

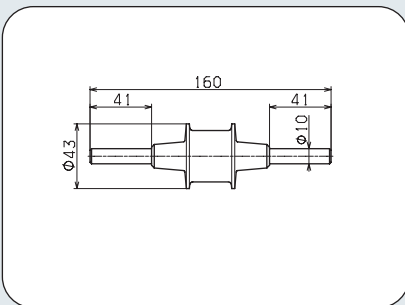


- For indirect connection/earthing of functionally separate parts of installations when being affected by lightning
- For use in correspondence with lightning equipotential bonding according to IEC 62305
- With corrosion-resistant stainless steel connections
- For mounting inside of buildings, outdoors, in damp rooms as well as for underground installation
- Extremely loadable devices

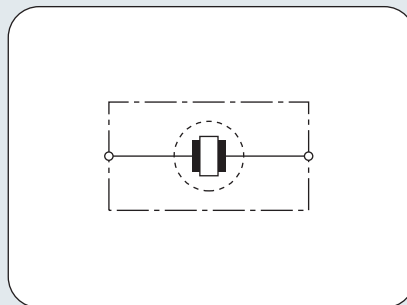
For lightning equipotential bonding according to IEC 62305 as well as for use in IT installations according to IEC 60364-5-54.

TFS: High-capacity isolating spark gap  
 KFSU: Isolating spark gap

**TFS / KFSU**



Dimension drawing TFS / KFSU



Basic circuit diagram TFS / KFSU



TFS / KFSU: Isolating spark gaps with plastic coating and 2 connections (Rd 10 mm) made of stainless steel

	TFS	KFSU
Lightning impulse current (10/350 $\mu$ s) $I_{imp}$	100 kA	—
Classification of lightning current carrying capability according to EN 50164-3	H	—
Nominal discharge current (8/20 $\mu$ s) $I_n$	100 kA	100 kA
Rated power-frequency withstand voltage (50 Hz) $U_{W/AC}$	300 V	300 V
100% Lightning impulse sparkover voltage $U_{rimp}$	$\leq 4$ kV	$\leq 4$ kV
Power frequency sparkover voltage (50 Hz) $U_{aw}$	$\leq 2.5$ kV	$\leq 2.5$ kV
Operating temperature range $T_U$	-20°C...+80°C	-20°C...+80°C
Degree of protection	IP 65	IP 65
Length	160 mm	160 mm
Diameter of enclosure	43 mm	43 mm
Enclosure material	steel-plastic coating	steel-plastic coating
Connection	Rd 10 mm	Rd 10 mm
Material (connection)	stainless steel	stainless steel
<b>Ordering information</b>		
Type	TFS	KFSU
Part No.	923 023	923 021
Packing unit	1 pc(s).	1 pc(s).



ATEX-certified isolating spark gap for lightning equipotential bonding according to IEC 62305 with low sparkover voltage

- For indirect connection/earthing of functionally separate parts of installations when being affected by lightning
- Device for lightning equipotential bonding according to IEC 62305 in hazardous areas
- For bridging insulating pieces, insulating flanges etc. in cathodic protected pipe sections
- For safe application in explosion protection zone 1 (gases) or 21 (dust)
- Considerably low sparkover voltage
- Considerably high a.c. current withstand capability

EXFS 100: Isolating spark gap for use in hazardous areas with plastic coating and threaded M10 sockets

EXFS 100 KU: Isolating spark gap for use in hazardous areas with 2 m connecting cables for underground installation



Type examination certificate

The Ex isolating spark gaps of the EXFS 100 / EXFS 100 KU product family are used when conductive parts of installations situated in hazardous areas cannot be connected directly with each other.

The low sparkover voltages of the spark gaps have proved themselves for protection especially for separate installation parts with only low insulation resistance against each other.

No special regulations have to be observed for safe application in zone 1 with gas atmospheres or zone 21 with combustible dust.

With a tested maximum lightning impulse current of 100 kA (10/350 μs), EXFS 100 and EXFS 100 KU meet class H, i.e. the maximum class of lightning impulse current strength according to EN 50164-3 "Lightning Protection Components (LPC) - Part 3: Requirements for isolating spark gaps".

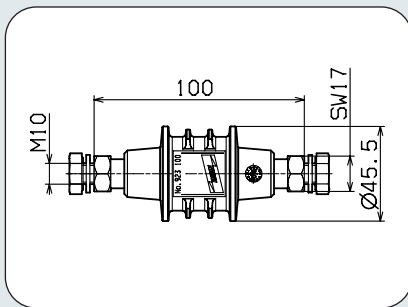
The ATEX-certified spark gaps EXFS 100 and EXFS 100 KU provide approved safety according to harmonised European standards.

For connecting EXFS 100 spark gaps, prewired connecting cables with different lengths are available as accessories.

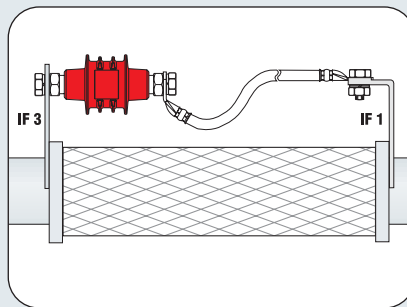
Flat and angled connection brackets (IF) make it easier to connect the spark gaps to pipe flanges.

EXFS 100 KU types are enclosed by a damp-proof plastic coating and can therefore be ideally used for underground installation for insulating couplings.





