

Overvoltage Protection Devices

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For further technical product information:

Service&Support Portal:

www.siemens.com/lowvoltage/technical-support

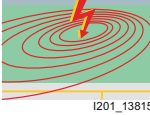
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Overvoltage Protection Devices

Introduction

Overview

Devices	Page	Application	Standards	Used in		
				Non-residential buildings	Residential buildings	Industry
	6/3	With plug-in protective modules for TN-C, TN-S and TT systems Rated voltage 350 V AC for lightning currents from 25 kA to 100 kA. All versions with remote signaling contact. For installation in main distribution boards, upstream or downstream of the counter.	EN 61643-11	✓	✓	✓
	6/5	With plug-in protective modules for TN-C, TN-S and TT systems Rated voltage 350 V AC for lightning currents from 25 kA to 100 kA. All versions with remote signaling contact. For installation in main distribution boards downstream of the counter.	EN 61643-11	✓	✓	✓
	6/7	With plug-in protective modules for TN-C, TN-S and TT systems Rated voltage 350 V AC, rated discharge surge current 20 kA and discharge surge current 40 kA. For installation in sub-distribution boards.	EN 61643-11	✓	✓	✓
	6/10	With plug-in protective modules for single-phase and three-phase systems. Rated voltage, single-phase 24 V AC/DC, 60 V, 120 V, 230 V and three-phase 230/400 V AC. For installation as close as possible upstream from the terminal equipment.	EN 61643-11	✓	✓	✓
	6/11	Plug-in parts for lightning and surge arresters and through-type terminals for installation.	EN 61643-11	✓	✓	✓
 I201_13815	6/12	Everything you need to know about overvoltage protection: Function, mounting and technical connections.				
	6/15	With plug-in protective modules for measuring and control technology for installation in signal circuits.	EN 61643-21	✓	--	✓

Overview

Type 1 lightning arresters are the most powerful overvoltage protection. They protect low-voltage systems against any overvoltage or high impulse currents that may be triggered by a direct or indirect lightning strike.

All lightning arresters are fitted with a mechanical fault indication, which does not require an extra power supply.

The lightning conductors can therefore also be used in the pre-counter area.

The protective modules are available as connectors. The majority of lightning arresters have a remote signaling contact, which signals if the device fails.

Technical specifications

		5SD7 411-1		5SD7 412-1	5SD7 413-1	5SD7 413-2 5SD7 413-3	5SD7 414-1	5SD7 414-2 5SD7 414-3	
Standards		IEC 61643-11							
Approvals		UL/cUL					KEMA	UL/cUL	KEMA
Rated voltage U_N	V AC	240		240/415					
Rated arrester voltage U_C									
• L/N, N/PE, L/PEN	V AC	350				335	350	335	
Lightning impulse current I_{imp} (10/350µs)									
• L/N or L/PEN, 1P/3P	kA	25	25	25/75	12.5/37.5	25/75	12.5		
• N/PE	kA	--	100	--	--	100	50		
Rated discharge surge current I_n (8/20µs)									
• L/N or L/PEN, 1P/3P	kA	25	25	25/75	12.5/37.5	25/75	12.5/50		
• N/PE	kA	--	100	--	--	100	--		
Protection level U_p									
• L/N, N/PE, L/PEN	kV	≤ 1.5				≤ 1.2	≤ 1.5	≤ 1.2/1.7	
Follow current discharge capacity I_{fi} (AC)									
• L/N or L/PEN for 264 V/350 V	kA	50/25	50/25	50/25	--	50/25	--		
• N/PE	A	--	100	--	--	100	--		
Response time t_A									
• L/N or L/PEN	ns	≤ 100	≤ 100	≤ 100	≤ 25	≤ 100	≤ 25		
• L-(N)-PE	ns	--	≤ 100	--	--	≤ 100	≤ 100		
Max. back-up fuse acc. to IEC 61643-1									
• For parallel connection	A	315 gL/gG				160 gL/gG	315 gL/gG	160 gL/gG	
• For series connection	A	125 gL/gG				80 gL/gG	125 gL/gG	80 gL/gG	
Short-circuit withstand current with max. back-up fuse	kA _{rms}	50				25	50	25	
Temperature range	°C	-40 ... +80							
Degree of protection		IP20, with connected conductors							
Conductor cross-section									
• Finely stranded	mm ²	2.5 ... 25				1.5 ... 25	2.5 ... 25	1.5 ... 25	
• Solid	mm ²	2.5 ... 35				1.5 ... 35	2.5 ... 35	1.5 ... 35	

