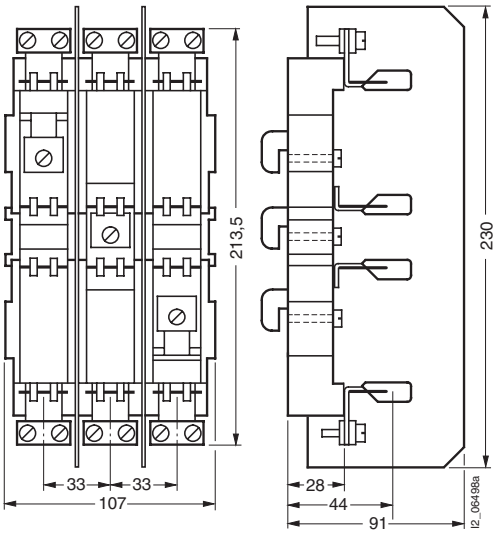
Size	Type	Dimensions					
		w_1	w_2	w_3	h_1	h_2	l
000/00	3NH3 0..	17	34	–	48	25.5	7.5
0	3NH3 1..	17	41	–	74	25	7.5
1	3NH3 2..	9	31	25	88	26	10.5
2	3NH3 3..	9	31	38	100	26	10.5
3	3NH3 4..	9	31	50	108	26	10.5
4	3NH3 530	36	30	95	141	25	13

Note:
These LV HRC bases are mounted without phase barriers.
A minimum clearance of a = 25 mm is required.

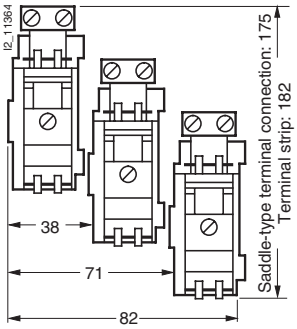
Dimensional drawings

LV HRC bus-mounting bases in tandem design

Busbar center-to-center clearance 40 mm
3NH4 037, 3NH4 045

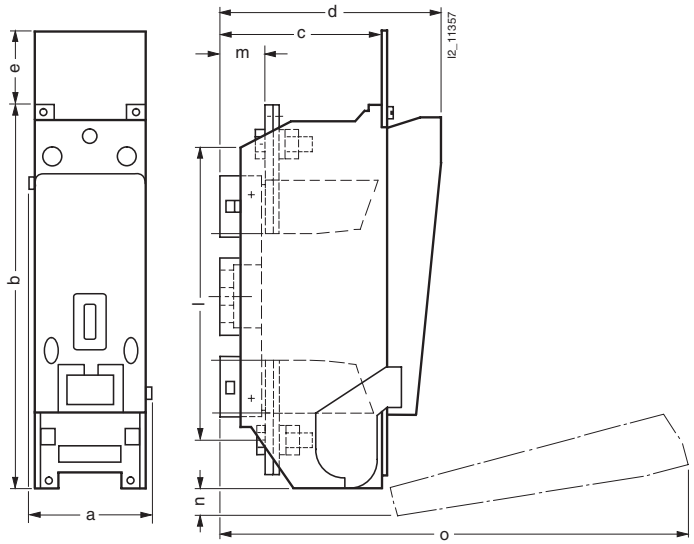


Space requirements for
3-piece, 1-pole LV HRC bus-mounting bases, staggered



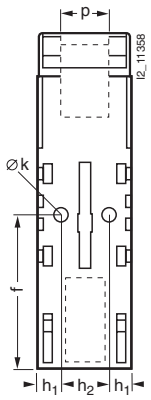
LV HRC bases with slewing equipment, 1-pole

Sizes 000/00 to 4a

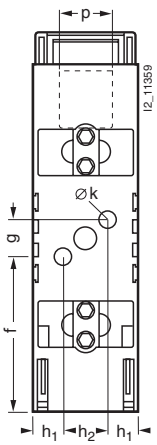


Drill hole dimensions for base plate mounting

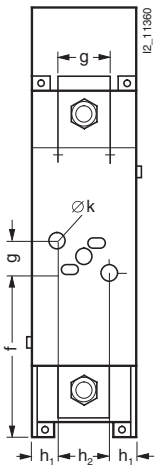
Size 000/00



Sizes 1 and 2/3



Size 4a



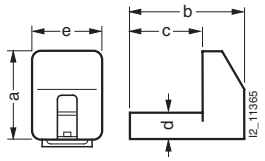
Size	I_n	Type	Dimensions														
	A		a	b	c	d	e	f	g	h_1	h_2	k	l	m	n	o	p
000/00	160	3NH7 03.	44	149	45	88.5	22.5	79	–	9.5	25	7	120	17	18	200	20
1	250	3NH7 23.	68	230	68	123.5	23	102.5	25	19	30	10.5	177	25	40	300	25
2/3	630	3NH7 33.	90	270	96	153.5	15.5	122.5	25	30	30	10.5	220.5	30.5	35	350	40
4 A	1250	3NH7 520	116	350	154.5	217.5	69	170	30	31.5	45	13	270	40	26	440	50

Dimensional drawings

Mounting parts for LV HRC fuse bases

LV HRC contact covers

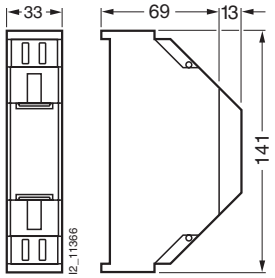
Sizes 000/00 to 3, 3NX3 10



Size	Type	Dimensions				
		a	b	c	d	e
000/00	3NX3 105	38	47.5	34	11.5	30
1	3NX3 106	61.5	57	42.5	35	46
2	3NX3 107	74	65	51	35	46
3	3NX3 108	81.5	77.5	57.5	35	46

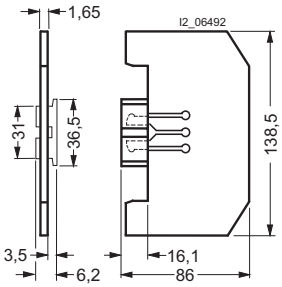
3NX3 115 LV HRC protection cover, with 3NX3 116 LV HRC shrouding cover

Size 000/00, degree of protection IP2X

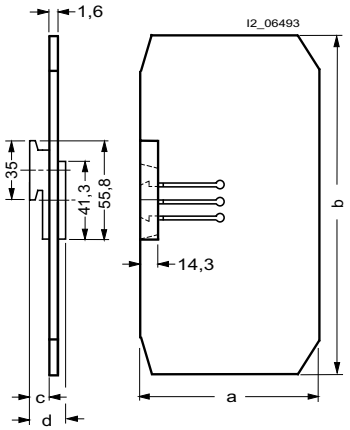


LV HRC partitions

Size 000/00
3NX3 023



Sizes 0 to 3
3NX2 030, 3NX2 024 to 3NX2 026

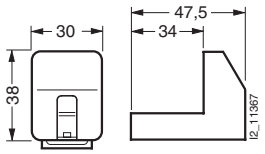


Size	Type	Dimensions			
		a	b	c	d
0	3NX2 030	87.6	178.5	7.7	12.3
1	3NX2 024	107.3	202.5	7.7	12.3
2	3NX2 025	115.3	227.5	14.2	25.1
3	3NX2 026	129.8	242	20.2	37.2

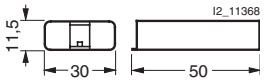
Mounting parts for LV HRC bus-mounting bases

LV HRC contact covers

for 1-pole design and tandem design,
3NX3 105

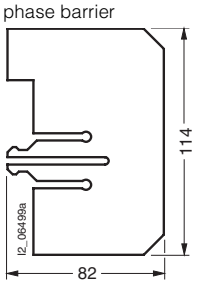


3-pole,
3NX3 113

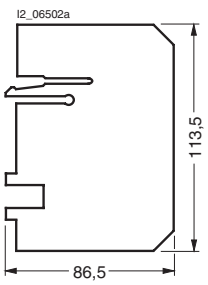


LV HRC partitions

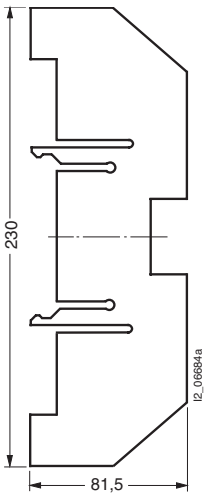
3NX2 027
phase barrier



3NX2 028
end barrier



3NX2 031 non-interrupted,
for LV HRC bases in tandem design

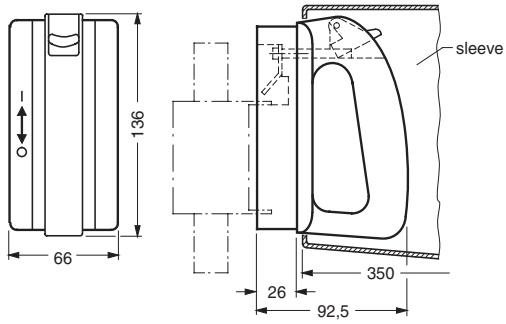


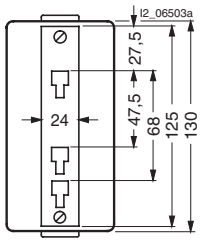
Dimensional drawings

Mounting parts for LV HRC fuses

Fuse puller

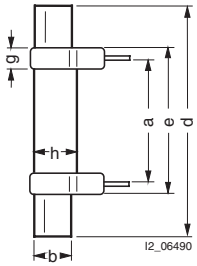
Sizes 000 to 4
3NX1 013 (without sleeve), 3NX1 014 (with sleeve)

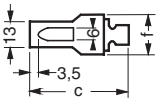




Isolating link

with insulated grip lug, sizes 000/00 to 3
3NG1 .02

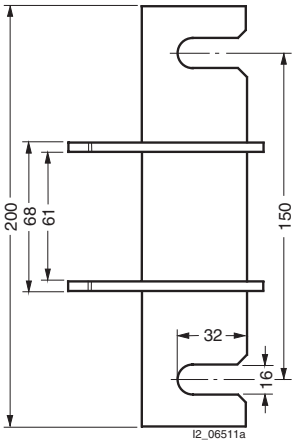


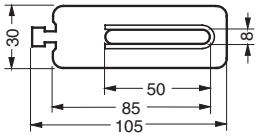


Size	Type	Dimensions a	b	c	d	e	f	g	h
000/00	3NG1 002	44	15	48	78	54	20.5	8	19
0	3NG1 102	60.5	15	48	125	68	20.5	8	19
1	3NG1 202	61	20	53	135	72	23	9	24
2	3NG1 302	61	26	61	150	72	23	9	29
3	3NG1 402	61	32	73	150	72	23	9	36

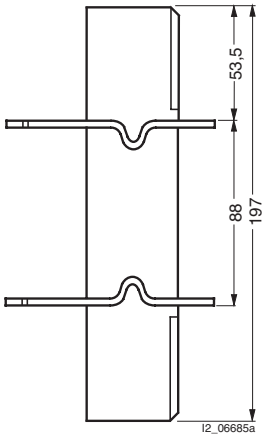
Isolating link with non-insulated grip lugs

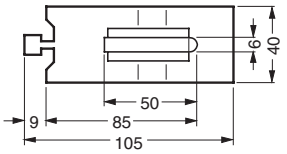
Size 4
3NG1 503





Size 4a
3NG1 505





Overview

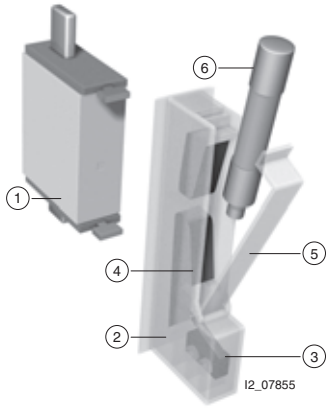
The signal detector supports monitoring of LV HRC fuse links of 10 A or higher. The signal detector can be mounted onto any LV HRC fuse link of size 000 to 4 with non-insulated grip lugs.

The signal detector link is connected in parallel to the LV HRC fuse link via spring contacts.

In the event of a fault, the LV HRC fuse link is released simultaneously with the LV HRC fuse signaling link. A tripping pin in the LV HRC fuse signaling link switches a microswitch for 250 V AC/5 A.

In order to replace the signal detector link, the signal detector is removed from the LV HRC fuse link. It is then off circuit.

① LV HRC fuse link
② Signal detector
③ Microswitch
④ Spring contact
⑤ Flap
⑥ Signal detector link



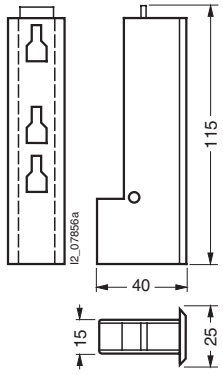
Selection and ordering data

		Size	Order No.	Weight 1 item	PS*/ P. unit
				kg	Items
	**LV HRC signal detector** for LV HRC fuse links with non-insulated grip lugs • rated voltage up to 690 V AC/600 V DC • contact: microswitch 250 V AC, 6 A • connection: flat connector 2.3 mm ... 0.5 mm 	000 ... 4	**3NX1 021**	0.036	1/4
	**Signal detector link** rated voltage up to 690 V AC/600 V DC response value > 9 V; 2.5 A; for standard applications response value > 2 V; 7 A; only for meshed systems	000 ... 4	**3NX1 022** **3NX1 023**	0.015 0.015	1/12 1/12

Dimensional drawings

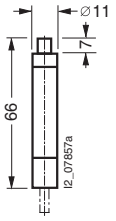
LV HRC signal detector

3NX1 021



Signal detector link

3NX1 022, 3NX1 023



* You can order this quantity or a multiple thereof.

LV HRC fuse switch disconnectors

Application

SENTRIC 3NP4 and 3NP5 fuse switch disconnectors are switching devices for the occasional manual switching/isolating of loads and distribution boards. They are able to switch on, control and switch off the specified rated current (including a specific overload).

With the SENTRIC 3NP4 and 3NP5 fuse switch disconnectors, all poles of downstream electric loads can be safely disconnected from the system under load.

The SENTRIC 3NP4 and 3NP5 fuse switch disconnectors are ideal for mounting on and in distribution boards (e.g. ALPHA, SIKUS), meter cabinets (e.g. ALPHA 400-ZS) and molded-plastic distribution system, such as SENTRIC 8HP.

The ability to mount them on a range of different busbar systems allows their very diverse implementation in switchgear cabinet and control engineering.

The sizes SENTRIC 3NP4 LV HRC 000 [2] and LV HRC 00 can be snapped onto 35 mm mounting rails and are ideal for combining with other switching devices e.g. in capacitor modules for p.f. compensation.

SENTRIC 3NP4 and 3NP5 fuse switch disconnectors

Used together with semiconductor fuses (e.g. SITOR), they provide effective protection for frequency converters and soft starters.

SENTRIC NP fuse switch disconnectors

3NP40 10 **3NP40 70** **3NP52** with open fuse carrier

The SENTRIC 3NP4 and 3NP5 fuse switch disconnectors are climate proof and comply with the standards IEC 60947-1, IEC 60947-3 and EN 60947-1, EN 60947-3.

For use in heavily sulfurous atmospheres, the SENTRIC 3NP5 series, as well as the 3NP40 1 and 3NP40 7 versions, are available as tinned models (delivery on request).

The SENTRIC 3NP5 fuse switch disconnector series also complies with the standard BS 5419 and is approved for use in shipboard systems. [1]

All SENTRIC 3NP4 and 3NP5 fuse switch disconnectors can be sealed as standard (or can be sealed through accessories).

Design

The SENTRIC 3NP4 and 3NP5 fuse switch disconnectors comprise a base and a removable fuse carrier with view and measuring window.

The base contains integral lyra contacts, arcing chambers and terminal fittings. The fuse links/isolating links are contained in the fuse carrier.

The fuse links can be replaced without tools.

The three conducting paths in the base and the fuse links in the fuse carrier are separated by partitions that overlap when opening and closing the device.

This type of failsafe protection is called "complete compartmentalization" and effectively prevents phase arcing.

SENTRIC 3NP5 fuse switch disconnectors are also equipped with locating springs, which are fitted to the side of the base. These enable the "high speed closing" of devices, regardless of the actuation speed of the operator.

The SENTRIC 3NP4 and 3NP5 fuse switch disconnectors are used with LV HRC fuses of sizes LV HRC 000 to LV HRC 3 according to IEC 60269-2-1, DIN VDE 0636-201 and DIN 43620. SITOR semiconductor fuses can continue to be used for a wide range of applications.

For more detailed information, please refer to the instruction manual for the SENTRIC 3NP4 and 3NP5 fuse switch disconnectors.

Auxiliary switches

The SENTRIC 3NP4 and 3NP5 fuse switch disconnectors also be retrofitted with auxiliary switches for indicating the switching position of the fuse carrier.

One switching element (1 CO) can be mounted on SENTRIC 3NP4 fuse switch disconnectors size LV HRC 000 and two switching elements (1 CO) on sizes LV HRC 00 to LV HRC 3 respectively.

SENTRIC 3NP5 fuse switch disconnectors can also be delivered with a 2-pole auxiliary switch (1 NO + 1 NC) if required. The version with fuse monitoring is fitted with this auxiliary switch as standard.

1) Always use approved fuse links.

2) Corresponds to fuse size LV HRC 000 (LV HRC 00C) or LV HRC 00 with reduced dimensions; maximum width 21 mm according to IEC 60269-2-1 and DIN 43620.

Function

Fuse monitoring using the SIRIUS circuit-breaker

For fuse monitoring, a SIRIUS circuit-breaker is factory-fitted and hard-wired to the fuse carrier of the SENTRIC 3NP4 and 3NP5 fuse switch disconnectors.

If the fuse carrier is closed, the three conducting paths of the SIRIUS circuit-breaker are switched in parallel to the fuse links to be monitored. If the fuse carrier is open, all main conducting paths of the circuit-breaker are off circuit.

The internal resistance of the circuit-breaker is great enough not to impair the protective function of the monitored fuse links.

Failure of a fuse will trigger the circuit-breaker. The auxiliary switch of the circuit-breaker can be used for indication purposes or to disconnect the main circuit, e.g. through a contactor.

The signal lead for the SENTRIC 3NP4 fuse switch-disconnector size LV HRC 00 needs to be ordered separately. Sizes LV HRC 1 to LV HRC 3 are connected using flat connectors.

Delivery of the SENTRIC 3NP5 fuse switch disconnectors includes the signal lead, complete with connector.

SIRIUS circuit-breakers cannot be used for fuse monitoring in branch circuits with circuit-breakers where a fault may result in > 220 V DC feedback.

In the case of parallel cables and meshed systems, only a voltage difference of > 24 V at the switch will trigger the circuit-breaker.

Electronic fuse monitors

For electronic fuse monitoring, the EF monitor is factory-fitted and hard-wired to the fuse carrier of SENTRIC 3NP5 fuse switch-disconnectors.

The EF monitor works independently of any loads. Failure of a fuse can be relayed to a control room through integrated auxiliary switches (2 NO + 1 NC) by means of a centralized fault indication or used to isolate the load through e.g. a contactor

Actuation of the auxiliary switch depends on the ESÜ version. Version "A" stands for "open-circuit principle", version "R" for closed-circuit principle" (see block diagram).

If a fuse is tripped, a green LED signal flashes (general fault) and the location of the failed fuse is indicated by a red LED. Using more than one device facilitates identification of the affected branch circuit.

The EF monitor is automatically reset to the standby position once the faulty fuses are replaced. This state is indicated visually by the status display (green LED).

The Ef monitor is also suitable for use in industrial systems badly afflicted by harmonics.

Technical specifications

Type		3NP40 1	3NP40 7	3NP42 7	3NP43 7	3NP44 7
Standards		IEC 60947-1, IEC 60947-3, EN 60947-1, EN 60947-3				
Rated continuous current I_u	A	160 [1]	160	250	400	630
for fuse links acc. to DIN 43620	Size	00C/000	00	1 and 0	2 and 1	3 and 2
Conventional free air thermal current I_{th}	A	160 [1]	160	250	400	630
Rated operational voltage U_e						
50 Hz/60 Hz AC	V	690		690		
DC	V	220 (3 current paths connected in series)		440 (2 current paths conn. in series)		
Rated insulation voltage U_i	V	690	690	800 [3]	800 [3]	800 [3]
Rated impulse voltage U_{imp}	kV	6	6	6	6	6
Rated conditional short-circuit current with fuses (by fast switch on)						
with fuse links						
rated current)	Size/A	000/100 (35)	00/160	1/250	2/400	3/630
at 400 V AC (690 V)	kA (rms value)	50 (50)	50	50	50	50
maximum permissible let-through I^2t value	kA^2s	56 (7.8)	158	551	1515	4340
permissible let-through current of the fuse	kA (peak value)	11 (5)	15	25	35	55
Short-circuit strength with fuses (with closed disconnector)						
with fuse links						
rated current	Size/A	000/100	00/160	1/250	2/400	3/630
at 690 V	kA (rms value)	100	50	50	50	50
permissible let-through current of the fuse	kA (peak value)	15	15	25	35	55
Rated making and breaking capacity (incoming supply from top or bottom)						
at 400 V AC, with fuse links or isolating links	Size	000	00	1	2	3
rated breaking current I_c (p.f. = 0.35)	A (rms value)	800 (p.f. = 0.45)	800	2000	3200	5040
rated operational current I_e for						
AC-21B, AC-22B	A	160	160	250	400	630
AC-23B	A	100	100	250	400	630
at 500 V AC, with fuse links or isolating links	Size	000	00	1	2	3
rated breaking current I_c (p.f. = 0.35)	A (rms value)	320 (p.f. = 0.45)	320	750	1200	1890
rated operational current I_e for						
AC-21B,	A	160	160	250	400	630
AC-22B	A	100	100	250	400	630
AC-23B	A	40	40	–	–	–
at 690 V AC, with fuse links or isolating links	Size	000	00	1	2	3
rated breaking current I_c (p.f. = 0.35)	A (rms value)	200/240 (p.f. = 0.45/0.95)	200/240 (p.f. = 0.45/0.95)	375	600	945
rated operational current I_e for						
AC-21B,	A	160	160	250	400	630
AC-22B	A	50	50	–	–	–
AC-23B	A	25	25	–	–	–
at 220 V/240 V DC, with fuse links [2][4][5] or isolating links	Size	000	00	1	2	3
rated operational current I_e at						
220 V DC-23B/DC-21B	A	80/160	80/160	–	–	–
440 V DC-21B	A	–	–	250	400	630

1) 125/160 A only with 3NY1 236 supply terminals and with 3NY1 822 (125 A) and 3NY1 824 (160 A) 21 mm-wide fuse links; see accessories.

2) When switching without load (AC-20 B, DC-20 B), direct voltages up to 690 V DC can be applied.

3) For safety monitoring max. 690 V.

4) For degree of soiling 2, the disconnectors can be used up to 1000 V AC-20 B, DC-20 B (switching without load).

5) Conducting paths in series: 3 for 3NP40; 2 for 3NP42, 3NP43 and 3NP44.

Technical specifications

Type		3NP40 1	3NP40 7	3NP42 7	3NP43 7	3NP44 7
Standards		IEC 60947-1, IEC 60947-3, EN 60947-1, EN 60947-3				
Capacitor switching capacity						
at 400 V AC						
capacitor rating	kvar	50	50	–	–	–
rated current I_n	A	72	72	–	–	–
at 525 V AC						
capacitor rating	kvar	50	50	–	–	–
rated current I_n	A	55	55	–	–	–
Permissible ambient temperature	°C	–25 ... +55 [1] for operation, –50 ... +80 for storage				
Mechanical lifetime	Operating cycles	2000	2000	1600	1000	1000
Degree of protection (operator side)						
without insulating cover/cable lug cover		IP00 (3NP40 with box terminal and properly connected conductors: IP20)				
with insulating cover/cable lug cover		IP30 (switch closed), IP20 (switch open)				
Power dissipation of switch at I_{th} (plus power dissipation of fuse links)						
without busbar adapter	W	4.5 (at 100 A)	10	15	30	47
with busbar adapter	W	8.5 (at 100 A)	20	47	83	127
Main conductor connection						
flat termination for lug, max. conductor cross-section (stranded)	mm^2	–	up to 2 × 70 (M8)	up to 150 (M10)	up to 240 (M10)	up to 2 × 240 (M12)
box terminal/terminal (finely stranded with end sleeve)	mm^2	1.5 ... 50 (35)	2.5 ... 70 (50)	70 ... 150	120 ... 240	150 ... 300
power rail (width × thickness)	mm	–	22 × 5	22 ... 30 × 5 ... 10	22 ... 30 × 5 ... 10	25 ... 40 × 5 ... 10
laminated Cu strips, non-perforated in terminals (width × thickness)	mm	8 × 8	up to 9 × 8	up to 16 × 8	up to 20 × 10	up to 24 × 10
Tightening torque for terminal screws						
for flat termination	Nm	–	10 ... 12	25	25	30
with SIGUT box terminal/terminal	Nm	3 ... 3.5	8 ... 10	6	8	8
Auxiliary switch 1 CO (accessories)						
3NY3 035 50 Hz/60 Hz to 230 V AC rated operational current I_e for AC-14	A	0.25 (I_{th} = 5 A), at 24 V DC: I_e = 0.45 A; flat connectors according to DIN 46244: A 2.8 × 0.5				
3NY3 030 50 Hz/60 Hz to 230 V AC rated operational current I_e for AC-13	A	0.1 (I_{th} = 0.1 A); quick-connect terminal according to DIN 46245: A 2.8 – 1				
Permissible mounting position		vertical or horizontal installation (no reduction of specified switching capacity)				

1) Only with isolating links; otherwise, please observe specifications of fuse manufacturer.

Technical specifications

Type		3NP50	3NP52	3NP53	3NP54
Standards		IEC 60947-1, IEC 60947-3, EN 60947-1, EN 60947-3			
Rated continuous current I_u for fuse links acc. to DIN 43620 (when using semiconductor fuse links, reduction of rated current required)	A Size	160 00	250 1 and 0	400 2 and 1	630 3 and 2
Conventional free air thermal current I_{th}	A	160	250	400	630
Rated operational voltage U_e 50 Hz/60 Hz AC DC	V V	690 440 (3 conducting paths in series), 220 (2 conducting paths in series and for fuse monitoring through 3RV)			
Rated insulation voltage U_i	V	690 [1]	690 [1]	690 [1]	690 [1]
Rated impulse voltage U_{imp}	kV	6	6	6	6
Rated conditional short-circuit current with fuses (by fast switch on)					
with fuse links rated current at 500 V AC	Size/A kA (rms value)	00/160 50	1/250 50	2/400 50	3/630 50
permissible let-through current of the fuses	kA (peak value)	15	25	40	50
Short-circuit strength with fuses (with closed disconnector)					
with fuse links rated current at 500 V AC	Size/A kA (rms value)	00/160 100	1/250 100	2/400 50	3/630 50
maximum permissible let-through I^2t value	kA^2s	223	780	2150	5400
permissible let-through current of the fuses	kA (peak value)	23	32	40	60
Rated short-circuit making capacity with isolating links [2] at 500 V AC	Size kA (peak value)	00 6	1 17	2 17	3 17
Rated making and breaking capacity [2] (incoming supply from top or bottom) [3]					
at 400 V AC, with fuse links breaking current I_c (p.f. = 0.35) rated operational current I_e for AC-21B, AC-22B, AC-23B	Size A (rms value) A	00 1600 160	1 / 0 2500 / 1600 250 / 160	2 / 1 4000 / 2500 400 / 250	3 / 2 5040 / 4000 630 / 400
at 500 V AC, with fuse links breaking current I_c (p.f. = 0.35) rated operational current I_e for AC-21B, AC-22B, AC-23B	A (rms value) A	1300 160	2500 / 1600 250 / 160	4000 / 2500 400 / 250	5040 / 4000 400 / 400
at 690 V AC, with fuse links breaking current I_c (p.f. = 0.35) rated operational current I_e for	A (rms value)	800	1280 / 1000	2520 / 1600	3200 / 2520
AC-21B, AC-22B AC-23B	A A	160 100	250 / 160 160 / 125	400 / 250 315 / 200	630 / 400 400 / 315
at 220 V DC, with fuse links breaking current I_c (L/R = 15 ms) rated operational current I_e for DC-23B	A A	640 160	1000 / 640 250 / 160	1600 / 1600 250 / 250	2520 / 1600 400 / 400
Switching capacity with isolating links [4] (incoming supply from top or bottom) [4]					
at 400 V AC, with isolating links breaking current I_c (p.f. = 0.35) rated operational current I_e for	Size A (rms value)	00 1600	1 2500	2 2500	3 4000
AC-21B, AC-22B AC-23B	A A	160 160	250 250	400 315	630 500
at 500 V AC, with isolating links breaking current I_c (p.f. = 0.35) rated operational current I_e for	A (rms value)	1300	2500	2500	4000
AC-21B, AC-22B AC-23B	A A	160 160	250 250	400 315	630 500
at 690 V AC, with isolating links breaking current I_c (p.f. = 0.35) rated operational current I_e for	A (rms value)	800	1280	1600	2520
AC-21B, AC-22B AC-23B	A A	160 100	250 160	400 200	630 315
at 220 V DC, with isolating links breaking current I_c (L/R = 15 ms) rated operational current I_e for DC-23B	A A	640 160	1000 200	1600 400	1600 400
Switching capacity for horizontal installation up to 690 V AC-22B		no reduction of the specified switching capacity (values for 230 to 690 V AC on request)			

1) U_i = 1000 V is possible when maintaining pollution degree 2 (instead of 3).

2) Rated making and breaking current according to IEC 60947-3:
Rated making current I = 10 × I_e (AC-23); 3 × I_e (AC-22); 1.5 × I_e (AC-21);
Rated breaking current I_e = 8 × I_e (AC-23); 3 × I_e (AC-22); 1.5 × I_e (AC-21).

3) When electronic fuse monitors are used, infeed must be from the top.

4) Use silver-plated isolating links.

Technical specifications

Type		3NP50	3NP52	3NP53	3NP54
Capacitor switching capacity					
at 400 V AC					
capacitor rating	kvar	80	90	150	250
rated current I_n	A	116	130	216	361
at 525 V AC					
capacitor rating	kvar	100	125	200	300
rated current I_n	A	110	137	220	330
Permissible ambient temperature	°C	– 25 ... + 55 for operation [1], – 50 ... + 80 for storage			
Mechanical lifetime	Operating cycles	1600			
Degree of protection					
without molded-plastic cover		IP00 [2]			
with insulating cover and					
closed fuse carrier on the operator side		IP30			
with open handle unit		IP10			
Power loss of the switch at I_{th}					
(plus power dissipation of the fuse links)					
without busbar adapter	W	7.8 (16.3) [3]	7.5	15	39
Main conductor connection					
cable lug, max. conductor cross-section (stranded)	mm^2	2.5 ... 120	6 ... 150	6 ... 240	6 ... 2 × 240
busbar	mm	16 ... 22	22 ... 30	22 ... 30	22 ... 30
clamp connections	mm^2	2.5 ... 50	35 ... 120	–	–
Tightening torque					
with cable lug	Nm	18 ... 22	25 ... 30	25 ... 30	25 ... 30
with power rail	Nm	18 ... 22	25 ... 30	25 ... 30	25 ... 30
with clamp connection	Nm	9 ... 11	5 ... 6	–	–
Terminal screws					
with cable lug		M 8	M 10	M 10	M 10
with power rail		M 8	M 10	M 10	M 10
with clamp connection		M 8	2 × M 6	–	–
Ground terminal					
lug according to DIN 46234	mm^2	–	2.5 ... 70	6 ... 2 × 70	6 ... 2 × 120
busbar	mm	–	25	25	30
terminal screws		–	M 8	M 10	M 10
Auxiliary switch 1 NO + 1 NC (accessories)					
(the same voltage potential must be applied to both NO and NC contact)					
at 50 Hz/60 Hz to 400 V AC, rated operational current I_e at AC-12/AC-15	A	16/6			
flat connector (DIN 46244)		A 6.3–0.8			
Permissible mounting position		vertical or horizontal installation (switching capacity is sometimes reduced with horizontal installation)			
Fuse monitor with 3RV circuit-breaker		see circuit-breaker			
Electronic fuse monitoring					
rated voltage 50 Hz/60 Hz AC	V	400 –15% ... 500 V +10%, self-powered (incoming supply from top)			
max. making current	A	20			
continuous current	A	5			
breaking current	A	5			
switching capacity	VA	1000			
short-circuit strength (1 ms)	A	100			
response time	s	< 1			
temperature range (operation)	°C	–10 ... +75			
plug-in connectors/connections		6-pole			
minimum potential difference required between top and bottom connections of the switch (e.g. for use in meshed systems)	V	> 10			
Signal contact for electronic fuse monitoring		2 NO + 1 NC			
rated operational current I_e					
at 250 V, DC-13	A	0.27			
at 240 V, AC-15	A	1.5			
rated free air thermal current I_{th}	A	5			

1) When using isolating links. If using fuse links, please observe specifications of fuse manufacturer.

2) For 3NP52 with clamp connection, degree of protection IP10.

3) With busbar adapter.