Dimension drawing EXFS 100



Installation of EXFS 100



**NEW**

EXFS 100: Isolating spark gap for use in hazardous zones with plastic coating and threaded M10 sockets

EXFS 100	
Lightning impulse current (10/350 $\mu$ s) $I_{imp}$	100 kA
Class of lightning impulse current strength according to EN 50164-3	H
Nominal discharge current (8/20 $\mu$ s) $I_n$	100 kA
Rated power-frequency withstand voltage (50 Hz) $U_{W/AC}$	250 V
100% Lightning impulse sparkover voltage $U_{rimp}$	$\leq 1.25$ kV
Power-frequency sparkover voltage (50 Hz) $U_{aw}$	$\leq 0.5$ kV
Rated discharge current (50 Hz) $I_{max}$	500 A / 0.5 sec. ( $T_U: \leq 45^\circ\text{C}$ )
(Ex) Marking according to EN 60079 (gas atmospheres)	$\text{Ex}$ II 2G Ex d IIC T6
(Ex) Marking according to EN 61241 (combustible dust)	$\text{Ex}$ II 2D Ex tD A21 IP67 T 80°C
Operating temperature range $T_U$	-20°C...+60°C
Degree of protection	IP 67
Approvals, Certifications	BVS 06 ATEX E 099
Length of enclosure	100 mm
Diameter of enclosure	45,5 mm
Enclosure material	plastic coating
Connection of enclosure	threaded M10 socket, 2x M10x25 mm, 2x spring washer
<b>Ordering information</b>	
Type	EXFS 100
Part No.	923 100
Packing unit	1 pc(s).

**Accessory Part for EXFS 100**

**EXFS 100: Connecting cable, Cu 25 mm<sup>2</sup>**

Connecting cable for EXFS 100;

2 x cable lug  $\varnothing 10.5$  mm, hexagon screw and nut (M10), StSt (V2A) and spring washer

**NEW**

Type	Cable lug material	Cross section	Cable length	PU pc(s)	Part No.
AL EXFS L100 KS	Cu/gal Sn	25 mm <sup>2</sup>	100 mm	1	923 025
AL EXFS L200 KS	Cu/gal Sn	25 mm <sup>2</sup>	200 mm	1	923 035
AL EXFS L300 KS	Cu/gal Sn	25 mm <sup>2</sup>	300 mm	1	923 045



**Accessory Part for EXFS 100 / EXFS 100 KU**

**Pair of angled connection brackets – IF 1 –**

Pair of angled connection brackets for EXFS ...;

Diameter corresponds to bolt diameter of the flange screw joint (allows for max. 60 mm for d1, please confirm the diameter required when placing your order)

Type	Material	PU pc(s)	Part No.
IF1	St/tZn	1	923 011



**Pair of flat connection brackets – IF 3 –**

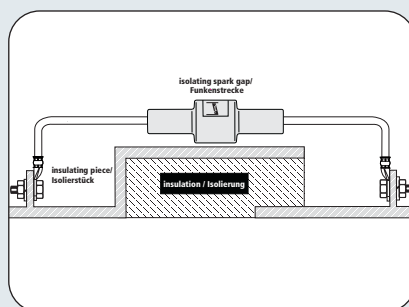
Pair of flat connection brackets for EXFS ...;

Diameter corresponds to bolt diameter of the flange screw joint (allows for max. 60 mm for d1, please confirm the diameter required when placing your order)

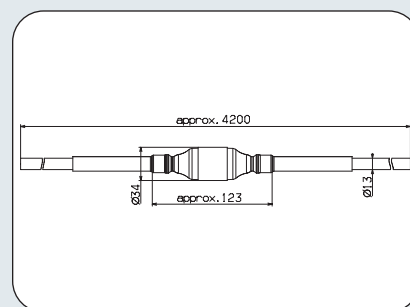
Type	Material	PU pc(s)	Part No.
IF3	St/tZn	1	923 016



NEW



Installation of EXFS 100 KU



Dimension drawing EXFS 100 KU

EXFS 100 KU: Ex isolating spark gap with connecting cable for aboveground and underground installation

## EXFS 100 KU

Lightning impulse current (10/350 $\mu$ s) $I_{imp}$	100 kA
Class of lightning impulse current strength according to EN 50164-3	H
Nominal discharge current (8/20 $\mu$ s) $I_n$	100 kA
Rated power-frequency withstand voltage (50 Hz) $U_{W/AC}$	250 V
100% Lightning impulse sparkover voltage $U_{rimp}$	$\leq 1.25$ kV
Power-frequency sparkover voltage (50 Hz) $U_{aw}$	$\leq 0.5$ kV
Rated discharge current (50 Hz) $I_{max}$	500 A / 0.5 sec. ( $T_U \leq 45^\circ\text{C}$ )
(Ex) Marking according to EN 60079 (gas atmospheres)	$\text{Ex}$ II 2G Ex d IIC T6
(Ex) Marking according to EN 61241 (combustible dust)	$\text{Ex}$ II 2D Ex tD A21 IP 67 T 80°C
Operating temperature range $T_U$	-20°C...+60°C
Degree of protection	IP 67
Approvals, Certifications	BVS 06 ATEX E 099
Length of enclosure	123 mm
Diameter of enclosure	34 mm
Enclosure material	plastic coating; water-proof coating
Connection of enclosure	NYY-J-1x25 mm <sup>2</sup> , approx. 2 m long

## Ordering information

Type	EXFS 100 KU
Part No.	923 101
Packing unit	1 pc(s).



ATEX-certified isolating spark gap for lightning equipotential bonding according to IEC 62305, approved device with flexible conductor connection

- For indirect connection/earthing of functionally separate parts of installations when being affected by lightning
- Device for lightning equipotential bonding according to IEC 62305 in hazardous areas (Zone 2)
- Corresponds to "ATEX Directive" 94/9/EC
- Corrosion-resistant enclosure made of zinc die casting with plastic cover and flexible conductor connection
- For bridging insulating pieces, insulating flanges etc. in pipe sections with cathodic corrosion protection
- Highly loadable unit

EXFS L ...: Isolating spark gap for use in hazardous areas with flexible connecting cable

EXFS KU: Isolating spark gap for use in hazardous areas with 1.5 m connecting cables for underground installation

The Ex isolating spark gaps of the EXFS L / EXFS KU product family are used for conductive parts of an installation which cannot be interconnected directly in hazardous areas. This affects, for example, pipe sections supplied with a cathodic corrosion protection system.