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5SD7 lightning arresters, type 1

Selection and ordering data

	Version	Discharge capacity	Mounting width	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*/ P. unit	PG	Weight per PU approx.
		kA	MW							kg
     	Lightning arresters									
	1-pole For single-conductor systems with remote signaling	25	2		5SD7 411-1		1	1 unit	037	0.424
	2-pole For TN-S and TT systems with remote signaling	100	4		5SD7 412-1		1	1 unit	037	0.808
	3-pole For TN-C systems									
	• With remote signaling	75	6		5SD7 413-1		1	1 unit	037	1.221
	• Without remote signaling	37.5	3		5SD7 413-2		1	1 unit	037	0.551
	• With remote signaling	37.5	3		5SD7 413-3		1	1 unit	037	0.557
	4-pole For TN-S and TT systems									
	• With remote signaling	100	8		5SD7 414-1		1	1 unit	037	1.609
	• Without remote signaling	50	4		5SD7 414-2		1	1 unit	037	0.671
	• With remote signaling	50	4		5SD7 414-3		1	1 unit	037	0.677

5SD7 combination surge arresters, type 1 and type 2

Overview

Combination surge arresters, type 1 + 2 are compact designs comprising lightning arresters (type 1) and surge arresters (type 2). They protect low-voltage systems against overvoltages triggered by lightning strikes or by switching operations in the network.

A thermal isolating arrester for the varistors offers a high degree of protection against overload. The protective modules are available as connectors. All combination surge arresters have a remote signaling contact, which signals if the device fails.

Technical specifications

		5SD7 441-1	5SD7 442-1	5SD7 443-1	5SD7 444-1
Standards		IEC 61643-11; EN 61643-11			
Approvals		KEMA, UL/cUL		KEMA, UL/cUL	KEMA, UL/cUL
Rated voltage U_N	V AC	240		240/415	
Rated arrester voltage U_C					
• L/N, N/PE, L/PEN	V AC	350			
Lightning impulse current I_{imp} (10/350µs)					
• L/N or L/PEN, 1P/3P	kA	25	25	25/75	25/75
• N/PE	kA	--	100	--	100
Rated discharge surge current I_n (8/20µs)					
• L/N or L/PEN, 1P/3P	kA	25	25	25/75	25/75
• N/PE	kA	--	100	--	100
Protection level U_p					
• L/N, N/PE, L/PEN	kV	≤ 1.5			
Follow current discharge capacity I_{fi} (AC)					
• L/N or L/PEN	kA	25	25	25	25
• N/PE	kA	--	100	--	100
Response time t_A					
• L/N or L/PEN	ns	≤ 25	≤ 100	≤ 100	≤ 100
• L-(N)-PE	ns	--	≤ 100	--	≤ 100
Max. back-up fuse	Acc. to IEC 61643-1				
• For parallel connection	A	315 gL/gG			
• For series connection	A	125 gL/gG			
Short-circuit withstand current with max. back-up fuse	kA _{rms}	25			
Temperature range	°C	-40 ... +80			
Degree of protection		IP20, with connected conductors			
Conductor cross-section					
• Finely stranded	mm ²	2.5 ... 25			
• Solid	mm ²	2.5 ... 35			
Mounting width	Acc. to DIN 43880 MW	2	4	6	8
Visual function/fault indication		Yes			

Overvoltage Protection Devices

5SD7 combination surge arresters, type 1 and type 2

Selection and ordering data

Version	Discharge capacity	Mounting width	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*/P. unit	PG	Weight per PU approx.
	kA	MW							kg
	Combination surge arresters 1-pole For single-conductor systems With remote signaling	25	2	5SD7 441-1		1	1 unit	037	0.356
	2-pole For TN-S and TT systems With remote signaling	100	4	5SD7 442-1		1	1 unit	037	0.741
	3-pole For TN-C systems With remote signaling	75	6	5SD7 443-1		1	1 unit	037	1.004
	4-pole For TN-S and TT systems With remote signaling	100	8	5SD7 444-1		1	1 unit	037	1.403

Overview

Surge arresters type 2 are used downstream of lightning arresters type 1 in main distribution boards or sub-distribution boards. They protect low-voltage systems against transient overvoltages, such as those triggered by switching operations. A thermal

isolating arrester for the varistors offers a high degree of protection against overload. The protective modules are available as connectors. The surge arresters have an optional remote signaling contact, which signals if the device fails.

