



DEHN railway earthing

Expert solutions



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¹⁾DB Netz AG: rail infrastructure company of German railway

Railway earthing - Protect people, ensure reliable rail traffic

Railway earthing protects people and equipment in the railway environment. It is necessary to prevent danger to people on the platform or damage to equipment in the event of an incident, e.g. if a contact wire of the catenary system breaks.

Railway earthing means a current-proof connection between all conductive components, the return circuit and the overall earth-termination system at the substation. This connection must be short-circuit-current-proof since operating currents and, in the event of a fault, also short-circuit currents flow through it.

In case of a short-circuit, the overhead contact line must be disconnected quickly. Railway earthing establishes a permanent connection with the return circuit (running rail or return wire) and also reduces the rail potential.

Railway earthing is therefore a fundamental requirement in the overhead contact line zone and current collector zone of tracks (break area).

EN 50122-1 is an important standard for railway earthing concepts. Requirements from this European standard can be found in the regulation "Bahn-Richtlinie RIL 997, Untergruppe 02" (RIL 997 guideline by German Railways, subgroup 02) entitled "Rückstromführung, Bahnerdung und Potentialausgleich" (return circuit, railway earthing and equipotential bonding).

What must be earthed?

Primarily,

- catenary masts
- tracks
- steel and reinforced concrete bridges above tracks
- tunnels
- conductive components on and above platforms
- noise protection walls
- conductive fences (e.g. wire mesh)
- earth-termination systems for power supply, signalling and control and telecommunication systems

must be earthed.

The importance of railway earthing becomes clear if a contact wire breaks, putting lives at risk and having a negative effect on economic efficiency. Line closures, delays, loss of image – all of these should be avoided wherever possible.

Railway earthing reduces touch voltages, e.g. on railings, masts or ticket machines, thus ensuring uninterrupted railway traffic and protecting human life.

Causes of a contact wire break:

- Fallen trees
- Construction site vehicles
- Material fatigue of overhead contact line components
- Faulty current collectors
- Individual vehicles, e.g. trucks with too high superstructures

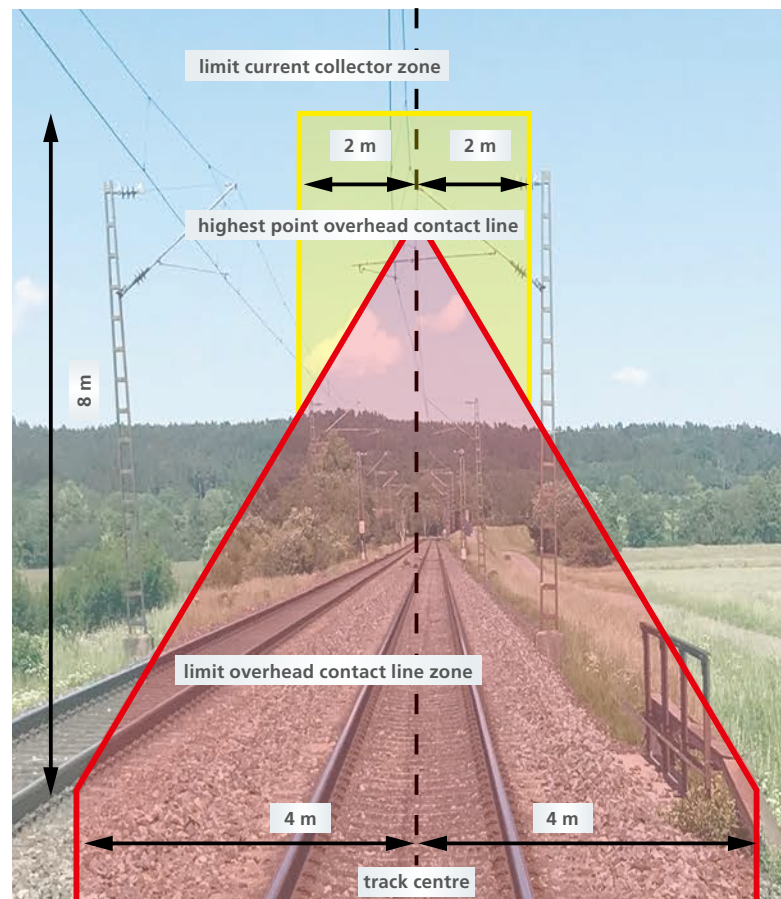


Fig. 1: Break area in the overhead contact line zone in Germany

Figure 1 shows the break area.