LV HRC fuse switch disconnectors for power distribution

Selection and ordering data

	Rated uninterrupted current I_u	Connection type (double-ended) Connection	for conductor cross-section	For fuse links according to DIN 43620 [1]	For isolating links [2]	**Degree of protection IP00, without fuse links, without isolating links, with terminal screws** Order No.	Weight 1 item	PS*/ P. unit
	A		mm^2	Size			kg	Items
	for mounting and installation							
	up to 160 A, also clip-on for mounting rail							
3NP40 10	160 [3]	Box terminal	1.5–50	000 [4]	00	**3NP40 10–0CH01**	0.512	1
	160	Flat termination	up to 2 × 70 (M 8)	00 and 000	00	**3NP40 70–0CA01**	0.749	1
		Box terminal	2.5–70 or 2 × 2.5-16			**3NP40 70–0CH01**	0.800	1
	250	Flat termination	up to 150 (M 10)	1 and 0	1 and 0	**3NP42 70–0CA01**	2.430	1
	400	Flat termination	up to 240 (M 10)	2 and 1	2 and 1	**3NP43 70–0CA01**	3.610	1
	630	Flat termination	up to 2 × 240 (M 12)	3 and 2	3 and 2	**3NP44 70–0CA01**	4.980	1
	for snapping onto busbar system, busbar center-to-center clearance 40 mm							
	Rails of width 12 mm or 15 mm and thickness 5 mm or 10 mm [5]							
3NP40 70	• with adapter, deep, e.g. for installation in ALPHA meter cabinets (ALPHA 400-ZS) and ALPHA distribution boards (STAB/SIKUS)							
	160 [3]	Box terminal	1.5–50					
			• Connection, top	000 [4]	00	**3NP40 15–0CK01**	0.952	1
			• Connection, bottom			**3NP40 15–0CJ01**	0.970	1
	160	Flat termination	up to 2 × 70 (M 8)					
			• Connection, top	00 and 000	00	**3NP40 75–0CE01**	1.210	1
			• Connection, bottom			**3NP40 75–0CF01**	1.240	1
		Box terminal	2.5–70 or 2 × 2.5-16					
			• Connection, top	00 and 000	00	**3NP40 75–0CK01**	1.290	1
			• Connection, bottom			**3NP40 75–0CJ01**	1.270	1
	• with adapter, flat, according to DIN 43620 Part 6, for general applications and ALPHA distribution boards (STAB/SIKUS)							
3NP42 70	160 [3]	Box terminal	1.5–50					
			• Connection, top	000 [4]	00	**3NP40 15–1CK01**	0.892	1
			• Connection, bottom			**3NP40 15–1CJ01**	0.888	1
	160	Flat termination	up to 2 × 70 (M 8)					
			• Connection, top	00 and 000	00 and 000	**3NP40 75–1CE01**	1.180	1
			• Connection, bottom			**3NP40 75–1CF01**	1.180	1
		Box terminal	2.5–70 OR 2 × 2.5-16					
			• Connection, top	00 and 000	00 and 000	**3NP40 75–1CK01**	1.260	1
			• Connection, bottom			**3NP40 75–1CJ01**	1.210	1
	250	Flat termination	up to 240 (M 10)					
			• Connection bottom or top	1 and 0	1 and 0	**3NP42 75–1CG01**	3.710	1
	for snapping onto busbar system, busbar center-to-center clearance 60 mm							
	Rails of width 12 mm to 30 mm and thickness 5 mm or 10 mm [5] flat, T and I profiles, as well as on Rittal PLS systems.							
3NP40 16	160 [3]	Box terminal [6]	1.5–50					
			• Connection, top	000 [4]	00	**3NP40 16–1CK01**	0.916	1
			• Connection, bottom			**3NP40 16–1CJ01**	0.950	1
	160	Flat termination	up to 2 × 70 (M 8)					
			• Connection, top	00 and 000	00	**3NP40 76–1CE01**	1.200	1
			• Connection, bottom			**3NP40 76–1CF01**	1.200	1
		Box terminal [6]	2.5–70 OR 2 × 2.5-16					
			• Connection, top	00 and 000	00	**3NP40 76–1CK01**	1.290	1
			• Connection, bottom			**3NP40 76–1CJ01**	1.240	1
	250	Flat termination	up to 150 (M 10)					
			• Connection, bottom or top	1 and 0	1 and 0	**3NP42 76–1CG01**	3.710	1
	400	Flat termination	up to 240 (M 10)					
			• Connection, bottom or top	2 and 1	2 and 1	**3NP43 76–1CG01**	5.440	1
	630	Flat termination	up to 2 × 240 (M 12)					
			• Connection, bottom or top	3 and 2	3 and 2	**3NP44 76–1CG01**	7.680	1
3NP42 76								

For all fuse switch disconnectors with flat terminations, use the relevant cable lug covers (3NY7 101 to 3NY7 141) in order to ensure protection against finger touch according to VBG4, see accessories.

1) See LV HRC fuse links

2) Use silver-plated isolating links.

3) 125/160 A only possible with 3NY1 822 (125 A) and 3NY1 824 (160 A) 21 mm fuse links, see accessories.

4) Corresponds to size 00 with maximum width 21 mm (according to IEC 60269-2-1 and DIN 43620).

5) For mounting on 5 mm thick busbars, a bar thickness compensation is required for 3NP42 and 3NP43, see accessories. 3NP44 can only be mounted on 10 mm thick busbars!

6) No further cover required for 3NP40 with box terminal.

*** You can order this quantity or a multiple thereof.**

Selection and ordering data

with fuse monitoring through SIRIUS circuit-breaker [1) 2)]

	Rated uninterrupted current I_u	Connection type (double-ended) Connection	for conductor cross-section	For fuse links according to DIN 43620 [3)]	For isolating links [4)]	**Degree of protection IP00, without fuse links, without isolating links, with terminal screws** Order No.	Weight 1 item	PS*/ P. unit
	A		mm^2	Size	Size		kg	Items
for mounting and installation								
	up to 160 A, also clip-on for mounting rail							
	160	Flat termination	up to 2 × 70 (M 8)	00 and 000	00	**3NP40 70–0FA01**	1.270	1
		Box terminal	2.5–70 or 2 × 2.5-16			**3NP40 70–0FH01**	1.350	1
	250	Flat termination	up to 150 (M 10)	1 and 0	1 and 0	**3NP42 70–0FA01**	2.940	1
	400	Flat termination	up to 240 (M 10)	2 and 1	2 and 1	**3NP43 70–0FA01**	4.170	1
	630	Flat termination	up to 2 × 240 (M 12)	3 and 2	3 and 2	**3NP44 70–0FA01**	5.490	1
for snapping onto busbar system, busbar center-to-center clearance 40 mm								
	Rails of width 12 mm or 15 mm and thickness 5 mm or 10 mm [5)]							
	• with adapter, deep, e.g. for installation in ALPHA meter cabinets (ALPHA 400-ZS) and ALPHA distribution boards (STAB/SIKUS)							
	160	Flat termination	up to 2 × 70 (M 8)					
			• Connection, top	00 and 000	00	**3NP40 75–0FE01**	1.810	1
			• Connection, bottom			**3NP40 75–0FF01**	1.780	1
		Box terminal	2.5–70 or 2 × 2.5-16					
			• Connection, top	00 and 000	00	**3NP40 75–0FK01**	1.820	1
			• Connection, bottom			**3NP40 75–0FJ01**	1.830	1
	• With adapter, flat, according to DIN 43620 Part 6, for general applications and ALPHA distribution boards (STAB/SIKUS)							
	160	Flat termination	up to 2 × 70 (M 8)					
			• Connection, top	00 and 000	00 and 000	**3NP40 75–1FE01**	1.610	1
			• Connection, bottom			**3NP40 75–1FF01**	1.620	1
		Box terminal	2.5–70 or 2 × 2.5-16					
			• Connection, top	00 and 000	00 and 000	**3NP40 75–1FK01**	1.710	1
			• Connection, bottom			**3NP40 75–1FJ01**	1.630	1
	250	Flat termination	up to 240 (M 10)					
			• connection, top or bottom	1 and 0	1 and 0	**3NP42 75–1FG01**	4.210	1
for snapping onto busbar system, busbar center-to-center clearance 60 mm								
	Rails of width 12 mm to 30 mm and thickness 5 mm or 10 mm [5)] flat, T and I profiles, as well as on Rittal PLS systems.							
	160	Flat termination	up to 2 × 70 (M 8)					
			• Connection, top	00 and 000	00	**3NP40 76–1FE01**	1.670	1
			• Connection, bottom			**3NP40 76–1FF01**	1.890	1
		Box terminal	2.5–70 or 2 × 2.5-16					
			• Connection, top	00 and 000	00	**3NP40 76–1FK01**	1.750	1
			• Connection, bottom			**3NP40 76–1FJ01**	1.910	1
	250	Flat termination	up to 150 (M 10)					
			• Connection, bottom or top	1 and 0	1 and 0	**3NP42 76–1FG01**	4.170	1
	400	Flat termination	up to 240 (M 10)					
			• Connection, bottom or top	2 and 1	2 and 1	**3NP43 76–1FG01**	5.840	1
	630	Flat termination	up to 2 × 240 (M 12)					
			• Connection, bottom or top	3 and 2	3 and 2	**3NP44 76–1FG01**	8.230	1
with electronic fuse monitoring								
	Through electronic fuse monitoring for installation as a single unit 5TT3 170.							

For all fuse switch disconnectors with flat terminations, use the relevant cable lug covers (3NY7 101 to 3NY7 141) in order to ensure protection against finger touch according to VBG4, see accessories.

1) SIRIUS circuit-breaker as standard with auxiliary switch 1 NO+ 1 NC. On request 3NP40 7 also available with auxiliary switch 2 NO or 2 NC.

2) For 3NP40 7 with output socket for auxiliary switch, the signal lead must be ordered separately, see accessories. For 3NP41 to 3NP44, the auxiliary switch must be connected through the flat termination 2.8 mm × 0.5 mm according to DIN 46244-A.

3) See LV HRC fuse links

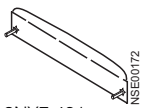
4) Use silver-plated isolating links.

5) For mounting on 5 mm thick busbars, a bar thickness compensation is required for 3NP42 and 3NP43, see accessories. 3NP44 can only be mounted on 10 mm thick busbars!

*** You can order this quantity or a multiple thereof.**

LV HRC fuse switch disconnectors for power distribution

Accessories

		For fuse switch disconnectors	Version	Order No.	Weight 1 item	PS*/ P. unit
					kg	Items
 3NY1 995	**Quick retaining plate** between 2 mounting rails according to EN 50022 and EN 50023					
	busbar center-to-center clearance, 125 mm	3NP40 10, 3NP40 70		**3NY1 995**	0.135	1
	busbar center-to-center clearance, 125 mm	3NP42 70		**3NY7 322**	0.249	1
	Cable lug covers and finger touch cover according to VBG 4 (1 set=2 pieces) for single mounting or 2 adapter devices	3NP40 7 with flat termination [1] 3NP42 7 3NP43 3NP44		**3NY7 101** **3NY7 121** **3NY7 131** **3NY7 141**	0.065 0.220 0.221 0.319	1 set 1 set 1 set 1 set
	Connection terminals (1 set=3 pieces)		conductor cross-section			
		3NP42 7	70 mm²–150 mm²	**3NY7 120**	0.333	1 set
		3NP43	120 mm²–240 mm²	**3NY7 130**	0.583	1 set
		3NP44	150 mm²–300 mm²	**3NY7 140**	0.725	1 set
 3NY7 102	**Triple terminal** (1 set = 3 items)		conductor cross-section • solid/stranded: 2.5 mm²–16 mm² • solid with end sleeve: 2.5 mm²–10 mm²			
	for mounting on box terminals	3NP40 1, 3NP40 7		**3NY7 102**	0.131	1 set
	for mounting on flat terminations	3NP40 7		**3NY7 105**	0.113	1 set
 3NY1 263	**3-phase busbar** modular width 90 mm = 5 MW	3NP40 1	for $I_{u\,max}$ = 225 A for 2 switch disconnectors	**3NY1 237**	0.265	1
 3NY1 237	permissible connection 25 mm² or supply terminal		for 3 switch disconnectors	**3NY1 238**	0.434	1
			for 4 switch disconnectors	**3NY1 438**	0.650	1
 3NY1 238			connecting bar	**3NY1 263**	0.267	1
	Cap for 1 blank space in 3NY1 238	3NP40 1		**3NY1 265**	0.012	1
	**Feeder terminal** (1 set = 3 items) for $I_{u\,max}$ = 225 A	3NP40 1	conductor cross-section • solid/stranded: 25 mm²–95 mm² • solid with end sleeve: 16 mm²–70 mm²	**3NY1 236**	0.262	1 set
 3NY7 481	**Overreaching protection**	3NP42 7, 3NP43, 3NP44		**3NY7 481**	0.021	1
	Sealing pin (1 Pack = 10 items)	3NP42 7, 3NP43, 3NP44		**3NY7 482**	0.056	10
	Busbar thickness compensation (1 assembly kit = 5 items) for 5 mm busbars only	3NP42 7, 3NP43		**3NY7 381**	0.064	1 set
	Handle unit gray with inscription label with voltage inspection holes	3NP40 1 3NP40 7		**3NY7 003** **3NY7 001**	0.160 0.220	1 1
 3NY3 035	**Auxiliary switch 1 CO** for sizes 000 and 00 with self-tapping screws for sizes 1 to 3 to clip on	3NP40 1 to 3NP44		**3NY3 035**	0.004	1
	Electronically optimized			**3NY3 030**	0.004	1
	Fuse links size 000 with non-insulated grip lugs, utilization category gL/gG for cable and line protection, overall width 21 mm according to IEC 60269-2-1 and DIN 43620	3NP40 1	400 V/125 A 400 V/160 A	**3NY1 822** **3NY1 824**	0.130 0.129	1 1
	Signal lead for connection to output socket of fuse monitor size 00					
	1-m cable with connector	3NP40 7		**3NY1 910**	0.097	1
	3-m cable with connector	3NP40 7		**3NY1 911**	0.261	1

1) The fuse switch-disconnector with mounted cable lug covers, together with molded-plastic masking frame for distributor/device field/incoming feeder unit, is easy to install in the meter center.

* You can order this quantity or a multiple thereof.

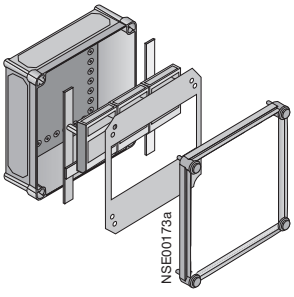
Accessories

Covers

	For fuse switch disconnectors	Height × Width	Order No.	Weight 1 item	PS*/ P. unit
		mm		kg	Items
for installation in any distribution boards [1]					
 3NY1 251 **Molded-plastic covers**	3NP40 1	215 × 130	**3NY1 251**	0.052	1
	3NP40 7 with box terminals	215 × 130	**3NY7 200**	0.037	1
	3NP40 7 with flat termination	215 × 130	**3NY7 201**	0.046	1
	3NP42 7	375 × 220	**3NY7 220**	0.112	1
	3NP43	375 × 245	**3NY7 230**	0.117	1
	3NP44	375 × 290	**3NY7 240**	0.125	1
for installation in ALPHA 400-ZS meter cabinets see "Installation and mounting" manual, Order No. E20001–P285–A526–V1.					
Molded-plastic covers for distributor/device field or suitable for incoming feeder unit in meter center (mounting on busbar)	2 × 3NP40 1	197 × 215.5	**3NY1 258**	0.063	1
	1 × 3NP40 1 left	197 × 215.5	**3NY1 262**	0.093	1
	1 × 3NP40 1 right	197 × 215.5	**3NY1 264**	0.091	1
	1 × 3NP40 7 left	208 × 229	**3NY7 500**	0.120	1
	1 ×	208 × 229	**3NY7 501**	0.120	1
	2 × 3NP40 7	208 × 229	**3NY7 502**	0.054	1
	3NP42 7	309 × 216	**3NY7 220**	0.112	1
	3NP43	375 × 245	**3NY7 230**	0.117	1
	3NP44	375 × 290	**3NY7 240**	0.125	1
for installation in ALPHA 160 and ALPHA 400 wall-mounted distribution boards (STAB 160/STAB 400) and ALPHA 630 floor-mounted distribution board (SIKUS 630)					
Molded-plastic covers for attachment on mounting plate or busbars for further information, see catalog ET A1 "ALPHA distribution boards"	1 × 3NP40 1 right	166 × 199	**3NY1 260**	0.082	1
	1 × 3NP40 1 left	166 × 199	**3NY1 261**	0.086	1
	2 × 3NP40 1	166 × 199	**3NY1 248**	0.036	1
	1 × 3NP40 7 left	208 × 229	**3NY7 500**	0.120	1
	1 × 3NP40 7 right	208 × 229	**3NY7 501**	0.120	1
	2 × 3NP40 7	208 × 236	**3NY7 502**	0.054	1
	3NP42 7	309 × 216 [2]	**3NY7 820**	0.113	1
	3NP43	375 × 245	**3NY7 230**	0.117	1
	3NP44	375 × 290	**3NY7 240**	0.125	1
for installation in STAB/SIKUS Universal 8GF					

Covers and fuse assemblies are available for all switch disconnectors for fuse links, sizes 000 to 3. Order Nos. and prices on request.

	For fuse switch disconnectors	8HP casing	Order No.	Weight 1 item	PS*/ P. unit
		Size		kg	Items
for installation in molded-plastic distribution system SENTRIC 8HP					
Molded-plastic covers for installation in 8HP complete casing with fuse switch disconnectors	1 × 3NP40 10	1	**8HP6 431**	0.221	1
	1 × 3NP40 70	1	**8HP6 422**	0.224	1
	2 × 3NP40 10	2	**8HP6 432**	0.465	1
	3 × 3NP40 10	2	**8HP6 432**	0.465	1
	1 × 3NP40 70	2	**8HP6 423**	0.230	1
	2 × 3NP40 70	2	**8HP6 424**	0.203	1
	1 × 3NP40 70	2.5	**8HP6 423**	0.230	1
	2 × 3NP40 70	2.5	**8HP6 424**	0.203	1
	1 × 3NP42 70	2.5	**8HP6 427**	0.250	1



See also; catalog "8HP molded-plastic distribution system", Order No. 8ZX1012-0HP54-5AB1.

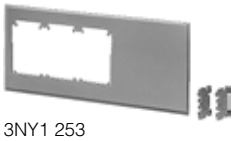
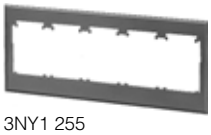
1) For installation in ALPHA wall and floor-mounted distributors and meters (STAB, SIKUS, SIPRO), special covers are sometimes required, see accessories.

2) The 3NY7 220 insulating cover (for installation in any distribution board) can also be used with 8GE3 818-0 mounting plate.

LV HRC fuse switch disconnectors for power distribution

Accessories

Covers

		For fuse switch disconnectors	Height × Width	Order No.	Weight 1 item	PS*/ P. unit
			mm		kg	Items
for installation in 8GD/8GA STAB-/SIKUS distribution board "Classic" see "Installation and mounting" manual Order No. E20001-P285-A526-V1.						
 3NY1 250	**Molded-plastic covers** for fixing between two mounting rails with 3NY1 995 quick retaining plate	1 × 3NP40 10 right with and without auxiliary switch	197 × 215.5	**3NY1 256**	0.116	1
		1 × 3NP40 10 left with and without auxiliary switch	197 × 215.5	**3NY1 257**	0.118	1
	in a field of width B1	2 × 3NP40 10 with and without auxiliary switch	197 × 215.5	**3NY1 258**	0.063	1
 3NY1 253	in a field of width B2/2	2 × 3NP40 10 with and without auxiliary switch	197 × 235	**3NY1 250**	0.075	1
	in a field of width B2	3 × 3NP40 10 with and without auxiliary switch (supports included in delivery)	197 × 485	**3NY1 253**	0.225	1
		4 × 3NP40 10 with and without auxiliary switch (supports included in delivery)	197 × 485	**3NY1 254**	0.188	1
 3NY1 255		5 × 3NP40 10 with and without auxiliary switch	197 × 485	**3NY1 255**	0.125	1
	Supports (1 set = 10 items) for 3NY1 253 and 3NY1 254 insulating covers	3NP40 1		**3NY1 271**	0.100	1 set
 3NY1 260	**Insulating cover** for snapping 3NP40 1 switch disconnectors onto mounting rails with special 8GD9 device holders and for mounting onto busbars (except 3NY1 247)	1 × 3NP40 1 right with and without auxiliary switch	166 × 199	**3NY1 260**	0.082	1
		1 × 3NP40 1 left with and without auxiliary switch	166 × 199	**3NY1 261**	0.086	1
 3NY1 247	in a field of width B1	2 × 3NP40 1 with and without auxiliary switch	166 × 199	**3NY1 248**	0.036	1
	in a field of width B2	5 × 3NP40 1 with and without auxiliary switch	166 × 469	**3NY1 247**	0.072	1
	Blanking cover (1 set = 10 items) for covering blank space in the 3NY1 2 insulating cover	3NP40 1	Width 90	**3NY1 270**	0.040	1 set
	Molded-plastic covers for attachment between two mounting rails	1 × 3NP40 7 left	208 × 219	**3NY7 800**	0.100	1
		1 × 3NP40 7 right	208 × 219	**3NY7 801**	0.120	1
	with 3NY1 995 quick retaining plate	2 × 3NP40 7	208 × 222	**3NY7 802**	0.060	1
	with 3NY1 322 quick retaining plate	1 × 3NP42 7	309 × 216	**3NY7 820**	0.113	1
	Molded-plastic covers for attachment to 8GD9 100 mounting plate	1 × 3NP40 7 left	208 × 229	**3NY7 500**	0.120	1
		1 × 3NP40 7 right	208 × 229	**3NY7 501**	0.120	1
		2 × 3NP40 7	208 × 236	**3NY7 502**	0.054	1
		1 × 3NP42 70	309 × 216 [1)]	**3NY7 820**	0.113	1
	Molded-plastic covers for attachment					
	to 8GD9 591 mounting plate	1 × 3NP43 70	375 × 245	**3NY7 230**	0.117	1
	to 8GD9 592 mounting plate	1 × 3NP44 70	375 × 290	**3NY7 240**	0.125	1

1) For mounting on 8GD9 590 mounting plate, the 3NY7 220 insulating cover can also be used.

* You can order this quantity or a multiple thereof.

Selection and ordering data

Completely compartmentalized, with high speed closing feature

	Rated uninterrupted current I_u	Connection type (double-ended) Connection	for conductor cross-section	For fuse links according to DIN 43620 [1]	For isolating links	Auxiliary switch on switch disconnector	**Degree of protection IP00, without fuse links, without isolating links, with terminal screws** Order No.	Weight 1 item	PS*/ P. unit
	A		mm^2	Size	Size	Version		kg	Items
for mounting and installation									
	160	Flat termination [6]	2.5–150 [2]	00 and 000	00	without [3] 1 NO + 1 NC	**3NP50 60–0CA00** **3NP50 60–0CA10**	1.600 1.650	1 1
		Clamp connections	1-wire 2.5–50 or 2-wire 1× 2.5–50 1× 2.5–35	00 and 000	00	without [3] 1 NO + 1 NC	**3NP50 60–0CB00** **3NP50 60–0CB10**	1.730 1.740	1 1
	250	Flat termination	6–150 [4]	1 and 0	1	without 1 NO + 1 NC	**3NP52 60–0CA00** **3NP52 60–0CA10**	5.470 5.490	1 1
		Clamp connections	35–120	1 and 0	1	without 1 NO + 1 NC	**3NP52 60–0CB00** **3NP52 60–0CB10**	5.600 5.810	1 1
	400	Flat termination	6–240 [4]	2 and 1	2	without 1 NO + 1 NC	**3NP53 60–0CA00** **3NP53 60–0CA10**	6.530 6.550	1 1
	630	Flat termination	6–2 × 240 [4]	3 and 2	3	without 1 NO + 1 NC	**3NP54 60–0CA00** **3NP54 60–0CA10**	7.940 7.950	1 1
for adaptation to busbar systems [5], busbar center-to-center clearance 40 mm									
		Rails of width 12 mm and thickness 5 mm or 10 mm							
	160	Flat termination	2.5–150 [2] Connection, bottom	00 and 000		without 1 NO + 1 NC	**3NP50 65–1CF00** **3NP50 65–1CF10**	2.380 2.370	1 1
		Clamp connections	1-wire 2.5–50 or 2-wire 1× 2.5–50 1× 2.5–35 connection, bottom	00 and 000		without 1 NO + 1 NC	**3NP50 65–1CG00** **3NP50 65–1CG10**	2.430 2.430	1 1
for adaptation to busbar systems [5], busbar center-to-center clearance 60 mm									
		Use switch version "Mounting and installation" and busbar adapter, see accessories.							

1) See LV HRC fuse links

2) According to DIN 46234 or 16 mm^2– 95 mm^2 according to DIN 46235 (use lug M 10 if required).

3) If auxiliary switch is retrofitted, additional drill holes are required on the switch.

4) According to DIN 46234 or DIN 46235; with lug according to DIN 46235: min. conductor cross-section 16 mm^2 (use lug M 12 if required).

5) For accessories and additional devices on busbar systems, see accessories and distribution board, busbar systems and switchgear.

6) For 3NP50 60 with flat terminations, the relevant 3NY1 106 cable lug covers must be used (see accessories) for the purpose of protection against accidental contact according to DIN VDE 0106 Part 100.

*** You can order this quantity or a multiple thereof.**

LV HRC fuse switch disconnectors for advanced technical demands

Selection and ordering data

Completely compartmentalized, with high speed closing feature with fuse monitoring through SIRIUS circuit-breaker [1]

	Rated uninterrupted current I_u	Connection type (double-ended) Connection	for conductor cross-section	For fuse links according to DIN 43620 [2]	Auxiliary switch on switch disconnector	Auxiliary switch on circuit-breaker	**Degree of protection IP00, without fuse links, without isolating links, with terminal screws** Order No.	Weight 1 item	PS*/ P. unit
	A		mm^2	Size	Version	Version		kg	Items
for mounting and installation									
	with plug-in connection of the auxiliary switch connecting cable (length approx. 1 m) to the circuit-breaker								
	160	Flat termination [6]	2.5–150 [3]	00 and 000	1 NO + 1 NC	1 NO + 1 NC	**3NP50 60–0EA86**	2.480	1
					1 NO + 1 NC	2 NO	**3NP50 60–0EA26**	2.550	1
		Clamp connections	1-wire	00 and 000	1 NO + 1 NC	1 NO + 1 NC	**3NP50 60–0EB86**	2.610	1
			2.5–50 2-wire 1× 2.5–50 1× 2.5–35		1 NO + 1 NC	2 NO	**3NP50 60–0EB26**	2.650	1
	250	Flat termination	6–150 [4]	1 and 0	1 NO + 1 NC	1 NO + 1 NC	**3NP52 60–0EA86**	6.010	1
					1 NO + 1 NC	2 NO	**3NP52 60–0EA26**	6.860	1
		Clamp connections	35–120	1 and 0	1 NO + 1 NC	1 NO + 1 NC	**3NP52 60–0EB86**	7.090	1
					1 NO + 1 NC	2 NO	**3NP52 60–0EB26**	6.650	1
	400	Flat termination	6–240 [4]	2 and 1	1 NO + 1 NC	1 NO + 1 NC	**3NP53 60–0EA86**	7.080	1
					1 NO + 1 NC	2 NO	**3NP53 60–0EA26**	5.410	1
	630	Flat termination	6–2 × 240 [4]	3 and 2	1 NO + 1 NC	1 NO + 1 NC	**3NP54 60–0EA86**	8.460	1
					1 NO + 1 NC	2 NO	**3NP54 60–0EA26**	9.230	1
for adaptation to busbar systems [5], busbar center-to-center clearance 40 mm									
	Rails of width 12 mm and thickness 5 mm or 10 mm								
	160	Flat termination	2.5–150 [3] Connection, bottom	00 and 000	1 NO + 1 NC	1 NO + 1 NC	**3NP50 65–1EF86**	2.900	1
					1 NO + 1 NC	2 NO	**3NP50 65–1EF26**	2.950	1
		Clamp connections	1-wire	00 and 000	1 NO + 1 NC	1 NO + 1 NC	**3NP50 65–1EG86**	3.020	1
			2.5–50 2-wire 1× 2.5–50 1× 2.5–35 connection, bottom		1 NO + 1 NC	2 NO	**3NP50 65–1EG26**	2.970	1
for adaptation to busbar systems [5], busbar center-to-center clearance 60 mm									
	Use switch version "Mounting and installation" and busbar adapter, see accessories.								

1) SIRIUS circuit-breaker on request, also auxiliary switch 2 NC.

2) See LV HRC fuse links.

3) According to DIN 46234 or 16 mm^2–95 mm^2 according to DIN 46235 (use lug M 10 if required).

4) According to DIN 46234 or DIN 46235; with lug according to DIN 46235: min. conductor cross-section 16 mm^2 (use lug M 12 if required).

5) For accessories and additional devices on busbar systems, see accessories and distribution board, busbar systems and switchgear.

6) For 3NP50 60 with flat terminations, the relevant 3NY1 106 cable lug covers must be used (see accessories) for the purpose of protection against accidental contact according to DIN VDE 0106 Part 100.

*** You can order this quantity or a multiple thereof.**

Selection and ordering data

Completely compartmentalized, with high speed closing feature
with electronic fuse monitoring ESÜ (self-powered) Version "A" (open-circuit principle) [1]
for rated operational voltage U_e from 400 V to 500 V
Incoming supply must come from above!

	Rated uninterrupted current I_u	Connection type (double-ended) Connection	for conductor cross-section	For fuse links according to DIN 43620 [2]	Auxiliary switch on switch disconnector	Auxiliary switch on fuse monitor	**Degree of protection IP00, without fuse links, without isolating links, with terminal screws** Order No.	Weight 1 item	PS*/ P. unit
	A		mm²	Size	Version	Version		kg	Items
for mounting and installation									
	with plug-in connection of auxiliary switch connecting cable (length approx. 1 m) for fuse monitoring status display: green LED illuminated, fault indication: green LED flashing fuse failure: red LED (display per phase)								
	160	Flat termination [5]	2.5–120 [3]	00 and 000	1 NO + 1 NC	2 NO + 1 NC	**3NP50 60–0HA13**	2.370	1
		Clamp connections	1-wire 2.5–50 2-wire 1× 2.5–50 1× 2.5–35	00 and 000	1 NO + 1 NC	2 NO + 1 NC	**3NP50 60–0HB13**	2.500	1
	250	Flat termination	6–150 [4]	1 and 0	1 NO + 1 NC	2 NO + 1 NC	**3NP52 60–0HA13**	5.860	1
	400	Flat termination	6–240 [4]	2 and 1	1 NO + 1 NC	2 NO + 1 NC	**3NP53 60–0HA13**	6.950	1
	630	Flat termination	6–240 [4]	3 and 2	1 NO + 1 NC	2 NO + 1 NC	**3NP54 60–0HA13**	8.510	1

1) Version "R" (closed-circuit principle) on request! (See also block diagram)

2) See LV HRC fuse links.

3) According to DIN 46234 or 16 mm²–95 mm² according to DIN 46235 (use lug M 10 if required).

4) According to DIN 46234 or DIN 46235; with lug according to DIN 46235: min. conductor cross-section 16 mm² (use lug M 12 if required).

5) For 3NP50 60 with flat terminations, the relevant 3NY1 106 cable lug covers must be used (see accessories) for the purpose of protection against accidental contact according to DIN VDE 0106 Part 100.

*** You can order this quantity or a multiple thereof.**

LV HRC fuse switch disconnectors for advanced technical demands

Selection and ordering data

Completely compartmentalized, with high speed closing feature with electronic fuse monitoring (self-powered) Version "A" (open-circuit principle) [1]
for rated operational voltage U_e from 400 V to 500 V
Incoming supply must come from above!

	Rated uninterrupted current I_u	Connection type (double-ended) Connection	for conductor cross-section	For fuse links according to DIN 43620 [2]	Auxiliary switch on switch disconnector	Auxiliary switch on fuse monitor	**Degree of protection IP00, without fuse links, without isolating links, with terminal screws** Order No.	Weight 1 item	PS*/ P. unit
	A		mm^2	Size	Version	Version		kg	Items
for adaptation to busbar systems [4], busbar center-to-center clearance 40 mm									
	Rails of width 12 mm and thickness 5 mm or 10 mm								
	160	Flat termination	2.5–120 [3] connection, bottom	00 and 000	1 NO + 1 NC	2 NO + 1 NC	**3NP50 65–1HF13**	2.770	1
for adaptation to busbar systems [4], busbar center-to-center clearance 60 mm									

Use switch version "Mounting and installation" and busbar adapter, see accessories.

1) Version "R" (closed-circuit principle) on request! (See also block diagram)

2) See LV HRC fuse links.

3) According to DIN 46234 or 16 mm^2–95 mm^2 according to DIN 46235 (use lug M 10 if required).

4) For accessories and additional devices on busbar systems, see accessories and components for distribution systems.