Technical specifications

		Surge arresters, standard design						
		N/PE Plug-in 5SD7 481-0	Single-pole Plug-in 5SD7 461-.	Multi-pole 3-pole 5SD7 463-.	4-pole 5SD7 464-.	3-pole 5SD7 473-.	4-pole 5SD7 485-.	3-pole 5SD7 483-.
Standards Approvals		IEC 61643-11; EN 61643-11 KEMA						
Rated voltage U_N	V AC	240	240	240/415	240/415	500	240/415	--
Rated arrester voltage U_C								
• L/N	V AC	--	350	--	--	--	--	--
• L/N or L/PEN	V	--	--	350 AC	350 AC	580 AC	440 AC	1000 DC
• N/PE	V AC	260	--	--	260	--	--	--
Rated discharge surge current I_n (8/20 μs)								
• L/N	kA	--	20	--	--	--	--	--
• L/N or L/PEN, 1P	kA	--	--	20	20	15	20	15
• N/PE	kA	20	--	--	20	--	--	--
Max. discharge surge current I_{max} (8/20 μs)								
• L/N	kA	--	40	--	--	--	--	--
• L/N or L/PEN, 1P	kA	--	--	40	40	--	--	30
• L/N or L/PEN, 1P/multi-pole	kA	--	--	--	--	30	40	--
• N/PE	kA	40	--	--	40	--	--	--
Lightning impulse current I_{imp} (10/350 μs)	kA	12	--					
Protection level U_p								
• L/N or L/PEN	kV	--	≤ 1.4	≤ 1.4	≤ 1.4	≤ 2.5	≤ 2.2	≤ 5
• N/PE	kV	≤ 1.5	--	--	≤ 1.5	--	--	--
Response time t_A								
• L/N or L/PEN	ns	--	≤ 25	≤ 25	≤ 25	≤ 25	≤ 25	≤ 25
• N/PE	ns	≤ 100	--	--	≤ 100	--	--	--
Max. back-up fuse acc. to IEC 61643-1								
• For parallel connection	A	125 gL/gG						--
• For series connection	A	63 gL/gG						--
Short-circuit withstand current with max. back-up fuse	kA _{rms}	25						
Temperature range	°C	-40 ... +80						
Degree of protection		IP20, with connected conductors						
Conductor cross-section								
• Finely stranded	mm ²	1.5 ... 25						
• Solid	mm ²	1.5 ... 35						
Mounting width according to DIN 43880	MW	1	1	3	4	3	4	3
Visual function/fault indication		Yes						

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5SD7 surge arresters, type 2

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		Multi-pole surge arresters, narrow design				
		5SD7 422-0	5SD7 422-1	5SD7 423-0	5SD7 423-1	5SD7 424-0 5SD7 424-1
Standards		IEC 61643-11				
Approvals		KEMA/UL/ cUL				
Rated voltage U_N	V AC	240		240/415		240/415
Rated arrester voltage U_C						
• L/N or L/PEN	V AC	350		350		350
• N/PE	V AC	264		--		264
Rated discharge surge current I_n (8/20 μs)						
• L/N or L/PEN, 1P/3P	kA	20		20		20
• N/PE	kA	20		--		20
Max. discharge surge current I_{max} (8/20 μs)						
• L/N or L/PEN, 1P/3P	kA	40		40		40
• N/PE	kA	40		--		40
Protection level U_p						
• L/N or L/PEN	kV	≤ 1.4		≤ 1.4		≤ 1.4
• N/PE	kV	≤ 1.5		--		≤ 1.5
Response time t_A						
• L/N	ns	≤ 25		≤ 25		≤ 25
• N/PE	ns	≤ 100		--		≤ 100
Max. back-up fuse	Acc. to IEC 61643-1					
• For parallel connection	A	125 gL/gG				
• For series connection	A	63 gL/gG				
Short-circuit withstand current with max. back-up fuse	kA _{rms}	25		25		25
Temperature range	°C	-40 ... +80				
Degree of protection		IP20, with connected conductors				
Conductor cross-section						
• Finely stranded	mm ²	1.5 ... 16				
• Solid	mm ²	1.5 ... 25				
Mounting width	Acc. to DIN 43880 mm	26		38		50
Visual function/fault indication		Yes				