In the overhead contact line zone (red), the zones whose limits are in general not exceeded by a broken overhead contact line is marked as a triangle. The rectangle shows the current collector zone (yellow). This is the area not normally exceeded by a live current collector in case of a break or derailment.

Which materials and cross-sections are sufficient?

To obtain approval from DB Netz AG, it must be proven that all railway earthing components are short-circuit-current-proof. This is specified in the RIL 997.0205A01 guideline „Elektrotechnische Anforderungen und Prüfbedingungen von Verbindungen“ (electrical requirements and test conditions for connections).

The following parameters are used:

$I_{k''} \leq 25 \text{ kA}$: test current of 25 kA, duration of 100 ms
 $I_{k''} > 25 \text{ kA}$: test current of 40 kA, duration of 100 ms

Short-circuit current	$\leq 25 \text{ kA}$		$> 25 \text{ kA}$	
Earthing conductors laid in open space	Cu, 50 mm ² ¹⁾ NYY-O	Fe, 95 mm ² Steel cable	Cu, 70 mm ² ¹⁾ NYY-O	Fe, 120 mm ² Steel cable
Earthing conductors laid in concrete	Cu, 70 mm ² NYY-O or H07V-K	Fe, 120 mm ² No structural reinforcement steel	Cu, 95 mm ² NYY-O or H07V-K	Fe, 200 mm ² No structural reinforcement steel

¹⁾ To prevent theft, the use of copper cables in outdoor areas is generally not permitted at DB AG, therefore Fe versions, Al versions or mixed forms such as CuStAl are offered.

These points must be observed:

Bare steel conductors, embedded in concrete

Structural reinforcement steels and statically required components must not be used as earthing conductors. Welding earthing parts to the structural reinforcement is not permitted.

When laid in concrete

Parts of the earth-termination system must be checked before concreting. This is done by an approved inspector or qualified electrician. This partial acceptance must be documented.

For series-produced precast concrete parts, the check is carried out during technical acceptance.

In case of individual concrete production, the check is carried out directly at the manufacturer's premises before concreting.

Concrete-embedded joints

Concrete-embedded joints must generally be welded to be short-circuit-current-proof. The defined welding seam lengths and thicknesses must be observed:

Welding seam length

Defined weld seam lengths are required for welded joints.

In case of short-circuit currents $\leq 25 \text{ kA}$ at the installation point, a length of at least $2 \times 30 \text{ mm}$ is required - in case of short-circuit currents $> 25 \text{ kA}$, a length of at least $2 \times 45 \text{ mm}$ is required.

Welding seam thickness

To avoid a reduction in cross-section, an effective welding seam thickness of 4 mm is required.