*** You can order this quantity or a multiple thereof.**

Accessories

		For fuse switch disconnectors	Height × Width mm	Order No.	Weight 1 item kg	PS*/ P. unit Items
for installation in any distribution board						
 3NY1 107	**Molded-plastic cover** for installation in cabinet	3NP50 with and without auxiliary switch	215 × 135	**3NY1 105**	0.045	1
		with auxiliary switch	215 × 135	**3NY1 115**	0.044	1
	Molded-plastic cover for installation in metal front panel	with and without auxiliary switch	220 × 160	**3NY1 125**	0.062	1
 3NY1 106	**Molded-plastic cover** for connection terminals	3NP50 with and without auxiliary switch	265 × 135	**3NY1 107**	0.073	1
	Molded-plastic cover for cable lug connections	3NP50 with and without auxiliary switch	290 × 135	**3NY1 106**	0.071	1
	Molded-plastic cover for separate covering of top and bottom cable lug connections	with auxiliary switch	290 × 135	**3NY1 116**	0.071	1
		3NP50 with and without auxiliary switch	290 × 135	**3NY1 108**	0.048	1
 3NY1 212	**Assembly kit for installation** with molded-plastic cover, fixing bracket and small components for switches with and without auxiliary switch	3NP50 60	250 × 149	**3NY1 208**	0.531	1
		3NP52 60	300 × 220	**3NY1 210**	0.287	1
		3NP53 60	300 × 245	**3NY1 211**	0.298	1
		3NP54 60	300 × 290	**3NY1 212**	0.313	1
 3TX6 546–3B	**Cover for cable lug connection** (1 set = 6 items) screw onto free screw end for protection against accidental contact	3NP52	cover length 99 mm	**3NY1 241**	0.205	1 set
		3NP53/3NP54 60	cover length 95 mm	**3TX6 546–3B**	0.260	1 set
			cover length 120 mm	**3NY1 245**	0.336	1 set
for installation in any distribution board						
 3NY1 907	**Clamp connections** (1 set = 3 items)		Conductor cross-section			
		3NP50	2.5–50 mm² [1]	**3NY1 903**	0.108	1 set
		3NP52	35–120 mm²	**3NY1 907**	0.225	1 set
 8US12 10–4AG00	**Busbar adapter** for 60-mm busbar system	3NP50	108 mm wide	**8US12 91–4SB00**	0.551	1
		3NP52, 3NP53.3 NP54 [2]	250 mm wide (length 320 mm, terminal screws M 10, connecting cables must be made up)	**8US12 10–4AG00**	3.060	1
	Sealing eye can be retrofitted (1 pack = 10 items)	3NP50		**3NY1 940**	0.010	1 set

1) Also available in 2-wire version: 1 × 2.5 mm² to 50 mm² and 1 × 2.5 mm² to 35 mm².

2) Switch is wider than adapter; however, this can be expanded to 276 mm using 2 8US19 98–2BM00 lateral modules.

* You can order this quantity or a multiple thereof.

LV HRC fuse switch disconnectors for advanced technical demands

Accessories

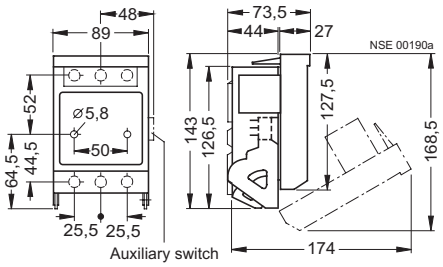
			For fuse switch disconnectors	Order No.	Weight 1 item kg	PS*/ P. unit Items
 3NY1 074	**Handle unit**		3NP50 6.–.C. .0	**3NY1 074**	0.620	1
			3NP52 60–.C. .0	**3NY1 371**	0.263	1
			3NP53 60–.C. .0	**3NY1 372**	1.510	1
			3NP54 60–.C. .0	**3NY1 373**	1.690	1
	with fuse monitoring through circuit-breaker 3RV1 (with auxiliary switch 1 NO + 1 NC), with plug-in connection, without connector and connecting cable		3NP50 6.–.E. .6	**3NY1 420**	1.400	1
			3NP52 60–.E. .6	**3NY1 421**	1.900	1
			3NP53 60–.E. .6	**3NY1 422**	1.980	1
			3NP54 60–.E. .6	**3NY1 423**	2.600	1
	Connector and connecting cable					
	1 m long		3NP5 with 3RV1	**3NY1 910**	0.097	1
	3 m long			**3NY1 911**	0.261	1
 3NY1 513–3	with electronic fuse monitoring for 400 V-500 V (with auxiliary switch 2 NO + 1 NC), with plug-in connection, without connector and connecting cable		3NP50 6.–.H .13	**3NY1 513–0**	1.230	1
			3NP52 60–.H .13	**3NY1 513–2**	2.130	1
			3NP53 60–.H .13	**3NY1 513–3**	2.140	1
			3NP54 60–.H .13	**3NY1 513–4**	0.325	1
 3NY1 915	Connector and connecting cable (6-pole) 3 m long		3NP5 with ESÜ	**3NY1 915**	0.372	1
	Strain relief assembly kit for control cable of		3NP5 with ESÜ	**3NY1 918**	0.024	1 set
	Auxiliary switch 1 NO + 1 NC					
 3NY3 033	with actuating cams, screws and washers (mounting kit)		3NP50 [1]	**3NY3 033**	0.015	1
 3NY3 034	with fixing bracket and screws (mounting kit)		3NP52–3NP54	**3NY3 034**	0.015	1
 3NY4 031	**Arc chamber** (for 3NP52, 3NP53 and 3NP54, 3 items each are required)		3NP50	**3NY4 031**	0.218	1
 3NY4 011			3NP52	**3NY4 011**	0.215	1
			3NP53, 3NP54	**3NY4 012**	0.240	1
	Molded-plastic covers as replacement for covers from assembly kits for installation (without fixing brackets and small components)	300 × 220 mm	3NY1 210	**3NY1 102**	0.071	1
		300 × 245 mm	3NY1 211	**3NY1 103**	0.075	1
		300 × 290 mm	3NY1 212	**3NY1 104**	0.084	1

1) If retrofitted, drill holes required.

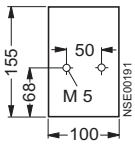
* You can order this quantity or a multiple thereof.

Dimensional drawings

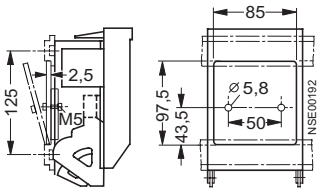
3NP40 10



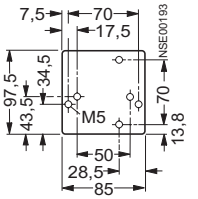
Cutout
for 3NP35
and 3NP40 10



3NP40 10
with 3NY1 995 quick retaining plate
mounting rail center-to-center
clearance 125 mm

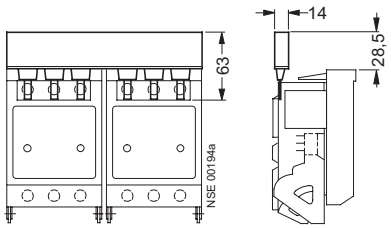


3NY1 995 quick fitting plate
for 3NP40 10 and 3NP40 70

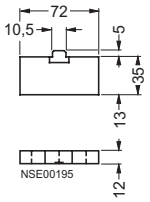


For installation
STAB 8GD wall-
mounted
distribution
boards,
upper
perforations
with 50 mm
clearance

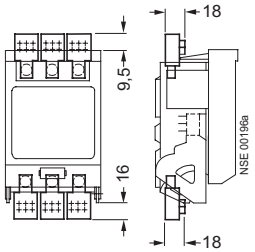
3NP40 10
with **3NY1 237** 3-phase busbar
for 2 fuse switch disconnectors



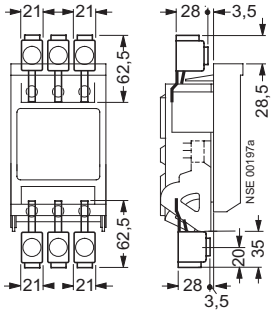
3NY1 265
cap
for 3NY1 238
3-phase busbar



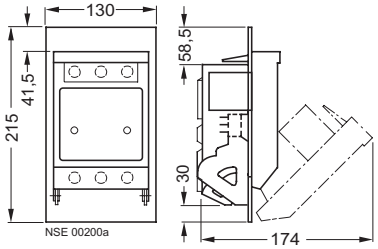
3NP40 10
with **3NY1 235** triple terminal



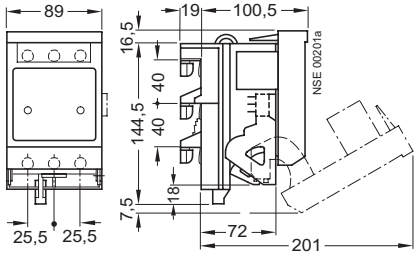
3NP40 10
with **3NY1 236** supply terminal



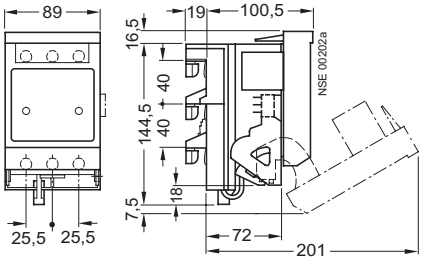
3NP40 10
with 3NY1 251 molded-plastic cover



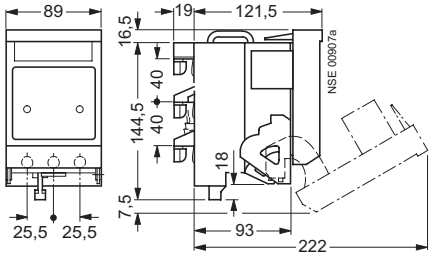
3NP40 15–1CJ01
with busbar adapter, flat, rails; width 12 mm or 15 mm
and thickness 5 mm or 10 mm, bottom connection



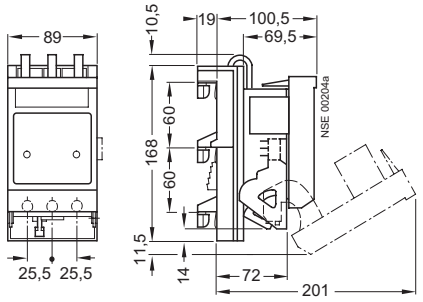
3NP40 15–1CK01
with busbar adapter, flat, rails; width 12 mm or 15 mm
and thickness 5 mm or 10 mm, top connection



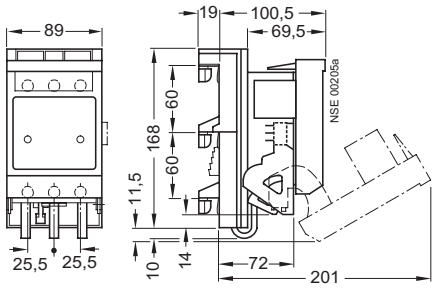
3NP40 15–0CJ01
with busbar adapter, deep, rails; width 12 mm or 15 mm
and thickness 5 mm or 10 mm, bottom connection



3NP40 16–1CJ01
with busbar adapter, rails of width 12, 15, 20 mm or
30 mm and thickness 5 mm or 10 mm, flat, T, I profiles and
other renowned busbar systems, bottom connection



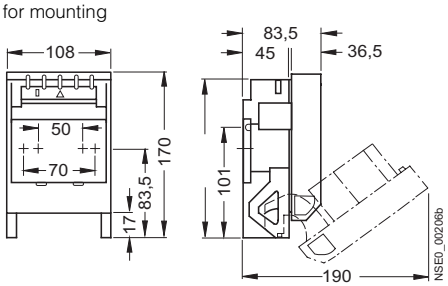
3NP40 16–1CK01
with busbar adapter, rails of width 12, 15, 20, 25 mm or
30 mm and thickness 5 mm or 10 mm, flat, T, I profiles and
other renowned busbar systems, top connection



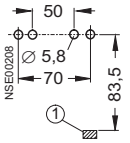
LV HRC fuse switch disconnectors

Dimensional drawings

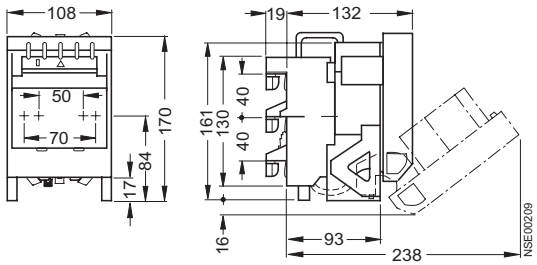
3NP40 70
for mounting



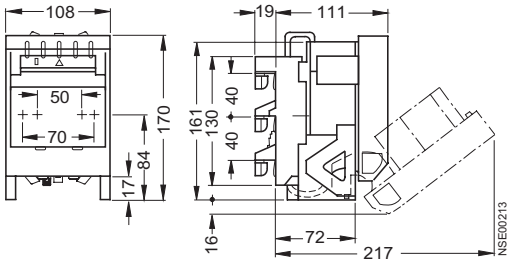
Drilling pattern for 3NP40 70



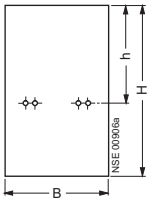
3NP40 75–0
with busbar adapter, deep,
rails of width 12 mm or 15 mm
and thickness 5 mm or 10 mm



3NP40 75–1
with busbar adapter, flat,
rails of width 12 mm or 15 mm
and thickness 5 mm or 10 mm



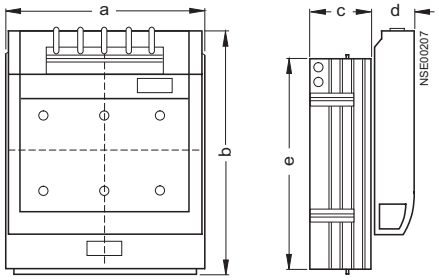
For metal frames
cutout for 3NP4



Type	Cover between assembly kit			Panel cutout min.		
	Type	B	H	B	H	h [1]
Insulating cover behind panel						
3NP40 1	3NY1 251	130	215	100	180	100
3NP40 7	3NY7 200, 3NY7 201	130	215	118	195	110
3NP42 7	3NY7 220	220	375	210	275	157
3NP43 7	3NY7 230	245	375	235	315	174
3NP44 7	3NY7 240	290	375	280	325	178
Insulating cover in front of panel						
3NP40 1	3NY1 251	130	215	100	155	87
3NP40 7	3NY7 200, 3NY7 201	130	215	118	195	110
3NP42 7	3NY7 220	220	375	198	275	157
3NP43 7	3NY7 230	245	375	224	315	174
3NP44 7	3NY7 240	290	375	270	325	178

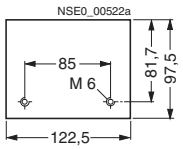
1) h = distance from upper edge of panel cutout to center of disconnector mounting.

3NP42 70, 3NP43 70, 3NP44 70
for mounting

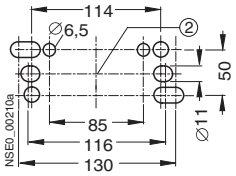


Type	a	b	c	d	e
3NP42 70	184	243	66	45.5	215
3NP43 70	210	288	80	48	255
3NP44 70	256	300	94.5	48	267

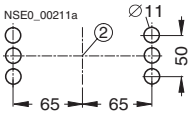
3NY73 22 quick retaining plate



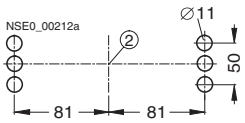
Drilling pattern for 3NP42 70



Drilling pattern for 3NP43 70

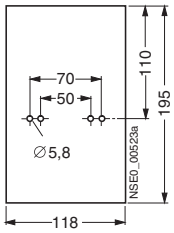


Drilling pattern for 3NP44

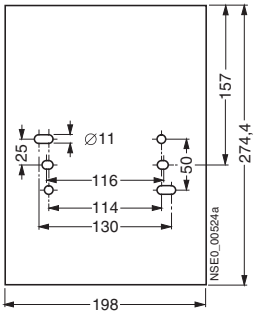


① Bottom edge disconnector-base
② Center disconnector-base

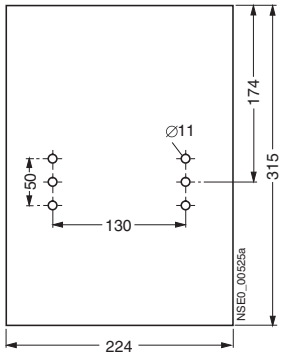
For plastic frame
Cutouts [2]
for 3NP40 70



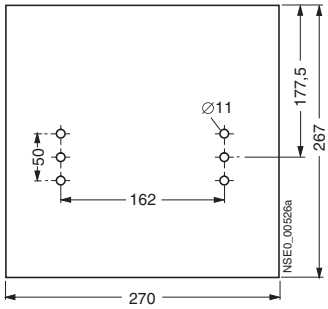
Cutouts [2]
for 3NP42



Cutouts [2]
for 3NP43



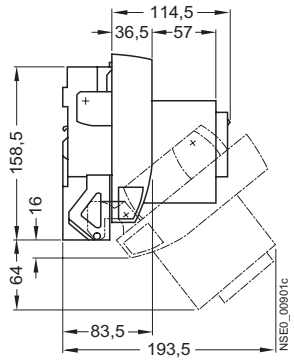
Cutouts [2]
for 3NP44



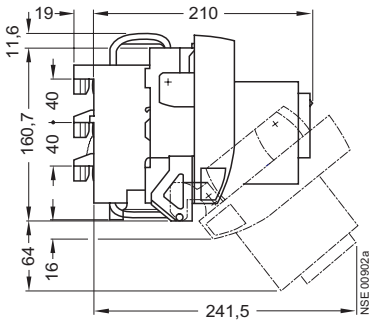
2) Cover is placed open on the switchgear cabinet panel, for cover behind control cabinet panel: cutout dimensions on request.

Dimensional drawings

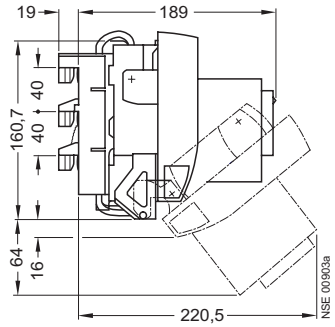
3NP40 70–0F
for mounting and installation



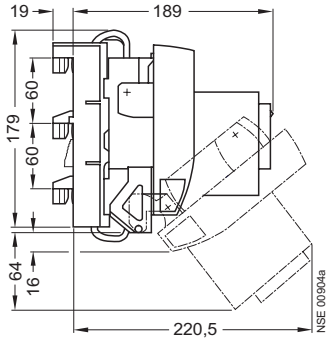
3NP40 75–0F
with busbar adapter, deep, 40 mm,
rails; width 12 mm or 15 mm
and thickness 5 mm or 10 mm



3NP40 75–1F
with busbar adapter, flat, 40 mm,
rails; width 12 mm or 15 mm
and thickness 5 mm or 10 mm



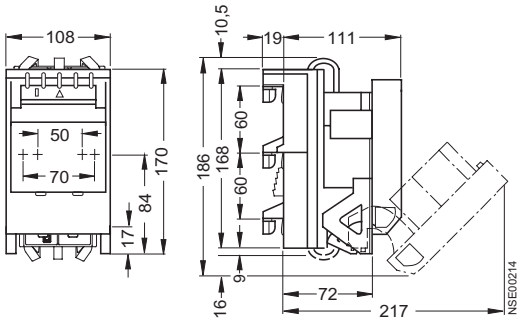
3NP40 76–0F
with busbar adapter, flat, 60 mm,
rails; width 12 mm or 30 mm
and thickness 5 mm or 10 mm



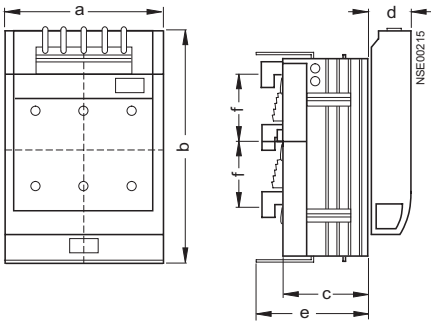
LV HRC fuse switch disconnectors

Dimensional drawings

3NP40 76–1
with busbar adapter,
rails; width 12 mm to 30 mm
and thickness 5 mm or 10 mm,
flat-, T and I profiles

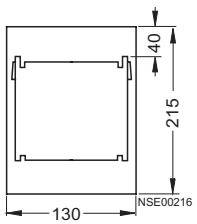


3NP42 75–1
3NP42 76–1
3NP43 76–1
3NP44 76–1
with busbar adapter,
rails; width 12 mm to 30 mm
and thickness 5 mm or 10 mm
flat, T and I profiles

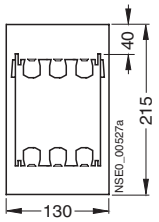


Type	a	b [1]	c	d	e	f
3NP42 75-1	184	243	83 [2]	45.5	111	40
3NP42 76-1	184	243	83 [2]	45.5	111	60
3NP43 76-1	210	288	97	48	125	60
3NP44 76-1	256	300	112	48	139	60

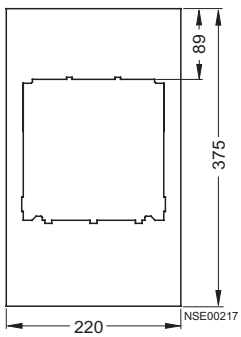
3NY7 200 molded-plastic cover
for 3NP40 7
for installation in any distribution boards



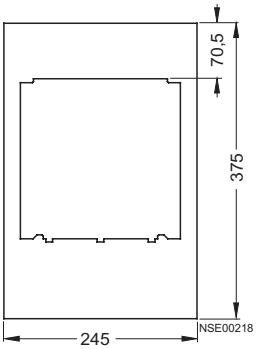
3NY7 201 molded-plastic cover
for 3NP40 7.-
for 3NP40 7.-CA01



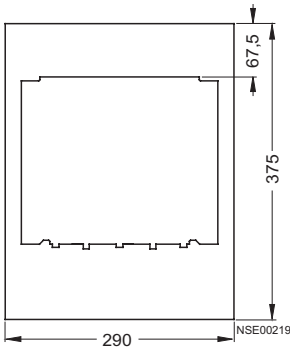
3NY7 220 molded-plastic cover
for 3NP42
for installation in any distribution boards



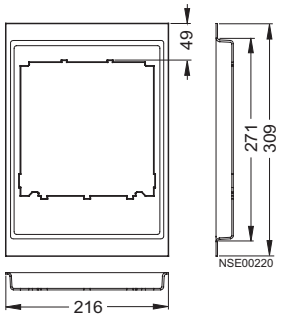
3NY7 230 molded-plastic cover
for 3NP43
for installation in any distribution boards



3NY7 240 molded-plastic cover
for 3NP44
for installation in any distribution boards



3NY7 820 molded-plastic cover
for 1 3NP42 70 switch-disconnector
for installation in STAB-/SIKUS distribution boards

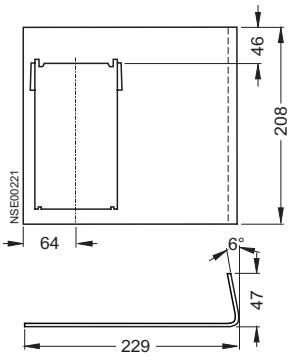


1) For VBG4 plus dimension c of cable lug covers (see page 1/153).

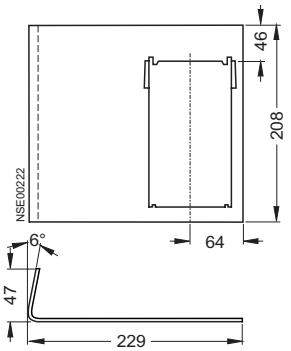
2) When installed together with size 000 or size 00 in STAB/SIKUS distribution boards, 3NY7 820 molded-plastic cover is used as a depth compensation (underneath).

Dimensional drawings

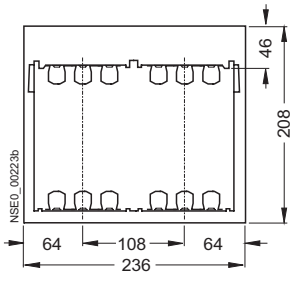
3NY7 500 molded-plastic cover
for 1 3NP40 switch-disconnector, left
for installation in SIKUS 3200-, STAB 160- and 400- and SIKUS 630 distribution boards



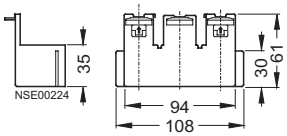
3NY7 501 molded-plastic cover
for 1 3NP40 switch-disconnector, right
for installation in SIKUS 3200-, STAB 160- and 400- and SIKUS 630 distribution boards



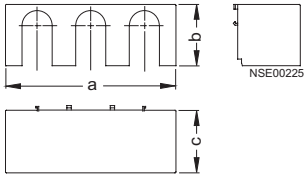
3NY7 502 molded-plastic cover
for 2x 3NP40 switch disconnectors
for installation in SIKUS 3200-, STAB 160- and 400- and SIKUS 630 distribution boards



Cable lug cover for 3NP40 7 with flat termination, 3NY7 101



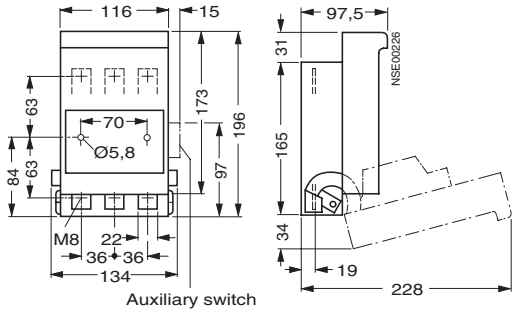
Cable lug cover for 3NP42 to 3NP44, 3NY7 121, 3NY7 131, 3NY7 141



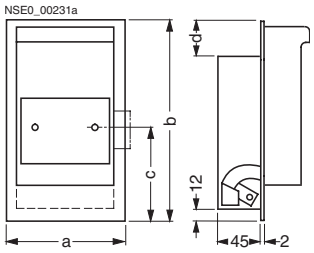
Type	a	b	c
3NY7 121	181	65	67
3NY7 131	207	79	50
3NY7 141	253	94	47

Dimensional drawings

3NP50 60, 160 A
for mounting

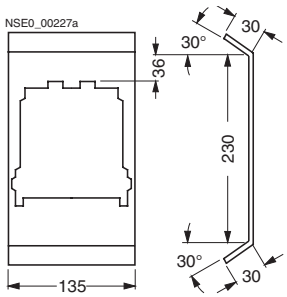


3NP50 60, 160 A
with molded-plastic cover
for any type of installation

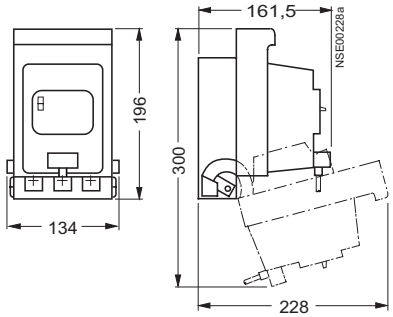


Type	a	b	c	d
3NY1 105	135	215	95.5	38
3NY1 115	135	215	95.5	38
3NY1 106	135	290	144.5	64
3NY1 108	135	290	144.5	64
3NY1 208	149	250	115	53.5

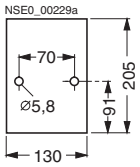
3NY1 107 molded-plastic cover



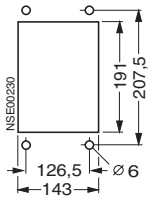
3NP50 60, 160 A
with fuse monitoring through 3RV1 circuit-breaker,
with plug-in connector



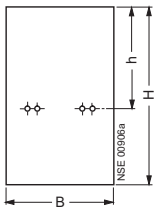
For plastic frame
Cutout
for 3NP50 60, with and
without auxiliary switch



Cutout
for 3NY1 208 mounting kit



For metal frames
Cutout for 3NP5



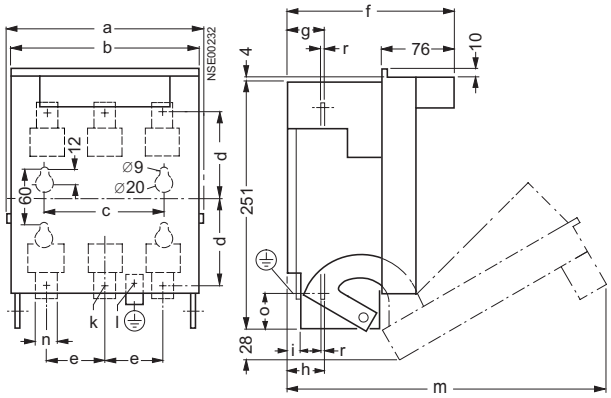
Type	Cover between assembly kit			Panel cutout min.		
	Type	B	H	B	H	h [1]
Molded-plastic cover behind panel						
3NP50 6	3NY1 105 [2]	135	215	130	206	115
3NP50 6	3NY1 125					
3NP52 6	3NY1 210	222	300	210	293	146
3NP53 6	3NY1 211	245	300	235	293	146
3NP54 6	3NY1 212	290	300	280	293	146
Molded-plastic cover in front of panel						
3NP50 6	3NY1 105	135	215	130	205	115
3NP50 6	3NY1 208	149	250	143	191	–
3NP52 6	3NY1 210	220	300	210	262	132
3NP53 6	3NY1 211	245	300	234	262	132
3NP54 6	3NY1 212	290	300	279	262	132

1) h = distance from upper edge of panel cutout to center of disconnector mounting.

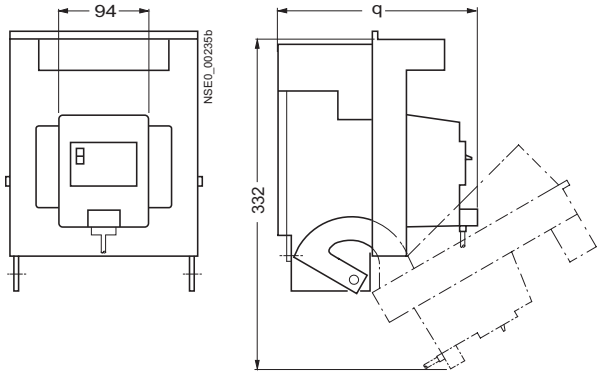
2) With standard molded-plastic cover behind panel and corresponding panel cutout, the standard switching capacity is reduced to the following AC 23B values: For 400 V I_e 160 V, at 500 V from I_e 160 V to 125 A and at 690 V from I_e 100 A to 50 A.