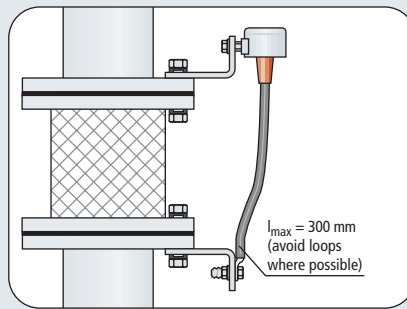
ATEX-certified EXFS L and EXFS KU spark gaps provide approved and tested safety in accordance with harmonised European standards.

The arc-resistant tungsten-copper electrodes ensure a long service life of the Ex spark gaps.

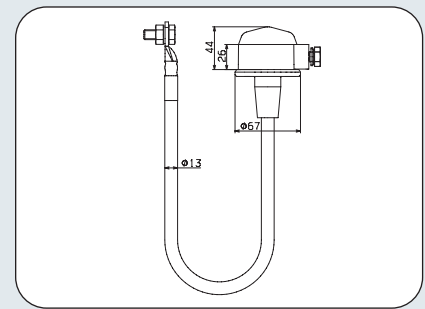
The approved type EXFS L with flexible conductor connection adjusts itself quickly to any application environment. The prewired spark gaps provide connecting cables with different lengths with cable lugs, M10 screws and nuts. The flat or angled connection brackets (IF), which are available as accessories, allow for easy connection of the spark gap to pipeline flanges.

Type EXFS KU is enclosed by a damp-proof PVC enclosure and can be ideally used for underground installation at insulating couplings.





Installation of EXFS



Dimension drawing EXFS

EXFS L ...: Ex isolating spark gap for aboveground installation

	EXFS L100	EXFS L200	EXFS L300
Lightning impulse current (10/350 µs) $I_{imp}$	50 kA	50 kA	50 kA
Classification of lightning current carrying capability according to EN 50164-3	N	N	N
Nominal discharge current (8/20 µs) $I_n$	100 kA	100 kA	100 kA
Rated power-frequency withstand voltage (50 Hz) $U_{W/AC}$	300 V	300 V	300 V
100% Lightning impulse sparkover voltage $U_{rimp}$	≤ 2.5 kV	≤ 2.5 kV	≤ 2.5 kV
Power frequency sparkover voltage (50 Hz) $U_{aw}$	≤ 1.2 kV	≤ 1.2 kV	≤ 1.2 kV
Type of protection according to EN 50014, EN 50021	Ⓔ II 3 G EEx nC II T4	Ⓔ II 3 G EEx nC II T4	Ⓔ II 3 G EEx nC II T4
Operating temperature range $T_U$	-20°C...+80°C	-20°C...+80°C	-20°C...+80°C
Degree of protection	IP 54	IP 54	IP 54
Approvals, Certifications	ZELM 03 ATEX 3192X	ZELM 03 ATEX 3192X	ZELM 03 ATEX 3192X
Length of enclosure	90 mm	90 mm	90 mm
Diameter of enclosure	63 mm	63 mm	63 mm
Enclosure material	zinc die casting, plastic	zinc die casting, plastic	zinc die casting, plastic
Connecting cable	H01N2-D 25 mm <sup>2</sup> with cable lug and screw/nut (M10)		
Cable length	100 mm	200 mm	300 mm
Suitable for flange size	20-130 mm	120-230 mm	220-320 mm
<b>Ordering information</b>			
Type	EXFS L100	EXFS L200	EXFS L300
Part No.	923 060	923 061	923 062
Packing unit	1 pc(s).	1 pc(s).	1 pc(s).

Accessory Part for EXFS L / EXFS KU

Pair of angled connection brackets – IF 1 –

Pair of angled connection brackets for EXFS ...;

Diameter corresponds to bolt diameter of the flange screw joint (allows for max. 60 mm for d1, please confirm the diameter required when placing your order)



Type	Material	PU pc(s)	Part No.
IF1	St/tZn	1	923 011

Accessory Part for EXFS L / EXFS KU

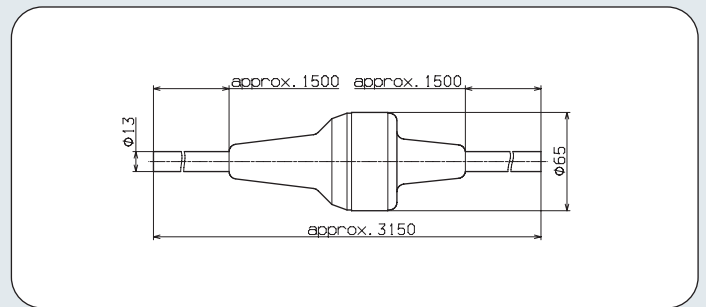
Pair of flat connection brackets – IF 3 –

Pair of flat connection brackets for EXFS ...;

Diameter corresponds to bolt diameter of the flange screw joint (allows for max. 60 mm for d1, please confirm the diameter required when placing your order)



Type	Material	PU pc(s)	Part No.
IF3	St/tZn	1	923 016



Dimension drawing EXFS KU

EXFS KU: Ex isolating spark gap with connecting cables for aboveground and underground installation

EXFS KU	
Lightning impulse current (10/350 $\mu$ s) $I_{imp}$	50 kA
Classification of lightning current carrying capability according to EN 50164-3	N
Nominal discharge current (8/20 $\mu$ s) $I_n$	100 kA
Rated power-frequency withstand voltage (50 Hz) $U_{W/AC}$	300 V
100% Lightning impulse sparkover voltage $U_{rimp}$	$\leq 2.5$ kV
Power frequency sparkover voltage (50 Hz) $U_{aw}$	$\leq 1.2$ kV
Type of protection according to EN 50014, EN 50021	$\text{Ex}$ II 3 G EEx nC II T4
Operating temperature range $T_U$	-20°C...+80°C
Degree of protection	IP 67
Approvals, Certifications	ZELM 03 ATEX 3192X
Length of enclosure	90 mm
Diameter of enclosure	63 mm
Enclosure material	zinc die casting, plastic
Connecting cable	NYY-J-1x25 mm <sup>2</sup>
Cable length	2 x approx. 1500 mm
<b>Ordering information</b>	
Type	EXFS KU
Part No.	923 019
Packing unit	1 pc(s).