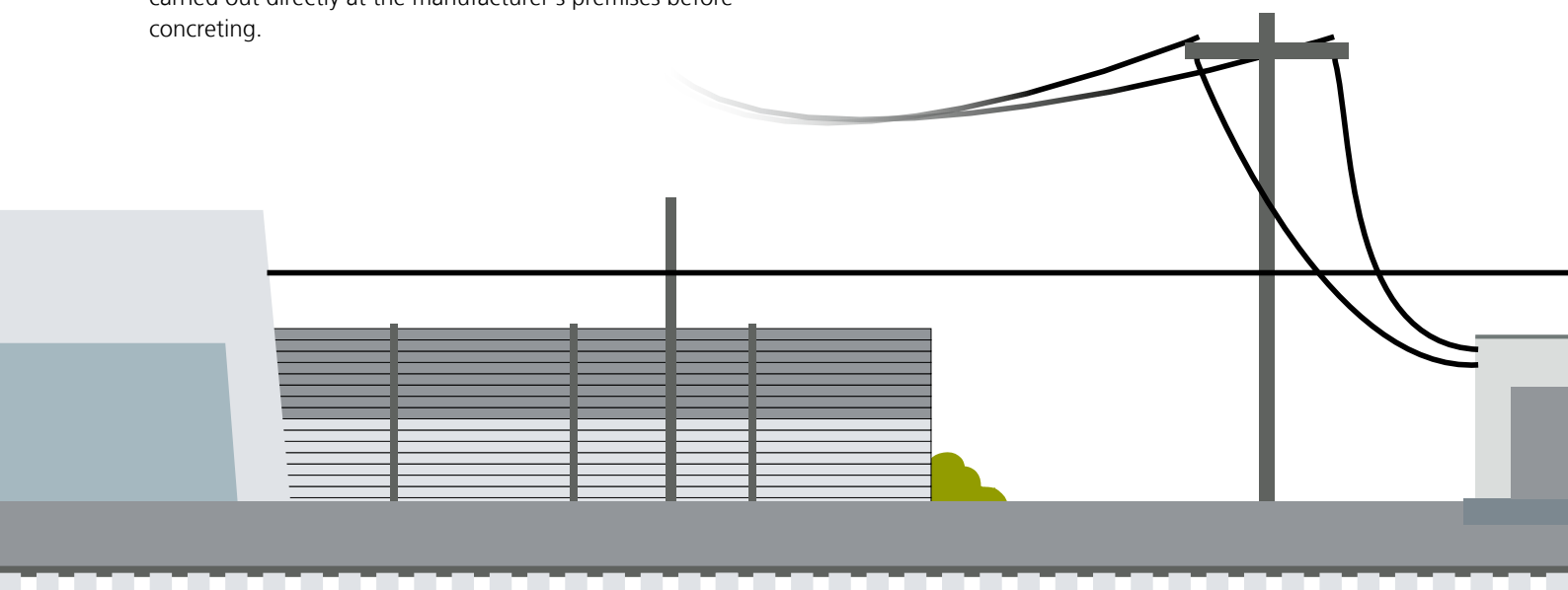


Fig. 2: 16.7 Hz traction power supply

Earthing bridges and earthing connectors

The DEHN railway earthing portfolio is designed for use in railway transportation systems. It is used to connect electrically conductive metal parts such as noise protection walls, metal structures of tunnels or supporting walls and other structures in the vicinity of the railway line. The aim is to ensure personal and equipment protection in the overhead contact line and current collector zone, e.g. in the event of a contact wire break and to avoid impermissibly high rail potentials.

DEHN offers the user a range of earthing bridges and earthing connectors which, due to variable end caps and connection elements, make up a comprehensive modular system with various possible combinations.

Our DEHN railway earthing systems are approved by DB Netz AG.

DEHN earthing bridges Internal, invisible connection

The concrete-embedded earthing bridges are designed for earthing, current return circuits and equipotential bonding. They are used to connect the internal and external earthing.

A connection plate serves as the intersection between the internal and external earthing and ensures ideal contact with the earthing connectors.

Connection to the internal, later no longer visible, railway earthing is ensured by a defined welded joint