Dimensional drawings

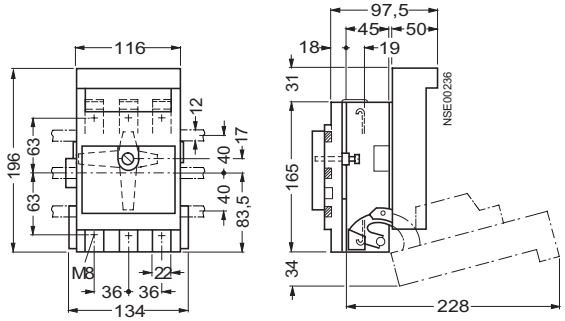
3NP5. 60, 250 to 630 A
for mounting



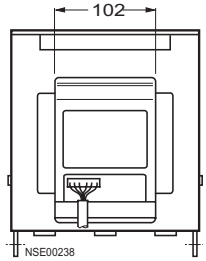
3NP5. 60, 250 to 630 A with fuse monitoring
through 3RV circuit-breaker, with plug-in connection



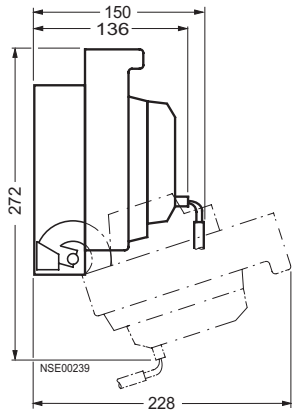
3NP50 65, 160 A with busbar adapter,
rails; width 12 mm and thickness 5 mm or 10 mm



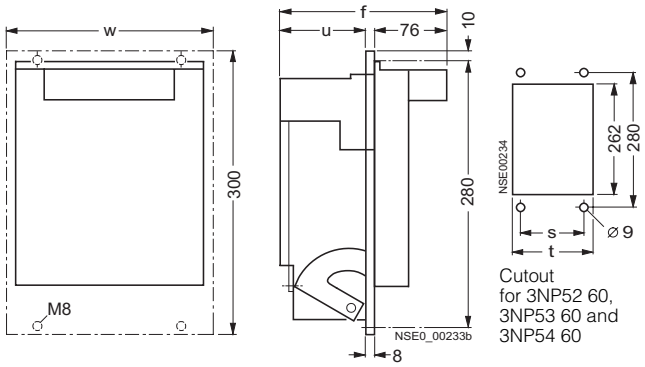
3NP5. 60, 160 to 630 A
with electronic fuse monitoring,
with plug-in connection and control cable



3NP50 60, 160 A
with electronic fuse monitoring,
with plug-in connection and control cable



3NP5. 60, 250 to 630 A
with molded-plastic cover, for installation



Cutout
for 3NP52 60,
3NP53 60 and
3NP54 60

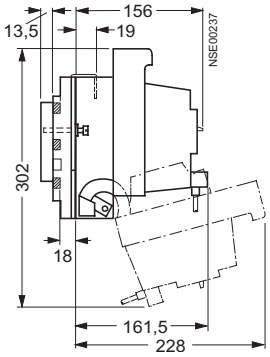
Type	a	b	c	d	e	f	g	h
3NP52 60	207	202	130	93	62	176	38	41
3NP53 60	231	226	130	106	70	192	39	39
3NP54 60	276	271	200	111	85	207	40.5	40.5

Type	l	k [1]	l [1]	m	n	o	q	r
3NP52 60	11.5	M 10	M 8	336	25	32	212	3.6
3NP53 60	11.5	M 10	M 10	352	25	25	228	4.4
3NP54 60	11.5	M 10	M 10	367	30	25	243	6

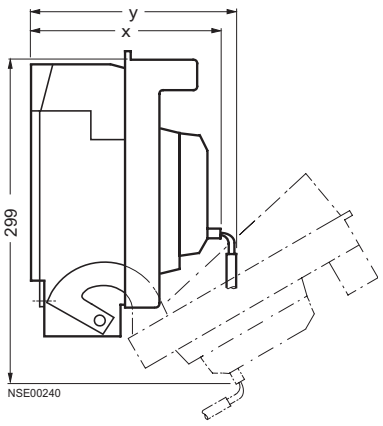
Type	s	t	u	w	x	y		
3NP52 60	156	210	89.5	220	186.5	200.5		
3NP53 60	180	234	105.5	245	202.5	216.5		
3NP54 60	225	279	120.5	290	217.5	231.5		

1) Through-hole for screw

3NP50 65, 160 A with busbar adapter,
with fuse monitoring through 3RV circuit-breaker,
with plug-in connection



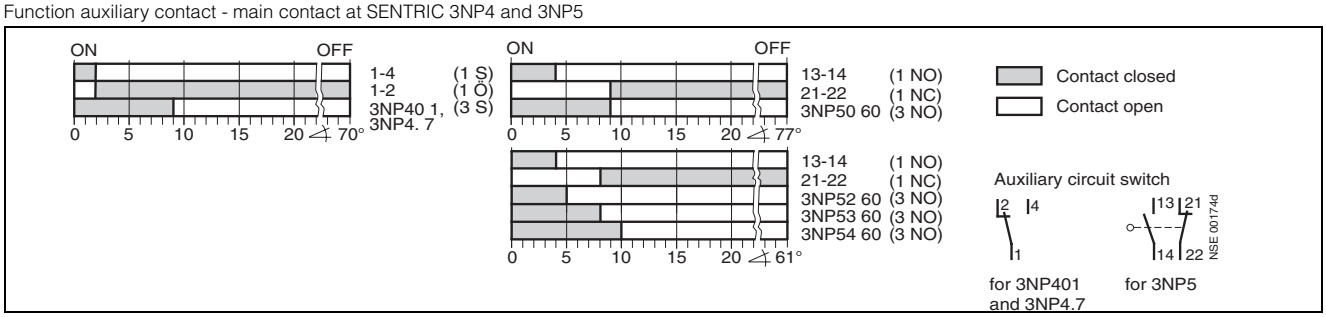
3NP5. 60, 250 to 630 A
with electronic
fuse monitoring,
with plug-in connection and control cable



LV HRC fuse switch disconnectors

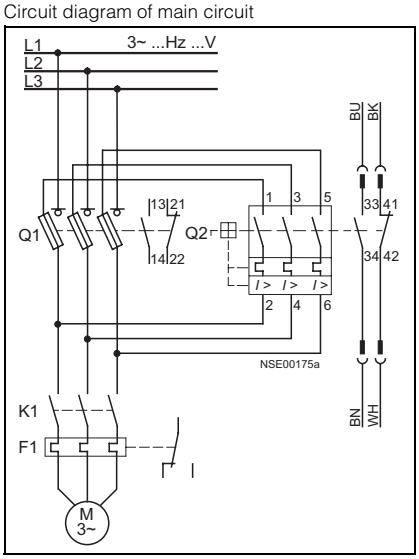
Schematics

Function auxiliary contact - main contact at SENTRIC 3NP4 and 3NP5

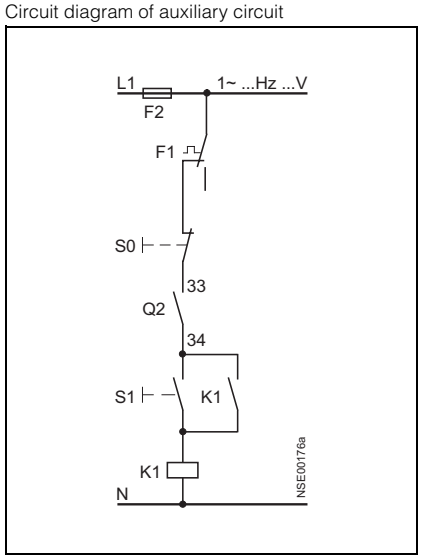


SENTRIC 3NP fuse switch disconnectors with fuse monitoring (with circuit-breaker 3RV1, with auxiliary switch 1 NO + 1 NC)

Circuit diagram of main circuit



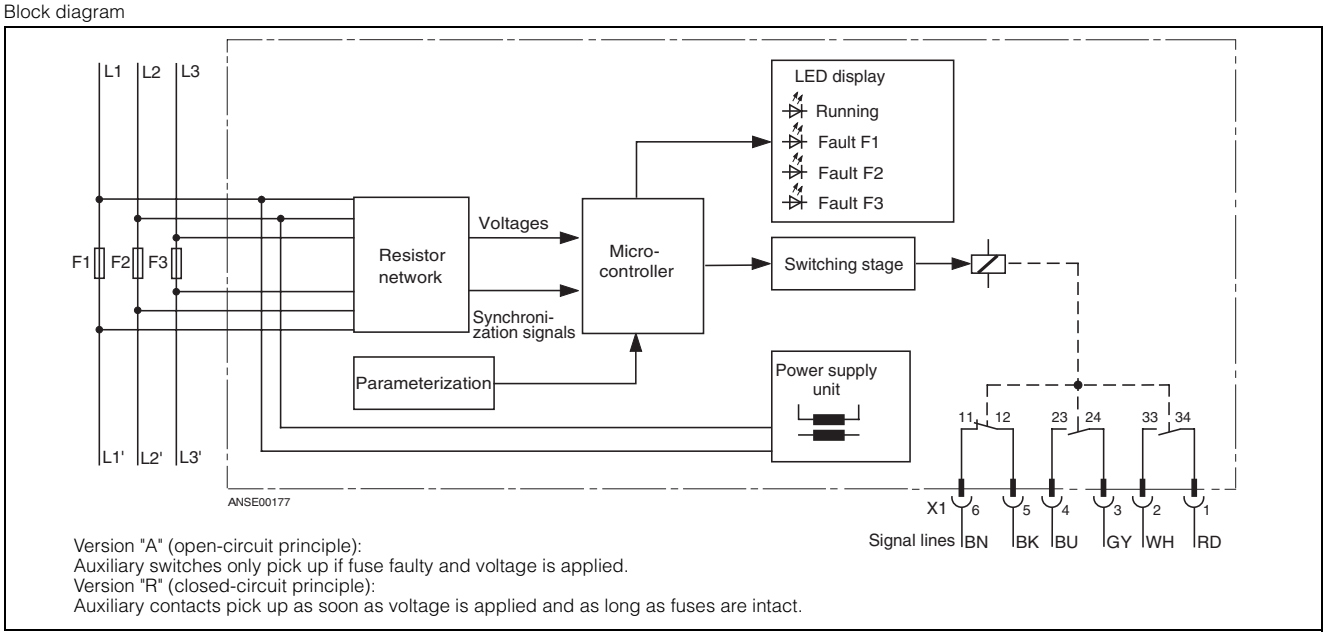
Circuit diagram of auxiliary circuit



Q1 = fuse switch disconnector
Q2 = circuit-breaker
K1 = contactor
S1 = ON pushbutton
S0 = OFF pushbutton
F1 = overload relay
F2 = control-circuit fuse

SENTRIC 3NP5 fuse switch disconnector with electronic fuse monitoring

Block diagram



Version "A" (open-circuit principle):
Auxiliary switches only pick up if fuse faulty and voltage is applied.
Version "R" (closed-circuit principle):
Auxiliary contacts pick up as soon as voltage is applied and as long as fuses are intact.

Overview

Cylindrical fuse links

SITOR cylindrical fuse links

Bases for cylindrical fuses

Cylindrical Fuse System

Product overview

Benefits

Application
Cylindrical fuses are used for line protection or for protecting switching devices. The design is used all over the world.

Disconnectors
Cylinder fuse bases are disconnectors that cannot be switched under load.

VDE mark
Cylindrical fuses are not included in the standard DIN VDE 0636-201, the German version of IEC 60269-2-1. Therefore this design did not receive the VDE mark.

Safety
No-voltage changing of the fuse links.

Signal detector
When a fuse link fails, an LED in the window of the fuse link flashes.

Technical specifications

Cylindrical fuse links					
Type		**3NW6 3..**	**3NW6 0..**	**3NW6 1..**	**3NW6 2..**
Size	mm × mm	8 × 32	10 × 38	14 × 51	22 × 58
Standards		IEC 60269-1, -2, -2-1 NF C 60-200, 63-210, 63-211 NBN C 63269-2en-2-1 CEI 32-4, -12			
Utilization category		gL/gG	gL/gG and aM		
Rated voltages U_n	V AC	400 or 500 (see selection table)			
Rated current I_n	A	0.5 ... 100			
Rated breaking capacity	kA AC	100, but 400 V versions: 20			
Mounting position		any, but preferably vertical			

Selection and ordering data

	Size	I_n	U_n	Utilization category gL/gG Order No.	Utilization category aM Order No.	Weight 1 item	PS*/ P. unit
	mm × mm	A	V AC			kg	Items
Cylindrical fuse links							
	8 × 32	2	400	**3NW6 302-1**	–	0.004	10
		4		**3NW6 304-1**	–	0.004	10
		6		**3NW6 301-1**	–	0.004	10
		10		**3NW6 303-1**	–	0.004	10
		16		**3NW6 305-1**	–	0.004	10
		20		**3NW6 307-1**	–	0.004	10
	10 × 38	0.5	500	–	**3NW8 000-1**	0.003	10
		1		–	**3NW8 011-1**	0.008	10
		2		**3NW6 002-1**	**3NW8 002-1**	0.008	10
		4		**3NW6 004-1**	**3NW8 004-1**	0.008	10
		6		**3NW6 001-1**	**3NW8 001-1**	0.008	10
		8		**3NW6 008-1**	**3NW8 008-1**	0.008	10
		10		**3NW6 003-1**	**3NW8 003-1**	0.008	10
		12		**3NW6 006-1**	**3NW8 006-1**	0.008	10
		16		**3NW6 005-1**	**3NW8 005-1**	0.008	10
		20		**3NW6 007-1**	**3NW8 007-1**	0.008	10
		25		**3NW6 010-1**	–	0.008	10
			400	–	**3NW8 010-1**	0.008	10
		32		**3NW6 012-1**	–	0.008	10
	14 × 51	2	500	–	**3NW8 102-1**	0.019	10
		4		**3NW6 104-1**	**3NW8 104-1**	0.019	10
		6		**3NW6 101-1**	**3NW8 101-1**	0.019	10
		8		**3NW6 108-1**	**3NW8 108-1**	0.019	10
		10		**3NW6 103-1**	**3NW8 103-1**	0.019	10
		12		**3NW6 106-1**	**3NW8 106-1**	0.019	10
		16		**3NW6 105-1**	**3NW8 105-1**	0.019	10
		20		**3NW6 107-1**	**3NW8 107-1**	0.019	10
		25		**3NW6 110-1**	**3NW8 110-1**	0.019	10
		32		**3NW6 112-1**	**3NW8 112-1**	0.019	10
		40		**3NW6 117-1**	**3NW8 117-1**	0.019	10
		50	400	**3NW6 120-1**	**3NW8 120-1**	0.019	10
	22 × 58	8	500	**3NW6 208-1**	–	0.051	10
		10		**3NW6 203-1**	**3NW8 203-1**	0.051	10
		12		**3NW6 206-1**	**3NW8 206-1**	0.051	10
		16		**3NW6 205-1**	**3NW8 205-1**	0.051	10
		20		**3NW6 207-1**	**3NW8 207-1**	0.051	10
		25		**3NW6 210-1**	**3NW8 210-1**	0.051	10
		32		**3NW6 212-1**	**3NW8 212-1**	0.051	10
		40		**3NW6 217-1**	**3NW8 217-1**	0.051	10
		50		**3NW6 220-1**	**3NW8 220-1**	0.051	10
		63		**3NW6 222-1**	**3NW8 222-1**	0.051	10
		80		**3NW6 224-1**	**3NW8 224-1**	0.051	10
		100	400	**3NW6 230-1**	**3NW8 230-1**	0.051	10

* You can order this quantity or a multiple thereof.

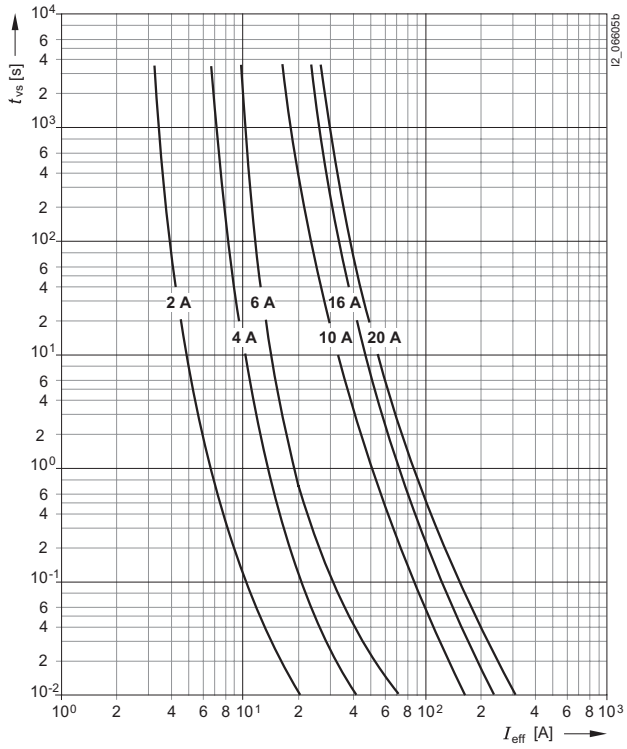
Cylindrical fuse links

Characteristic curves

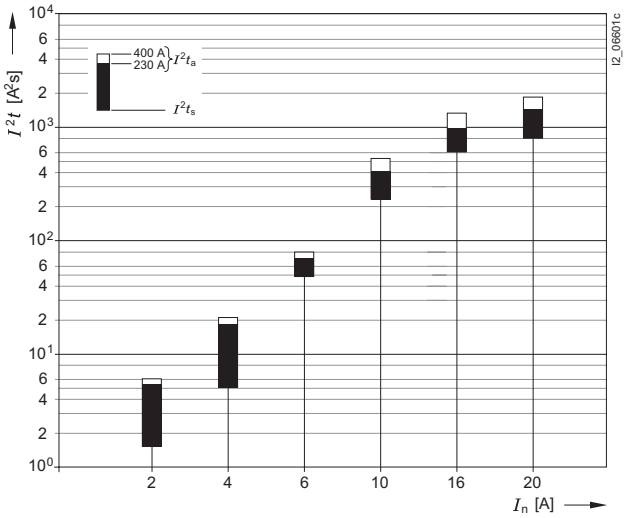
Series 3NW6 30.-1

Size: 8 mm × 32 mm
Utilization category: gL/gG
Rated voltage: 400 V AC
Rated current: 2 ... 20 A

Time/current characteristics diagram

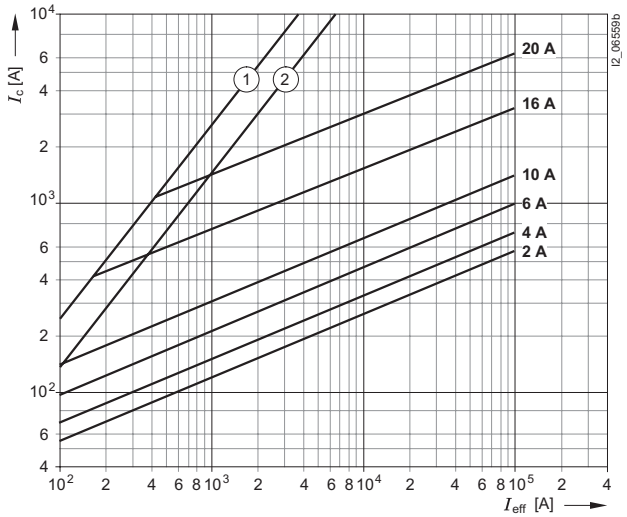


Melting I^2t_s values diagram



Type	I_n	P_v	$\Delta\vartheta$	I^2t_s 1 ms	I^2t_a 400 V AC
	A	W	K	A^2s	A^2s
3NW6 302-1	2	2	27	1.6	6
3NW6 304-1	4	1.5	19	5	21
3NW6 301-1	6	1.5	20.5	48	85
3NW6 303-1	10	0.7	15	230	530
3NW6 305-1	16	1.1	29	600	1400
3NW6 307-1	20	1.7	34.5	790	1800

Current limitation diagram



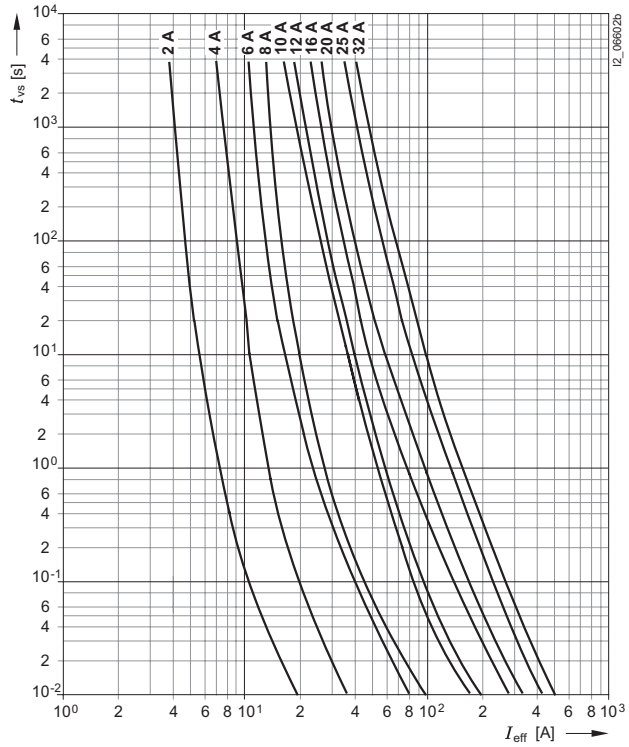
① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Characteristic curves

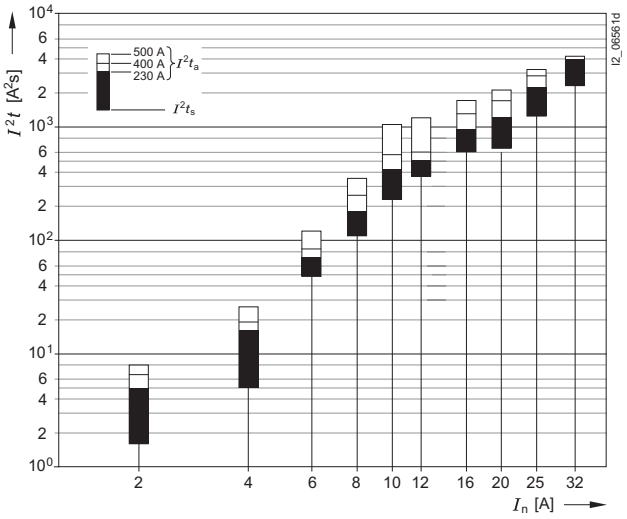
Series 3NW6 0

Size: 10 mm × 38 mm
Utilization category: gL/gG
Rated voltage: 500 V AC (2 ... 25 A)
400 V AC (32 A)
Rated current: 2 ... 32 A

Time/current characteristics diagram

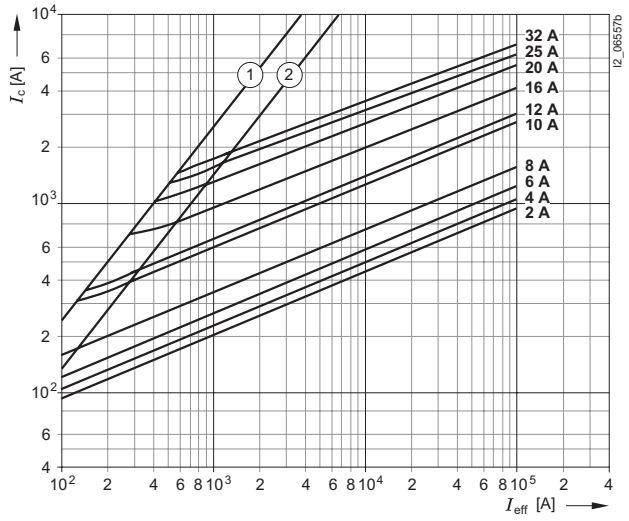


Melting I^2t_s values diagram



Type	I_n	P_v	$\Delta\vartheta$	I^2t_s	I^2t_a		
				1 ms	230 V AC	400 V AC	500 V AC
	A	W	K	A²s	A²s	A²s	A²s
3NW6 002-1	2	2.2	32	1.6	5	6.5	8
3NW6 004-1	4	1.2	16.5	5	16	19	26
3NW6 001-1	6	1.6	23	48	70	84	120
3NW6 008-1	8	2.3	35	110	180	140	350
3NW6 003-1	10	0.7	16	230	420	570	1050
3NW6 006-1	12	0.9	33	390	510	600	1200
3NW6 005-1	16	1.3	38	600	950	1300	1700
3NW6 007-1	20	2.1	51.5	640	1200	1700	2100
3NW6 010-1	25	2.1	54	1300	2200	2800	3200
3NW6 012-1	32	2.5	51	2360	4000	4200	–

Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

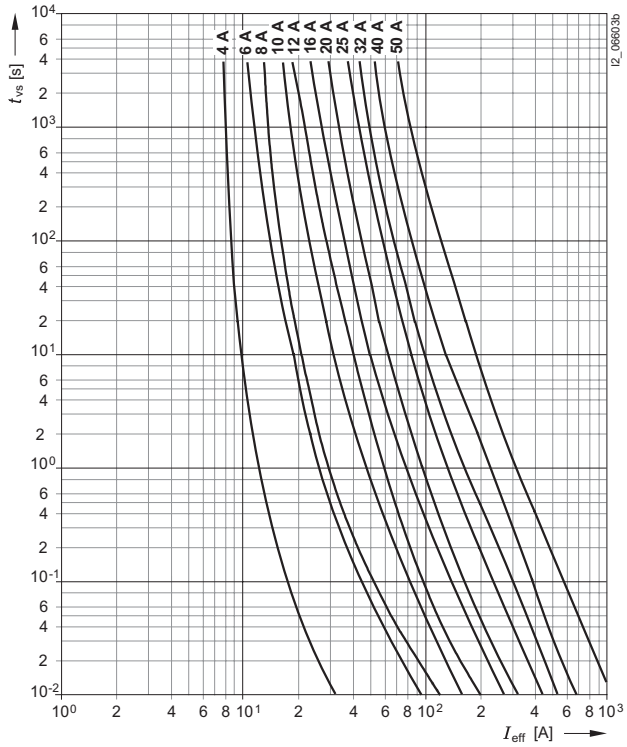
Cylindrical fuse links

Characteristic curves

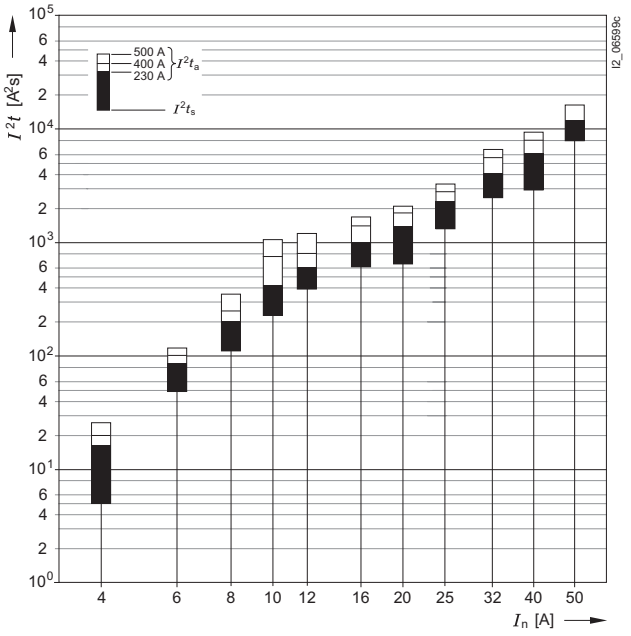
Series 3NW6 1

Size: 14 mm × 51 mm
Utilization category: gL/gG
Rated voltage: 500 V AC (4 ... 40 A)
400 V AC (50 A)
Rated current: 4 ... 50 A

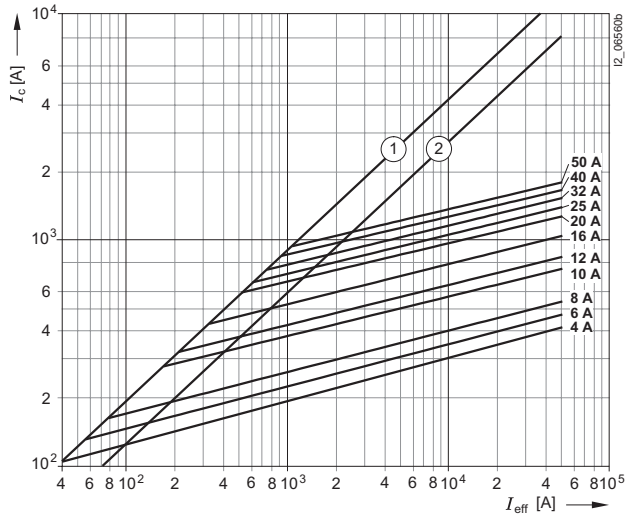
Time/current characteristics diagram



Melting I^2t_s values diagram



Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

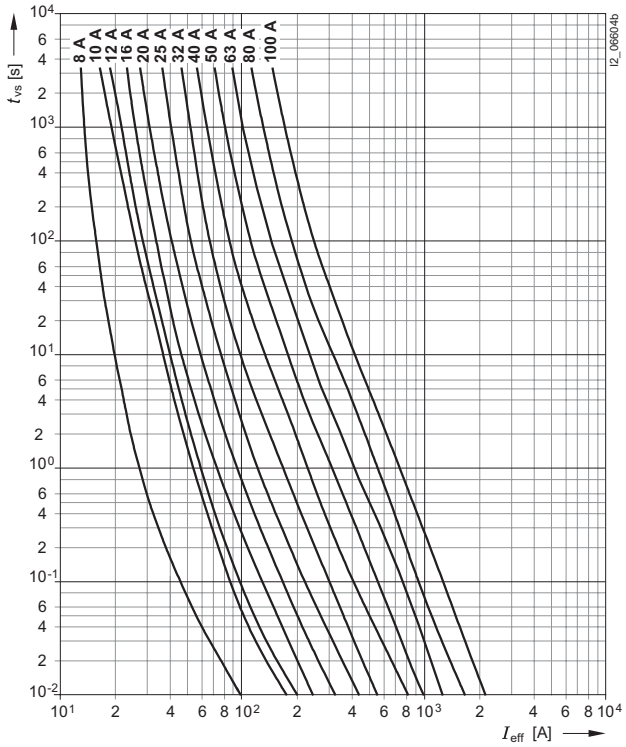
Type	I_n	P_v	$\Delta\vartheta$	I^2t_s	I^2t_a		
				1 ms	230 V AC	400 V AC	500 V AC
	A	W	K	A²s	A²s	A²s	A²s
3NW6 104-1	4	1.9	19	5	16	20	26
3NW6 101-1	6	2.5	25	48	85	100	120
3NW6 108-1	8	2.4	18	110	200	250	350
3NW6 103-1	10	0.8	12	230	420	750	1050
3NW6 106-1	12	1.0	16	390	600	800	1200
3NW6 105-1	16	1.6	27	600	1000	1400	1700
3NW6 107-1	20	2.3	32.5	670	1400	1800	2100
3NW6 116-1	25	2.2	31.5	1300	2300	2800	3200
3NW6 112-1	32	3.2	39.5	2500	4100	5500	6500
3NW6 117-1	40	4.5	48	3600	6100	8000	9200
3NW6 120-1	50	4.8	55	8000	12200	16000	–

Characteristic curves

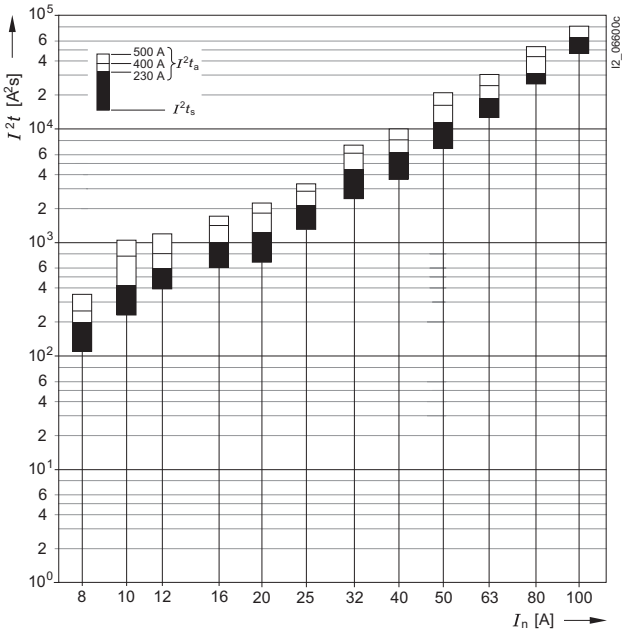
Series 3NW6 2

Size: 22 mm × 58 mm
Utilization category: gL/gG
Rated voltage: 500 V AC (8 ... 80 A)
400 V AC (100 A)
Rated current: 8 ... 100 A

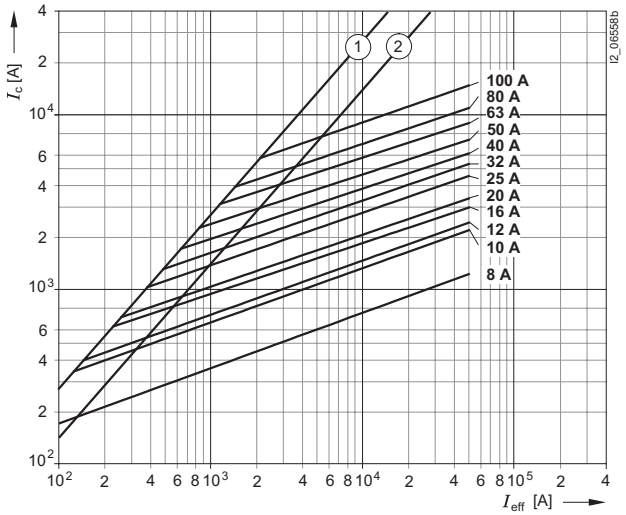
Time/current characteristics diagram



Melting I^2t_s values diagram



Current limitation diagram



① Peak short-circuit current with largest DC component
② Peak short-circuit current without DC component

Type	I_n	P_v	$\Delta\vartheta$	I^2t_s	I^2t_a		
				1 ms	230 V AC	400 V AC	500 V AC
	A	W	K	A²s	A²s	A²s	A²s
3NW6 208-1	8	2.5	15	110	200	170	350
3NW6 203-1	10	0.9	10.5	230	420	760	1050
3NW6 206-1	12	1.1	12	390	600	800	1200
3NW6 205-1	16	1.6	14.5	600	1000	1400	1700
3NW6 207-1	20	2.4	22.5	670	1200	1800	2200
3NW6 210-1	25	2.7	24	1300	2100	2800	3300
3NW6 212-1	32	3.2	28	2450	4400	6100	7200
3NW6 217-1	40	4.9	35	3600	6200	8000	10000
3NW6 220-1	50	5.9	46	6800	11400	16200	20600
3NW6 222-1	63	6.8	48	12500	18800	24000	30000
3NW6 224-1	80	7.5	48	24700	30500	43000	52500
3NW6 230-1	100	8.4	55	46000	64700	80000	–