For fixing at pipes installed in hazardous areas

- For use in potentially explosive areas, i.e. Ex zones 1 and 2 (gases, vapours, fog) and Ex zones 21 and 22 (dust)
- Tested according to explosion group IIB
- Considerable saving of time for installation – no more deactivation of the installation/zone required for welding or drilling work

Pipe clamp for use in hazardous areas from 1" to 3" and 3" to D = 300 mm.

Separate clamping element for continuous tightening strap (Part No. 540 901) from 1" to D = 300 mm.

So far, connections for equipotential bonding and lightning equipotential bonding in hazardous areas have often been welded or provided as threaded sockets. Using clamps was only permitted if their ignition-proofness had been verified before. DEHN + SÖHNE has now provided evidence of no ignition of a pipe clamp affected by lightning currents. By testing according to DIN EN 50164-1 (VDE 0185-201) (Requirements for connection components) in a potentially explosive atmosphere, no ignition of the test sample with a lightning current carrying capability up to 50 kA (10/350 µs) was verified. The design of this new pipe clamp takes



Pipe clamp for attaching to pipes in hazardous areas for lightning equipotential bonding according to EN 62305-3 (DIN VDE 0185-305-3)

- both a safe electrical contact by means of two contact clips into consideration as well as the mechanical fixation by an electrically insulated clamping element per clip. The pipe clamp can be attached by means of
- round conductors, Cu, St/tZn, Al, StSt with Ø8 mm or stranded copper conductors, cross section 16-35 mm<sup>2</sup> with E-Cu crimping cable lug (DIN 46235)
  - flat copper conductors with minimum dimensions of 20 x 2.5 mm and a Ø10.5 mm hole.



Attached to a StSt pipe

Accessory Part for Pipe Clamp for use in hazardous Areas

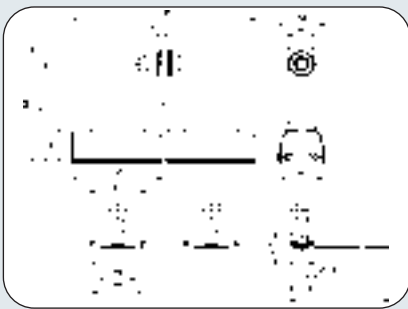


Tensioning strap

Continuous tensioning strap (100 m long)

Material	Strap dimension (l1 x w x d)	PU pc(s)	Part No.
StSt (V2A)	... x 25 x 0.3 mm	1	540 901

**Pipe clamp for use in hazardous areas for ¾" to D = 300 mm**



Pipe clamp for use in hazardous areas in zones 1 and 21;  
Clamping ranges from ¾" to 3" and 3" to D=300 mm

Lightning impulse current (10/350 µs) for Cu I <sub>imp</sub>	50 kA	50 kA
Lightning impulse current (10/350 µs) for St/tZn I <sub>imp</sub>	50 kA	50 kA
Lightning impulse current (10/350 µs) for StSt I <sub>imp</sub>	25 kA	50 kA
Lightning current carrying capability according to DIN EN 50164-1 (does not apply to StSt, 25 kA)	Class N	Class N
Pipe clamping range Ø	26.9-88.9 mm	88.9-300 mm
Clamping range	¾" – 3"	3" – Ø300 mm
Dimension of tightening strap (l1 x w x d)	410x25x0.3 mm	1100x25x0.3 mm
Clamping element material	polyamide	polyamide
Head/Strap material	StSt (V2A)	StSt (V2A)
Contact angle material	Cu/gal Sn	Cu/gal Sn
<b>Ordering information</b>		
Part No.	540 801	540 803
Packing unit	1 pc(s).	1 pc(s).

**Separate clamping element for continuous tightening strap**



Separate clamping element for combination with continuous tightening strap (Part No. 540 901) for use in hazardous zones 1 and 21; clamping range from ¾" to D=300 mm

Lightning impulse current (10/350 µs) for Cu I <sub>imp</sub>	50 kA	
Lightning impulse current (10/350 µs) for St/tZn I <sub>imp</sub>	50 kA	
Lightning impulse current (10/350 µs) for StSt I <sub>imp</sub>	25 kA	
Lightning current carrying capability according to DIN EN 50164-1 (does not apply to StSt, 25 kA)	Class N	
Pipe clamping range Ø	max. 300 mm	
Clamping range	¾" – Ø300 mm	
Clamping element material	polyamide	
Head/Strap material	StSt (V2A)	
Contact angle material	Cu/gal Sn	
<b>Ordering information</b>		
Part No.	540 810	
Packing unit	1 pc(s).	

Voltage limiting device

ISOLATING SPARK GAPS

- Electrical isolation of insulated track sections and earthed parts of installations
- Safe equipotential bonding by heavy-current-resistant welding of the electrodes in case of a short circuit or earth fault at the overhead contact line
- Discharging of surges without generating short circuits due to lightning-resistant SDS ... voltage limiting device
- Short-circuit withstand capability  
25 kA<sub>rms</sub> / 100 ms; 36 kA<sub>rms</sub> / 75 ms



SDS ...: SDS Spark gap unit, cylindrical design for supporting Siemens rail adapter No. 431.34

SDS ... NH00: SDS Spark gap unit for support in NH fuse holders, size 00

DIN EN 50122-1 defines the use of voltage limiting devices for d.c. and a.c. railways for so-called "open earthing of railways" for components of overhead contact lines and current collectors.

In order to prevent any upcoming of hazardous surges between the insulated rails or rail sections of electrical railways and earthed parts of the installation, voltage limiting devices (SDS ...) are used.

