

Overvoltage protection devices

The more than one million lightning strikes in Germany every year pose a considerable risk for buildings and systems that can be damaged due to the unhindered effect of lightning currents, overvoltage and power surges. In many cases however, it is not apparent that such damage has been caused by lightning currents, overvoltage and power surges.

Overvoltage results in considerable damage to electrical and electronic equipment. Even brief transients in power supply lines or between electrical lines and other conductive parts (e.g. grounded metallic parts, ground) are sufficient to cause such damage. The damage patterns of destroyed lines, printed circuit boards or switchgear demonstrate this. Such damage can be prevented employing suitable overvoltage protection means.

Reliably protected by Siemens lightning and surge arresters!



Overvoltage Protection Devices



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A multitude of additional information ...

Information + ordering

All the important things at a glance

For information about overvoltage protection devices, please visit our website
www.siemens.com/overvoltage-protection

Your product in detail

The Siemens Industry Online Support (SIOS) provides comprehensive information
www.siemens.com/lowvoltage/product-support

- Technology Primer
 - Overvoltage protection devices (109756965)

The relevant tender specifications can be found at
www.siemens.com/lowvoltage/tenderspecifications

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Everything you need for your order

Refer to the Industry Mall for an overview of your products

- SENTRON overvoltage protection devices
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Direct forwarding to the individual products in the Industry Mall by clicking on the article number in the catalog or entering this web address incl. article number
www.siemens.com/product?Article No.

The fast track to the experts

Contact persons in your region

We offer a comprehensive portfolio of services. You can find your local contacts at
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You will find further information on services at
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Competent expert advice on technical questions with a wide range of demand-optimized services for all our products and systems.

Assistance with technical queries is provided at
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... can be found in our online services

Commissioning + operation

Your product in detail

The Siemens Industry Online Support (SIOS) provides detailed technical information

www.siemens.com/lowvoltage/product-support

- Operating instructions
- Certificates

Comprehensive mobile support via the Siemens Industry Online Support app available for download from the [App Store](#) and [Play Store](#)

You will find further information at www.siemens.com/support-app

Provision of 3D data (step and u3d data formats)

- Siemens Industry Mall
www.siemens.com/lowvoltage/mall
- Image database
www.siemens.com/lowvoltage/picturedb

Engineering data for CAD or CAE systems are available in the CAX Download Manager at www.siemens.com/cax

Manuals

Manuals are available for downloading in Siemens Industry Online Support (SIOS) at

www.siemens.com/lowvoltage/manuals

- Configuration Manual
 - Overvoltage protection devices ([45315289](#))

Face-to-face or online training

Our training courses can be found at

www.siemens.com/sitrain-lowvoltage

- Basic principles of electrical engineering (WT-LVBGET)
- Protection concept (WT-LVBPC)

Technical overview – Overvoltage protection devices



The fast way to get you to our online services

This page provides you with comprehensive information and links on overvoltage protection devices

www.siemens.com/lowvoltage/product-support ([109769084](#))

System overview

Basic units



5SD74 lightning arresters,
type 1



5SD74 combination surge
arresters, type 1 + type 2



5SD74 surge arresters,
type 1 + type 2 + type 3
for 40 mm busbar system



5SD74 combination
surge arresters,
type 1/type 2



5SD74 surge arresters,
type 2 (standard design)



5SD74 surge arresters,
type 3



Spare part plugs



N-PE



L-N, L-PEN (type 1)