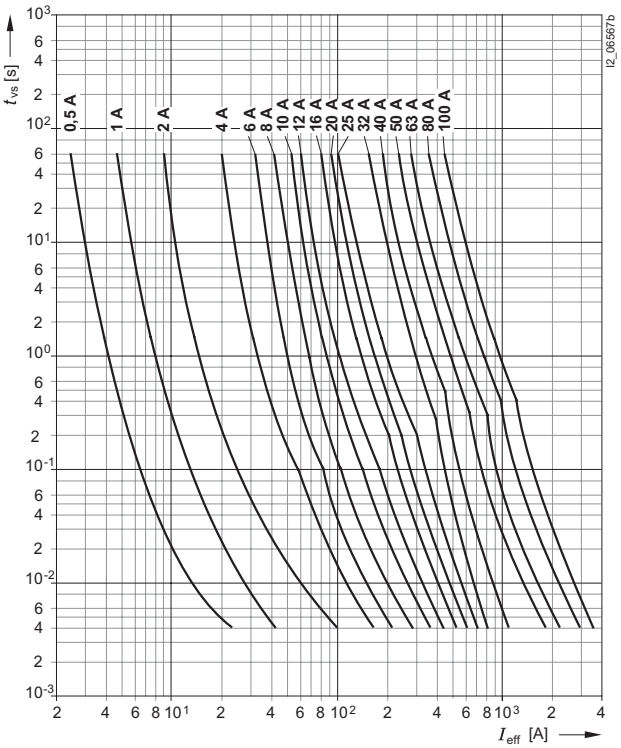
Cylindrical fuse links

Characteristic curves

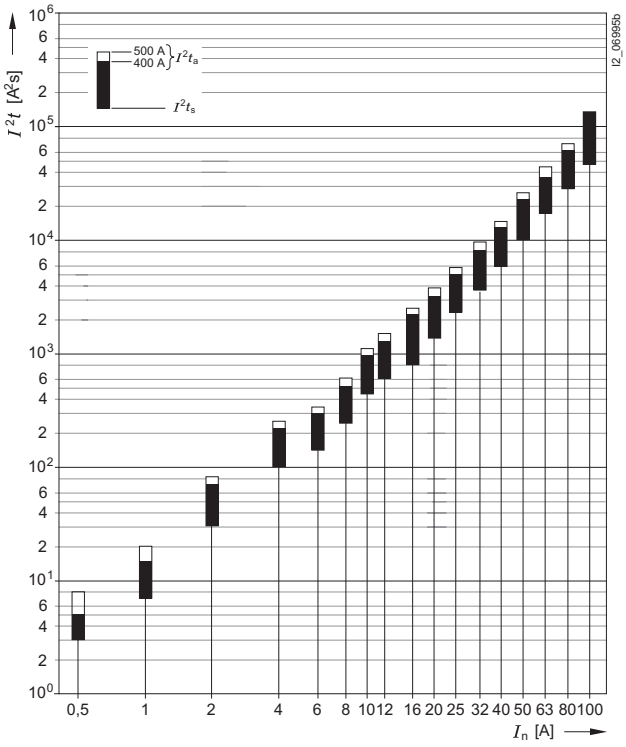
Series 3NW8

Size:	10 mm × 38 mm 14 mm × 51 mm 22 mm × 58 mm
Utilization category:	aM
Rated voltage:	500 V AC 400 V AC (3NW8 120-1, 3NW8 230-1)
Rated current:	0.5 ... 100 A

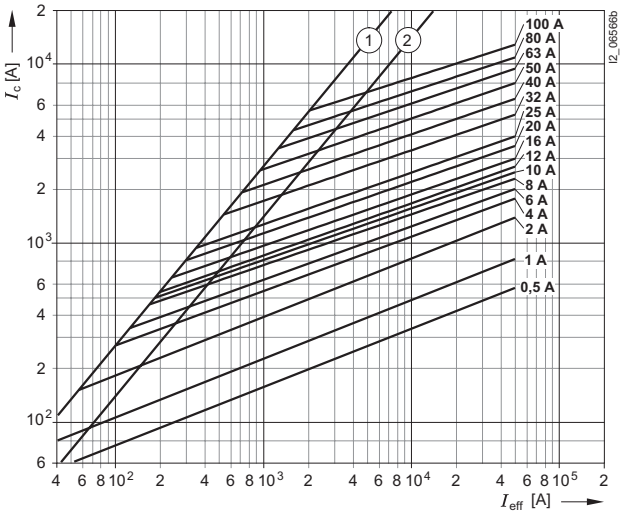
Time/current characteristics diagram



Melting I^2t_s values diagram



Current limitation diagram



① Peak short-circuit current with largest DC component

② Peak short-circuit current without DC component

Characteristic curves

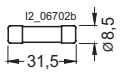
Series 3NW8

Size: 10 mm × 38 mm
14 mm × 51 mm
22 mm × 58 mm
Utilization category: aM
Rated voltage: 500 V AC
400 V AC (3NW8 120-1, 3NW8 230-1)
Rated current: 0.5 ... 100 A

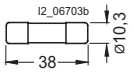
Type	Size	I_n	P_v	$\Delta\vartheta$	I^2t_s	I^2t_a	
					1 ms	400 V AC	500 V AC
	mm	A	W	K	A^2s	A^2s	A^2s
3NW8 000-1	10 × 38	0.5	0.5	2.2	3	5	8
3NW8 011-1		1	0.08	1.5	7	15	20
3NW8 002-1		2	0.15	2.3	30	70	82
3NW8 004-1		4	0.25	4.5	100	220	250
3NW8 001-1		6	0.4	7	140	300	340
3NW8 008-1		8	0.5	8	240	510	610
3NW8 003-1		10	0.56	10	440	960	1100
3NW8 006-1		12	0.66	12.5	600	1300	1500
3NW8 005-1		16	0.8	15	800	2200	2500
3NW8 007-1		20	1	20	1350	3200	3200
3NW8 010-1		25	1.25	23	2300	5000	–
3NW8 102-1	14 × 51	2	0.2	2.5	30	70	82
3NW8 104-1		4	0.35	4	100	220	250
3NW8 101-1		6	0.5	6	140	300	340
3NW8 108-1		8	0.6	7.5	240	510	610
3NW8 103-1		10	0.65	8	440	960	1100
3NW8 106-1		12	0.75	10	600	1300	1500
3NW8 105-1		16	1.08	14	800	2200	2500
3NW8 107-1		20	1.3	18.5	1350	3200	3800
3NW8 110-1		25	1.7	20	2300	5000	5700
3NW8 112-1		32	1.9	23	3600	8000	9500
3NW8 117-1		40	2.25	24	5800	13000	14500
3NW8 120-1		50	2.8	34	10000	23000	–
3NW8 203-1	22 × 58	10	0.75	7.5	440	960	1100
3NW8 206-1		12	0.8	8.5	600	1300	1500
3NW8 205-1		16	1.2	13	800	2200	2500
3NW8 207-1		20	1.46	16.6	1350	3200	3800
3NW8 210-1		25	1.7	17.8	2300	5000	5700
3NW8 212-1		32	2.5	27	3600	8000	9500
3NW8 217-1		40	3	23	5800	13000	14500
3NW8 220-1		50	3.4	29	10000	23000	26000
3NW8 222-1		63	4.1	32.6	17000	36000	44000
3NW8 224-1		80	5	38	28000	62000	70000
3NW8 230-1		100	6.1	43	46000	118000	–

Dimensional drawings

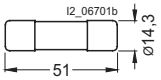
3NW6 3



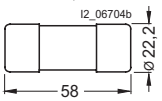
3NW6 0, 3NW8 0



3NW6 1, 3NW8 1



3NW6 2, 3NW8 2



SITOR cylindrical fuse links

Overview

Permissible load and required conductor cross-section for operation in cylindrical fuse bases and cylindrical fuse switch disconnectors

For SITOR fuse links	Rated current	Required conductor cross-section	Cylindrical fuse bases						Fuse tongs	Cylindrical fuse switch disconnectors					
			1-pole		2-pole		3-pole			1-pole		2-pole		3-pole	
	I_n	Cu	Type	I_{max}	Type	I_{max}	Type	I_{max}	Type	Type	I_{max}	Type	I_{max}	Type	I_{max}
	A	mm^2		A		A		A			A		A		A
3NC1 003	3	1	**3NC1 038-1**	3	**3NC1 038-2**	3	**3NC1 038-3**	3	**3NC1 000**	**3NC1 091**	3	**3NC1 092**	3	**3NC1 093**	3
3NC1 006	6	1		6		6		6			6		6		6
3NC1 008	8	1		8		8		8			8		8		8
3NC1 010	10	1.5		10		10		10			10		10		10
3NC1 012	12	1.5		12		12		12			12		12		12
3NC1 016	16	2.5		16		16		16			16		16		16
3NC1 020	20	2.5		20		20		20			20		20		20
3NC1 025	25	4		25		24		24			25		25		25
3NC1 032	32	6		32		28		28			30		32		29
3NC1 401	1	1	**3NC1 451-1**	1	–		–		**3NC1 000**	**3NC1 491**	1	**3NC1 492**	1	**3NC1 493**	1
3NC1 402	2	1		2							2		2		2
3NC1 403	3	1		3							3		3		3
3NC1 404	4	1		4							4		4		4
3NC1 405	5	1		5							5		5		5
3NC1 406	6	1		6							6		6		6
3NC1 410	10	1.5		10							10		10		10
3NC1 415	15	1.5		15							15		15		15
3NC1 420	20	2.5		20							20		20		20
3NC1 425	25	4		25							25		24		23
3NC1 430	30	6		30							28		27		25
3NC1 432	32	6		32							31		30		30
3NC1 440	40	10		40							38		37		36
3NC1 450	50	10		50							48		46		44
3NC2 220	20	2.5	**3NC2 258-1**	20	–		–		**3NC1 000**	**3NC2 291**	20	**3NC2 292**	20	**3NC2 293**	20
3NC2 225	25	4		25							25		25		25
3NC2 232	32	6		32							32		32		32
3NC2 240	40	10		40							40		39		38
3NC2 250	50	10		50							50		48		46
3NC2 263	63	16		63							60		58		56
3NC2 280	80	25		80							74		71		69
3NC2 200	100	35		100							95		90		85

Technical specifications

Type		3NC1 003	3NC1 006	3NC1 008	3NC1 010	3NC1 012	3NC1 016	3NC1 020	3NC1 025	3NC1 032
Utilization category (IEC 60269)		aR								
Rated voltage U_n	V	600 AC/400 DC								
Rated current I_n	A	3	6	8	10	12	16	20	25	32
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	3	4	6	9	15	25	34	60	95
Breaking I^2t value I^2t_A at U_n	A^2s	8	30	50	70	120	150	260	390	600
Temperature rise at I_n (body center)	K	30		25	40	50	60	80	90	110
Power dissipation at I_n	W	1.2	1.5	2	2.5	3	3.5	4.8	6	7.5
Weight approx.	kg	0.01								

Type		3NC1 401	3NC1 402	3NC1 403	3NC1 404	3NC1 405	3NC1 406	3NC1 410
Utilization category (IEC 60269)		aR						
Rated voltage U_n	V	660 AC/700 DC				690 AC/700 DC		
Rated current I_n	A	1	2	3	4	5	6	10
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	–				1.6	–	3.6
Breaking I^2t value I^2t_A at U_n	A^2s	–				11	–	22
Temperature rise at I_n (body center)	K	90	30	40	50	20	30	50
Power dissipation at I_n	W	5	3	2.5	–	1.5		4
Approval		according to UL 248-13						
Weight approx.	kg	0.02						

Type		3NC1 415	3NC1 420	3NC1 425	3NC1 430	3NC1 432	3NC1 440	3NC1 450
Utilization category (IEC 60269)		aR						
Rated voltage U_n	V	660 AC/700 DC						
Rated current I_n	A	15	20	25	30	32	40	50
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	10	26	44	58	95	110	220
Breaking I^2t value I^2t_A at U_n	A^2s	22	60	130	150	800	980	1800
Temperature rise at I_n (body center)	K	60	70	80			100	110
Power dissipation at I_n	W	5.5	6	7	9	7.6	8	9
Approval		according to UL 248-13						
Weight approx.	kg	0.02						

Type		3NC2 220	3NC2 225	3NC2 232	3NC2 240	3NC2 250	3NC2 263	3NC2 280	3NC2 200
Utilization category (IEC 60269)		aR							
Rated voltage U_n	V	660 AC/700 DC							600 AC/700 DC
Rated current I_n	A	20	25	32	40	50	63	80	100
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	34	60	95	185	155	310	620	1250
Breaking I^2t value I^2t_A at U_n	A^2s	370	560	850	1350	1120	2700	5100	10000
Temperature rise at I_n (body center)	K	40	50	65	80	90	100	110	
Power dissipation at I_n	W	4.6	5.6	7	8.5	9.5	11	13.5	16
Approval		according to UL 248-13							
Weight approx.	kg	0.06							

SITOR cylindrical fuse links

Selection and ordering data

	Size	I_n	U_n	Utilization category	Order No.	Weight 1 item	PS*/ P. unit
	mm × mm	A	V AC/V DC			kg	Items
Cylindrical fuse links							
	10 × 38	3	600/	aR	**3NC1 003**	0.009	10
		6			**3NC1 006**	0.009	10
		8			**3NC1 008**	0.009	10
		10			**3NC1 010**	0.009	10
		12			**3NC1 012**	0.009	10
		16			**3NC1 016**	0.009	10
		20			**3NC1 020**	0.009	10
		25			**3NC1 025**	0.009	10
		32			**3NC1 032**	0.009	10
	14 × 51	1	660/700	aR	**3NC1 401**	0.020	10
		2			**3NC1 402**	0.020	10
		3			**3NC1 403**	0.020	10
		4			**3NC1 404**	0.020	10
		5	690/700		**3NC1 405**	0.020	10
		6			**3NC1 406**	0.020	10
		10			**3NC1 410**	0.020	10
		15			**3NC1 415**	0.020	10
		20			**3NC1 420**	0.020	10
		25			**3NC1 425**	0.020	10
		30			**3NC1 430**	0.020	10
		32			**3NC1 432**	0.021	10
		40			**3NC1 440**	0.021	10
		50			**3NC1 450**	0.021	10
	22 × 58	20	690/700	aR	**3NC2 220**	0.056	5
		25			**3NC2 225**	0.056	5
		32			**3NC2 232**	0.056	5
		40			**3NC2 240**	0.056	5
		50			**3NC2 250**	0.056	5
		63			**3NC2 263**	0.056	5
		80			**3NC2 280**	0.057	5
		100	600/700		**3NC2 200**	0.057	5

Accessories

	For cylindrical fuse links	Version	Order No.	Weight 1 item	PS*/ P. unit
				kg	Items
Fuse tongs					
	3NC1, 3NC2		**3NC1 000**	0.069	1
Cylindrical fuse switch disconnectors					
	3NC1 0	1-pole	**3NC1 091**	0.065	12
		2-pole	**3NC1 092**	0.131	6
		3-pole	**3NC1 093**	0.197	4
	3NC1 4	1-pole	**3NC1 491**	0.125	6
		2-pole	**3NC1 492**	0.233	3
		3-pole	**3NC1 493**	0.350	2
	3NC2 2	1-pole	**3NC2 291**	0.193	6
		2-pole	**3NC2 292**	0.381	3
		3-pole	**3NC2 293**	0.584	2
Cylindrical fuse bases					
	3NC1 0	1-pole	**3NC1 038-1**	0.042	10
		2-pole	**3NC1 038-2**	0.077	8
		3-pole	**3NC1 038-3**	0.113	6
	3NC1 4	1-pole [1]	**3NC1 451-1**	0.120	3
	3NC2 2	1-pole [1]	**3NC2 258-1**	0.238	3

1) The cylindrical fuse bases can be modularly expanded to make multi-pole bases.

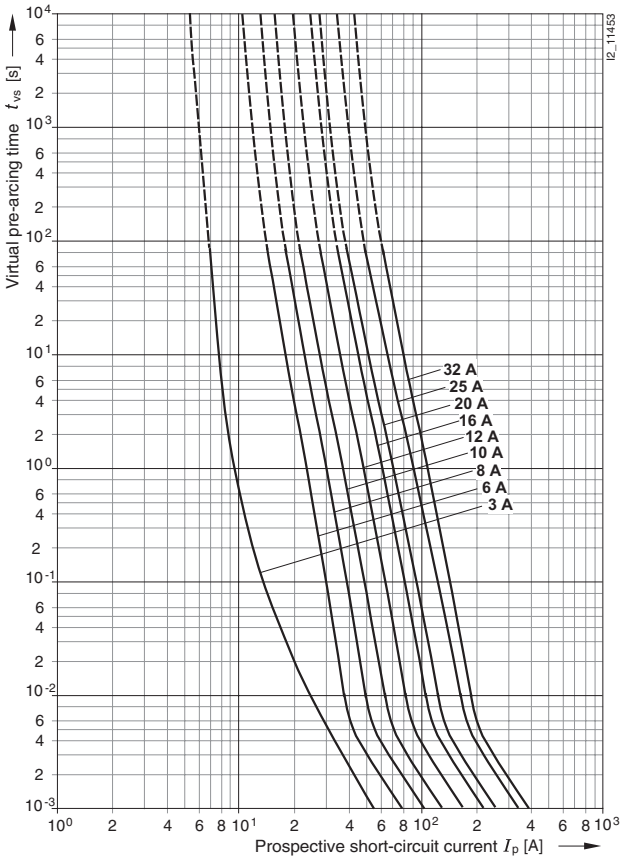
* You can order this quantity or a multiple thereof.

Characteristic curves

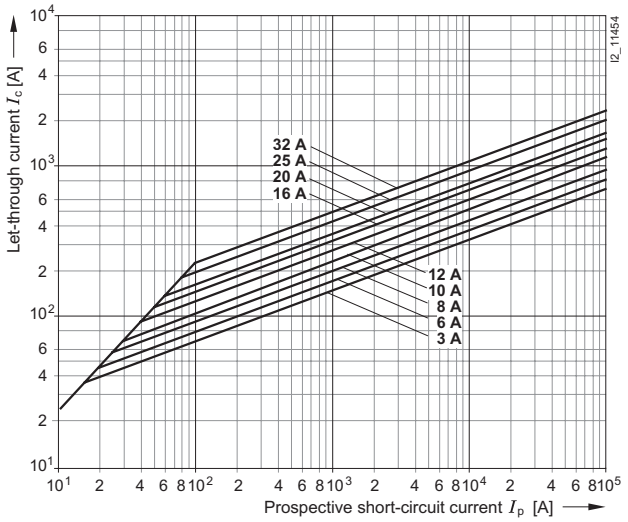
Series 3NC1 0

Size: 10 mm x 38 mm
Utilization category: aR
Rated voltage: 600 V AC/400 V DC
Rated current: 3 ... 32 A

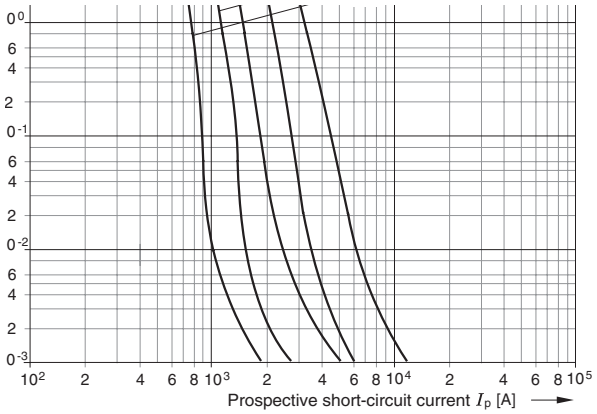
Time/current characteristics diagram



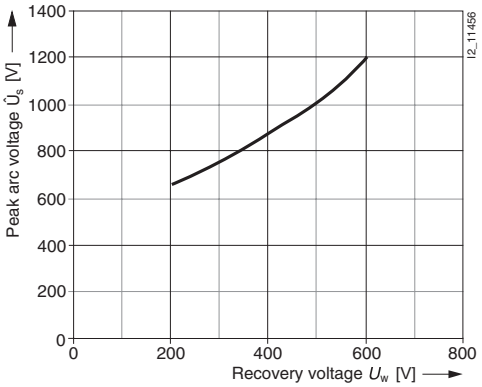
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A factor for breaking I^2t value



Peak arc voltage



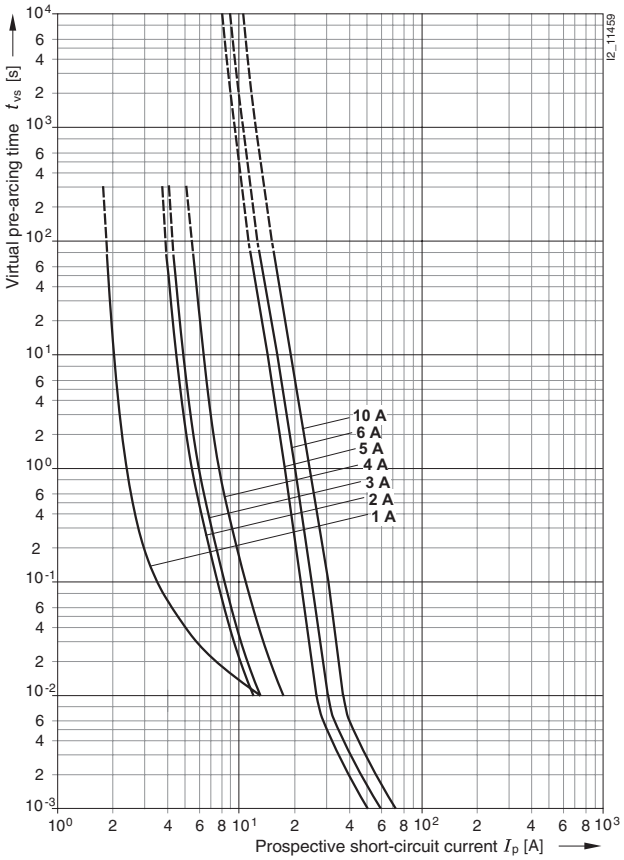
SITOR cylindrical fuse links

Characteristic curves

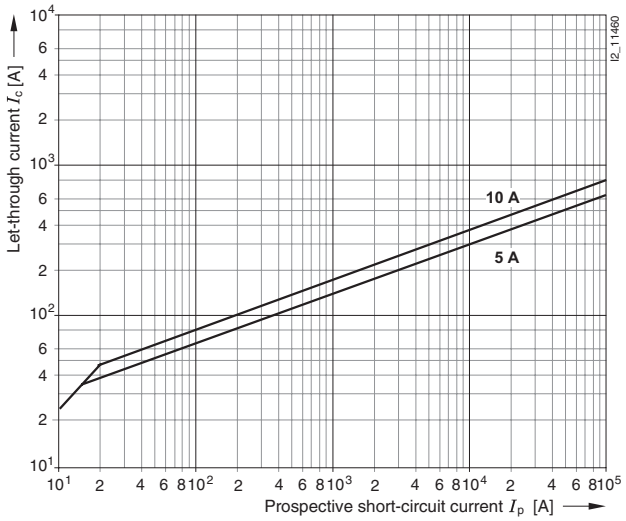
Series 3NC1 40, 3NC1 41

Size: 14 mm x 51 mm
Utilization category: aR
Rated voltage: 660 V AC/700 V DC (1 ... 4 A); 690 V AC/700 V DC (5 ... 50 A)
Rated current: 1 to 10 A

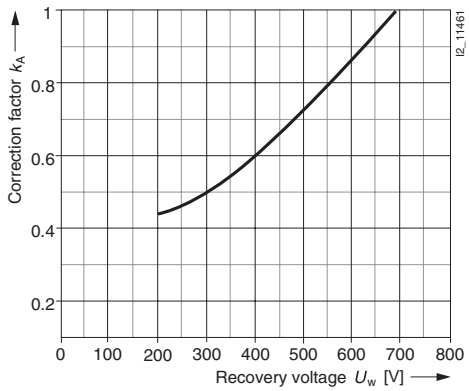
Time/current characteristics diagram



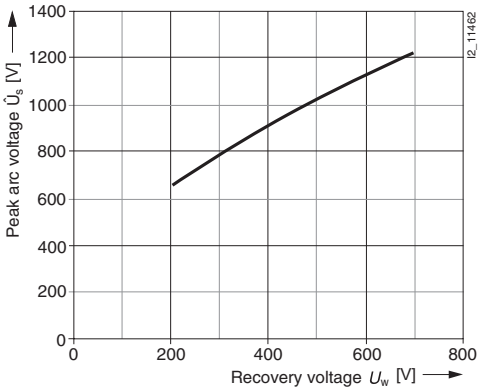
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A factor for breaking I^2t value



Peak arc voltage

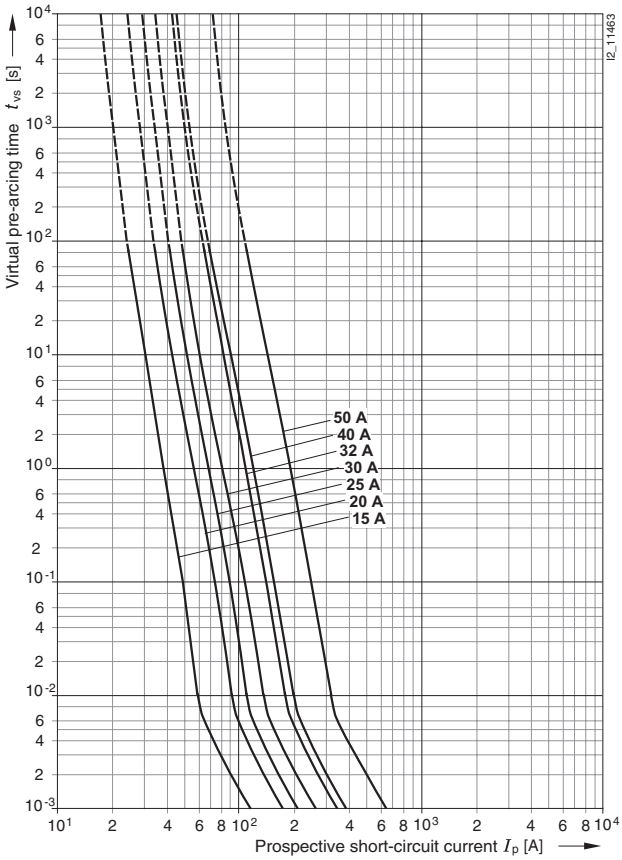


Characteristic curves

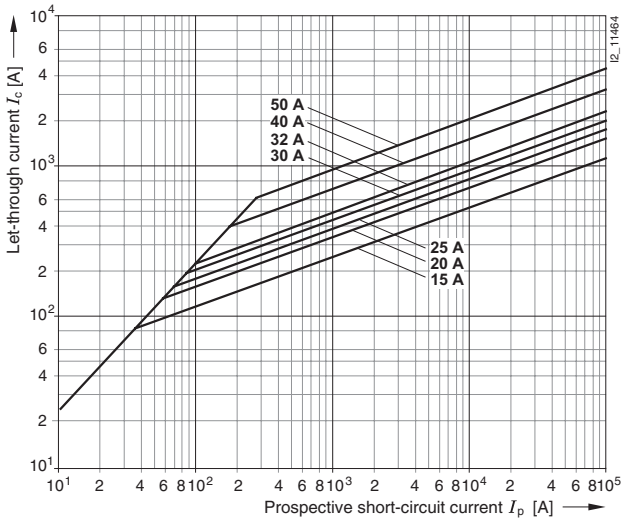
Series 3NC1 415, 3NC1 42., 3NC1 440, 3NC1 450

Size: 14 mm x 51 mm
Utilization category: aR
Rated voltage: 690 V AC/700 V DC
Rated current: 15 ... 50 A

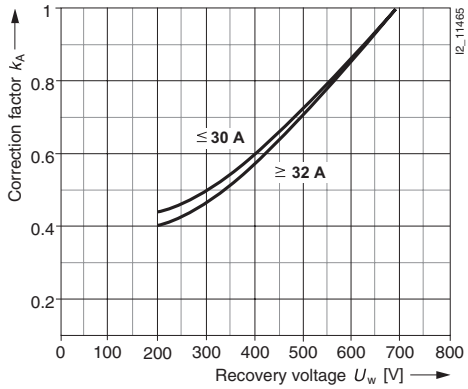
Time/current characteristics diagram



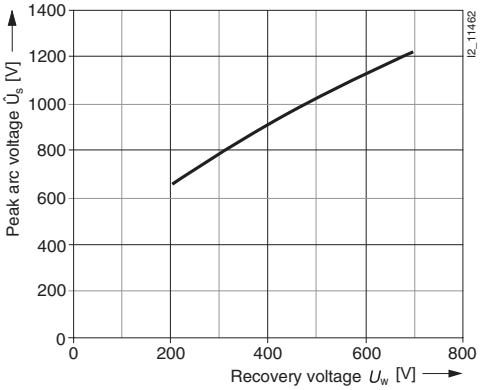
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A factor for breaking I^2t value



Peak arc voltage



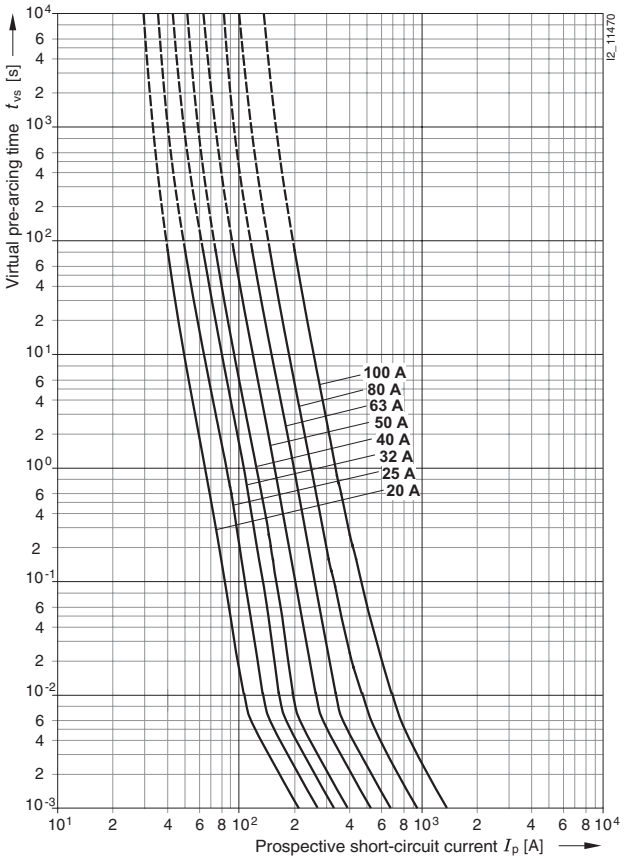
SITOR cylindrical fuse links

Characteristic curves

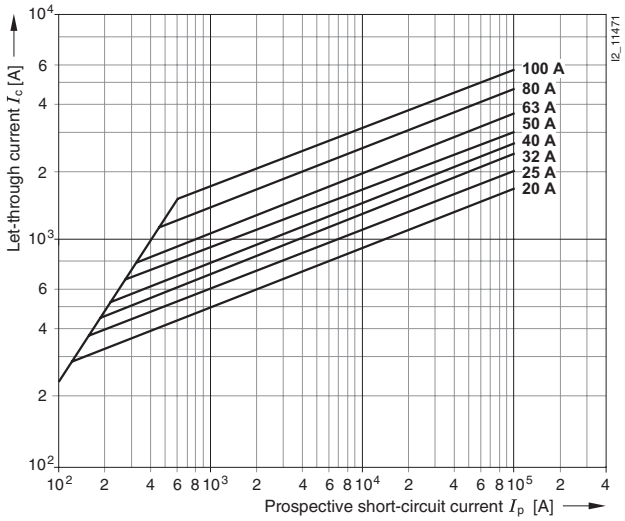
Series 3NC2 2

Size:	22 mm x 58 mm
Utilization category:	aR
Rated voltage:	690 V AC/700 V DC (20 ... 80 A) 600 V AC/700 V DC (100 A)
Rated current:	20 ... 100 A

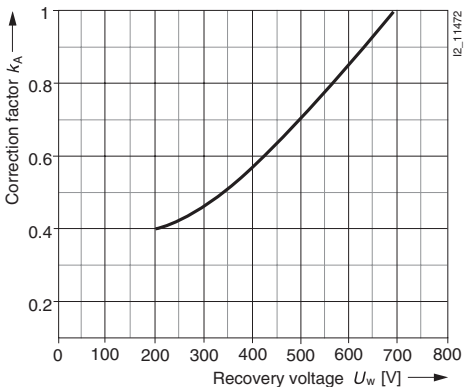
Time/current characteristics diagram



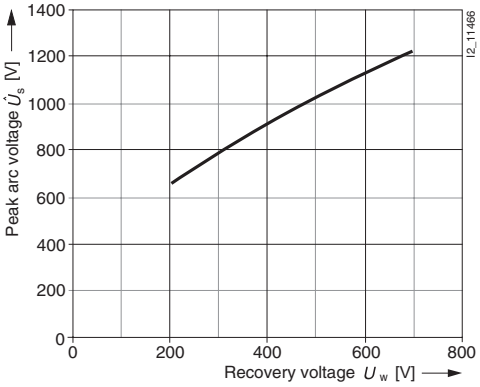
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A factor for breaking I^2t value



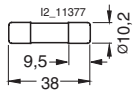
Peak arc voltage



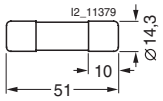
Dimensional drawings

Cylindrical fuse links

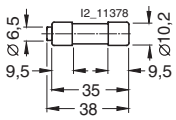
3NC1 0



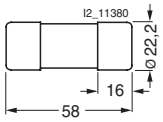
3NC1 4, 3NC1 5



3NC1 1

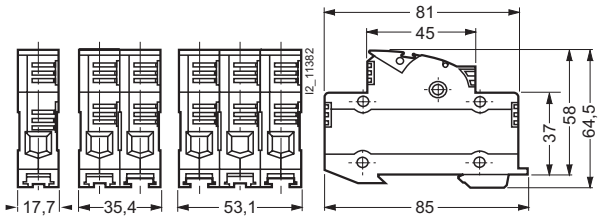


3NC2 2

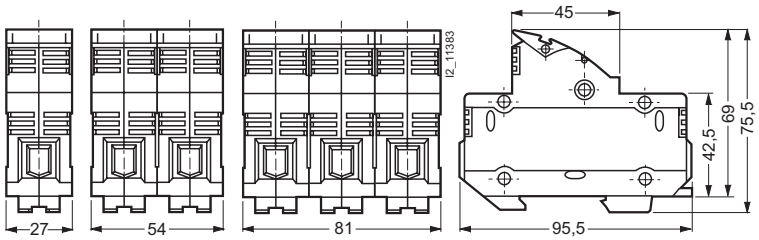


Cylindrical fuse switch disconnectors

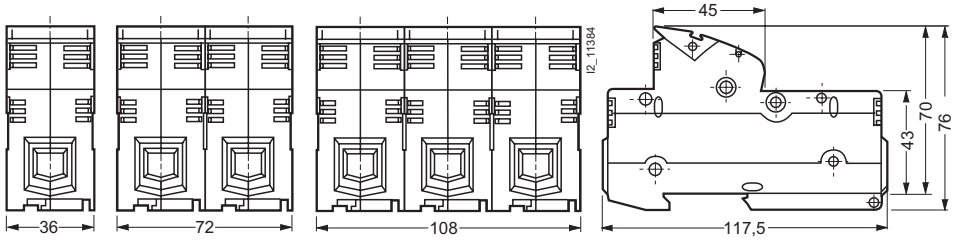
3NC1 09.