Selection and ordering data

Version	Discharge surge current I_n/I_{max}	Mounting width	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*/P. unit	PG	Weight per PU approx.
	kA	mm (MW)							kg
Surge arresters, standard design									
	1-pole, plug-in								
	- Without remote signaling	20/40	1	5SD7 461-0		1	1 unit	037	0.133
	- With remote signaling	20/40	1	5SD7 461-1		1	1 unit	037	0.139
	1P, N/PE, plug-in								
	- Without remote signaling	20/40	1	5SD7 481-0		1	1 unit	037	0.122
	3-pole, plug-in, 3+0 circuit								
	• For TN-C systems								
	- Without remote signaling	20/40	3	5SD7 463-0		1	1 unit	037	0.362
	- With remote signaling	20/40	3	5SD7 463-1		1	1 unit	037	0.371
	• For IT systems								
	- Without remote signaling	15/30	3	5SD7 473-0		1	1 unit	037	0.384
	- With remote signaling	15/30	3	5SD7 473-1		1	1 unit	037	0.371
3-pole, plug-in									
For protecting the DC part of the photovoltaic systems up to 1000 V DC acc. to IEC 60364-7-712									
	- Without remote signaling	15/30	3	5SD7 483-0		1	1 unit	037	0.344
	- With remote signaling	15/30	3	5SD7 483-1		1	1/44 units	037	0.352

Overvoltage Protection Devices

5SD7 surge arresters, type 2

	Version	Discharge surge current I_N/I_{max}	Mounting width	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*/P. unit	PG	Weight per PU approx.
		kA	mm (MW)							kg
	4-pole, plug-in, 3+1 circuit									
	For TN-S and TT systems									
	- Without remote signaling	20/40	4		5SD7 464-0		1	1 unit	037	0.426
	- With remote signaling	20/40	4		5SD7 464-1		1	1 unit	037	0.432
	4-pole, plug-in, 4+0 circuit									
	For IT systems with N conductor incorporated in the cable									
	- Without remote signaling	20/40	4		5SD7 485-0		1	1/44 units	037	0.445
	- With remote signaling	20/40	4		5SD7 485-1		1	1 unit	037	0.455
Surge arresters, narrow design										
	2-pole									
	For TN-S and TT systems									
	- Without remote signaling	20/40	24 (1 1/3)		5SD7 422-0		1	1 unit	037	0.220
	- With remote signaling	20/40	24 (1 1/3)		5SD7 422-1		1	1 unit	037	0.229
	3-pole									
	For TN-C systems									
	- Without remote signaling	20/40	36 (2)		5SD7 423-0		1	1 unit	037	0.320
	- With remote signaling	20/40	36 (2)		5SD7 423-1		1	1 unit	037	0.317
	4-pole									
	For TN-S and TT systems									
	- Without remote signaling	20/40	48 (2 2/3)		5SD7 424-0		1	1 unit	037	0.407
	- With remote signaling	20/40	48 (2 2/3)		5SD7 424-1		1	1 unit	037	0.423

Overvoltage Protection Devices

5SD7 surge arresters, type 3

Overview

Type 3 surge arresters are installed downstream of type 2 surge arresters in sub-distribution boards as close as possible to the load. The protective modules are available as connectors. In the event of a power failure, a remote signaling is output over an optocoupler with open collector output.

			Multi-pole surge arresters, plug-in					
			2-pole				4-pole	
			5SD7 432-1	5SD7 432-2	5SD7 432-3	5SD7 432-4	5SD7 434-1	
Standards			IEC 61643-11; EN 61643-11				KEMA	
Approvals			KEMA/UL/ cUL					
Rated voltage U_N		V AC	230	120	60	24	230/400	
Rated load current I_L (at 30 °C)		A	26	26	26	26	3 × 26	
Rated arrester voltage U_C		V AC	253	150	100	34	335	
Rated discharge surge current I_n (8/20μs)		kA	3	2.5	2.5	1	1.5	
Max. discharge surge current I_{max} (8/20 μs)		kA	10	10	6.5	2	4.5	
Combined surge U_{oc}		kV	6	6	4	2	4	
Protection level U_p		L–N/1	V	≤ 1500/≤ 600	≤ 850/≤ 350	≤ 700/≤ 250	≤ 550/≤ 100	≤ 1200
Response time t_A		ns	≤ 100	≤ 100	≤ 100	≤ 100	≤ 100	
Required back-up fuse, max.		A	25 gL/gG	25 gL/gG	25 gL/gG	25 gL/gG	25 gL/gG	
Temperature range		°C	-40 ... +85					
Degree of protection			IP20, with connected conductors					
Conductor cross-section								
• Finely stranded		mm ²	0.2 ... 4					
• Solid		mm ²	0.2 ... 2.5					
Mounting width		Acc. to DIN 43880	MW	1	1	1	1	2
Visual function/fault indication			Yes					