DEHN earthing connectors External, visible earthing

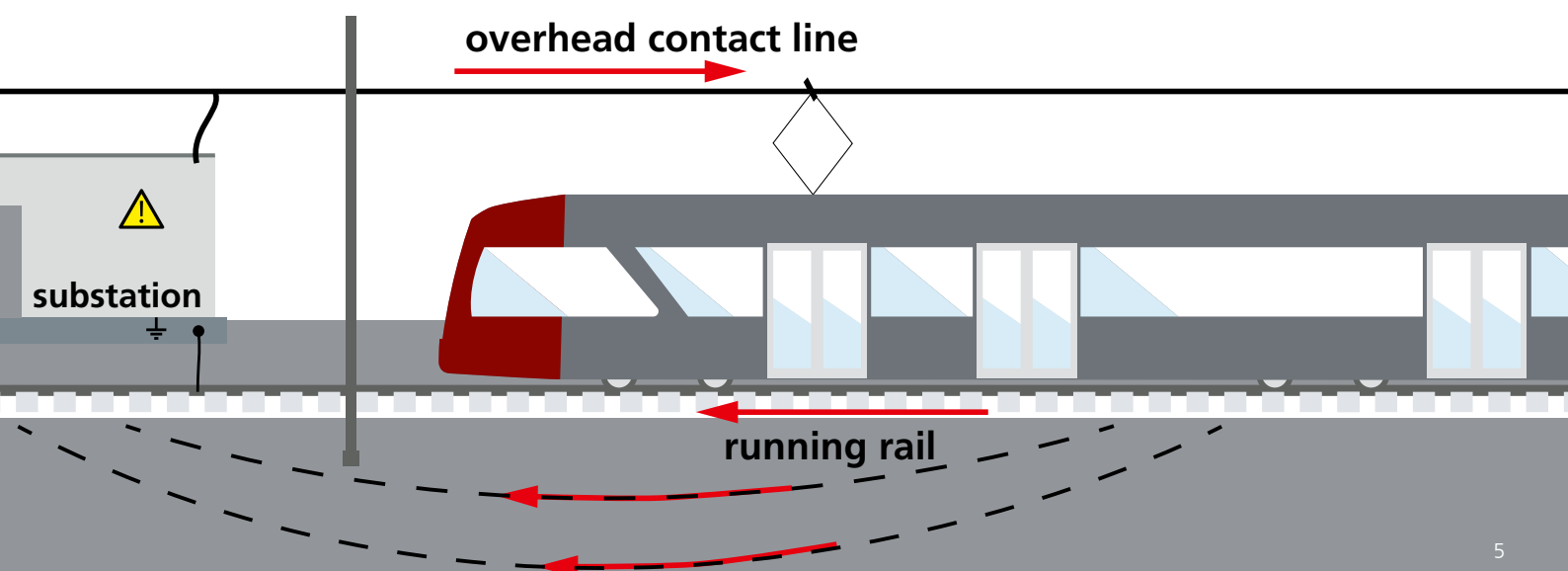
Earthing connectors are screwed to concrete-embedded earthing bridges. They continue the invisible, internal railway earthing. For inspection purposes, the screw connection must be accessible from the outside at all times. Steel or also CuStAl is particularly suitable for this purpose. Not least to prevent damage caused by theft, which unfortunately is quite common with copper components.



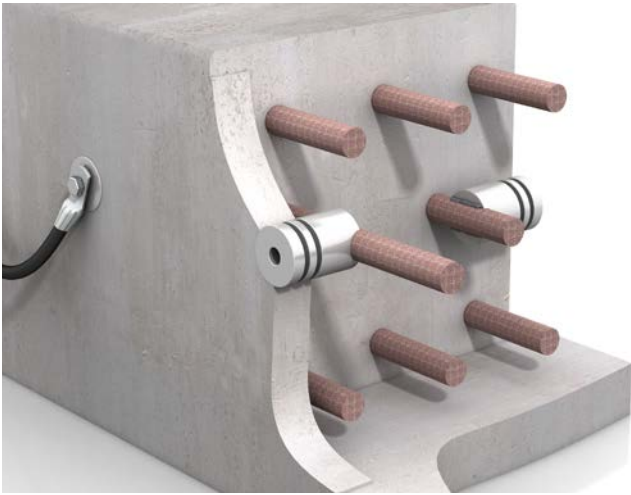
Fig. 3: Earthing connectors

Good to know:

The DEHN railway earthing portfolio also includes products for earthing large pipes - i.e. for partly visible and partly invisible connections.



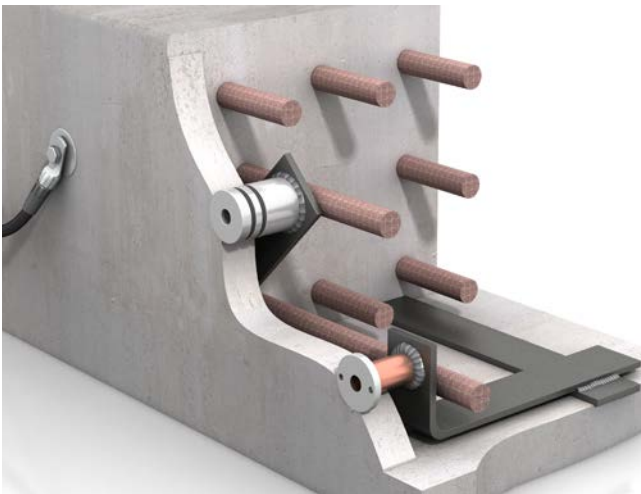
Railway earthing system



Stainless steel earthing bridges

The earthing bridges are designed for earthing, current return circuits and equipotential bonding in railway applications. The stainless steel earthing bridge ensures this via a defined welding seam to the earthing conductor. This earthing bridge also has a technical approval from DB Netz AG and can be reliably used in planning.