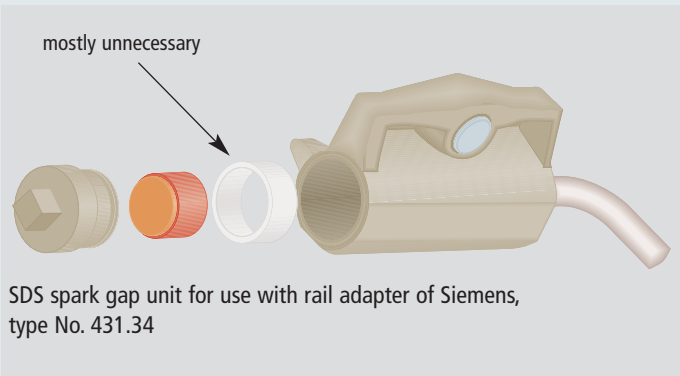
Their function is to connect parts of the installation in overhead contact lines and current collectors permanently with the return circuit, as soon as the threshold voltage is exceeded.

In case of atmospherical overvoltages, the lightning-resistant SDS ... voltage limiting device is capable of returning to the initial condition after discharging impulse currents. Only if the provided lightning current loads are exceeded, a permanent short circuit is initiated by heavy-current-resistant welding of the electrodes. Then, as a consequence, the fuse link has to be replaced.

The SDS voltage limiting device consists of a spark gap unit and the respective terminal set for direct connection with the rail or overhead contact line tower.

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

Type SDS ... NH 00 is designed for installation into NH00 fuse holders or insulators. In connection with DEHNisola leakage current detecting device, the user can localise a short-circuited spark-gap unit quickly and easily.



SDS spark gap unit for use with rail adapter of Siemens, type No. 431.34

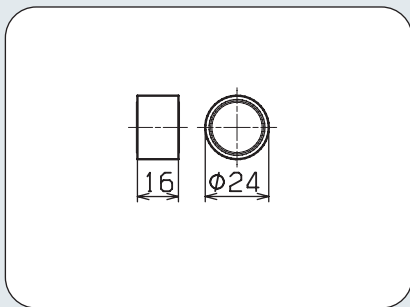


SDS 2 NH00 installed into a mains connection box with DEHNisola combined operating state monitoring device

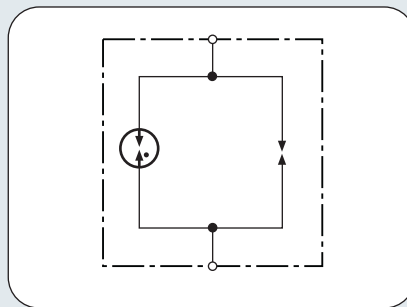
# LIGHTNING EQUIPOTENTIAL BONDING ISOLATING SPARK GAPS

SDS  
SDS ...

NEW



Dimension drawing SDS ...



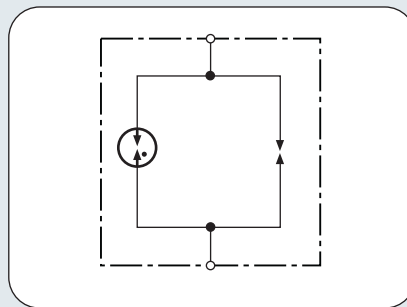
Basic circuit diagram SDS ...



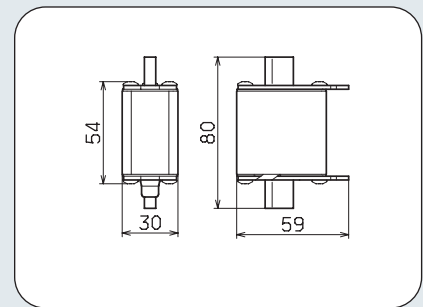
	SDS 1	SDS 2	SDS 3	SDS 4	SDS 5
Power frequency sparkover voltage $U_{aw}$	≤ 940 V	—	—	—	—
d.c. Sparkover voltage $U_{ag}$	600 V +/- 20 %	350 V +/- 20 %	550 V	230 V +/- 20 %	120 V +/- 20 %
Impulse sparkover voltage	≤ 1400 V (1 kV/μs)	≤ 900 V (1 kV/μs)	≤ 1000 V (1 kV/μs)	≤ 650 V (1 kV/μs)	≤ 600 V (1 kV/μs)
Self-extinguishing capability	300 A / 65 V	—	—	—	—
Lightning current discharge capacity (10/350 μs) 0.1; 0.5; 1 x $I_{imp}$	5 kA	2 kA	5 kA	3 kA	2 kA
Lightning current withstand capability (10/350 μs)	25 kA	25 kA	25 kA	25 kA	25 kA
Impulse current discharge capacity (8/20 μs) 0.1; 0.5; 1 x	—	—	—	20 kA	20 kA
Safe short circuit due to welding of the electrodes for a.c. currents of 100 ms	≥ 1.5 kA / 1000 V / 100 ms	—	—	—	—
Safe short circuit due to welding of the electrodes for a.c. currents of 30 ms	≥ 2.5 kA / 1000 V / 30 ms	—	—	—	—
Safe short circuit due to welding of the electrodes for d.c. currents	≥ 750 A / 250 ms	≥ 600 A / 250 ms	≥ 600 A / 250 ms	≥ 600 A / 250 ms	≥ 600 A / 250 ms
Short circuit withstand capability	25 kA <sub>rms</sub> / 100 ms; 36 kA <sub>rms</sub> / 75 ms	25 kA <sub>rms</sub> / 100 ms; 36 kA <sub>rms</sub> / 75 ms	25 kA <sub>rms</sub> / 100 ms; 36 kA <sub>rms</sub> / 75 ms	25 kA <sub>rms</sub> / 100 ms; 36 kA <sub>rms</sub> / 75 ms	25 kA <sub>rms</sub> / 100 ms; 36 kA <sub>rms</sub> / 75 ms
Long-term current	1 kA <sub>rms</sub> for t ≤ 120 s	1 kA <sub>rms</sub> for t ≤ 120 s	1 kA <sub>rms</sub> for t ≤ 120 s	1 kA <sub>rms</sub> for t ≤ 120 s	1 kA <sub>rms</sub> for t ≤ 120 s
Leakage current $I_{lc}$	< 1 μA for 100 V d.c.	< 1 μA for 100 V d.c.	< 1 μA for 100 V d.c.	< 1 μA for 100 V d.c.	< 1 μA for 100 V d.c.
Operating temperature range $T_U$	-40°C...+80°C	-40°C...+80°C	-40°C...+80°C	-40°C...+80°C	-40°C...+80°C
For mounting on	allows for installation into voltage breakdown protector/rail adapter of SIEMENS No. 431.34				
Tightening torque of the fuse link in the busbar adapter	15 Nm	15 Nm	15 Nm	15 Nm	15 Nm
Approvals, Certifications	EBA	—	—	—	—
DB Drawing No.	4 Ebs 15.13.20 Blatt 2	—	—	—	—
<b>Ordering information</b>					
Type	SDS 1	SDS 2	SDS 3	SDS 4	SDS 5
Part No.	923 110	923 117	923 116	923 118	923 119
Packing unit	10 pc(s).	10 pc(s).	10 pc(s).	10 pc(s).	10 pc(s).