Selection and ordering data

Version		Rated voltage U_N	Mounting width	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*/P. unit	PG	Weight per PU approx.
		V AC	MW							kg
Surge arresters, plug-in										
• 2-pole										
	With remote signaling	24	1		5SD7 432-4		1	1 unit	037	0.086
		60	1		5SD7 432-3		1	1 unit	037	0.087
		120	1		5SD7 432-2		1	1 unit	037	0.089
		230	1		5SD7 432-1		1	1 unit	037	0.087
• 4-pole										
	With remote signaling	230/400	2		5SD7 434-1		1	1 unit	037	0.135

Selection and ordering data

Using the plug-in parts in the various overvoltage protection devices

Plug-in parts	5SD7 428-1	5SD7 428-0	5SD7 468-1	5SD7 488-0	5SD7 488-1	5SD7 498-1
Surge arresters, type 2	5SD7 424-1 5SD7 424-0 5SD7 423-1 5SD7 423-0 5SD7 422-1 5SD7 422-0	5SD7 424-1 5SD7 424-0 5SD7 422-1 5SD7 422-0	5SD7 461-0 5SD7 461-1 5SD7 463-0 5SD7 463-1 5SD7 464-0 5SD7 464-1	5SD7 481-0 5SD7 464-0 5SD7 464-1	5SD7 485-0 5SD7 485-1	5SD7 473-0 5SD7 473-1 5SD7 483-0 5SD7 483-1

Plug-in parts	5SD7 428-1	5SD7 448-1	5SD7 418-0	5SD7 418-1	5SD7 418-2	5SD7 418-3
Lightning arresters, type 1 and combination surge arresters, type 1+2	5SD7 444-1 5SD7 443-1 5SD7 442-1 5SD7 441-1	5SD7 444-1 5SD7 443-1 5SD7 442-1 5SD7 441-1	5SD7 414-1 5SD7 412-1 5SD7 444-1 5SD7 442-1	5SD7 414-1 5SD7 413-1 5SD7 412-1 5SD7 411-1	5SD7 412-2 5SD7 412-3 5SD7 414-2 5SD7 412-2	5SD7 412-1 5SD7 412-3 5SD7 413-2 5SD7 413-3 5SD7 414-2 5SD7 414-3

For arresters	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*/P. unit	PG	Weight per PU approx.
							kg

Plug-in parts for lightning arresters, type 1



5SD7 418-0	1	1 unit	037	0.254
5SD7 418-1	1	1 unit	037	0.270
5SD7 418-2	1	1 unit	037	0.101
5SD7 418-3	1	1 unit	037	0.132

Plug-in parts for combination surge arresters, type 1 and type 2



5SD7 418-0	1	1 unit	037	0.254
5SD7 428-1	1	1 unit	037	0.069
5SD7 448-1	1	1 unit	037	0.148

Plug-in parts for surge arresters, type 2



5SD7 428-0	1	1 unit	037	0.067
5SD7 428-1	1	1 unit	037	0.069
5SD7 468-1	1	1 unit	037	0.066
5SD7 488-0	1	1 unit	037	0.056
5SD7 488-1	1	1 unit	037	0.053
5SD7 498-1	1	1 unit	037	0.065

Plug-in part for surge arresters, type 3



5SD7 432-1
5SD7 432-2
5SD7 432-3
5SD7 432-4

5SD7 437-1	1	1 unit	037	0.042
5SD7 437-2	1	1 unit	037	0.041
5SD7 437-3	1	1 unit	037	0.041
5SD7 437-4	1	1 unit	037	0.042



5SD7 434-1

5SD7 438-1	1	1 unit	037	0.060
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More information