Type	D BEB 0 - 63	D BEB 0 - 70	D BEB 0 - 77
Part No.	419 000	419 001	419 002
Material of connection element	StSt	StSt	StSt
Material No.	1.4301	1.4301	1.4301
Short-circuit current	> 25 kA	> 25 kA	> 25 kA
Test current	40 kA / 100 ms	40 kA / 100 ms	40 kA / 100 ms
Standard	Ril 997.0205A01	Ril 997.0205A01	Ril 997.0205A01
Thread	M16	M16	M16
Diameter of connection plate	50 mm	50 mm	50 mm
Total height	63 mm	70 mm	77 mm
Installation height	55 mm	62 mm	69 mm
DB drawing No.	3 Ebs 15.03.19 - 37	3 Ebs 15.03.19 - 37	3 Ebs 15.03.19 - 37
PU	1 pc(s)	1 pc(s)	1 pc(s)

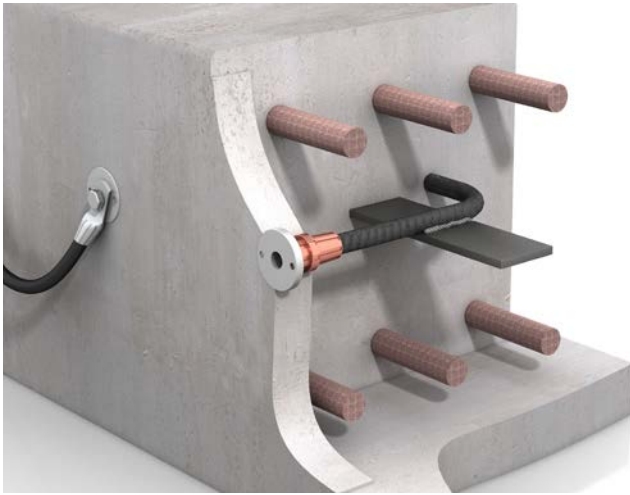


Flat steel earthing bridges

The earthing bridges are designed for earthing, current return circuits and equipotential bonding in railway applications. This version is installed flush with the surface and the flat steel is welded to the earthing reinforcement via a defined welding seam. This earthing bridge also has a technical approval from DB Netz AG and can therefore be reliably used in planning.

Type	D BEB 1	D BEB 1 - L100	D BEB 1-L	D BEB 1-NR
Part No.	419 010	419 500 <small>NEW</small>	419 011	419 012
Material of plate	StSt	StSt	StSt	StSt
Material No.	1.4301	1.4301	1.4301	1.4301
Material of socket	St / Cu	St / Cu	St / Cu	–
Material of flat steel	S235	S235	S235	S235
Short-circuit current	> 25 kA	> 25 kA	> 25 kA	> 25 kA
Test current	40 kA / 100 ms	40 kA / 100 ms	40 kA / 100 ms	40 kA / 100 ms
Standard	Ril 997.0205A01	Ril 997.0205A01	Ril 997.0205A01	Ril 997.0205A01
Thread	M16	M16	M16	M16
Diameter of connection plate	50 mm	50 mm	50 mm	50 mm
Dimensions of flat steel	400 x 40 x 5 mm	100 x 40 x 5 mm	402 x 40 x 5 mm	400 x 50 x 5 mm
Total height	58 mm	58 mm	58 mm	63 mm
Installation height	–	–	410 mm	–
DB drawing No.	3 Ebs 15.03.19 - 30	3 Ebs 15.03.19 - 30	3 Ebs 15.03.19 - 30	3 Ebs 15.03.19 - 30
PU	1 pc(s)	1 pc(s)	1 pc(s)	1 pc(s)