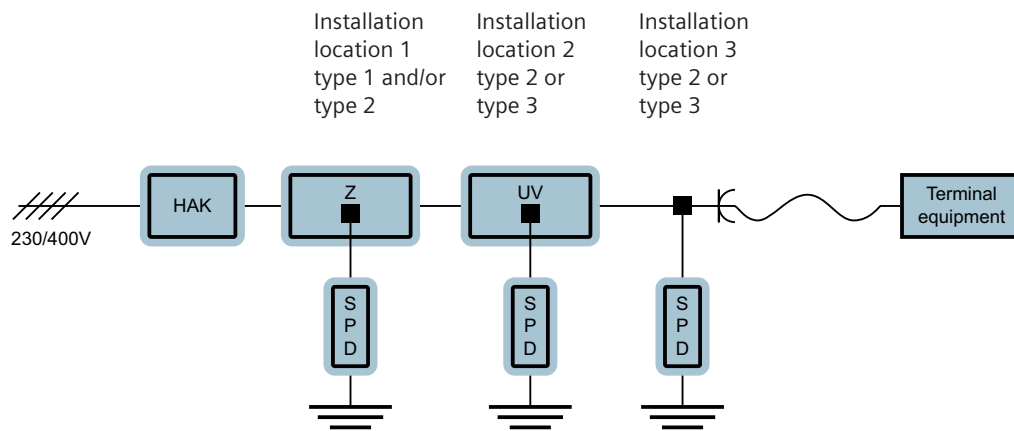
L-PEN

Note:

You will find a detailed range of accessories with the basic units.



Installation locations for surge protection devices (SPDs)



HAK: Main terminal box

Z/HV: In or close to the central meter system/main distribution board

UV: Subdistribution board

Installation location 1 must be as close as possible to the supply point for the electrical system, so that the downstream installations are protected. The SPDs at installation locations 2 and 3 shall not be used without SPDs at installation location 1, and they must be coordinated with these SPDs (i.e. SPDs all from the same manufacturer).

5SD74 lightning arresters, type 1

	For TN-C systems and IT networks	For TN-C systems	For TN-S and TT systems	
Protection paths	L-PE	L-PEN	L-N, L-PE and N-PE	L-N, L-PE and N-PE
Rated voltage U_n	690 V AC	240/415 V AC	240 V AC	240/415 V AC
Maximum continuous voltage U_c	800 V AC	350 V AC	350 V AC	350 V AC
				

Circuit	Mounting width				
With remote signaling					
1 + 0	— ¹⁾	5SD7411-2	—	—	—
1 + 1	4 MW	—	—	5SD7412-1	—
3 + 0	6 MW	—	5SD7413-1	—	—
3 + 1	8 MW	—	—	—	5SD7414-1

¹⁾ No modular installation device.

Further technical specifications

Further technical specifications		5SD7411-2	5SD7412-1	5SD7413-1	5SD7414-1
Standards					
Standards		IEC 61643-11, EN 61643-11			
Approvals		–	KEMA, UL/cUL		
Voltage					
Protection level U_p	L-N and L-PEN	≤4.50 kV	≤1.50 kV		
	L-PE	–	≤2.50 kV	–	≤2.50 kV
	N-PE	–	≤1.50 kV	–	≤1.50 kV
Current					
Lightning impulse current I_{imp} (10/350 μs)	L-N and L-PEN, 1P/3P	35 kA	25 kA	25/75 kA	
	N-PE	–	100 kA	–	100 kA
Rated discharge surge current I_n (8/20 μs)	L-N and L-PEN, 1P/3P	35 kA	25 kA	25/75 kA	
	N-PE	–	100 kA	–	100 kA
Follow current discharge capacity I_{fi} (AC)	L-N and L-PEN for 264/350 V	–	50/25 kA		
	N-PE	–	100 A	–	100 A
Function					
Response time t_A	L-N and L-PEN	≤100 ns			
	L-N and N-PE	–	≤100 ns	–	≤100 ns
Connections					
Conductor cross-section	Finely stranded	16 ... 50 mm ²	2.5 ... 25 mm ²		
	Solid	16 ... 50 mm ²	2.5 ... 35 mm ²		
Protection devices					
Max. back-up fuse acc. to IEC 61643-1	For stub wiring (gL/gG)	400 A	315 A		
	For V wiring (gL/gG)	125 A	125 A		
Short-circuit strength	With max. back-up fuse	50 kA	50 kA		
Ambient conditions					
Degree of protection		IP20, with connected conductors			
Temperature range		–40 ... +80 °C			

Accessories

Spare part plugs



Protection paths	Basic units	Article No.
N-PE	5SD7412-1 and 5SD7414-1	5SD7418-0
L-N and L-PEN	For 5SD7412-1, 5SD7413-1 and 5SD7414-1	5SD7418-1