Situation	Systems	Basic protection
Which type of building do you want to protect? Generally speaking, all our devices are suitable for residential buildings, office buildings, industrial and commercial buildings.		For installation upstream of counters in main distribution boards or in combined main/sub-distribution boards
Low risk buildings	TN-S and TT systems	5SD7 surge arresters, type 2 Narrow design 5SD7 424-0, 5SD7 424-1 Wide design 5SD7 464-0, 5SD7 464-1 With or without remote signaling
- No outer lightning protection - Power supply over ground conductor		
	TN-C systems	5SD7 surge arresters, type 2 Narrow design 5SD7 423-0, 5SD7 423-1 Wide design 5SD7 463-0, 5SD7 463-1 With or without remote signaling
High-risk buildings	TN-S and TT systems	5SD7 lightning arresters, type 1 Narrow design 5SD7 414-2, 5SD7 414-3 Wide design 5SD7 414-1 With or without remote signaling
- Outer lightning protection system		
- Power supply over overhead lines	TN-C systems	5SD7 lightning arresters, type 1 Narrow design 5SD7 414-2, 5SD7 414-3 Wide design 5SD7 413-1, 5SD7 411-1 With or without remote signaling
- Grounded aerial structures	TN-S and TT systems	5SD7 combination surge arresters, type 1 and type 2 5SD7 444-1 With remote signaling
	TN-C systems	5SD7 combination surge arresters, type 1 and type 2 5SD7 443-1, 5SD7 441-1 With remote signaling
	IT systems without N conductor incorporated in the cable	Typically, IT systems are only installed in special building sections. TN-C, TN-S and TT systems are generally still used in the area of the main distribution board. In this case, the protective devices shown above must be installed.
	IT systems with N conductor incorporated in the cable	

Medium protection

For installation upstream of counters in main distribution boards or in combined main/sub-distribution boards

Fine protection

For installation directly upstream of the terminal equipment

5SD7 surge arresters, type 2

Narrow design

5SD7 424-0, 5SD7 424-1

Standard design

5SD7 464-0, 5SD7 464-1

With or without remote signaling

Only required if the distance between the main and sub-distribution boards is **> 10 m**



Surge arresters, type 3

For installation in sub-distribution boards or control cabinets

5SD7 432-x and 5SD7 434-1

With remote signaling



5SD7 surge arresters, type 2

Narrow design

5SD7 423-0, 5SD7 423-1

Standard design

5SD7 463-0, 5SD7 463-1

With or without remote signaling

Only required if the distance between the main and sub-distribution boards is **> 10 m**



5SD7 surge arresters, type 2

Narrow design

5SD7 424-0, 5SD7 424-1

Standard design

5SD7 464-0, 5SD7 464-1

With or without remote signaling



5SD7 surge arresters, type 2

Narrow design

5SD7 423-0, 5SD7 423-1

Standard design

5SD7 463-0, 5SD7 463-1

With or without remote signaling



5SD7 surge arresters, type 2

Narrow design

5SD7 424-0, 5SD7 424-1

Standard design

5SD7 464-0, 5SD7 464-1

With or without remote signaling

Only required if the distance between the main and sub-distribution boards is **> 10 m**



5SD7 surge arresters, type 2

Narrow design

5SD7 423-0, 5SD7 423-1

Standard design

5SD7 463-0, 5SD7 463-1

With or without remote signaling

Only required if the distance between the main and sub-distribution boards is **> 10 m**



5SD7 surge arresters, type 2

5SD7 473-0, 5SD7 473-1

3-pole (3+0 circuit)

$U_c = 580 \text{ V AC}$

With or without remote signaling



5SD7 surge arresters, type 2

5SD7 485-0, 5SD7 485-1

4-pole (4+0 circuit)

$U_c = 440 \text{ V AC}$

With or without remote signaling



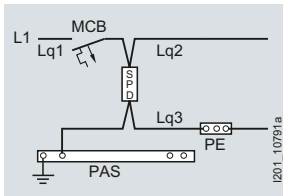
Overvoltage Protection Devices

Configuration

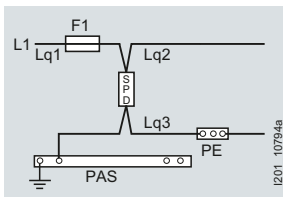
Dimensioning of conductor cross-sections

The different conductor cross-sections (Lq 1 to Lq 3) must be dimensioned according to the rated current of the miniature circuit breaker or of the fuse.