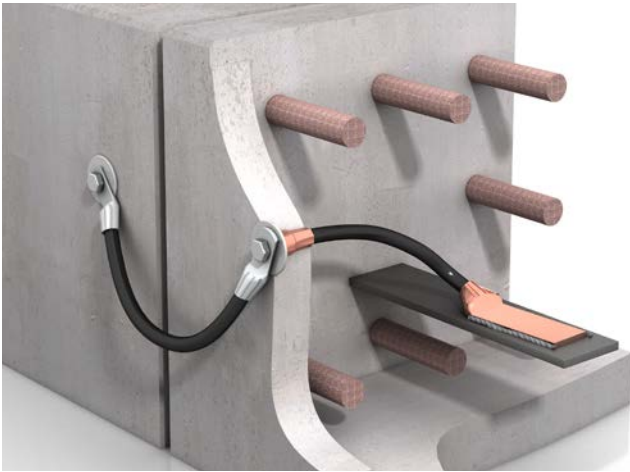
Reinforcing steel earthing bridges

The earthing bridges are designed for earthing, current return circuits and equipotential bonding in railway applications. This version is installed flush with the surface and welded to the earthing reinforcement with the angled reinforcing steel, particularly in installation situations where space is critical. This earthing bridge also has a technical approval from DB Netz AG and can therefore be reliably used in planning.



Type	D BEB 2	D BEB 3	D BEB 8
Part No.	419 020	419 030	419 080
Material of plate	StSt	StSt	StSt
Material No.	1.4301	1.4301	1.4301
Material of socket	St / Cu	St / Cu	St / Cu
Material of shaft	reinforcing steel B500B	reinforcing steel B500B	reinforcing steel B500B
Short-circuit current	> 25 kA	> 25 kA	> 25 kA
Test current	40 kA / 100 ms	40 kA / 100 ms	40 kA / 100 ms
Standard	Ril 997.0205A01	Ril 997.0205A01	Ril 997.0205A01
Thread	M16	M16	M16
Diameter of connection plate	50 mm	50 mm	50 mm
Diameter of reinforcing steel	16 mm	16 mm	16 mm
Installation height	160 mm	–	–
Length	400 mm	400 mm	500 mm
DB drawing No.	3 Ebs 15.03.19 - 31	3 Ebs 15.03.19 - 31	3 Ebs 15.03.19 - 33
PU	1 pc(s)	1 pc(s)	1 pc(s)

Railway earthing system



Copper cable earthing bridges

The earthing bridges are designed for earthing, current return circuits and equipotential bonding in railway applications. This version is installed flush with the surface. The copper-plated steel lug pressed onto the copper cable is welded to the earthing reinforcement. The flexibility of the cable makes installation in the reinforcement easier for the user. The special FLEX versions are particularly suited for installation situations where space is critical since extra-flexible, finely stranded copper cables are used. The earthing bridges also have technical approval from DB Netz AG and can be reliably used in planning.

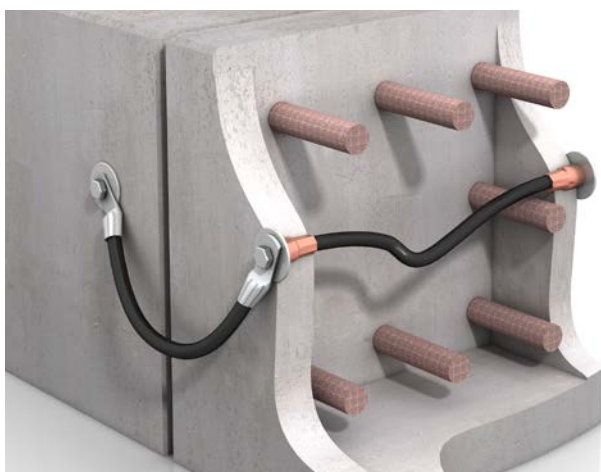
Type	D BEB 4	D BEB 4-FLEX	D BEB 5	D BEB 5-FLEX
Part No.	419 040	419 041	419 050	419 051
Material of plate	StSt	StSt	StSt	StSt
Material No.	1.4301	1.4301	1.4301	1.4301
Material of socket	St / Cu	St / Cu	St / Cu	St / Cu
Material of lug	St / Cu	St / Cu	St / Cu	St / Cu
Material of cable	Cu	Cu	Cu	Cu
Short-circuit current	≤ 25 kA	≤ 25 kA	> 25 kA	> 25 kA
Test current	25 kA / 100 ms	25 kA / 100 ms	40 kA / 100 ms	40 kA / 100 ms
Standard	Ril 997.0205A01	Ril 997.0205A01	Ril 997.0205A01	Ril 997.0205A01
Thread	M16	M16	M16	M16
Diameter of connection plate	50 mm	50 mm	50 mm	50 mm
Cable	NYO	H07V-K	NYO	H07V-K
Cable cross-section	70 mm ²	70 mm ²	95 mm ²	95 mm ²
Cable diameter	17 mm	17 mm	19 mm	19 mm
Dimensions of lug	80 x 30 mm	80 x 30 mm	80 x 30 mm	80 x 30 mm
Length	500 mm	500 mm	500 mm	500 mm
DB drawing No.	3 Ebs 15.03.19 - 32	3 Ebs 15.03.19 - 32	3 Ebs 15.03.19 - 32	3 Ebs 15.03.19 - 32
PU	1 pc(s)	1 pc(s)	1 pc(s)	1 pc(s)



