

Voltage Limiting Devices

- Electrical isolation of insulated track sections and earthed parts of installations
- Safe equipotential bonding in case of a short-circuit or earth fault at the overhead contact line due to high-current-resistant welding of the electrodes
- Discharge of lightning surges without short-circuit formation due to lightning-resistant SDS ... voltage limiting device
- Short-circuit withstand capability up to 25 kA_{rms} / 100 ms; 36 kA_{rms} / 75 ms



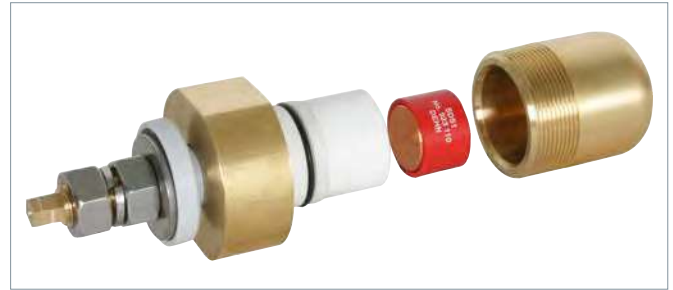
EN 50122-1 describes the use of voltage limiting devices for d.c. and a.c. traction systems for so-called „open traction system earthing“ of conductive components of the overhead contact line and pantograph zone. Voltage limiting devices (SDS ...) are used to prevent the occurrence of hazardous surges between the insulated tracks or track sections of electric railways and earthed parts of the installation.

Their function is to permanently connect parts of the installation in the overhead contact line and pantograph zone to the return circuit as soon as the threshold voltage is exceeded.

In case of atmospheric overvoltages, the lightning-resistant SDS ... voltage limiting device is capable of returning to its initial state after discharging the impulse current. Only if the specified lightning current load is exceeded, a permanent short-circuit is initiated by high-current-resistant welding of the electrodes and the fuse link has to be replaced.

The SDS voltage limiting device consists of a spark gap unit and the respective connecting kit and can be directly connected to the rail or overhead contact line tower.

The spark gap unit of type SDS 1 (Part No. 923 110) developed by DEHN has also been approved by the German Federal Railway Authority (EBA).



SDS 1 Voltage limiting device for a power-frequency sparkover voltage ≤ 940 V.

Type SDS ...	1
Part No.	923 110
VLD type (EN 50122-1)	VLD-F
Power frequency sparkover voltage (U_{aw})	≤ 940 V
d.c. sparkover voltage (U_{ag})	600 V +/- 20 %
Impulse sparkover voltage	≤ 1400 V (1 kV/μs)
Self-extinguishing capability	300 A / 65 V
Lightning current discharge capacity (10/350 μs) 0.1x / 0.5x / 1x	5 kA
Lightning current withstand capability (10/350 μs)	25 kA
Safe short-circuit due to welding of the electrodes in case of alternating currents	≥ 2.5 kA / 1000 V / 30 ms, ≥ 1.5 kA / 1000 V / 100 ms
Safe short-circuit due to welding of the electrodes in case of direct currents	≥ 750 A / 250 ms
Short-circuit withstand capability	25 kA _{rms} / 100 ms; 36 kA _{rms} / 75 ms
Long-term current	1 kA _{rms} for t ≤ 120 s
Leakage current (I_{lc})	< 1 μA for 100 V d.c.
Operating temperature range (T_U)	-40 °C ... +80 °C
To be mounted with	mast adapter MA SDS M12 or SIEMENS No. 8WL6503-xx
Approvals	EBA
DB drawing No.	4 Ebs 15.13.20 Sheet 2



SDS 2 Voltage limiting device for a d.c. sparkover voltage of 350 V.