5SD74 combination surge arresters, type 1 + type 2

	For TN-C systems	For TN-S and TT systems	
Protection paths	L-PEN	L-N, L-PE and N-PE	L-N, L-PE and N-PE
Rated voltage U_n	240/415 V AC	240 V AC	240 V AC
Maximum continuous voltage U_c	350 V AC	350 V AC	350 V AC



Circuit	Mounting width			
With remote signaling				
1 + 1	4 MW	–	5SD7442-1	–
3 + 0	6 MW	5SD7443-1	–	–
3 + 1	8 MW	–	–	5SD7444-1

Further technical specifications

Further technical specifications		5SD7442-1	5SD7443-1	5SD7444-1
Standards				
Standards		IEC 61643-11; EN 61643-11		
Approvals		KEMA, UL/cUL		
Voltage				
Protection level U_p	L-N and L-PEN	≤1.50 kV		
	L-PE	≤2.20 kV	–	≤2.20 kV
	N-PE	≤1.50 kV	–	≤1.50 kV
Current				
Lightning impulse current I_{imp} (10/350 μs)	L-N and L-PEN	25 kA		
	N-PE	100 kA	–	100 kA
Rated discharge surge current I_n (8/20 μs)	L-N and L-PEN	25 kA		
	N-PE	100 kA	–	100 kA
Follow current discharge capacity I_{fi} (AC)	L-N and L-PEN	25 kA		
	N-PE	100 A	–	100 A
Function				
Response time t_A	L-N and L-PEN	≤25 ns		
	L-N and N-PE	≤100 ns	–	≤100 ns
Connections				
Conductor cross-section	Finely stranded	2.5 ... 25 mm²		
	Solid	2.5 ... 35 mm²		
Protection devices				
Max. back-up fuse acc. to IEC 61643-1	For stub wiring (gL/gG)	315 A		
	For V wiring (gL/gG)	125 A		
Short-circuit strength	With max. back-up fuse	25 kA		
Ambient conditions				
Degree of protection	IP20, with connected conductors			
Temperature range	–40 ... +80 °C			
Display				
Visual function/fault indication	Yes			

Accessories

Spare part plugs



Protection paths	Type	Basic units	Article No.
N-PE	—	5SD7442-1 and 5SD7444-1	5SD7418-0
L-N and L-PEN	1	5SD7442-1, 5SD7443-1 and 5SD7444-1	5SD7448-1
	2	5SD7442-1, 5SD7443-1 and 5SD7444-1	5SD7428-1

5SD74 surge arresters, type 1 + type 2 + type 3 for 40 mm busbar system

Protection paths Rated voltage U_n Maximum continuous voltage U_c	For TN-C systems			
	L-PEN			
	240/415 V AC 300 V AC	240/415 V AC 300 V AC	240/415 V AC 300 V AC	240/415 V AC 300 V AC
				

Circuit	Mounting width				
With remote signaling					
3 + 0	47 mm	5SD7443-8KK21	–	5SD7443-8KK11	–
3 + 1	47 mm	–	–	–	–
With remote signaling and phase tap					
3 + 0	47 mm	–	5SD7443-8KK22	–	5SD7443-8KK12
3 + 1	47 mm	–	–	–	–

Further technical specifications

Further technical specifications		5SD7443-8KK21	5SD7443-8KK22	5SD7443-8KK11	5SD7443-8KK12
Standards					
Standards		IEC 61643-11			
Approvals		VDE			
Voltage					
Protection level U_p	L-N and L-PEN	≤1.50 kV			
	L-N/N-PE	–			≤1.5/1.5 kV
Current					
Lightning impulse current I_{imp} (10/350 μs)	L-N/N-PEN and N-PE	12.5 kA		7.5 kA	
Rated discharge surge current I_n (8/20 μs)	L-N/L-PEN and N-PE	20 kA			
Follow current discharge capacity I_{ff} (AC)	N-PE	–			
Connections					
Conductor cross-section	Feindrhtig	25 mm²			
	Eindrhtig	35 mm²			
Type of mounting					
40 mm busbar system		5 and 10 mm			
Protection devices					
Max. back-up fuse acc. to IEC 61643-1	For stub wiring (gL/gG)	315 A			
Short-circuit strength	With max. back-up fuse	25 kA			
Ambient conditions					
Degree of protection		IP20			
Temperature range		–40 ... +80 °C			
Display					
Visual function/fault indication		Yes			