Series connection



a) Protection of the SPD using miniature circuit breakers



b) Protection of the SPD using fuses

PAS = equipotential bonding strip

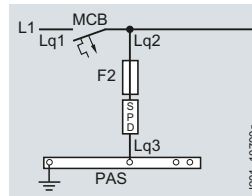
Conductor cross-sections for lightning arresters (type 1) and combination surge arresters (type 1 and type 2) for series connection

MCB/fuse (F1) upstream [A gL/gG]	Lq 2 [mm ²]	Lq 3 [mm ²]
25	10	16
35	10	16
40	10	16
50	10	16
63	10	16
80	16	16
100	25	16
125	35	16

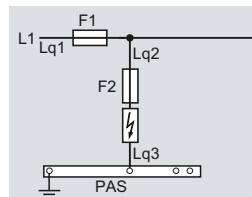
Conductor cross-sections for surge arresters (type 2) for series connection

MCB/fuse (F1) upstream [A gL/gG]	Lq 2 [mm ²]	Lq 3 [mm ²]
25	6	6
35	6	6
40	6	6
50	10	10
63	10	10

Parallel connection



a) Protection of the SPD using miniature circuit breakers



b) Protection of the SPD using fuses

Conductor cross-sections for lightning arresters (type 1) and combination surge arresters (type 1 and type 2) for parallel connection

MCB/fuse (F1) upstream [A gL/gG]	Lq 2 [mm ²]	Lq 3 [mm ²]	F2 fuse [A gL/gG]
25	6	16	/
35	10	16	/
40	10	16	/
50	10	16	/
63	10	16	/
80	10	16	/
100	16	16	/
125	16	16	/
160	25	25	/
200	35	35	160 ¹⁾
250	35	35	160 ¹⁾
315	50	50	160 ¹⁾
> 315	50	50	160 ¹⁾

¹⁾ Recommended fuse.

Conductor cross-sections for surge arresters (type 2) for parallel connection

MCB/fuse (F1) upstream [A gL/gG]	Lq 2 [mm ²]	Lq 3 [mm ²]	F2 fuse [A gL/gG]
25	6	6	/
32	6	6	/
40	6	6	/
50	6	6	/
63	10	10	/
80	10	10	/
100	16	16	/
125	16	16	/
> 125	16	16	125

In the case of surge arresters type 3, the following conductor cross-sections are generally used:

- Rigid: up to 4 mm²
- Flexible: up to 2.5 mm²

Overview

The surge arresters for measuring and control technology are overvoltage protection modules that comprise two parts, a basic element and a plug-in part. Their application area is the protection of signal circuits.

The cable shields of basic elements can be either directly or indirectly grounded.

The mounting width of the new surge arrester is 1 MW.

Through the number of integrated paths, it is possible to protect up to four signal cores or two double cores against overvoltages.

The arresters are made up of two parts (plug-in part and base element).

A mechanical encoding ensures protection against reverse polarity.

Technical specifications

		5SD7 502-0	5SD7 520-1	5SD7 522-7	5SD7 530-3	5SD7 541-7	5SD7 550-4
IEC category/EN type		C1/C2/C3/D1	C1/C2/C3/D1/B2	C1/C2/C3/D1	C1/C2/C3/D1	C1/C2/C3/D1	C1/C2/C3/D1
Max. continuous voltage U_C							
• Direct voltage	V DC	68	185	40	5.2	40	14
• AC voltage	V AC	48	130	28	3.6	28	9.8
Rated current I_N	mA	2000	450	450	450	300	450
Lightning test current I_{imp}	10/350 μ s Per path	kA	5	--	2.5	2.5	2.5
Rated discharge current I_n	8/20 μ s						
• Core - Core	kA	--	10	10	10	--	10
• Core - Ground	kA	20	10	10	10	10	10
Total surge current I_N	8/20 μ s	kA	40	10	20	20	20
Output voltage limit at 1 kV/μs							
• Core - Core	V	--	≤ 300	≤ 55	≤ 15	--	≤ 25
• Core - Ground	V	≤ 600	≤ 300	≤ 450	≤ 15	≤ 55	≤ 25
Residual voltage at I_n							
• Core - Core	V	--	≤ 160 (C2/5 kA)	≤ 55	≤ 15	--	≤ 25
• Core - Ground	V	--	≤ 160 (C2/5 kA)	--	≤ 30	≤ 55	≤ 40
Response time t_A							
• Core - Core	ns	--	≤ 500	≤ 1	≤ 500	--	≤ 500
• Core - Ground	ns	≤ 100	≤ 500	≤ 100	≤ 500	≤ 1	≤ 500
Insertion loss a_E							
• Symmetrical in the 50 Ω system	dB	--	--	Type 0.5 (1.5 MHz)	--	--	--
• Asymmetrical in the 50 Ω system	dB	0.1 (1 MHz)	--	--	--	0.5 (1.5 MHz)	--
• Symmetrical in the 100 Ω system	dB	--	Type 0.2 (5 MHz)	--	0.2 (5 MHz)	--	0.2 (5 MHz)
Limit frequency f_G (3 dB)							
• Symmetrical in the 50 Ω system	MHz	--	--	Type 8	--	--	--
• Asymmetrical in the 50 Ω system	MHz	--	--	--	--	Type 8	--
• Symmetrical in the 100 Ω system	MHz	--	Type 70	--	Type 70	--	Type 70
Resistor per path	Ω	--	--	2.2	2.2	4.7	2.2
Temperature range	$^{\circ}$ C	-40 ... +85					
Degree of protection according to IEC 60529/EN 60529		IP20					
Flammability class acc. to UL 94		V0					
Test standards		EN 61643-21	IEC 61643-21	EN 61643-21	IEC 61643-21	EN 61643-21	IEC 61643-21