Type	D BEB 5 - L700	D BEB 5 - L1000	D BEB 5 - L1500	D BEB 5 - L2000
Part No.	419 501 ^{NEW}	419 502 ^{NEW}	419 503 ^{NEW}	419 504 ^{NEW}
Material of plate	StSt	StSt	StSt	StSt
Material No.	1.4301	1.4301	1.4301	1.4301
Material of socket	St / Cu	St / Cu	St / Cu	St / Cu
Material of lug	St / Cu	St / Cu	St / Cu	St / Cu
Material of cable	Cu	Cu	Cu	Cu
Short-circuit current	≤ 25 kA	≤ 25 kA	> 25 kA	> 25 kA
Test current	40 kA / 100 ms	40 kA / 100 ms	40 kA / 100 ms	40 kA / 100 ms
Standard	Ril 997.0205A01	Ril 997.0205A01	Ril 997.0205A01	Ril 997.0205A01
Thread	M16	M16	M16	M16
Diameter of connection plate	50 mm	50 mm	50 mm	50 mm
Cable	NYO	NYO	NYO	NYO
Cable cross-section	95 mm ²	95 mm ²	95 mm ²	95 mm ²
Cable diameter	19 mm	19 mm	19 mm	19 mm
Dimensions of lug	80 x 30 mm	80 x 30 mm	80 x 30 mm	80 x 30 mm
Length	700 mm	1000 mm	1500 mm	2000 mm
DB drawing No.	3 Ebs 15.03.19 - 32	3 Ebs 15.03.19 - 32	3 Ebs 15.03.19 - 32	3 Ebs 15.03.19 - 32
PU	1 pc(s)	1 pc(s)	1 pc(s)	1 pc(s)



Railway earthing system



Copper cable earthing bridges

The earthing bridges are designed for earthing, current return circuits and equipotential bonding in railway applications. This version is installed flush with the surface on both sides and allows the earthing to pass through structural elements. The flexibility of the cable makes installation in the reinforcement easier for the user. The special FLEX versions are particularly suited for installations where space is critical - extra-flexible, finely stranded copper cables are used here. The earthing bridges also have technical approval from DB Netz AG and can be reliably used in planning.

Type	D BEB 6	D BEB 6-FLEX	D BEB 7	D BEB 7-FLEX
Part No.	419 060	419 061	419 070	419 071
Material of plate	StSt	StSt	StSt	StSt
Material No.	1.4301	1.4301	1.4301	1.4301
Material of socket	St / Cu	St / Cu	St / Cu	St / Cu
Material of cable	Cu	Cu	Cu	Cu
Short-circuit current	≤ 25 kA	≤ 25 kA	> 25 kA	> 25 kA
Test current	25 kA / 100 ms	25 kA / 100 ms	40 kA / 100 ms	40 kA / 100 ms
Standard	Ril 997.0205A01	Ril 997.0205A01	Ril 997.0205A01	Ril 997.0205A01
Thread	M16	M16	M16	M16
Diameter of connection plate	50 mm	50 mm	50 mm	50 mm
Cable	NYY-O	H07V-K	NYY-O	H07V-K
Cable cross-section	70 mm ²	70 mm ²	95 mm ²	95 mm ²
Cable diameter	17 mm	17 mm	19 mm	19 mm
Length	500 mm	500 mm	500 mm	500 mm
DB drawing No.	3 Ebs 15.03.19 - 33	3 Ebs 15.03.19 - 33	3 Ebs 15.03.19 - 33	3 Ebs 15.03.19 - 33
PU	1 pc(s)	1 pc(s)	1 pc(s)	1 pc(s)



Copper cable earthing bridges

The earthing bridges are designed for earthing, current return circuits and equipotential bonding in railway applications. This version establishes a non-visible connection within the concrete by welding the copper-plated steel lugs pressed onto the copper cable to the earthing reinforcement. The flexibility of the cable makes installation in the reinforcement easier for the user. The special FLEX versions are particularly suited for space-critical installation situations since extra-flexible, finely stranded copper cables are used. The earthing bridges also have technical approval from DB Netz AG and can be reliably used in planning.