3NC1 49.



3NC2 29.

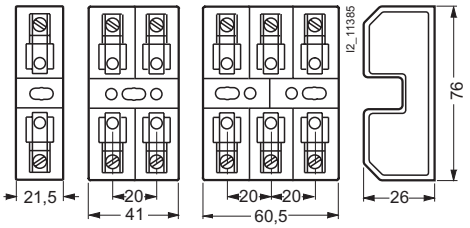


SITOR cylindrical fuse links

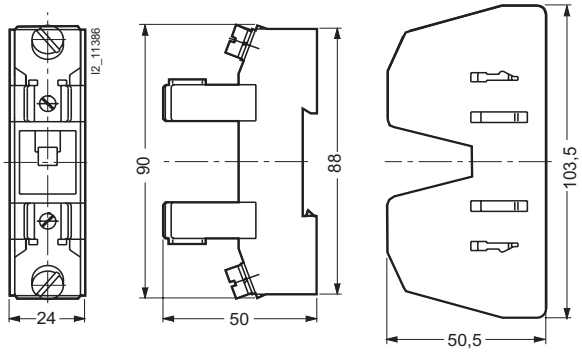
Dimensional drawings

Cylindrical fuse bases

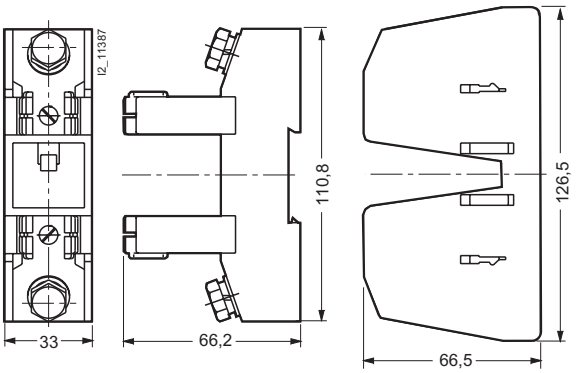
3NC1 038-1 to 3NC1 038-3



3NC1 451-2



3NC2 258-1



Benefits

- IEC 60269-1, -2, -2-1
- Rated voltage 400 V AC and 690 V AC
- No switching under load
- Off-circuit changing of fuses
- Without or with signal detector for signaling the tripping of the fuse link

Technical specifications

Fuse bases for cylindrical fuses					
Type		**3NW7 3**	**3NW7 0**	**3NW7 1**	**3NW7 2**
Size	mm x mm	8 x 32	10 x 38	14 x 51	22 x 58
Standards		IEC 60269-1, -2, -2-1 NF C 60-200, 63-210, 63-211 NBN C 63269-2en-2-1 CEI 32-4, -12			
UL Approval		1)			available soon
CSA Approval		c	c		available soon
Utilization category acc. to EN 60947-3		AC 20B (switching without load), DC 20B			
Rated voltage U_n	V AC	400	690		
Rated voltage according to UL/CSA	V AC	400	600		
Rated current I_n	A AC	0.5 ... 100			
Mounting position		any, but preferably vertical			
Degree of protection according to IEC 60529	in the distribution board	IP20			
Terminal version		anti-slip terminals			
Conductor cross-sections					
rigid, solid	mm^2	1.5 ... 10		2.5 ... 10	4 ... 10
stranded	mm^2	2.5 ... 16		2.5 ... 25	4 ... 50
finely stranded with end sleeve	mm^2	1.5 ... 10		2.5 ... 16	4 ... 35
Conductor cross-sections acc. to UL/CSA AWG (American wire gauge)		10 ... 18 solid		6 ... 10 solid and stranded	available soon
Stripped lengths	mm	11		14	20
Tightening torque	Nm	2.0			2.5

1) The Approval only applies to bases for cylindrical fuses without signal detectors; approval is expected to be available soon for bases with signal detectors.

Bases for cylindrical fuses

Selection and ordering data

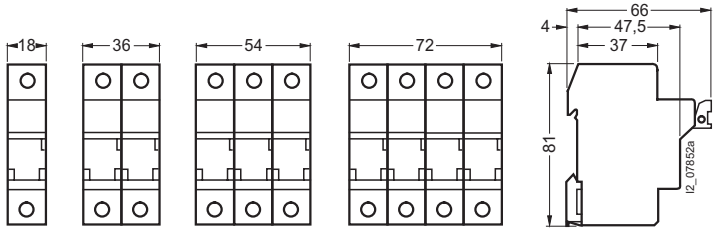
	I_n	For fuse links Size	MW	Order No.	Weight 1 item	PS*/ P. unit
	A	mm x mm			kg	Items
Draw-out type						
without signal detector						
1-pole						
	20	8 x 32	1	**3NW7 310**	0.058	1
	32	10 x 38	1	**3NW7 011**	0.080	1
	50	14 x 51	1.5	**3NW7 111**	0.095	1
	100	22 x 58	2	**3NW7 211**	0.145	1
1-pole + N						
	20	8 x 32	2	**3NW7 350**	0.120	1
	32	10 x 38	2	**3NW7 051**	0.167	1
	50	14 x 51	3	**3NW7 151**	0.215	1
	100	22 x 58	4	**3NW7 251**	0.330	1
2-pole						
	20	8 x 32	2	**3NW7 320**	0.112	1
	32	10 x 38	2	**3NW7 021**	0.162	1
	50	14 x 51	3	**3NW7 121**	0.195	1
	100	22 x 58	4	**3NW7 221**	0.300	1
3-pole						
	20	8 x 32	3	**3NW7 330**	0.167	1
	32	10 x 38	3	**3NW7 031**	0.243	1
	50	14 x 51	4.5	**3NW7 131**	0.295	1
	100	22 x 58	6	**3NW7 231**	0.691	1
3-pole + N						
	20	8 x 32	4	**3NW7 360**	0.227	1
	32	10 x 38	4	**3NW7 061**	0.327	1
	50	14 x 51	6	**3NW7 161**	0.315	1
	100	22 x 58	8	**3NW7 261**	0.475	1
with signal detector						
1-pole						
	20	8 x 32	1	**3NW7 312**	0.058	1
	32	10 x 38	1	**3NW7 012**	0.080	1
	50	14 x 51	1.5	**3NW7 112**	0.095	1
	100	22 x 58	2	**3NW7 212**	0.145	1
1-pole + N						
	20	8 x 32	2	**3NW7 352**	0.120	1
	32	10 x 38	2	**3NW7 052**	0.167	1
	50	14 x 51	3	**3NW7 152**	0.215	1
	100	22 x 58	4	**3NW7 252**	0.330	1
2-pole						
	20	8 x 32	2	**3NW7 322**	0.112	1
	32	10 x 38	2	**3NW7 022**	0.162	1
	50	14 x 51	3	**3NW7 122**	0.195	1
	100	22 x 58	4	**3NW7 222**	0.300	1
3-pole						
	20	8 x 32	3	**3NW7 332**	0.167	1
	32	10 x 38	3	**3NW7 032**	0.243	1
	50	14 x 51	4.5	**3NW7 132**	0.295	1
	100	22 x 58	6	**3NW7 232**	0.480	1
3-pole + N						
	20	8 x 32	4	**3NW7 362**	0.227	1
	32	10 x 38	4	**3NW7 062**	0.327	1
	50	14 x 51	6	**3NW7 162**	0.315	1
	100	22 x 58	8	**3NW7 262**	0.475	1
Auxiliary switch						
	for indicating disconnection of the fuse link Solely for application of Striker fuse links (not currently available in the Siemens manufacturing program) for retrofitting with factory-fitted brackets, 0.5 MW. contact: 250 V AC, 5 A, Minimum contact load: 12 V, 25 mA					
	for fuse bases	14 x 51	0.5	**3NW7 901**	0.050	1
	for fuse bases	22 x 58		**3NW7 902**	0.050	1

* You can order this quantity or a multiple thereof.

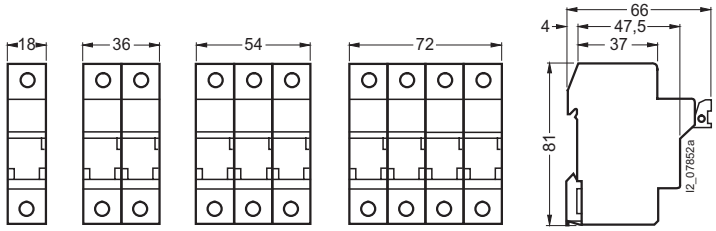
Dimensional drawings

3NW7 installation fuse bases
for cylindrical fuse links

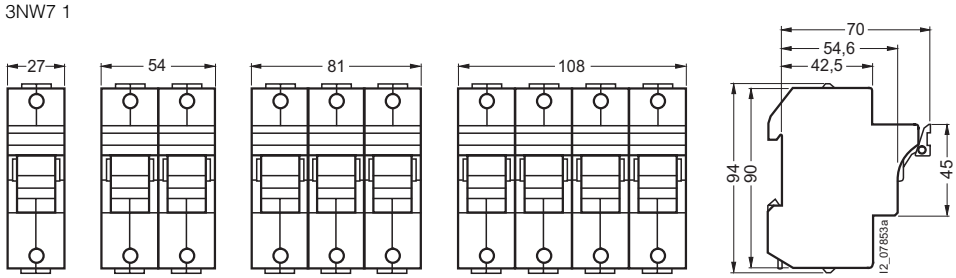
Size 8 mm × 32 mm
3NW7 3



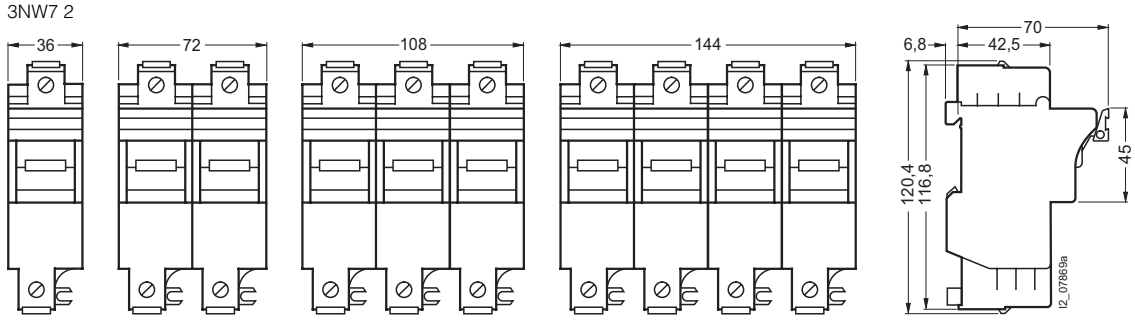
Size 10 mm × 38 mm
3NW7 0



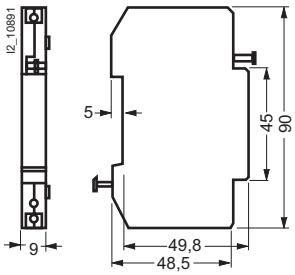
Size 14 mm × 51 mm
3NW7 1



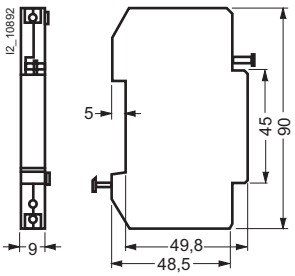
Size 22 mm × 58 mm
3NW7 2



3NW7 901
auxiliary switches



3NW7 902
auxiliary switches



Notes

Overview

for rectifiers in electrolysis systems

for SITOR thyristor sets

for railway supply rectifiers

SITOR Fuse Links for Special Applications

for rectifiers in electrolysis systems

Technical specifications

Type		3NC5 531 [1]	3NC5 841 [1]	3NC5 840 [1]	3NC5 838 [1]
Utilization category (IEC 60269)		aR			
Rated voltage U_n	V AC	800		1000	
Rated current I_n	A	350 [2]	630 [2]	600 [2]	800 [2]
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	66000	185000		360000
Breaking I^2t value I^2t_A at U_n	A^2s	260000	888000		1728000
Temperature rise at I_n (body center)	K	200	110		130
Power dissipation at I_n	W	80	145	150	170
Varying load factor WL		0.9			
Weight approx.	kg	0.67	1.2	1.4	1.2

Type		3NE9 440-6	3NE9 450	3NE6 437	3NE6 444	3NE9 450-7	3NE6 437-7
Utilization category (IEC 60269)		gR	aR				
Rated voltage U_n	V AC	600		900		600	900
Rated current I_n [3]	A	850	1250 [4]	710 [4]	900 [4]	1250 [5]	710 [5]
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	400000		100000	400000		100000
Breaking I^2t value I^2t_A at U_n	A^2s	2480000		620000	1920000	2480000	620000
Temperature rise at I_n (body center)	K	74	80			105	110
Power dissipation at I_n	W	85	210	150	170	210	150
Varying load factor WL		1.0	0.9				
Weight approx.	kg	1.0			1.1	1.0	

Selection and ordering data

	I_n	U_n	Utilization category	Order No.	Weight 1 item	PS*/ P. unit
	A	V AC			kg	Items
for rectifiers in electrolysis systems						
for screwing onto water-cooled power rails						
	350	800	aR	**3NC5 531**	0.671	3
	600	1000		**3NC5 840**	1.400	3
	630	800		**3NC5 841**	1.180	3
	800	1000		**3NC5 838**	1.190	3
	710	900		**3NE6 437-7**	1.160	3
	1250	600		**3NE9 450-7**	1.240	3
for air-cooled rectifiers in electrolysis systems						
	710	800	gR	**3NE6 437**	1.090	3
	850	1000		**3NE9 440-6**	1.080	3
	900	1000	aR	**3NE6 444**	1.170	3
	1250	800		**3NE9 450**	1.110	3

1) Maximum tightening torque:
- M10 thread (with indicator): 40 Nm
- M10 capped thread: 50 Nm, depth of screw entry ≥ 9 mm
- M24 × 1.5 thread: 60 Nm.

2) Temperature of water-cooled power rail max. +45 °C.
3) Maximum tightening torque: M10 capped thread: 35 Nm, depth of screw entry ≥ 9 mm.
4) Cooling air speed ≥ 2 m/s.
5) Bottom (cooled) connection max. +60 °C, top connection (M10) max. +110 °C.

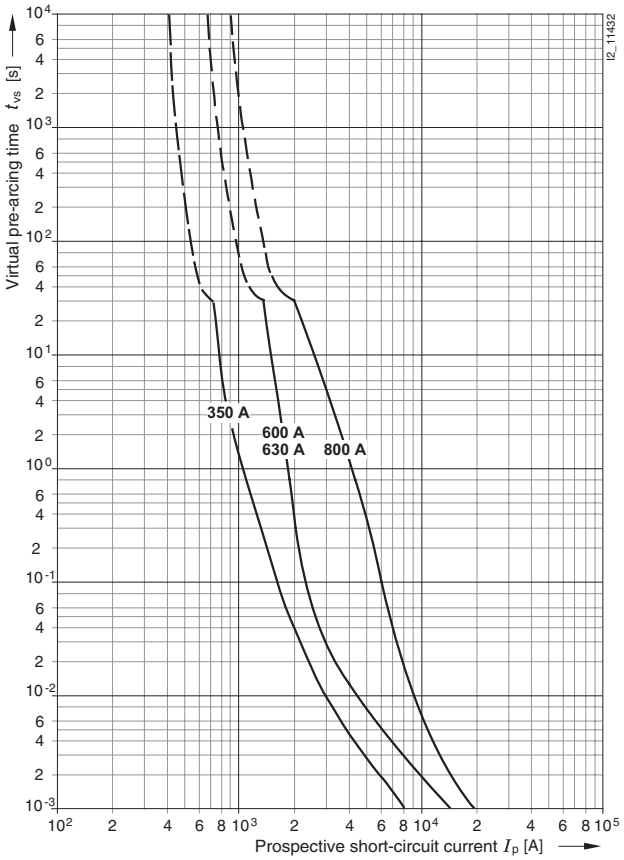
* You can order this quantity or a multiple thereof.

Characteristic curves

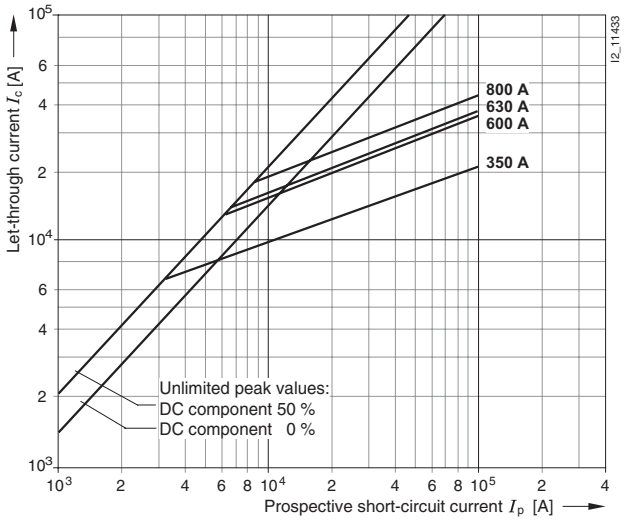
Series 3NC5 531, 3NC5 8..

Utilization category: aR
Rated voltage: 800 V AC(350 A, 600 A), 1000 V AC (600 A, 800 A)
Rated current: 350 ... 800 A

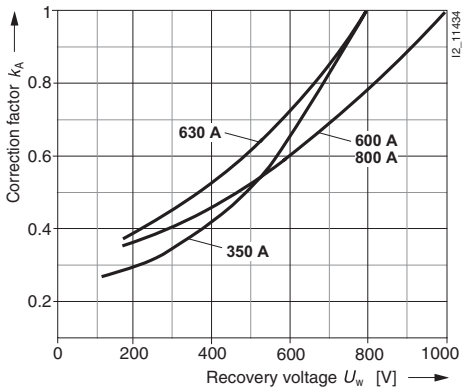
Time/current characteristics diagram



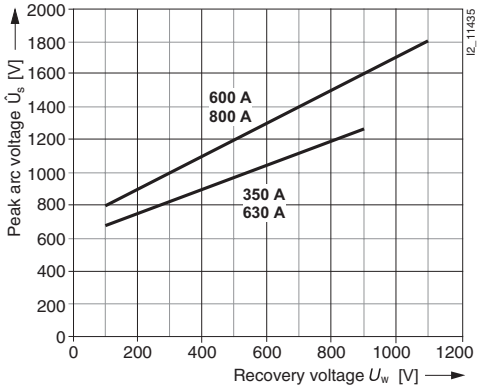
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage

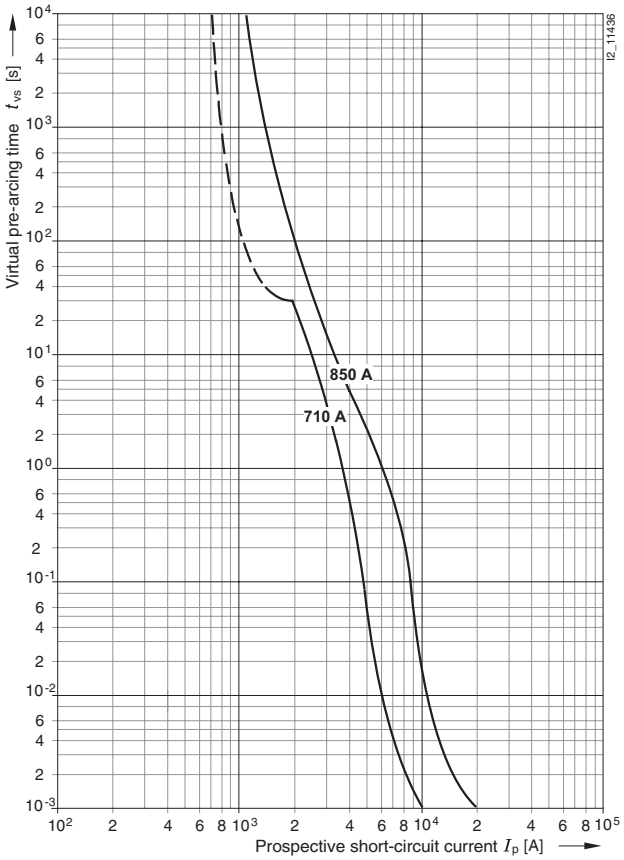


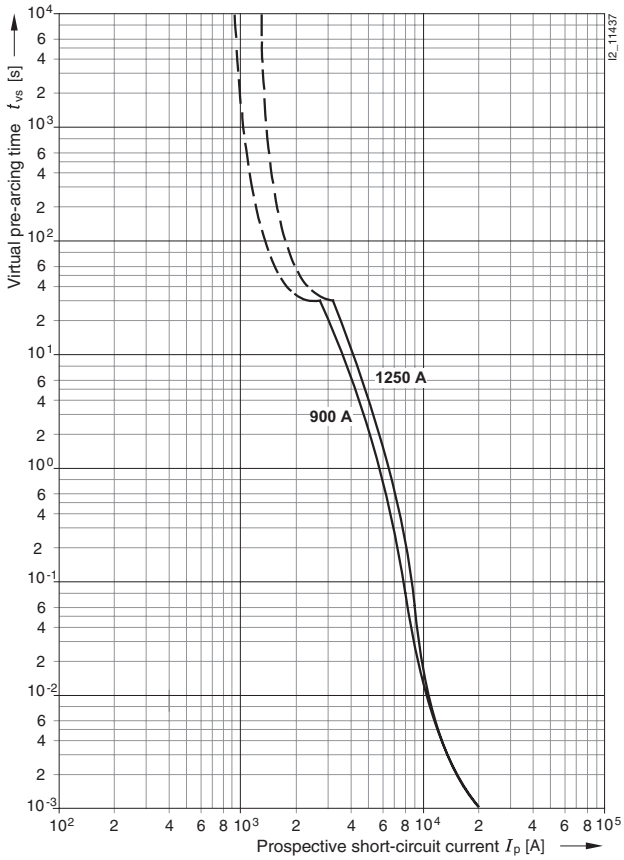
Characteristic curves

Series 3NE6 4.., 3NE9 4..

Utilization category: aR, gR
Rated voltage: 600 V AC (1250 A),
800 V AC (710 A, 1250 A),
900 V AC (710 A)
Rated current: 710 ... 1250 A

Time/current characteristics diagrams



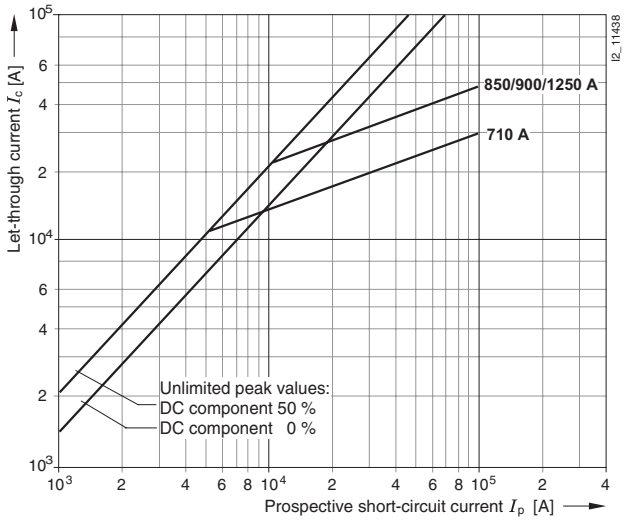


Characteristic curves

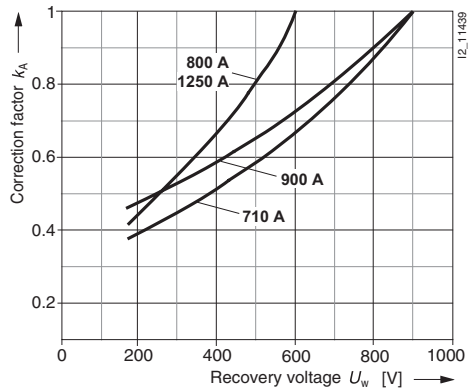
Series 3NE6 4.., 3NE9 4..

Utilization category: aR, gR
Rated voltage: 600 V AC (1250 A),
800 V AC (710 A, 1250 A),
900 V AC (710 A)
Rated current: 710 ... 1250 A

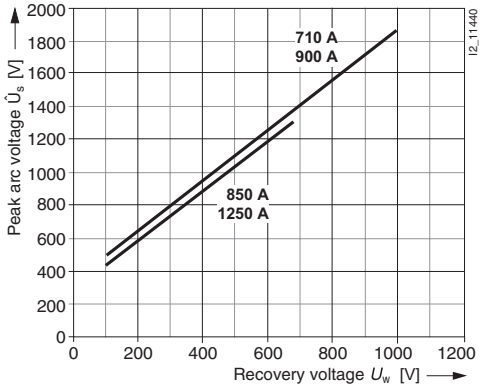
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value

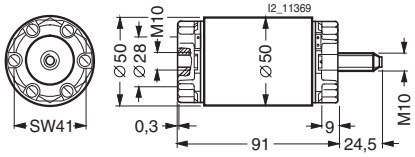


Peak arc voltage

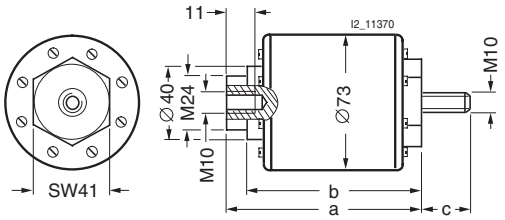


Dimensional drawings

3NC5 531

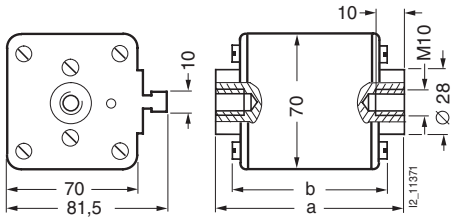


3NC5 8..



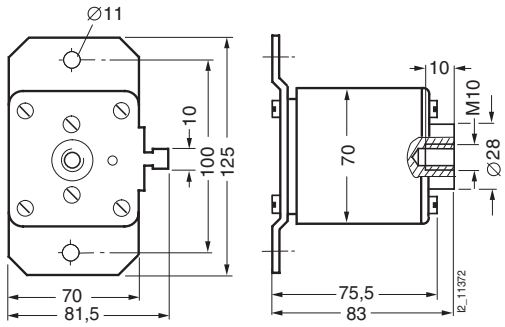
Type	Dimensions		
	a	b	c
3NC5 838, 3NC5 841	98	88.5	25
3NC5 844	119	109.5	20.5

3NE6 4.., 3NE9 4..,



Type	Dimensions	
	a	b
3NE6 437, 3NE9 440-6, 3NE9 450	89	76
3NE6 444	99	86

3NE6 4..-7, 3NE9 4..-7



Technical specifications

Type		3NE4 117-5	3NE4 121-5	3NE4 146-5	3NE3 525-5 [1]	3NE3 535-5 [1]
Utilization category (IEC 60269)		gR	aR			
Rated voltage U_n	V AC	1000		800	1000	
Rated current I_n	A	50	100	170	200 [2]	450 [2]
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	135	900	7370	7150	64500
Breaking I^2t value I^2t_A at U_n	A^2s	1100	7400	60500	44000	395000
Temperature rise at I_n (body center)	K	95	135	142	75	130
Power dissipation at I_n	W	20	35	43	50	90
Varying load factor WL		0.85				
Weight approx.	kg	0.28			0.7	

Type		3NE4 327-6B [1]	3NE4 330-6B [1]	3NE4 333-6B [1]	3NE4 334-6B [1]	3NE4 337-6 [1]
Utilization category (IEC 60269)		aR				
Rated voltage U_n	V AC	800				
Rated current I_n	A	250	315	450	500	710
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	3600	7400	29400	42500	142000
Breaking I^2t value I^2t_A at U_n	A^2s	29700	60700	191000	276000	923000
Temperature rise at I_n (body center)	K	175	170	190	195	170
Power dissipation at I_n	W	105	120	140	155	
Varying load factor WL		0.85				0.95
Weight approx.	kg	0.65				

Selection and ordering data

	I_n	U_n	Utilization category	Order No.	Weight 1 item	PS*/ P. unit
	A	V AC			kg	Items
for SITOR 6QG10 thyristor sets						
	200	1000	aR	**3NE3 525-5**	0.744	3
	450			**3NE3 535-5**	0.746	3
for SITOR 6QG11 thyristor sets						
	50	1000	gR	**3NE4 117-5**	0.303	1/3
	100		aR	**3NE4 121-5**	0.309	1/3
	170	800		**3NE4 146-5**	0.311	1/3
for SITOR 6QG12 thyristor sets						
	250	800	aR	**3NE4 327-6B**	0.692	3
	315			**3NE4 330-6B**	0.688	3
	450			**3NE4 333-6B**	0.690	3
	500			**3NE4 334-6B**	0.688	3
	710			**3NE4 337-6**	0.689	3

1) Maximum tightening torque: M10 capped thread: 35 Nm, depth of screw entry ≥ 9 mm.
2) Cooling air speed ≥ 0.5 m/s. In case of natural air cooling, reduction of 5%.

* You can order this quantity or a multiple thereof.