SDS ... in NH 00 enclosure

NEW



Basic circuit diagram SDS ... NH00



Dimension drawing SDS ... NH00

	SDS 2 NH00	SDS 4 NH00	SDS 5 NH00
d.c. Sparkover voltage $U_{ag}$	350 V +/- 20 %	230 V +/- 20 %	120 V +/- 20 %
Impulse sparkover voltage	$\leq 900$ V (1 kV/ $\mu$ s)	$\leq 650$ V (1 kV/ $\mu$ s)	$\leq 600$ V (1 kV/ $\mu$ s)
Lightning current discharge capacity (10/350 $\mu$ s) 0.1; 0.5; 1x $I_{imp}$	2 kA	3 kA	2 kA
Lightning current withstand capability (10/350 $\mu$ s)	25 kA	25 kA	25 kA
Safe short circuit due to welding of the electrodes for d.c. currents	$\geq 600$ A / 250 ms	$\geq 600$ A / 250 ms	$\geq 600$ A / 250 ms
Short circuit withstand capability	10 kA / 50 ms	10 kA / 50 ms	10 kA / 50 ms
Long-term current	1 kA <sub>rms</sub> for t $\leq 120$ s	1 kA <sub>rms</sub> for t $\leq 120$ s	1 kA <sub>rms</sub> for t $\leq 120$ s
Leakage current $I_{lc}$	< 1 $\mu$ A for 100 V d.c.	< 1 $\mu$ A for 100 V d.c.	< 1 $\mu$ A for 100 V d.c.
Operating temperature range $T_U$	-40°C...+80°C	-40°C...+80°C	-40°C...+80°C
For mounting on	NH fuse holder, size 00	NH fuse holder, size 00	NH fuse holder, size 00
Enclosure material	red thermoplastic, UL 94 V-0	red thermoplastic, UL 94 V-0	red thermoplastic, UL 94 V-0
Min. degree of protection for enclosures	IP 54	IP 54	IP 54
<b>Ordering information</b>			
Type	SDS 2 NH00	SDS 4 NH00	SDS 5 NH00
Part No.	923 123	923 126	923 127
Packing unit	1 pc(s).	1 pc(s).	1 pc(s).

### Equipotential Bonding Bars

#### K 12 Equipotential bonding bars with snap-on terminals

For main equipotential bonding according to DIN VDE 0100 Part 410/540 and lightning equipotential bonding according to EN 62305-3 (DIN VDE 0185-305-3)  
Type K12 with 12 contact studs:  
10 terminals for Rd 2.5 – 95 mm<sup>2</sup> conductors or  
10 terminals for Rd 10 mm conductors and 1 terminal for FI -30x4 mm conductors

Type	Contact bar	Cross section	PU pc(s)	Part No.
PAS 11AK	Cu/gal Sn	30 mm <sup>2</sup>	1	563 200



#### K 12 Equipotential bonding bars with snap-on terminals UV-stabilised device

UV-stabilised device

Type	Contact bar	Cross section	PU pc(s)	Part No.
PAS 11AK UV	Cu/gal Sn	30 mm <sup>2</sup>	1	563 201



#### Accessories – Snap-on terminal for FI 40 conductors

Type	Connections FI mm	Material	Reservation of contact studs	PU pc(s)	Part No.
AK FL40 PAS	1x -40x5	St/gal Zn	3	50	563 222



#### MS Equipotential bonding bars

For main equipotential bonding according to DIN VDE 0100 Part 410/540  
Connections for  
7 Rd conductors 2.5 – 16 mm<sup>2</sup>  
1 Rd conductor 7 – 10 mm  
1 FI conductor -30x3.5 mm or Rd conductor 8 – 10 mm

Type	Contact bar	Cross section	PU pc(s)	Part No.
PAS 9AK	MS	50 mm <sup>2</sup>	1	563 050



#### R15 Equipotential bonding bars with terminal block system

For main equipotential bonding according to DIN VDE 0100 Part 410/540 and lightning equipotential bonding according to EN 62305-3 (DIN VDE 0185-305-3)

Type A:

7 terminal blocks for Rd conductors 2.5 – 16 mm<sup>2</sup>  
2 terminal blocks for Rd conductors 16 – 95 mm<sup>2</sup>  
or Rd conductors 8 – 10 mm  
1 terminal block FI -30x4 mm

Type	Clamping bar	Cross section	PU pc(s)	Part No.
PAS 10RK	Ms/gal Sn	100 mm <sup>2</sup>	1	563 010



Type B:

5 terminal blocks for Rd conductors 2.5 – 16 mm<sup>2</sup>  
3 terminal blocks for Rd conductors 16 – 95 mm<sup>2</sup>  
or Rd conductors 8 – 10 mm  
1 terminal block FI -30x4 mm

Type	Clamping bar	Cross section	PU pc(s)	Part No.
PAS 9RK	Ms/gal Sn	100 mm <sup>2</sup>	1	563 020



Type C:

13 terminal blocks for Rd conductors 2.5 – 16 mm<sup>2</sup>  
1 terminal block for Rd conductors 16 – 95 mm<sup>2</sup>  
or Rd conductors 8 – 10 mm