For TN-S and TT systems

L-N, L-PE and N-PE

240/415 V AC

240/415 V AC

240/415 V AC

240/415 V AC

300 V AC

300 V AC

300 V AC

300 V AC



–

–

–

–

5SD7444-8KK21

–

5SD7444-8KK11

–

–

–

–

–

–

5SD7444-8KK22

–

5SD7444-8KK12

5SD7444-8KK21

5SD7444-8KK22

5SD7444-8KK11

5SD7444-8KK12

12.5 kA

7.5 kA

20/80 kA

100 A RMS

5SD74 combination surge arresters, type 1/type 2

	For TN-C systems and IT networks	For TN-C systems	For TN-S and TT systems		For photovoltaic systems
Protection paths	L-PE	L-PEN	L-N, L-PE and N-PE	L-N, L-PE and N-PE	(L+) – (L–)
Rated voltage U_n	690 V AC	240/415 V AC	240 V AC	240/415 V AC	–
Maximum continuous voltage U_c	800 V AC	335 V AC	335 V AC	335 V AC	1000 V DC
					

Circuit	Mounting width					Plug-in
With remote signaling						
1 + 0	— ¹⁾	5SD7411-2	—	—	—	—
3 + 0	3 MW	—	5SD7413-3	—	—	
3 + 1	4 MW	—	—	—	5SD7414-3	—
Without remote signaling						
1 + 1	2 MW	—	—	5SD7412-2	—	—
3 + 0	3 MW	—	5SD7413-2	—	—	5SD7483-6
3 + 1	4 MW	—	—	—	5SD7414-2	—

¹⁾ No modular installation device.

Further technical specifications		5SD7411-2	5SD7412-2	5SD7413-2 5SD7413-3	5SD7414-2 5SD7414-3	5SD7483-6
Standards						
Standards		IEC 61643-11				EN 50539
Approvals		–	KEMA			
Voltage						
Protection level U_p	L-N and L-PEN	≤4.50 kV	≤1.20 kV			≤3.50 kV
	L-PE	–	–			≤2.0 kV
	N-PE	–	≤1.70 kV	–	≤1.70 kV	–
Current						
Lightning impulse current I_{imp} (10/350 μs)	L-N and L-PEN	35 kA	12.5 kA			≤5 kA
	N-PE	–	50 kA	–	50 kA	–
Rated discharge surge current I_n (8/20 μs)	L-N and L-PEN	35 kA	12.5 kA			15 kA
	N-PE	–	50 kA	–		
Max. discharge surge current I_{max} . (8/20 μs)	L-N	100 kA	12.5 kA			50 kA
	N-PE	–	50 kA	–	50 kA	–
Function						
Response time t_A	L-N and L-PEN	<100 ns	≤25 ns			
	L-N and N-PE	–	≤100 ns	–	≤100 ns	≤25 ns
Connections						
Conductor cross-section	Finely stranded	16 ... 50 mm ²	1.5 ... 25 mm ²			
	Solid	16 ... 50 mm ²	1.5 ... 35 mm ²			
Protection devices						
Max. back-up fuse acc. to IEC 61643-1	For stub wiring (gL/gG)	400 A	160 A			–
	For V wiring (gL/gG)	125 A	80 A			–
Short-circuit strength	With max. back-up fuse	50 kA	25 kA			–
Ambient conditions						
Degree of protection		IP20, with connected conductors				
Temperature range		–40 ... +80 °C				