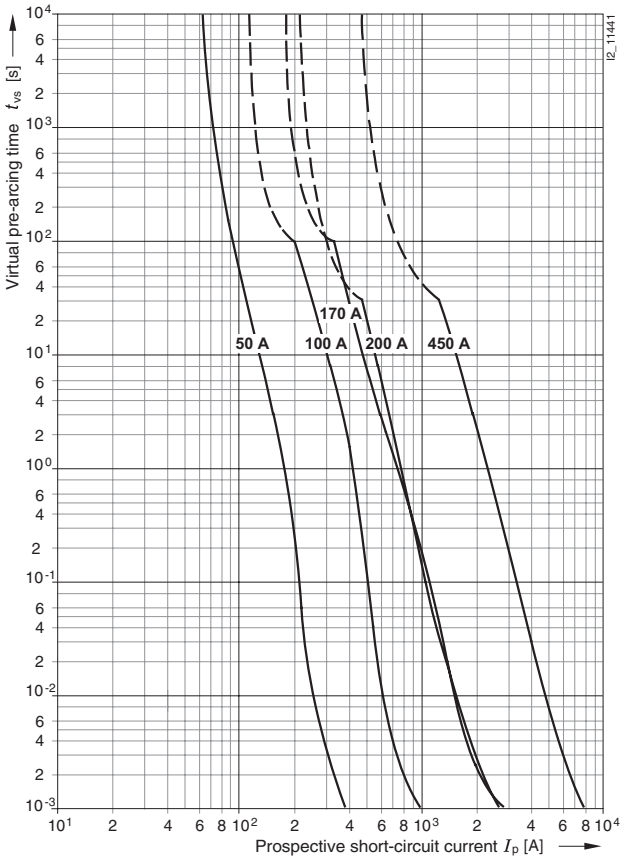
for SITOR thyristor sets

Characteristic curves

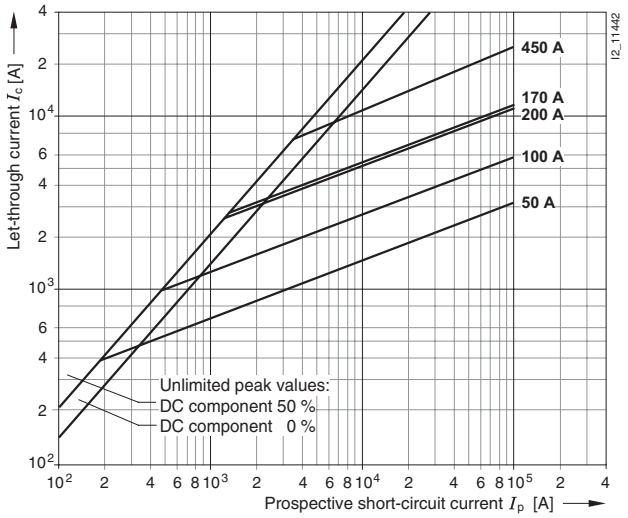
Series 3NE3 5.5-5, 3NE4 1..-5

Utilization category: aR, gR
Rated voltage: 800 V AC (170 A)
1000 V AC (50 A, 100 A, 200 A, 450 A)
Rated current: 50 ... 450 A

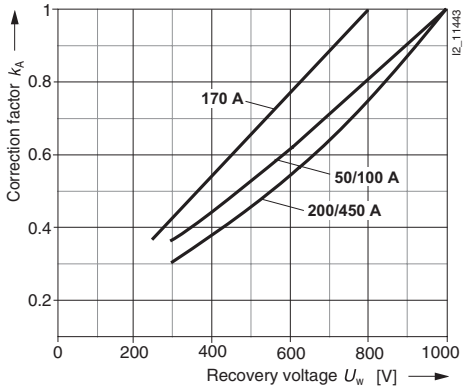
Time/current characteristics diagram



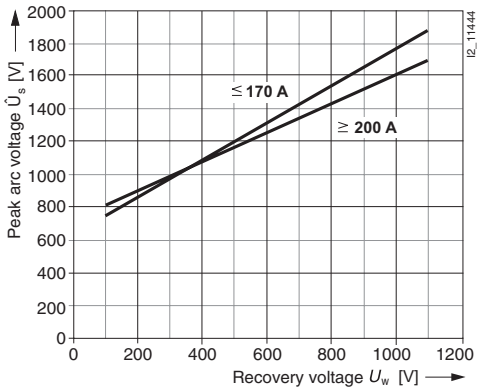
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value



Peak arc voltage

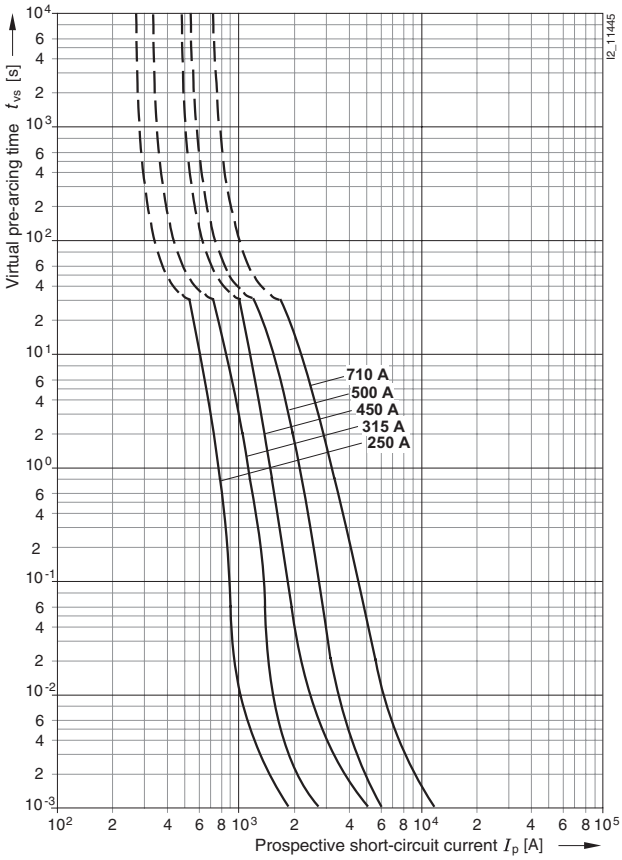


Characteristic curves

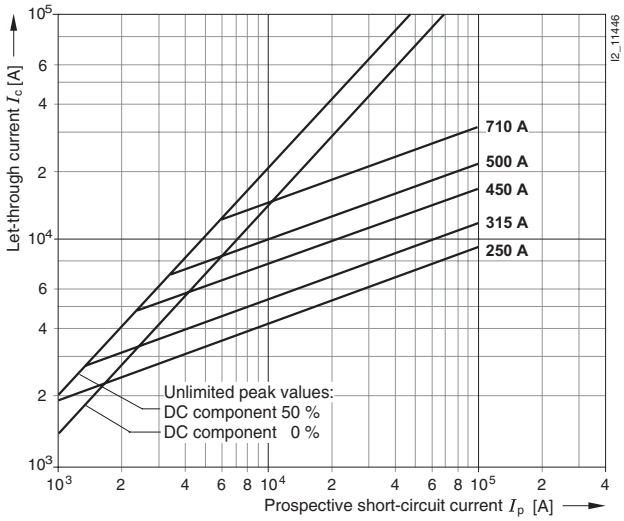
Series 3NE4 3..-6B, 3NE4 337-6

Utilization category: aR
Rated voltage: 800 V AC
Rated current: 250 ... 710 A

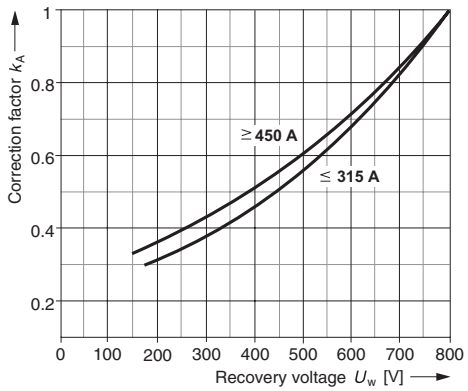
Time/current characteristics diagram



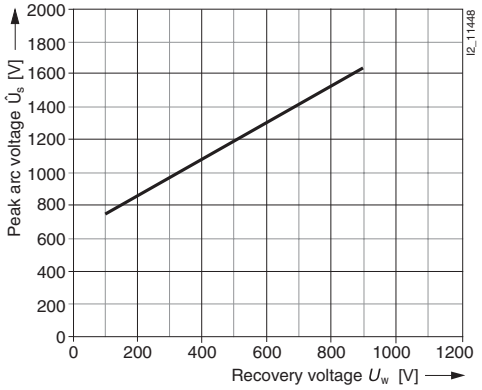
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value

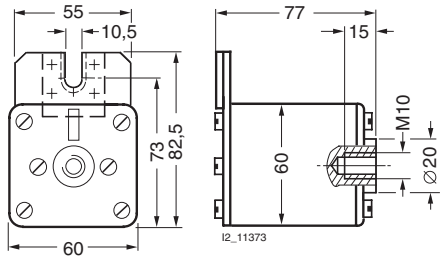


Peak arc voltage

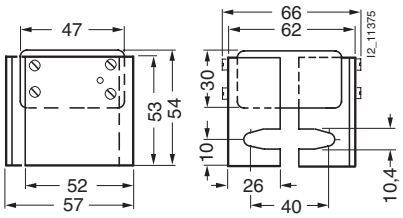


Dimensional drawings

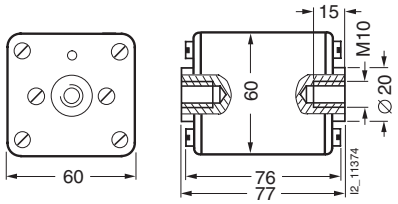
3NE3 5..-5



3NE4 1..-5



3NE4 3..-6B, 3NE4 337-6



Technical specifications

Type		3NC7 327-2	3NC7 331-2
Utilization category (IEC 60269)		aR	
Rated voltage U_n	V AC	680	
Rated current I_n	A	250	350
Melting I^2t value I^2t_s (t_{vs} = 1 ms)	A^2s	244000	550000
Breaking I^2t value I^2t_A at U_n	A^2s	635000	1430000
Temperature rise at I_n (body center)	K	45	66
Power dissipation at I_n	W	25	32
Varying load factor WL		0.9	
Weight approx.	kg	0.7	

Selection and ordering data

	I_n	U_n	Utilization category	Order No.	Weight 1 item	PS*/ P. unit
	A	V AC			kg	Items
for railway supply rectifiers						
	250	680	aR	**3NC7 327-2**	0.725	3
	350			**3NC7 331-2**	0.740	3

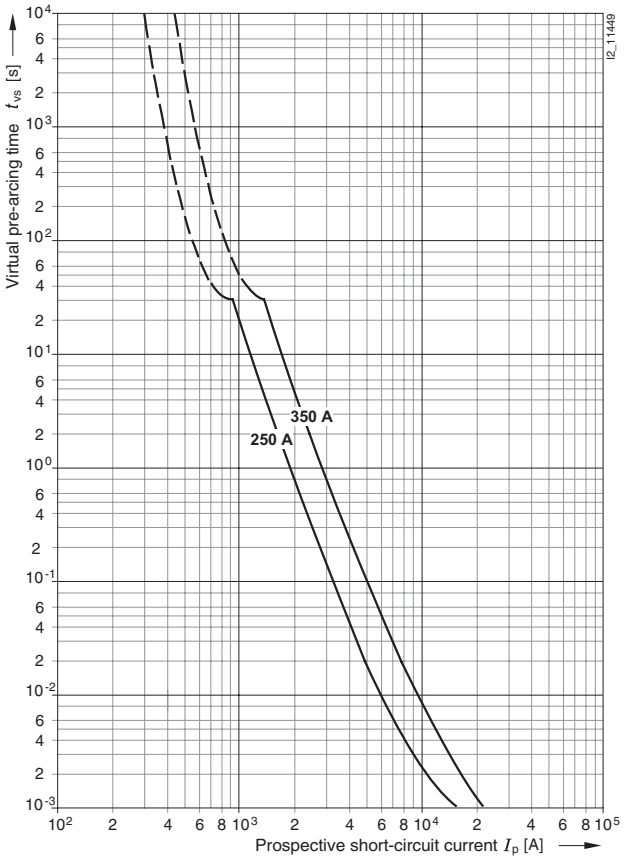
* You can order this quantity or a multiple thereof.

Characteristic curves

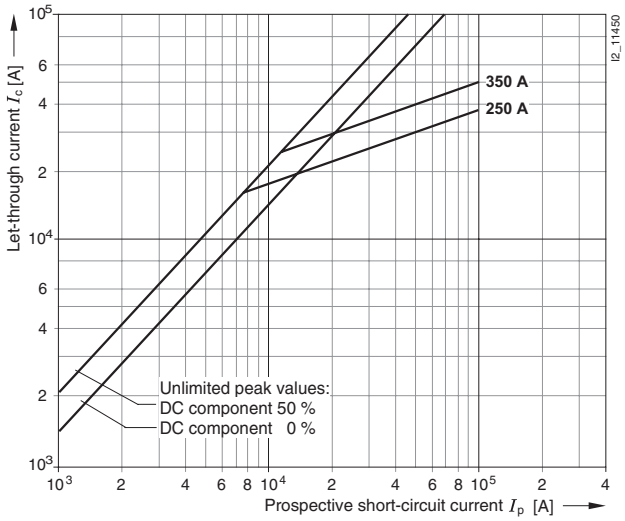
Series 3NC7 3..-2

Utilization category: aR
Rated voltage: 680 V AC
Rated current: 250 A, 350 A

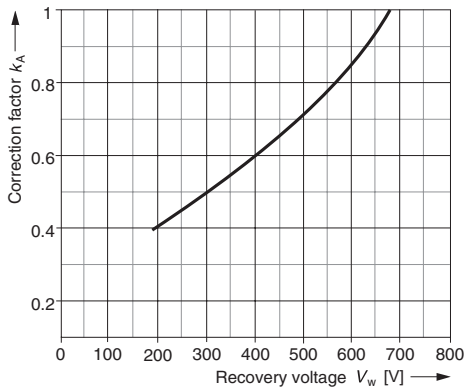
Time/current characteristics diagram



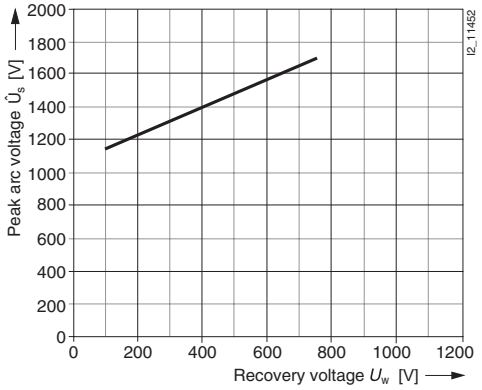
Let-through characteristics (current limitation at 50 Hz)



Correction factor k_A for breaking I^2t value

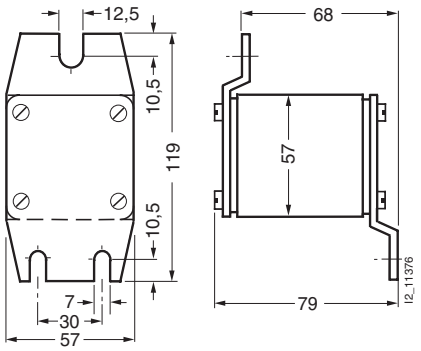


Peak arc voltage



Dimensional drawings

3NC7 3..-2



General Data for SITOR Semiconductor Safety Fuses

Technical explanations

Overview

Fuse links are selected according to rated voltage, rated current, breaking I^2t value I^2t_A and varying load factor, taking into account any further conditions specified. Unless stated otherwise, all of the following data refer to AC operation from 45 Hz to 62 Hz.

Rated voltage U_n

The rated voltage of a SITOR fuse link is the voltage specified as the r.m.s. value of the AC voltage on the fuse link and in the order and configuration data and the characteristics.

Always ensure that the rated voltage of the fuse link you select is such that the fuse link will reliably quench the voltage driving the short-circuit current. The driving voltage must not exceed the value U_n + 10 %. Please note that the supply voltage U_{v0} of a power converter can also be increased by 10 %. If, in the shorted circuit, two arms of a converter connection are connected in series, and if the short-circuit current is sufficiently high, it can be assumed that voltage sharing is uniform. It is essential to observe the instructions in '*Series connection of fuse links*' on page 1/198.

Rectifier operation

With converter equipment that can only be used for rectifier operation, the supply voltage U_{v0} is the driving voltage.

Inverter operation

With converter equipment that can also be used for inverter operation, shoot-throughs may occur as faults. In this case, the driving voltage U_{WK} in the shorted circuit is the sum of the infeed direct voltage (e.g. the e.m.f. of the DC generator) and the AC-line supply voltage. When rating a fuse link, this sum can be replaced by an AC voltage whose r.m.s. value is 1.8 times that of the AC-line supply voltage (U_{WK} = 1.8 U_{v0}). The fuse links must be rated so that they reliably quench the voltage U_{WK}.

Rated current I_n, current carrying capacity

The rated current of a SITOR fuse link is the current specified as r.m.s. value of the alternating current for the frequency range 45 Hz to 62 Hz in the *Selection and ordering data* and *Characteristics* , as well as on the fuse link itself.

When operating fuse links with rated current, the following are considered normal operating conditions:

- Natural air cooling with an ambient temperature of +45 °C
- Conductor cross-sections equal test cross-sections (see Test cross-sections table), for operation in LV HRC fuse bases and switch-disconnectors, please refer to the Selection and ordering data
- Conduction angle of a half-period 120 °el
- Continuous load maximum with rated current

For operating conditions that deviate from the above, the permissible load current I_n' of the SITOR fuse link can be determined using the following formula:

$I_n' = k_u \times k_q \times k_l \times k_l \times WL \times I_n$

whereby

I_n rated current of the fuse link [1)]

k_u correction factor for ambient temperature (page 1/193)

k_q correction factor for conductor cross-section (page 1/193)

k_l correction factor for conduction angle (page 1/193)

k_l correction factor for increased air cooling (page 1/193)

WL varying load factor (page 1/194)

Test cross-sections

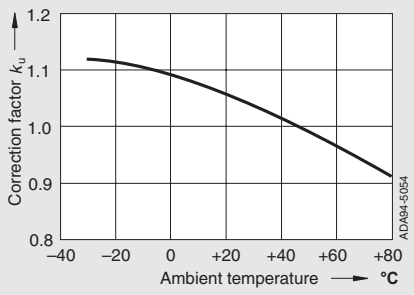
Rated current I_n	Test cross-sections (series 3NC1 0, 3NC1 1, 3NC1 4, 3NC1 5, 3NC2 2, 3NE1 ..., 3NE8 0.., 3NE4 1)	(all other series)
A	Cu mm^2	Cu mm^2
10	1.0	–
16	1.5	–
20	2.5	45
25	4	45
35	6	45
40	10	45
50	10	45
63	16	45
80	25	45
100	35	60
125	50	80
160	70	100
200	95	125
224	–	150
250	120	185
315	2 x 70	240
350	2 x 95	260
400	2 x 95	320
450	2 x 120	320
500	2 x 120	400
560	2 x 150	400
630	2 x 185	480
710	2 x (40 x 5)	560
800	2 x (50 x 5)	560
900	2 x (80 x 4)	720
1000	–	720
1250	–	960

1) When using SITOR fuse links in LV HRC fuse bases according to IEC/EN 60269-2-1 and fuse switch-disconnectors and switch disconnectors with fuses, please also refer to the data in the selection and ordering data.

Overview

Correction factor for ambient temperature k_u

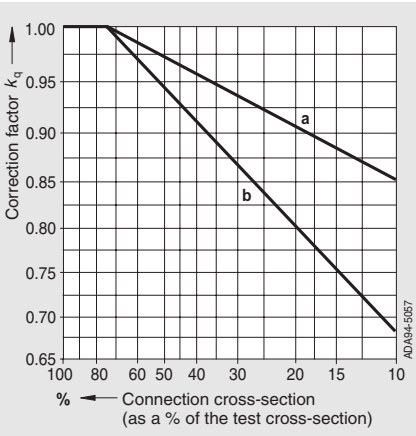
The influence of the ambient temperature on the permissible load of the SITOR fuse links is taken into account using the correction factor k_u as shown in the following graph.



Correction factor for conductor cross-section k_q

The rated current of the SITOR fuse links applies to operation with conductor cross-sections that correspond to the respective test cross-section (see the table on page 1/192).

In the case of reduced conductor cross-sections, the correction factor k_q, must be used as shown in the following graph.

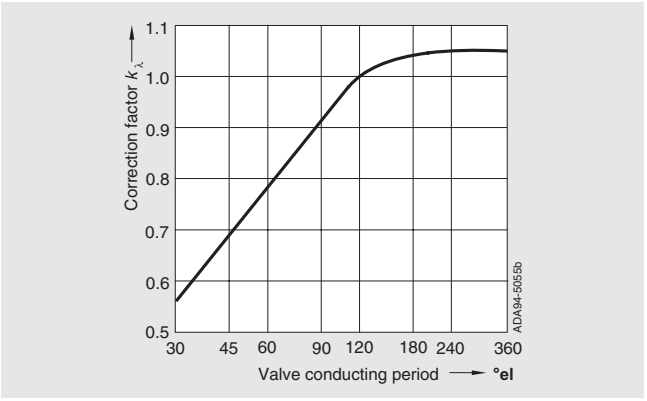


a = reduction of cross-section of one connection

b = reduction of cross-section of both connections

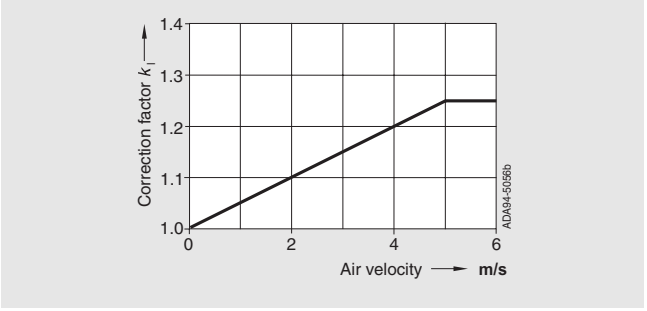
Correction factor for conduction angle k_l

The rated current of the SITOR fuse links is based on a sinusoidal alternating current (45 Hz to 62 Hz). However, in converter operation, the arm fuses are loaded with an intermittent current, whereby the conduction angle is generally 180 °el or 120 °el. With this load current wave form, the fuse link can still carry the full rated current. In the case of smaller conduction angles, the current must be reduced in accordance with the following graph.



Correction factor for increased air cooling k_l

In the case of increased air cooling, the current carrying capacity of the fuse link increases with the air speed, air speeds > 5 m/s do not effect any significant further increase of current carrying capacity.



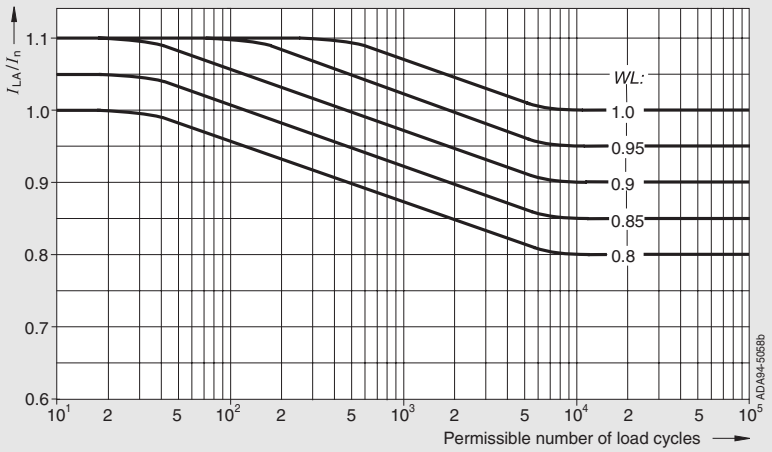
Technical explanations

Overview

Varying load factor *WL*

The varying load factor *WL* is a reduction factor by which the non-aging current carrying capacity of the fuse links can be determined for any load cycles. Due to their design, the SITOR fuse links have a range of different varying load factors. In the fuse link characteristics, the respective varying load factor *WL* for >10,000 load changes (1 hour "ON", 1 hour "OFF") is specified for the expected operating time of the fuse links. In the event of a lower number of load changes during the expected operating time, it may be possible to use a fuse link with a smaller varying load factor *WL* as shown in the following graph.

In the case of uniform loads (no load cycles and no shutdowns), the varying load factor can be taken as *WL* = 1. For load cycles and shutdowns that last longer than 5 min. and are more frequent than once a week, you need to select the varying load factor *WL* specified in the characteristics of the individual fuse links.



Waveform of the varying load factor *WL* for load cycles

Fuse currents for operation in power converter

The r.m.s. value of the fuse current can be calculated for the most common converter connections from the (smoothed) direct current I_d or the conductor current I_L according to the following table.

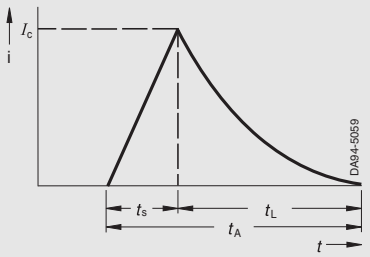
Converter connection		r.m.s. value of the conductor current (phase fuse)	r.m.s. value of the branch-circuit current (arm fuse)
One-pulse center tap connection	(M1)	1.57 I_d	–
Double-pulse center tap connection	(M2)	0.71 I_d	–
Three-pulse center tap connection	(M3)	0.58 I_d	–
Six-pulse center tap connection	(M6)	0.41 I_d	–
Double three-pulse center tap connection (parallel)	(M3.2)	0.29 I_d	–
Two-pulse bridge connection	(B2)	1.0 I_d	0.71 I_d
Six-pulse bridge connection	(B6)	0.82 I_d	0.58 I_d
Single-phase bidirectional connection	(W1)	1.0 I_L	0.71 I_L

Overview

I^2t values

In the event of a short-circuit, the current of the fuse link increases during melting time t_s up to let-through current I_c (melting current peak).

During the arc quenching time t_L, the electric arc develops and the short-circuit current is quenched (see following graph).



Current path when switching fuse links

The integral of the current squared $\left(\int I^2 dt\right)$ over the entire switching period

(t_s+t_L), in other words, the breaking I^2t value, determines the heat to be fed to the semiconductor device that is to be protected during the breaking procedure.

In order to ensure sufficient protection, the breaking I^2t value of the fuse link must be smaller than the I^2t value of the semiconductor device. As the temperature increases, i.e. preloading increases, the breaking I^2t value of the fuse link decreases almost in the same way as the I^2t value of a semiconductor device, so that it is enough to compare the I^2t values in a non-loaded (cold) state.

The breaking I^2t value (I^2t_A) is the sum of the melting I^2t value (I^2t_s) and the quenching I^2t value(I^2t_L).

$\left(\int I^2 dt\right)$ (semiconductor, t_{vj} = 25°C,
t_p = 10 ms) > $\left(\int I^2 t_A\right)$ (fuse link)

Melting I^2t value I^2t_s

The melting I^2t value can be calculated for the value pairs of the time/current characteristic curve of the fuse link for any periods.

As the melting time decreases, the melting I^2t value tends towards a lower limit value at which almost no heat is dissipated from the bottleneck of the fuse-element to the environment during the melting process. The melting I^2t values specified in the Selection and ordering data and in the characteristics correspond to the melting time t_{vs} = 1 ms.

Quenching I^2t value I^2t_L

While the melting I^2t value is a characteristic of the fuse link, the quenching I^2t value depends on circuit data, such as

- the recovery voltage U_w
- the power factor j of the shorted circuit
- the prospective current I_p (current at the installation point of the fuse link if this is bridged)

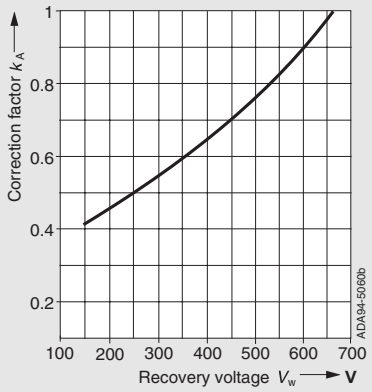
The maximum quenching I^2t value is reached at a current of 10 x I_n to 30 x I_n, depending on the fuse type.

Breaking I^2t value I^2t_A, correction factor k_A

The breaking I^2t values of the fuse link are specified in the characteristics for the rated voltage U_n. In order to determine the breaking I^2t value for recovery voltage U_w the correction factor k_A must be taken into account.

I^2t_A (for U_w) = I^2t_A (for U_n) x k_A

The characteristics "correction factor k_A" (see the following graph) is specified in the characteristics for the individual fuse series.
The breaking I^2t values determined in this way apply for prospective currents $I_p \geq 10 \times I_n$ and power factor = 0.35.



Correction factor k_A for breaking I^2t value

Example: Series 3NE8 0..

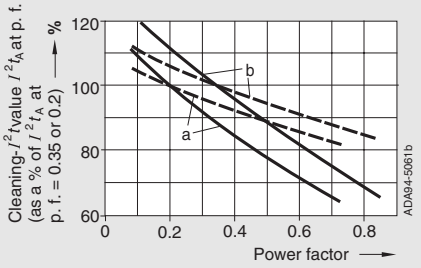
Taking into account the recovery voltage U_w

The recovery voltage U_w is derived from the voltage driving the short-circuit current. For most faults, the driving voltage is equal to the supply voltage U_{v0}, however, for shoot-throughs it is 1.8 times the value for the supply voltage U_{v0} (see rated voltage, page 1/192). If the shorted circuit contains two arms of a converter connection and thus two fuse links in series, and if the short-circuit current is sufficiently high (see series connection, page 1/198) it can be assumed that there is a uniform voltage sharing, i.e. U_w = 0.5 x U_{v0} or, in the case of shoot-throughs U_w = 0.9 x U_{v0}.

Influence of the power factor

The specifications in the characteristics for the breaking I^2t values (I^2t_A) refer to a power factor = 0.35 (exception: for SITOR fuse links 3NC5 8.., 3NE6 4.., 3NE9 4.. the power factor = 0.2 applies).

The dependence of the breaking I^2t values on the power factor at 1.0 x U_n and at 0.5 x U_n is shown in the following graph.



Dependence of breaking I^2t value I^2t_A of SITOR fuse links on power factor

—— at 1.0 U_n

– – – at 0.5 U_n

a = for SITOR fuse links 3NC5 8.., 3NE6 4.., 3NE9 4..
(reference to power factor = 0.2)

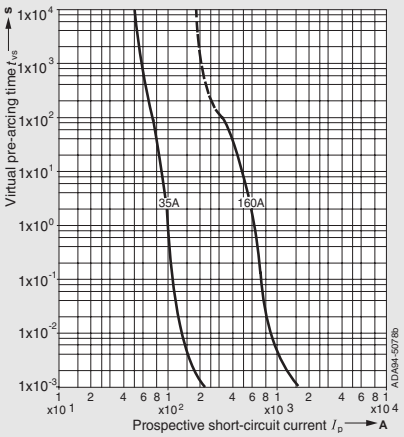
b = for all other SITOR fuse links (reference to power factor = 0.35)

Technical explanations

Overview

Time/current characteristics

The solid time/current characteristic curves in the following graph specify the time to melting for the non-loaded fuse link in a cold state (max. +45 °C) an.



35 A: Utilization category gR

160 A: Utilization category aR

If the time/current characteristic curve in the long-time range (t_{vs} > 30 s) is dashed (fuse links of utilization category aR), this specifies the limit of the permissible overload in a cold state. If the dashed part of the characteristic curve is exceeded, there is a risk of damage to the ceramic body of the fuse link. The fuse links can only be used for short-circuit protection. In this case, an additional protective device (overload relay, circuit-breaker) is required to protect against overload In the case of controlled converter equipment, the current limiter is sufficient.

If the time/current characteristic curve is solid over the entire time range (fuse links of utilization category gR or gS), then the fuse link can operate in this range. This means it can be used both for overload and short-circuit protection.

Actual melting time

The virtual melting time t_{vs} is specified in the time/current characteristic curve, depending on the prospective current. It is a value that applies to the current squared ($di/dt = \infty$).

In the case of melting times t_{vs} < 20 ms, the virtual melting time t_{vs} deviates from the actual melting time t_s. The actual melting time may be several milliseconds longer (depending on the rate of current rise).

Within the range of several milliseconds, during which the rise of the short-circuit current can be assumed to be linear, the actual melting time for a sinusoidal current rise and 50 Hz is as follows:

$$t_s = \frac{3xI^2t_s}{I_c^{\,2}}$$

Taking into account preloading, residual value factor RW

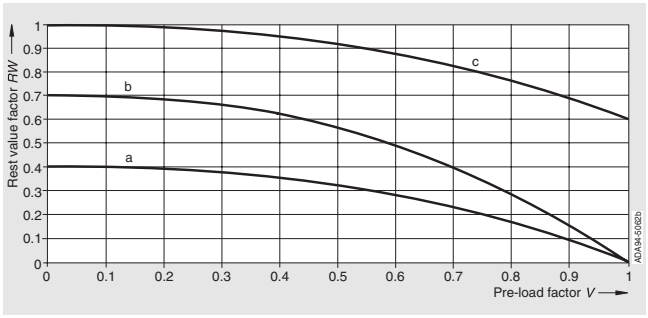
Preloading the fuse link shortens the permissible overload duration and the melting time.

The residual value factor *RW* can be used to determine the time that a fuse link can be operated during a periodic or non-periodic load cycle, above and beyond the previously determined permissible load current I_n', with any overload current I_{La} without aging.

The residual value factor *RW* is dependent on the preloading *V* (I_{eff} r.m.s. value of the fuse current during the load cycle at permissible load current I_n')

$$V = \frac{I_{eff}}{I_n'}$$

and the frequency of the overloads (see the following graph, curves a and b).



Permissible overload and melting time for previous load

a = frequent surge/load cycle currents (>1/week)

b = infrequent surge/load cycle currents (<1/week)

c = melting time for preloading

Permissible overload duration =
residual value factor *RW* x melting time t_{vs} (time/current characteristic curve)

A reduction of the melting time of a fuse link in the case of preloading can be derived from curve c.

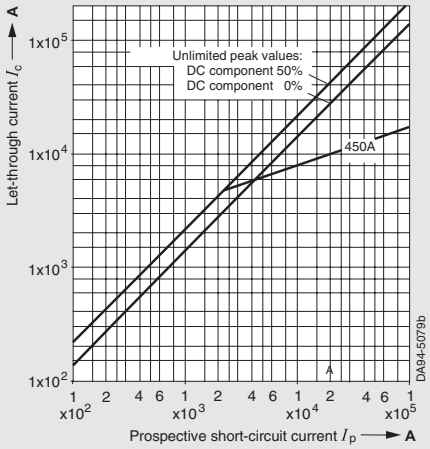
Melting time =
residual value factor *RW* x melting time t_{vs} (time/current characteristic curve)

Overview

Let-through current I_c

The let-through current I_c can be determined from the current limiting characteristics (current limitation at 50 Hz) specified for the respective fuse link. This depends on the prospective current and the DC component when the short-circuit occurs (instant of closing).

The following graph shows the let-through current I_c of a fuse link, depending on the prospective short-circuit current I_p, using the 3NE4 333-0B SITOR fuse link as an example.



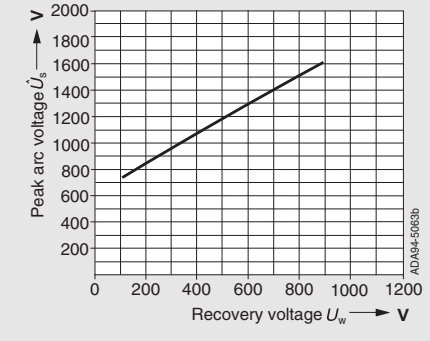
Example:
3NE4 333-0B SITOR fuse link

Rated breaking capacity

The rated breaking capacity of all SITOR fuse links is at least 50 kA, unless higher values are specified in the characteristic curves. This data applies to a test voltage of 1.1 x U_n, 45 Hz to 62 Hz and 0.1 ≤ power factor ≤ 0.2. In the case of inception voltages that are below the rated voltage, or rated currents of the fuse links that are below the maximum rated current of a fuse series, the breaking capacity is considerably higher than the rated breaking capacity.

Peak arc voltage $\hat{U}_s$

During the quenching process, a peak arc voltage $\hat{U}_s$ occurs at the connections of the fuse link, which can significantly exceed the supply voltage. The level of the peak arc voltage depends on the design of the fuse link and the level of the recovery voltage. The characteristic curve shown below depends on the recovery voltage U_w (see the following graph).