Type	Clamping bar	Cross section	PU pc(s)	Part No.
PAS 14RK	Ms/gal Sn	100 mm <sup>2</sup>	1	563 030



### Accessories / Construction Kit

#### Terminal blocks

Up to 16 mm<sup>2</sup>

Type	Material	Connection	Modules	PU pc(s)	Part No.
RK 16 PAS	StSt (V2A)- St/gal Zn	2.5-16 mm <sup>2</sup>	1	200	563 011



#### Terminal blocks

Up to 95 mm<sup>2</sup> or Rd 8-10 mm

Type	Material	Connection	Modules	PU pc(s)	Part No.
RK 95 PAS	St/gal Zn	16-95 mm <sup>2</sup>	2	100	563 013



#### Terminal blocks

Flat conductor 30 mm

Type	Material	Connection	Modules	PU pc(s)	Part No.
RK FL30 PAS	St/gal Zn	-30x4 mm <sup>2</sup>	4	25	563 012



#### Terminal blocks

Flat conductor 40 mm

Type	Material	Connection	Modules	PU pc(s)	Part No.
RK FL40 PAS	St/gal Zn	-40x5 mm <sup>2</sup>	5	25	563 019



#### Clamping bar

Type	Material	Length	PU Modules	Part pc(s)	No.
KS 198 PAS	MS/gal Sn	198 mm	15	10	563 016
KS 398 PAS	MS/gal Sn	398 mm	30	10	563 017
KS 798 PAS	MS/gal Sn	798 mm	60	10	563 018



#### Bar frame

Type	Material	Fixing holes	PU pc(s)	Part No.
SB PAS RK	plastic	6x4 mm	50	563 014



#### Covers

Snap-on devices

Type	Material	Modules	PU pc(s)	Part No.
AH PAS RK	plastic	15	10	563 015



Note: Our complete product range for earthing and equipotential bonding can be taken from our current Lightning Protection catalogue, which, of course, can also be requested from Export Department.

## Equipotential Bonding Bars with terminal block system

Equipotential bonding bars with miniature/terminal block system

For main equipotential bonding according to DIN VDE 0100 Part 410/540 in small-sized installations  
Miniature unit: For surface mounting without cover



Type	Clamping bar	Connections	Cross section	PU pc(s)	Part No.
PAS 6RK OH	Ms/gal Sn	6 x 2.5-16 mm <sup>2</sup>	100 mm <sup>2</sup>	10	563 105



For flush mounting: In box with plastic cover, white (sealable)

Type	Clamping bar	Connections	Cross section	PU pc(s)	Part No.
PAS 7RK UP	Ms/gal Sn	7 x 2.5-16 mm <sup>2</sup>	100 mm <sup>2</sup>	5	563 103

## Equipotential Bonding Bars Industry

Equipotential bonding bars for industrial installations

For main equipotential bonding according to DIN VDE 0100 Part 410/540 and lightning equipotential bonding according to EN 62305-3 (DIN VDE 0185-305-3)

Also for use in hazardous zones (screws protected against self-loosening)

6 connections with insulators

Type	Material	Dimension (l x w x d)	Cross section	PU pc(s)	Part No.
PAS I 6AP M10 CU	Cu	295x40x5 mm	200 mm <sup>2</sup>	1	472 207
PAS I 6AP M10 V2A	StSt (V2A)	295x40x6 mm	240 mm <sup>2</sup>	1	472 209



8 connections with insulators

Type	Material	Dimension (l x w x d)	Cross section	PU pc(s)	Part No.
PAS I 8AP M10 CU	Cu	365x40x5 mm	200 mm <sup>2</sup>	1	472 227
PAS I 8AP M10 V2A	StSt (V2A)	365x40x6 mm	240 mm <sup>2</sup>	1	472 229



10 connections with insulators

Type	Material	Dimension (l x w x d)	Cross section	PU pc(s)	Part No.
PAS I 10AP M10 CU	Cu	435x40x5 mm	200 mm <sup>2</sup>	1	472 217
PAS I 10AP M10 V2A	StSt (V2A)	435x40x6 mm	240 mm <sup>2</sup>	1	472 219



12 connections with insulators

Type	Material	Dimension (l x w x d)	Cross section	PU pc(s)	Part No.
PAS I 12AP M10 CU	Cu	505x40x5 mm	200 mm <sup>2</sup>	1	472 237
PAS I 12AP M10 V2A	StSt (V2A)	505x40x6 mm	240 mm <sup>2</sup>	1	472 239



8 connections with terminal holes Ø13 mm, without insulators

Type	Material	Dimension (l x w x d)	Cross section	PU pc(s)	Part No.
PAS BW 8AP M10 CU	Cu	500x40x5 mm	200 mm <sup>2</sup>	1	472 257



### Accessories – Covers for EBB (Industry)

Covers for EBB with insulators

Type	Screw/Nut material	EB type	Dimension (l x w x d)	PU pc(s)	Part No.
AD PAS 6AP V2A	StSt (V2A)	6 connections	301x60x0.8 mm	1	472 279
AD PAS 8AP V2A	StSt (V2A)	8 connections	371x60x0.8 mm	1	472 269
AD PAS 10AP V2A	StSt (V2A)	10 connections	441x60x0.8 mm	1	472 289
AD PAS 12AP V2A	StSt (V2A)	12 connections	511x60x0.8 mm	1	472 299



### Accessory – Fixing Set for EBB (Industry)

Type	Screw material	Screw type	Plastic dowel	PU pc(s)	Part No.
BS M10 PAS	St/tZn	45 mm	M10x20 mm	Ø 12x60 mm	1 472 201



### Accessory – Insulator for EBB (Industry)

Type	Terminal thread	Dimension (d x h)	PU pc(s)	Part No.
IS PAS M10	M10	32x40 mm	1	472 210



Note: Our complete product range for earthing and equipotential bonding can be taken from our current Lightning Protection catalogue, which, of course, can also be requested from Export Department.