Type SDS ...	2
Part No.	923 117
VLD type (EN 50122-1)	VLD-F
d.c. sparkover voltage (U_{ag})	350 V +/- 20 %
Impulse sparkover voltage	≤ 900 V (1 kV/μs)
Lightning current discharge capacity (10/350 μs) 0.1x / 0.5x / 1x	2 kA
Lightning current withstand capability (10/350 μs)	25 kA
Safe short-circuit due to welding of the electrodes in case of direct currents	≥ 600 A / 250 ms
Short-circuit withstand capability	25 kA _{rms} / 100 ms; 36 kA _{rms} / 75 ms
Long-term current	1 kA _{rms} for t ≤ 120 s
Leakage current (I_{lc})	< 1 μA for 100 V d.c.
Operating temperature range (T_U)	-40 °C ... +80 °C
To be mounted with	mast adapter MA SDS M12 or SIEMENS No. 8WL6503-xx



SDS 3

Voltage limiting device for a d.c. sparkover voltage of 550 V.



Type SDS ...	3
Part No.	923 116
VLD type (EN 50122-1)	VLD-F
d.c. sparkover voltage (U_{ag})	550 V +/- 20 %
Impulse sparkover voltage	≤ 1000 V (1 kV/ μ s)
Lightning current discharge capacity (10/350 μ s) 0.1x / 0.5x / 1x	2.5 kA
Lightning current withstand capability (10/350 μ s)	25 kA
Short-circuit withstand capability	25 kA _{rms} / 100 ms
Operating temperature range (T_U)	-40 °C ... +80 °C
To be mounted with	mast adapter MA SDS M12 or SIEMENS Nr. 8WL6503-xx

SDS 4

Voltage limiting device for a d.c. sparkover voltage of 230 V.



Type SDS ...	4
Part No.	923 118
VLD type (EN 50122-1)	VLD-F
d.c. sparkover voltage (U_{ag})	230 V +/- 20%
Impulse sparkover voltage	≤ 650 V (1 kV/ μ s)
Lightning current discharge capacity (10/350 μ s) 0.1x / 0.5x / 1x	2.5 kA
Lightning current withstand capability (10/350 μ s)	25 kA
Impulse current discharge capacity (8/20 μ s) 0.1x / 0.5x / 1x	20 kA
Safe short-circuit due to welding of the electrodes in case of direct currents	≥ 600 A / 250 ms
Short-circuit withstand capability	25 kA _{rms} / 100 ms; 36 kA _{rms} / 75 ms
Long-term current	1 kA _{rms} for $t \leq 120$ s
Leakage current (I_{lc})	< 1 μ A for 100 V d.c.
Operating temperature range (T_U)	-40 °C ... +80 °C
To be mounted with	mast adapter MA SDS M12 or SIEMENS No. 8WL6503-xx

SDS 5

Voltage limiting device for a d.c. sparkover voltage of 120 V.



Type SDS ...	5
Part No.	923 119
VLD type (EN 50122-1)	VLD-F
d.c. sparkover voltage (U_{ag})	120 V +/- 20 %
Impulse sparkover voltage	≤ 600 V (1 kV/ μ s)
Lightning current discharge capacity (10/350 μ s) 0.1x / 0.5x / 1x	2 kA
Lightning current withstand capability (10/350 μ s)	25 kA
Impulse current discharge capacity (8/20 μ s) 0.1x / 0.5x / 1x	20 kA
Safe short-circuit due to welding of the electrodes in case of direct currents	≥ 600 A / 250 ms
Short-circuit withstand capability	25 kA _{rms} / 100 ms; 36 kA _{rms} / 75 ms
Long-term current	1 kA _{rms} for $t \leq 120$ s
Leakage current (I_{lc})	< 1 μ A for 100 V d.c.
Operating temperature range (T_U)	-40 °C ... +80 °C
To be mounted with	mast adapter MA SDS M12 or SIEMENS No. 8WL6503-xx

Accessories for Voltage Limiting Devices

Mast adapter for SDS Voltage Limiting Devices

For installation on the mast profile of overhead contact line masts with $\varnothing 8$ -12 mm.



Type	MA SDS M12
Part No.	723 199
Lightning current carrying capability (10/350 μ s)	25 kA
Short-circuit withstand capability	21 kA _{rms} / 30 ms
Long-term current	1 kA _{rms} at $t \leq 120$ s
Leakage current (I_{lc})	< 1 μ A at 100 V d.c.
Dimensions of the threaded pin	M12
Material	Ms
Degree of protection of the inner enclosure	IP 67