Accessories

Spare part plugs



Protection paths	Type	Basic units	Article No.
N-PE	—	5SD7412-2, 5SD7412-3, 5SD7414-2 and 5SD7414-3	5SD7418-2
L-N and L-PEN	1	5SD7412-2, 5SD7412-3, 5SD7413-2, 5SD7413-3, 5SD7414-2 and 5SD7414-3	5SD7418-3
L-PE (PV)	2	5SD7483-6	5SD7498-3

5SD74 surge arresters, type 2

Standard design

	For TN and TT systems		For TN-C systems and IT networks		For IT networks		For TN-S and TT systems
Protection paths	N-PE	L-PEN and L-N	L-PEN and L-N	L-PEN	L-PEN and L-PE	L-PEN and L-PE	L-N, L-PE and N-PE
Rated voltage U_n	240/415 V AC	240/415 V AC	400/690 V AC	240/415 V AC	400/690 V AC	554/960 V AC	240/415 V AC
Maximum continuous voltage U_c	260 V AC	350 V AC	800 V AC	350 V AC	580 V AC	760 V AC	350 V AC (L-N, L-PE) 260 V AC (N-PE)
							

Circuit	Mounting width							
With remote signaling								
1 + 0	1 MW	–	5SD7461-1	–	–	–	–	–
	2 MW	–	–	5SD7481-1	–	–	–	–
3 + 0	3 MW	–	–	–	5SD7463-1	5SD7473-1	5SD7483-5	–
3 + 1	4 MW	–	–	–	–	–	–	5SD7464-1
Without remote signaling								
1 + 0	1 MW	5SD7481-0	5SD7461-0	–	–	–	–	–
3 + 0	3 MW	–	–	–	5SD7463-0	–	–	–
3 + 1	4 MW	–	–	–	–	–	–	5SD7464-0

Further technical specifications

Further technical specifications		5SD7481-0	5SD7461-0 5SD7461-1	5SD7481-1	5SD7463-0 5SD7463-1	5SD7464-0 5SD7464-1	5SD7473-1	5SD7483-5
Standards								
Standards		IEC 61643-11; EN 61643-11						
Approvals		KEMA					–	KEMA, UL/cUL
Voltage								
Protection level U_p	L-N and L-PEN	–	≤1.50 kV	≤5 kV	≤1.50 kV	≤1.60 kV	≤2.50 kV	≤2.90 kV
	L-PE	–				≤1.90 kV	–	
	N-PE	≤1.50 kV	–			≤1.50 kV	–	
Current								
Rated discharge surge current I_n (8/20 μs)	L-N and L-PEN	–	20 kA	15 kA	20 kA		15 kA	
	N-PE	20 kA	–			20 kA	–	
Max. discharge surge current $I_{max.}$ (8/20 μs)	L-N	–	40 kA	30 kA	40 kA		30 kA	
	N-PE	40 kA	–			40 kA	–	
Function								
Response time t_A	L-N and L-PEN	–	≤25 ns	≤100 ns	≤25 ns			
	L-N and N-PE	≤100 ns	–			≤100 ns	–	
Connections								
Conductor cross-section	Finely stranded	1.5 ... 25 mm ²						
	Solid	1.5 ... 35 mm ²						
Protection devices								
Max. back-up fuse acc. to IEC 61643-1	For stub wiring (gL/gG)	–	125 A	100 A	125 A		100 A	
	For V wiring (gL/gG)	–		80 A				
Short-circuit strength	With max. back-up fuse	25 kA						
Ambient conditions								
Degree of protection		IP20, with connected conductors						
Temperature range		–40 ... +80 °C						

Accessories

Spare part plugs



Protection paths	Basic units	Article No.
N-PE	5SD7481-0, 5SD7464-0 and 5SD7464-1	5SD7488-0
L-N and L-PEN	5SD7461-0, 5SD7461-1, 5SD7463-0, 5SD7463-1, 5SD7464-0 and 5SD7464-1	5SD7468-1
L-PEN	5SD7481-1 and 5SD7483-5	5SD7488-2
	5SD7481-1	5SD7488-4

5SD74 surge arresters, type 2

Narrow design

For TN-S and TT systems

Protection paths
Rated voltage U_n
Rated arrester voltage U_C ; L-N, N-PE, L-(PE)N
Rated arrester voltage U_C ; N-PE