Overvoltage Protection Devices

5SD7 surge arresters for measuring and control technology

Selection and ordering data

Combination options for basic elements and plug-in parts

Basic elements	Plug-in parts					
	5SD7 502-0	5SD7 520-1	5SD7 522-7	5SD7 530-3	5SD7 541-7	5SD7 550-4
5SD7 500-0	✓	--	--	--	--	--
5SD7 512-1	--	✓	--	✓	--	--
5SD7 522-0	--	--	✓	--	--	✓
5SD7 522-1	--	--	✓	--	--	✓
5SD7 541-1	--	--	--	--	✓	--

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Version	Mounting width	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*/P. unit	PG	Weight per PU approx.
	MW							kg
	Basic elements							
	• For plug-in parts with protection circuit for a 2-wire ungrounded signal circuit	1	5SD7 512-1		1	1 unit	037	0.052
	• Jumper between terminals 3/4 (GND) and 9/10							
	• For 5SD7 520-1 and 5SD7 530-3 plug-in parts							
	• For plug-in parts with protection circuit for two 2-wire ungrounded signal circuits	1	5SD7 522-1		1	1 unit	037	0.056
	• Jumper between terminals 3/4 (GND) and 9/10							
	• For 5SD7 522-1 and 5SD7 550-4 plug-in parts							
	• For plug-in parts with protection circuit for two 2-wire ungrounded signal circuits	1	5SD7 522-0		1	1 unit	037	0.057
	• Gas arrester between terminals 3/4 (GND) and 9/10							
	• For 5SD7 522-1 and 5SD7 550-4 plug-in parts							
	• For plug-in parts with protection circuit for four conductors single-sided grounded signal circuit	1	5SD7 541-1		1	1 unit	037	0.056
	• Jumper between terminals 3/4 (GND) and 9/10							
	• For 5SD7 541-7 plug-in parts							
	• Jumper between terminals 3/4 (GND) and 9/10	1	5SD7 500-0		1	1 unit	037	0.050
	• For 5SD7 502-0 plug-in parts							
	Plug-in parts - PROFIBUS	1	5SD7 530-3		1	1 unit	037	0.020
	• Protection for 2 signal cores with common reference potential							
	• For 5SD7 512-1 basic element							
	Plug-in parts for analog telecommunication interfaces	1	5SD7 520-1		1	1 unit	037	0.020
	• Protection for 2-wire Telecom cable (U_{k0} or T-DSL)							
	• For 5SD7 512-1 basic element							
	Plug-in parts, AC 24 V	1	5SD7 522-7		1	1 unit	037	0.024
	• Protection for two 2-wire ungrounded signal circuits							
	• Miniature protection element between the connected cores							
	• For 5SD7 522-0 and 5SD7 522-1 basic elements							
	Plug-in parts, 12 V DC	1	5SD7 550-4		1	1 unit	037	0.026
	• Protection for field bus systems and signal circuits in 3- or 4-wire method							
	• For 5SD7 522-0 and 5SD7 522-1 basic elements							
	Plug-in parts, 24 V DC	1	5SD7 541-7		1	1 unit	037	0.026
	• Protection for 4 signal cores with common reference potential							
	• For 5SD7 541-1 basic element							
	Plug-in part, 2-wire	1	5SD7 502-0		1	1 unit	037	0.020
	• Coarse protection for 2 single-sided grounded signal leads							
	• For 5SD7 500-0 basic element							