## Earthing Busbars

### Earthing busbars

For screwing or welding at steel structures

2x2 connections

Type	Material	Dimension (l x w x d)	Cross section	PU pc(s)	Part No.
PAS 2AP 10 ST	St/tZn	196x60x4 mm	240 mm <sup>2</sup>	1	472 023
PAS 2AP 10 V2A	StSt (V2A)	196x60x5 mm	300 mm <sup>2</sup>	1	472 109



2x3 connections

Type	Material	Dimension (l x w x d)	Cross section	PU pc(s)	Part No.
PAS 3AP 10 ST	St/tZn	242x60x4 mm	240 mm <sup>2</sup>	1	472 022
PAS 3AP 10 V2A	StSt (V2A)	242x60x5 mm	300 mm <sup>2</sup>	1	472 119



2x4 connections

Type	Material	Dimension (l x w x d)	Cross section	PU pc(s)	Part No.
PAS 4AP 10 ST	St/tZn	293x60x4 mm	240 mm <sup>2</sup>	1	472 024
PAS 4AP 10 V2A	StSt (V2A)	293x60x5 mm	300 mm <sup>2</sup>	1	472 129



2x6 connections

Type	Material	Dimension (l x w x d)	Cross section	PU pc(s)	Part No.
PAS 6AP 10 ST	St/tZn	393x60x4 mm	240 mm <sup>2</sup>	1	472 021
PAS 6AP 10 V2A	StSt (V2A)	393x60x5 mm	300 mm <sup>2</sup>	1	472 139



## Components for foundation earthing electrodes

### Distance holder

For installing earth conductors into the foundation level, includes safety device against loosening of the conductor Reinforced angled device

Type	Material	Support Fl	Support Rd	PU pc(s)	Part No.
AH FE RF V G	St/tZn	40 mm	8-10 mm	25	290 001



### Straight unit

Type	Material	Support Fl	Support Rd	PU pc(s)	Part No.
AH FE RF	St/tZn	40 mm	8-10 mm	50	290 002



### Wedge connector

For T-, cross and parallel connections for use in concrete foundations

With lock-in position in the wedge

Type	Material	Clamping range		PU pc(s)	Part No.
		Rd / Fl	Fl / Fl		
KV FE UNI	St/tZn *	10 /	30x3.5-40x4 /	25	308 001
		30x3.5-40x4 mm	30x3.5-40x4 mm		



\* tested with 50 Hz currents

### Expansion strap for foundation earthing electrodes

For leading the foundation earthing electrode in expansive foundations (several sections) through the expansion or isolating joints, without requiring the leading of the earthing electrode out of the base plate.

Strap material	Dimension (l x w x d)	Block material	PU pc(s)	Part No.
StSt (V2A)	approx. 700x30x(4x1) mm	styrene	1	308 150



### Expansion straps

For compensating expansion joints outside of the concrete when installing foundation earthing electrodes, with flat washers and spring washer

Type	Material	Dimension (l x w x t)	PU pc(s)	Part No.
DB FE 235 AL	Al	235x45x5 mm	25	308 050



Note: Our complete product range for earthing and equipotential bonding can be taken from our current Lightning Protection catalogue, which, of course, can also be requested from Export Department.

## Connecting Clamps

### Connecting clamps

For building reinforcements, for connecting reinforced concrete mats or reinforcements with round and flat conductors  
Arrangement: (II) = parallel (+) = cross  
For T-, cross and parallel connections



Type	Material	Clamping range			PU pc(s)	Part No.
		Rd / Rd	Rd / Fl	Fl / Fl		
VK A UNI ST	St/tZn *	(+) 6-10 / 6-10 mm	(+) 6-10 / 30 mm	(II) 30 / 30 mm	50	308 025

For T-, cross and parallel connections



Type	Material	Clamping range		PU pc(s)	Part No.
		Rd / Fl	Fl / Fl		
VK A UNI V2 ST	St/tZn *	(+) 6-10 / 30 mm	(+/II) 30 / 30 mm	25	308 026

\* tested with 50 Hz currents

For T- and cross connections



Type	Material	Clamping range	PU pc(s)	Part No.
		Rd / Fl		
VK A R22 F40 STBL	St/bare	(+) 6-22 / 40 mm	25	308 030

Maxi MV clamps for T-, cross and parallel connections



Type	Material	Clamping range	PU pc(s)	Part No.
		Rd / Rd		
MMVK R16 R25 ST	St/tZn	(+/II) 8-16 / 15-25 mm	20	308 041
MMVK R16 R25 STBL	St/bare	(+/II) 8-16 / 15-25 mm	20	308 040

For T-, cross and parallel connections, no threading of the conductors required



Type	Material	Clamping range mm		PU pc(s)	Part No.
		Rd / Fl	Fl / Fl		
VK EH R10 F30 ST	St/tZn	(+) 10 / 30	(+/II) 30 / 30	25	308 120
VK EH R10 F30 V2A	StSt (V2A)	(+) 10 / 30	(+/II) 30 / 30	25	308 129

## Components for ring equipotential bonding

### Support for tape conductors with pressure plate

For wall mounting with M8 screw  
For flat strip up to 6 mm



Type	CH material	Pressure plate/ Screw material	PU pc(s)	Part No.
FBH 6 ST	St/tZn	StSt (V2A)	25	277 230
FBH 6 CU	Cu	StSt (V2A)	25	277 237
FBH 6 V2A	StSt (V2A)	StSt (V2A)	25	277 239

For flat strip up to 11 mm



Type	CH material	Pressure plate/ Screw material	PU pc(s)	Part No.
FBH 11 CU	Cu	StSt (V2A)	25	277 247

### Terminals

For universal connection with the ring equipotential bonding for St/tZn, copper or stainless steel (StSt)



Type	Material	CH Rd / Fl	Cross-sectional area	PU pc(s)	Part No.
AK RPA V2A	StSt (V2A)	8-10 / 30 mm	2.5-95 mm <sup>2</sup>	50	563 169

Note: Our complete product range for earthing and equipotential bonding can be taken from our current Lightning Protection catalogue, which, of course, can also be requested from Export Department.