L-N and N-PE	L-N and N-PE
240 V AC	240/415 V AC
350 V AC	350 V AC
264 V AC	264 V AC



Circuit	Mounting width	Rated discharge surge current I_n (8/20 μ s)			
		L-N or L-(PE)N	N-PE		
With remote signaling					
1 + 1	24 mm (1 1/3 MW)	20 kA	20 kA	5SD7422-1	–
3 + 1	48 mm (2 2/3 MW)	20 kA	20 kA	–	5SD7424-1
		20 kA	40 kA	–	–
Without remote signaling					
1 + 1	24 mm (1 1/3 MW)	20 kA	20 kA	5SD7422-0	–
3 + 1	48 mm (2 2/3 MW)	20 kA	20 kA	–	5SD7424-0
		20 kA	40 kA	–	–

Further technical specifications

5SD7422-0
5SD7422-1

5SD7424-0
5SD7424-1

Standards		
Standards		IEC 61643-11, EN 61643-11
Approvals		KEMA/UL/cUL
Voltage		
Protection level U_p	L-N and L-PEN	≤ 1.50 kV
	L-PE	≤ 1.90 kV
	N-PE	≤ 1.50 kV
Current		
Rated discharge surge current I_n (8/20 μ s)	L-N and L-PEN	20 kA
	N-PE	20 kA
Max. discharge surge current $I_{max.}$ (8/20 μ s)	L-N	40 kA
	N-PE	40 kA
Function		
Response time t_A	L-N and L-PEN	≤ 25 ns
	L-N and N-PE	≤ 100 ns
Connections		
Conductor cross-section	Finely stranded	2.5 ... 16 mm ²
	Solid	2.5 ... 25 mm ²
Protection devices		
Max. back-up fuse acc. to IEC 61643-1	For stub wiring (gL/gG)	315 A
	For V wiring (gL/gG)	63 A
Short-circuit strength	With max. back-up fuse	25 kA
Ambient conditions		
Degree of protection		IP20, with connected conductors
Temperature range		–40 ... +80 °C

Accessories

Spare part plugs



Protection paths	Basic units	Article No.
N-PE	5SD7422-0, 5SD7422-1, 5SD7424-0 and 5SD7424-1	5SD7428-0
L-N and L-PEN	5SD7422-0, 5SD7422-1, 5SD7424-0 and 5SD7424-1	5SD7428-1

5SD74 surge arresters, type 3

For TN-S and TT systems			
Protection paths	L-N, L-PE, N-PE, (L+) – (L–) and (L+/L–) – PE	L-N, L-PE, N-PE, (L+) – (L–) and (L+/L–) – PE	L-N, L-PE, N-PE, (L+) – (L–) and (L+/L–) – PE
Rated voltage U_n	24 V AC	120 V AC	230 V AC
Rated arrester voltage U_C	34 V AC	150 V AC	264 V AC
			

Circuit	Mounting width			
With remote signaling				
1 + 0	1 MW	5SD7432-5	5SD7432-6	5SD7432-7

Further technical specifications

		5SD7432-5	5SD7432-6	5SD7432-7
Standards		IEC 61643-11; EN 61643-11		
Approvals		KEMA/UL/cUL		
Voltage				
Protection level U_p	L-N, L-PE and N-PE	≤200/≤600 V	≤750/≤850 V	≤1250/≤1400 V
Current				
Rated load current I_L (at 30 °C)		26 A		
Rated discharge surge current I_n (8/20 μs)		1 kA	5 kA	
Combined surge U_{oc}		2 kV	6 kV	
Function				
Response time t_A		≤100 ns		
Connections				
Conductor cross-section	Finely stranded	0.2 ... 2.5 mm ²		
	Solid	0.2 ... 4 mm ²		
Protection devices				
Required back-up fuse, max.	(gG/B/C)	25 A		
Ambient conditions				
Degree of protection		IP20, with connected conductors		
Temperature range		–40 ... +80 °C		
Display				
Visual function/fault indication		Yes		