Example:
3NE4 333-0B SITOR fuse link

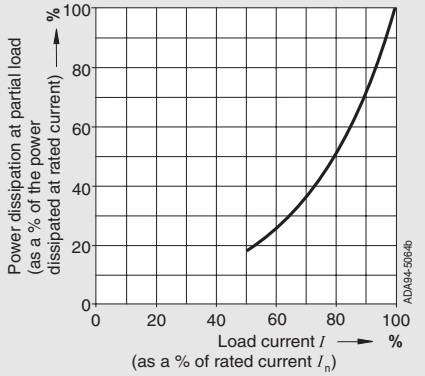
The peak arc voltage occurs as a cutoff voltage at the semiconductor devices not in the shorted circuit. In order to prevent voltage-related hazards, the peak arc voltage must not exceed the peak cutoff voltage of the semiconductor devices.

Power dissipation, temperature rise

On reaching the rated current, the fuse-elements of the SITOR fuse links have a considerably higher temperature than the fuse elements of line protection fuse links.

The power dissipation specified in the characteristic curve is the upper variance coefficient if the fuse link is loaded with the rated current.

In the case of partial loads, this power dissipation decreases as shown in the following graph



The temperature rise specified in the characteristic curve applies to the respective reference point and is determined when testing the fuse link (test setup according to DIN VDE 0636, Part 23 and IEC 269-4).

Technical explanations

Overview

Parallel and series connection of fuse links

Parallel connection

If an arm of a converter connection has several semiconductor devices so that the fuse links are connected in parallel, only the fuse link connected in series to the faulty semiconductor device is tripped in the event of an internal short-circuit. It must quench the full supply voltage.

To boost the voltage, two or more parallel fuse links can be assigned to a single semiconductor device without reducing the current. The resulting breaking I^2t value increases with the square of the number of parallel connections. In this case, in order to prevent incorrect distribution of the current, you should only use fuse links of the same type.

Series connection

There are two kinds of series connection available:

- series connection in the converter arm
- 2 fused converter arms through which a short-circuit current flows in series

In both cases, uniform voltage sharing can only be assumed if the melting time of the SITOR fuse link does not exceed the value specified in the following table.

SITOR fuse links Type	Maximum melting time for uniform voltage sharing ms
3NC1 0.. **3NC1 1..** **3NC1 4..** **3NC1 5..** **3NC2 2..**	10
3NC2 4.. **3NC5 8..** **3NC7 3..** **3NC8 4..**	40 10
3NE1 0.. **3NE1 2..** **3NE1 3..** **3NE1 4..** **3NE1 8..**	10 20 10
3NE3 2.. **3NE3 3..** **3NE3 4..** **3NE3 5..** **3NE3 6..**	10 20
3NE4 1.. **3NE4 3..**	10
3NE5 4.. **3NE5 6..**	20
3NE6 4..	10
3NE7 4.. **3NE7 6..**	20
3NE8 0.. **3NE8 7..**	10
3NE9 4.. **3NE9 6..**	10 20

Cooling conditions for series-connected fuse links should be approximately the same. If faults are expected, during which the specified melting times are exceeded (as a result of a slower current rise), it can no longer be assumed that voltage sharing is uniform. The voltage of the fuse links must then be rated so that a single fuse link can quench the full supply voltage.

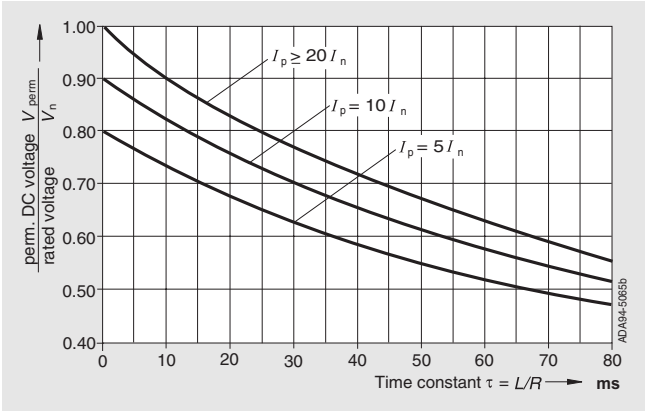
It is best to avoid the series connection of fuse links in a converter connection arm and instead use a single fuse link with a suitably high rated voltage.

Use with direct current

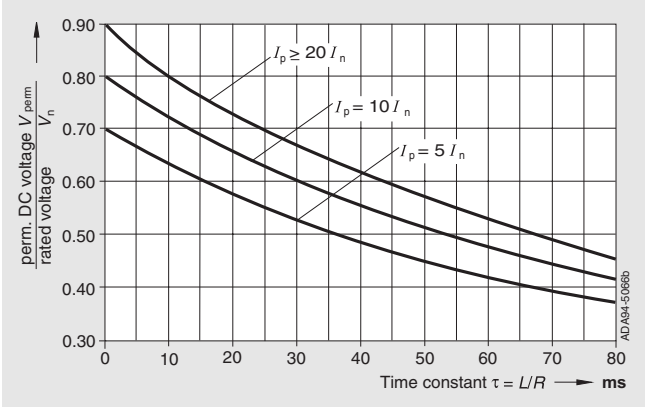
For fuse links that are to be used in DC circuits, some data may vary from the data specified in the characteristic curves for alternating current.

Permissible direct voltage

The permissible direct voltage U_{perm} of the fuse links depends on the rated voltage U_n, of the time constants $\tau = L/R$ in the DC circuit and on the prospective current I_p. The permissible direct voltage refers to the rated voltage U_n and is specified depending on the time constants τ, the prospective current is a parameter (see the following graphs).



with the exception of series 3NE1 0.., 3NE1 8..



with the exception of series 3NE1 0.., 3NE1 8..

Breaking I^2t value I^2t_A

The breaking I^2t value I^2t_A depends on the voltage, on the time constants $\tau = L/R$ and on the prospective current I_p. It is calculated from the I^2t_A value specified in the characteristic curve of the respective fuse link at rated voltage U_n and correction factor k_A, whereby, instead of the recovery voltage U_w, the direct voltage is used against which the fuse link is to switch.

The breaking I^2t value determined in this way applies under the following conditions:

- time constant $L/R \leq 25$ ms for $I_p \geq 20 \times I_n$
- time constant $L/R \leq 10$ ms for $I_p = 10 \times I_n$
- the breaking I^2t values increase by 20 %
- for $I_p \geq 20 \times I_n$ and time constant $L/R = 60$ ms
- for $I_p = 10 \times I_n$ and time constant $L/R = 35$ ms

Overview

Peak arc voltage $\hat{U}_s$

The peak arc voltage $\hat{U}_s$ is determined from the curve specified in the characteristics for the respective fuse link, whereby instead of the recovery voltage U_w, the direct voltage is used against which the fuse link is to switch.
The peak arc voltage determined in this way applies under the following conditions:

- time constant $L/R \leq 20$ ms for $I_p \geq 20 \times I_n$
- time constant $L/R \leq 35$ ms for I_p 10 x I_n

The switching voltages increase by 20%

- for $I_p \geq 20 \times I_n$ and time constant $L/R = 45$ ms
- for I_p 10 x I_n and time constant $L/R = 60$ ms

Indicator

An indicator shows the switching of the fuse link. The indicator of the SITOR fuse links has a transformer operating voltage between 20 V ($U_n \leq 1000$ V) and 40 V ($U_n > 1000$ V).

Accessories

Fuse bases, fuse pullers

Some of the SITOR fuse links can be inserted in matching fuse bases. The matching fuse bases (single-pole and three-pole) and the respective fuse pullers are listed in the technical specifications, from page 1/83.

Note
Even if the values of the rated voltage and/or current of the fuse bases are lower than that of the allocated fuse link, the values of the fuse link apply.

Fuse switch disconnectors, switch disconnectors with fuses

Some series of SITOR fuse links are suitable for operation in fuse switch disconnectors 3NP4 and 3NP5 or in switch disconnectors with fuses 3KL and 3KM (see catalogs LV 10 and LV 30).

When using switch disconnectors, the following points must be observed:

- Because, compared to LV HRC fuses, the power dissipation of the SITOR fuse links is higher, the permissible load current of the fuse links sometimes needs to be reduced, see below (Configuration manual).
- Fuse links with rated currents $I_n > 63$ A may also not be used for overload protection when they have utilization category gR.

Note
All fuse links of the series 3NE1 ... with rated currents I_n from 16 A to 850 A and utilization categories gR or gS can be used for overload protection.

- The rated voltage and rated isolation voltage of the switch disconnectors must at least correspond to the available voltage.
- However, when using fuse links of the series 3NE3 2.., 3NE3 3.., 3NE4 3.., 3NC2 4.. and 3NC8 4.., the switching capacity of the fuse switch disconnectors must not be fully utilized due to the slotted blade. Occasional switching of currents up to the rated current of the fuse link is permissible
- Fuse links of the series 3NE4 1.., when used in fuse switch disconnectors, may only be occasionally switched, and only without load, as this places the fuse blade under great mechanical stress.

In the technical specifications, from page 1/83, the switch disconnectors are allocated to their respective individual fuse links.

The permissible load of the fuse link and the required conductor cross-section can be found in the configuration manual "Configuring SITOR", Order No.: E20001-A700-P302.

Specifying the rated current

Overview

Specification of the rated current I_n for non-aging operation with varying load

Power converters are often operated not with a continuous load, but with varying loads, that can also temporarily exceed the rated current of the power converter.

The selection process for non-aging operation of SITOR fuse links for four typical types of load is as follows:[1)]

- continuous load
- unknown varying load, but with known maximum current
- varying load with known load cycle
- occasional surge load from preloading with unknown surge outcome

Please heed the diagrams for the correction factors k_u, k_q, k_λ , k_l, page 1/193, and the residual value factor *RW*, page 1/196. The varying load factor *WL* for the fuse links is specified on page 1/194.

Determining the required rated current I_n of the fuse link is carried out in two steps:

1. Determining the rated current I_n based on the r.m.s. value I_{rms} of the load current:

$$I_n > I_{eff} \times \frac{1}{k_u \times k_q \times k_\lambda \times k_l \times WL}$$

Permissible load current I_n' of the selected fuse link:
$I_n' = k_u \times k_q \times k_\lambda \times k_l \times WL \times I_n$

2. Checking the permissible overload duration of current blocks exceeding the permissible fuse load current I_n'.
Melting time t_{vs} (time/current characteristic curve) x residual value factor $RW \geq$ overload duration t_k

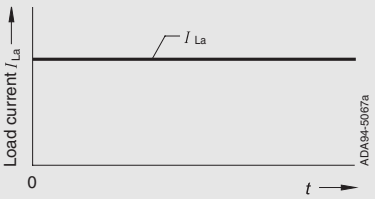
To do this, you require the previous load ratio

$$V = \frac{I_{eff}}{I_n'}$$

as well as the characteristic curve "permissible overload and melting time for previous load" (page 1/196, curve a) and the "time/current characteristic curve" for the selected fuse link.

If a determined overload duration is less than the respective required overload duration, then you need to select a fuse link with a greater rated current I_n (taking into account the rated voltage U_n and the permissible breaking I^2t value) and repeat the check.

Continuous load



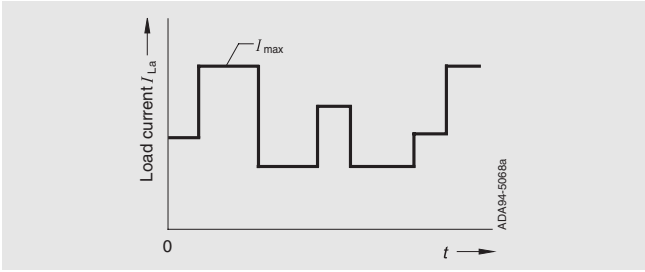
Rated current I_n of the fuse link

$$I_n \geq I_{La} \times \frac{1}{k_u \times k_q \times k_\lambda \times k_l \times WL}$$

I_{La} = load current of the fuse link (r.m.s. value)

Fewer than 1 shutdown per week: *WL* = 1
More than 1 shutdown per week: *WL* = see Technical specifications, from page 1/83.

Unknown varying load, but with known maximum current I_{max}

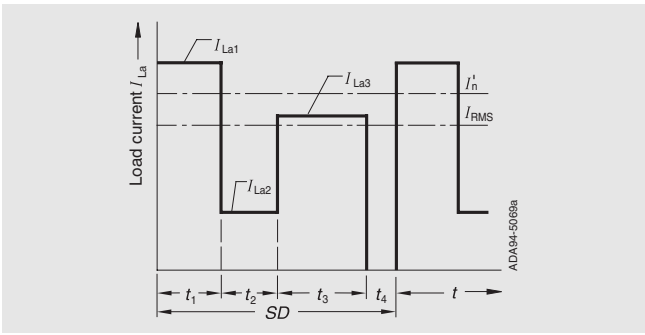


Rated current I_n of the fuse link

$$I_n \geq I_{max} \times \frac{1}{k_u \times k_q \times k_\lambda \times k_l \times WL}$$

I_{max} = maximum load current of the fuse link (r.m.s. value)

Varying load with known load cycle



$$I_{eff} = \sqrt{\frac{\sum_{k=1}^{k=n} I_{Lak}^2 \times t_k}{SD}}$$

$$I_{eff} = \sqrt{\frac{I_{La1}^2 t_1 + I_{La2}^2 t_2 + I_{La3}^2 t_3}{SD}}$$

I_{LK} = Maximum load current of the fuse link (r.m.s. value)

1) In the case of varying loads that cannot be assigned to one of the four types of load shown here, please contact us.

Overview

Occasional surge load from preloading with unknown surge outcome

Determining the required rated current I_n of the fuse link is carried out in two steps:

1. Determining the rated current I_n based on the previous load current I_{prev}:

$$I_n > I_{prev} \times \frac{1}{k_u \times k_q \times k_\lambda \times k_l \times WL}$$

Permissible load current I_n' of the selected fuse link:

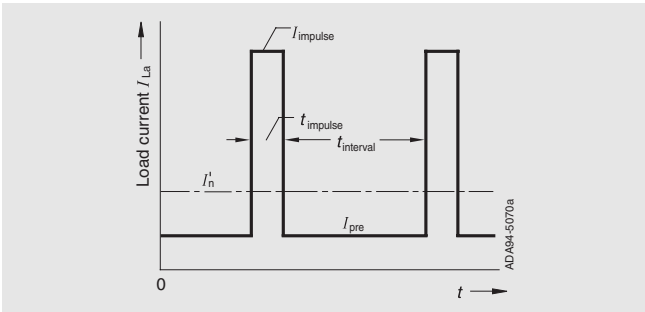
$I_n' = k_u \times k_q \times k_l \times WL \times I_n$

2. Checking the permissible overload duration of the surge current I_{surge}
Melting time t_{vs} (time/current characteristic curve) x residual value factor $RW \geq$ surge-wave duration t_{surge}
To do this, you require the previous load ratio

$$V = \frac{I_{eff}}{I_n'}$$

as well as the characteristic curve "permissible overload and melting time for previous load" (page 1/196, curve a or b) and the "time/current characteristic curve" for the selected fuse link.

If the determined overload duration is less than the required overload duration t_{surge} then you need to select a fuse link with a greater rated current I_n (taking into account the rated voltage U_n and the permissible breaking I^2t value) and repeat the check.



Condition:
$t_{interval} \geq 3 \times t_{surge}$
$t_{interval} \geq 5$ min

Sample selections

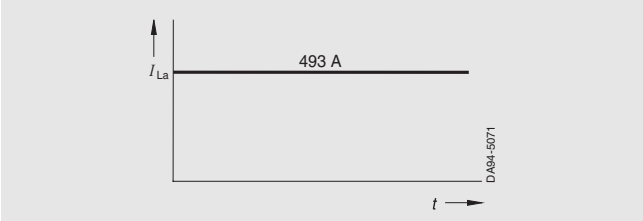
For a converter assembly in circuit (B6) A (B6) C, whose rated direct current is I_{dn} = 850 A, fuse links that can be installed as arm fuses should be selected. The choice of fuse is shown for different duty types of the converter assembly.

Data for converter assembly

- supply voltage
  U_N = 3 AC 50 Hz 400 V
- recovery voltage
  U_W = 360 V = U_N x 0.9 (for shoot-throughs)
- thyristor T 508N (from eupec),
  I2t value
  $\int i^2\,dt$ = 320 x 10 ^{3}A^{2}s (10 ms, cold)
- fuse links, natural air cooling,
  ambient temperature ϑ_u = +35 °C
- conductor cross-section for copper fuse link: 160 mm^2
- conversion factor
  direct current I_d/fuse load current I_{La} : $I_{La} = I_d$ x 0.58

For the following examples, it is assumed, in the case of loads that exceed the rated direct current of the converter assembly, that the converter assembly is rated for this load.

Continuous, no-break load



Direct current $I_d = I_{dn}$ = 850 A
$I_{La} = I_d$ x 0.58 = 493 A
Selected:
3NE3 335 SITOR fuse links
(560 A/1000 V), WL = 1
breaking I^2t value
I^2t_A = 360 x 10^3 x 0.53 = 191 x 10^3 A^{2}s
test cross-section according to page 1/192: 400 mm^2

The following correction factors are to be applied:

k_u = 1.02 (ϑ_u = +35 °C)

k_q = 0.91 (conductor cross-section, double-ended, 40 % of test cross-section)

k_λ = 1.0 (conduction angle λ = 120°)

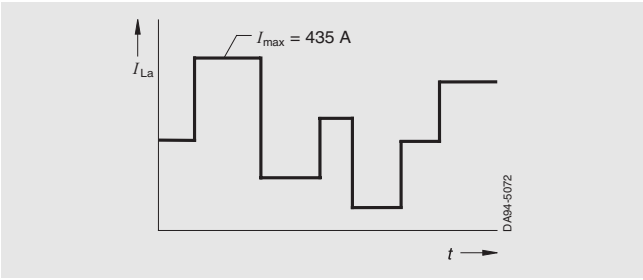
k_l = 1.0 (no forced-air cooling)

Required rated current I_n of the SITOR fuse link:

$$I_n \geq I_{La} \times \frac{1}{k_u \times k_q \times k_\lambda \times k_l \times WL} = 493\ \text{A}$$

$$493\ \text{A} \times \frac{1}{1,02 \times 0,91 \times 1,0 \times 1,0 \times 1,0} = 531\ \text{A}$$

Unknown varying load, but with known maximum current



Max. direct current I_{dmax} = 750 A
Max. fuse current $I_{max} = I_{dmax}$ x 0.58 = 435 A
Selected:
3NE3 334-0B SITOR fuse link
(560 A/1000 V), WL = 1
breaking I^2t value
I^2t_A = 260 x 10^3 x 0.53 = 138 x 10^3 A^{2}s
test cross-section according to page 1/192: 400 mm^2

The following correction factors are to be applied:

k_u = 1.02 (ϑ_u = +35 °C)

k_q = 0.91 (conductor cross-section, double-ended, 40 % of test cross-section)

k_λ = 1.0 (conduction angle λ = 120°)

k_l = 1.0 (no forced-air cooling)

Required rated current I_n of the SITOR fuse link:

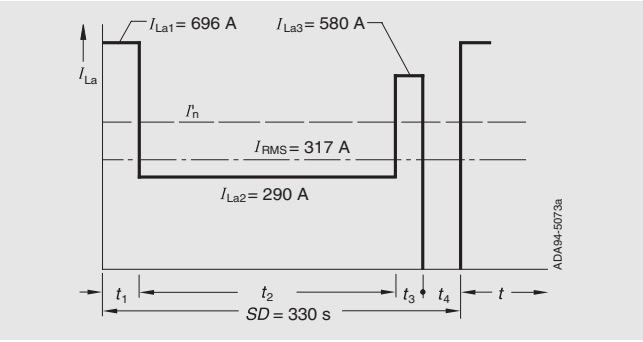
$$I_n \geq I_{max} \times \frac{1}{k_u \times k_q \times k_\lambda \times k_l \times WL} = 493\ \text{A}$$

$$435\ \text{A} \times \frac{1}{1,02 \times 0,91 \times 1,0 \times 1,0 \times 1,0} = 469\ \text{A}$$

Specifying the rated current

Overview

Varying load with known load cycle



Direct current:
I_{d1} = 1200 A t_1 = 20 s
I_{d2} = 500 A t_2 = 240 s
I_{d3} = 1000 A t_3 = 10 s
I_{d4} = 0 A t_4 = 60 s

Fuse current:
I_{La1} = 1200 x 0.58 = 696 A
I_{La2} = 500 x 0.58 = 290 A
I_{La3} = 1000 x 0.58 = 580 A

r.m.s. value of load current

$$I_{eff} = \sqrt{\frac{696^2 \times 20 + 290^2 \times 240 + 580^2 \times 10}{330}} = 317\,A$$

Selected:
3NE3 333 SITOR fuse link
(450 A/1000 V), WL = 1
Breaking I^2t value I^2t_A = 175 x 10^3 x 0.53 = 93 x 10^3 A^2s
Test cross-section according to page 1/192: 320 mm^2

The following correction factors are to be applied:

k_u = 1.02 (ϑ_u = +35 °C)

k_q = 0.94 (conductor cross-section, double-ended, 50 % of test cross-section)

k_λ = 1.0 (conduction angle λ = 120°)

k_I = 1.0 (no forced-air cooling)

1. Required rated current I_n of the SITOR fuse link:

$$I_n \geq I_{Eff} \times \frac{1}{k_u \times k_q \times k_\lambda \times k_I \times WL} = 493\ A$$

$$317\ A \times \frac{1}{1,02 \times 0,94 \times 1,0 \times 1,0 \times 1,0} = 331\,A$$

Permissible load current I_n' of the selected fuse link:

$I_n' = k_u$ x k_q x k_λ x k_I x WL x I_n = 1.02 x 0.94 x 1.0 x 1.0 x 1.0 x 450 = 431 A

2. Checking the permissible overload duration of current blocks exceeding the permissible fuse load current I_n'.

Previous load ratio:

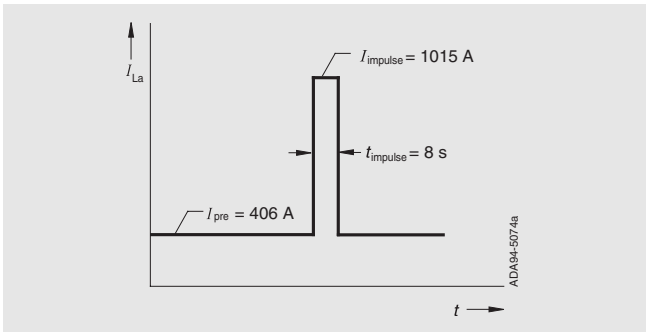
$$V = \frac{I_{eff}}{I_n'} = \frac{317}{431} = 0,74$$

Residual value factor RW: for V = 0.74 of curve a (characteristic curve page 1/196, frequent surge/load cycle currents) RW = 0.2

Current block I_{La1}: Melting time t_{vs} : 230 s (from time/current characteristic curve for 3NE3 333) t_{vs} x RW = 230 s x 0.2 = 46 s > t_1

Current block I_{La3}: Melting time t_{vs} : 1200 s (from time/current characteristic curve for 3NE3 333) t_{vs} x RW = 1200 s x 0.2 = 240 s > t_3

Occasional surge load from preloading with unknown surge outcome



Direct current:
I_{dvor} = 700 A
I_{dsurge} = 500 A t_{surge} = 8 s

Fuse current:
I_{prev} = I_{dprev} x 0.58 = 406 A
I_{surge} = I_{dsurge} x 0.58 = 1015 A

Conditions
$t_{interval} \geq 3\ t_{surge}$ and $t_{interval} \geq 5$ min is met.

Selected:
3NE3 333 SITOR fuse link
(560 A/1000 V), WL = 1
breaking I^2t value I^2t_A = 360 x 10^3 x 0.53 = 191 x 10^3 A^2s
test cross-section according to page 1/192: 400 mm^2

The following correction factors are to be applied:

k_u = 1.02 (ϑ_u = +35 °C)

k_q = 0.91 (conductor cross-section, double-ended, 40 % of test cross-section)

k_λ = 1.0 (conduction angle λ = 120°)

k_I = 1.0 (no forced-air cooling)

1. Required rated current I_n of the SITOR fuse link:

$$I_n \geq I_{prev} \times \frac{1}{k_u \times k_q \times k_\lambda \times k_I \times WL} = 493\ A$$

$$406\ A \times \frac{1}{1,02 \times 0,91 \times 1,0 \times 1,0 \times 1,0} = 437\,A$$

Permissible load current I_n' of the selected fuse link:

$I_n' = k_u$ x k_q x k_λ x k_I x WL x I_n = 1.02 x 0.91 x 1.0 x 1.0 x 1.0 x 560 = 520 A

2. Checking the permissible overload duration of the surge current I_{surge}

Previous load ratio:

$$V = \frac{I_{prev}}{I_n'} = \frac{406}{520} = 0,78$$

Residual value factor RW: for V = 0.78 of curve a (characteristic curve page 1/196, frequent surge/load cycle currents) RW = 0.18

Surge current I_{surge}: Melting time t_{vs} : 110 s (from time/current characteristic curve for 3NE3 333) t_{vs} x RW = 110 s x 0.18 = 19.8 s > t_{surge}

Correction factors can be found on pages 1/192 and 1/193.

Overview

**The following explains the key terms used in connection with fuse links for semiconductor protection.
Further definitions can be found in EN 60269-1.**

Rated breaking capacity

The rated breaking capacity is the highest prospective short-circuit current I_p that the fuse link can blow under prescribed conditions at 1.1 rated voltage.

Rated frequency

The rated frequency is the frequency for which the fuse link is rated with regard to power dissipation, current, voltage, characteristic curve and breaking capacity.

Rated voltage U_n

The rated voltage is the designated voltage of the fuse and according to which test conditions and operating voltage limits are determined.

For SITOR fuse links, the rated voltage is always the r.m.s. value of an AC voltage.

Rated current I_n

The rated current of a fuse link is the designated current of the fuse link and is the current up to which it can be continuously loaded under prescribed conditions (see page 1/192) without adverse affects.

Utilization category

The utilization category is the designation of the function class of a fuse link in connection with the object to be protected.

- Utilization category gS:
  general purpose semiconductor safety fuse for use in safety switching devices
- Utilization category gR:
  general purpose semiconductor protection
- Utilization category aR:
  back-up semiconductor protection

Let-through current I_c

The let-through current I_c is the maximum instantaneous value of the current reached during a switching operation of the fuse.

Let-through current characteristic curve

The let-through current characteristic curve specifies the value of the let-through current at 50 Hz as a function of the prospective current.

Function class

The function class means the ability of a fuse link to carry specific currents without damage and to switch off over-currents within a certain range (breaking capacity range).

Function class a

Back-up fuses:
Fuse links, that carry currents at least up to their rated current and can interrupt currents above a specific multiple of their rated current up to their rated breaking capacity.

Function class g

General purpose fuse:
Fuse links that can continuously carry currents up to at least their rated current and can interrupt currents from the smallest melting current through to the rated breaking capacity.

I^2t value

The I^2t value (joule integral) is the integral of the current squared over a specific time interval:

$$I^2t = \int_{t_0}^{t_1} i^2 \mathrm{d}t$$

Specifies the I^2t values for the melting process (I^2t_s) and the shut-down cycle (I^2t_A ≙ sum of melting and quenching I^2t value).

Power dissipation

Power dissipation is the power loss during the load of a fuse link with its rated current under prescribed conditions.

Peak arc voltage $\hat{U}_s$

The peak arc voltage is the highest value of the voltage that occurs at the contacts of the fuse link during the arc quenching time.

Residual value factor RW

The residual value factor is a reduction factor for determining the permissible load period of the fuse link with currents that exceed the permissible load current I_n' (see rated current I_n).

Prospective short-circuit current I_p

The prospective short-circuit current is the r.m.s. value of the line-frequency AC component, or the value of the direct current to be expected in the event of a short-circuit occurring after the fuse, were the fuse to be replaced by a component of negligible impedance.

Virtual time t_v

The virtual time is the time span calculated when a I^2t value is divided by the square of the prospective current:

$$t_v = \frac{\int i^2 \mathrm{d}t}{I_p^2}$$

The time/current characteristic curve gives the virtual melting time t_{vs}.

Varying load factor WL

The varying load factor is a reduction factor for the rated current with varying load states.

Recovery voltage U_w

The recovery voltage (r.m.s. value) is the voltage that occurs at the contacts of a fuse link after the power is cut off.

Time/current characteristic curve

The time/current characteristic curve specifies the virtual time (e.g. the melting time) as a function of the prospective current under specific operating conditions.

Characteristics

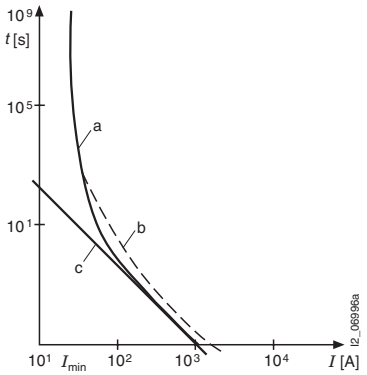
Overview

Legend

t_{vs} = Virtual melting time
I_c = Max. let-through current
I_{eff} = r.m.s. value of the prospective short-circuit current
I^2t_s = Melting I^2t value
I^2t_a = Breaking-I^2t value
I_n = Rated current
P_v = Rated power dissipation
$\Delta\vartheta$ = Temperature rise
k_a = Correction factor for I^2t value
U_w = Recovery voltage
$\hat{U}_s$ = Peak arc voltage
i_p = Peak short-circuit current
① = Peak short-circuit current with largest DC component
② = Peak short-circuit current without DC component
U = Voltage
i = Current
t_s = Melting time
t_L = Arc quenching time

Time/current characteristics

Melting times of fuse links are shown in the time/current diagrams with logarithmic scale and depending on their currents. The melting time characteristic curve runs from the smallest melting current, which just about melts the fuse element, asymptotic to the I^2t line of the same joule value in the range of the higher short-circuit currents, which specifies the constant joule value I^2t. To avoid overcomplication, the time/current characteristic curve diagrams omit the I^2t-line (c).



General representation of the time/current characteristic curve of a fuse link of utilization category gL/gG

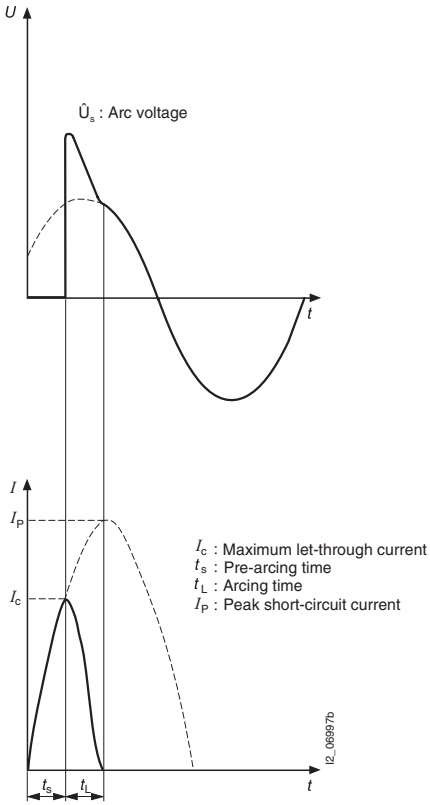
I_{min} : Smallest melting current
a : Melting time-current characteristic curve
b : Breaking time characteristic curve
c : I^2t line

The shape of the characteristic curve depends on the outwards heat transfer from the fuse-element. DIN VDE 0636 specifies tolerance-dependent time/current ranges within which the characteristic curves of the fuse must lie. Deviations of ± 10 % are permissible in the direction of the current axis. With Siemens LV HRC fuse links of utilization category gL/gG, the deviations work out at less than ± 5 % - a mark of outstanding quality. For currents up to approx. 20 I_n, the melting time-current characteristic curves are the same as the break time characteristic curves. In the case of higher short-circuit currents, the two characteristic curves move apart, influenced by the respective arc quenching time.

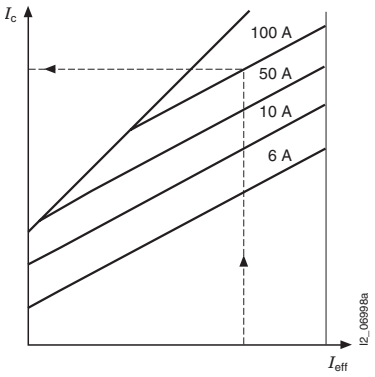
The difference between both lines (=arc quenching time) also depends on the power factor, the operational voltage and the breaking current.

The Siemens characteristic curves show the mean virtual melting time characteristic curves recorded at an ambient temperature of (20 ± 5) °C. They do not apply to preloaded fuse links.

The fuse-element of the fuse links melts so quickly at very high currents that the surge short-circuit current I_p is prevented from occurring. The highest instantaneous value of the current reached during the shutdown cycle is called the let-through current I_c. The current limitations are specified in the current limiting diagrams, otherwise known as let-through current diagrams.



Oscillograph of a short-circuit current shutdown through a fuse link



Current limitation diagram;
Let-through current diagram of LV HRC fuse links size 00,
Utilization category gL/gG,
Rated currents 6 A, 10 A, 50 A, 100 A