Type	D BEB 9	D BEB 9-FLEX	D BEB 10	D BEB 10 - L800	D BEB 10-FLEX
Part No.	419 090	419 091	419 100	419 505 ^{NEW}	419 101
Material of lug	St / Cu	St / Cu	St / Cu	St / Cu	St / Cu
Material of cable	Cu	Cu	Cu	Cu	Cu
Short-circuit current	≤ 25 kA	≤ 25 kA	> 25 kA	> 25 kA	> 25 kA
Test current	25 kA / 100 ms	25 kA / 100 ms	40 kA / 100 ms	40 kA / 100 ms	40 kA / 100 ms
Standard	Ril 997.0205A01	Ril 997.0205A01	Ril 997.0205A01	Ril 997.0205A01	Ril 997.0205A01
Cable	NYY-O	H07V-K	NYY-O	NYY-O	H07V-K
Cable cross-section	70 mm ²	70 mm ²	95 mm ²	95 mm ²	95 mm ²
Cable diameter	17 mm	17 mm	19 mm	19 mm	19 mm
Dimensions of lug	80 x 30 mm	80 x 30 mm	80 x 30 mm	80 x 30 mm	80 x 30 mm
Length	500 mm	500 mm	500 mm	800 mm	500 mm
DB drawing No.	3 Ebs 15.03.19 - 33	3 Ebs 15.03.19 - 33	3 Ebs 15.03.19 - 33	3 Ebs 15.03.19 - 33	3 Ebs 15.03.19 - 33
PU	1 pc(s)	1 pc(s)	1 pc(s)	1 pc(s)	1 pc(s)



Railway earthing system



Earthing connector for earthing large pipes

The earthing connectors are designed for earthing, current return circuits and equipotential bonding in railway applications. The version for earthing large pipes is designed for use with pile and large pipe foundations. The product consists of a steel cable with a copper-plated steel lug at one end and a cable lug at the other end. A heat shrinkable sleeve at the welding lug end prevents the ingress of water into the steel cable. The steel cable is therefore an anti-theft measure. The earthing connectors also have technical approval from DB Netz AG and can be reliably used in planning.

Type	D BEB 40
Part No.	419 400
Material of lug	St / Cu
Material of cable lug	Cu/gal Sn
Material of rope	St
Short-circuit current	≤ 25 kA
Test current	25 kA / 100 ms
Standard	Ril 997.0205A01
Rope cross-section	95 mm ²
Cable diameter	17 mm
Dimensions of lug	80 x 30 mm
Borehole cable lug	17 mm
Length	500 mm
DB drawing No.	4 Ebs 15.03.25 - 4
PU	1 pc(s)



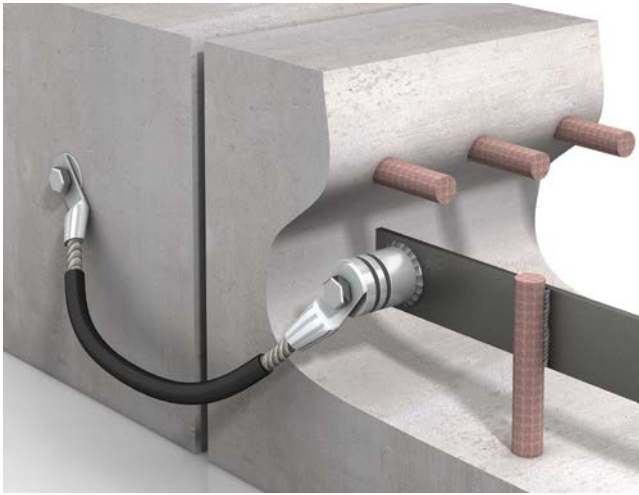
Earthing bridge for earthing large pipes

The earthing bridges are designed for earthing, current return circuits and equipotential bonding in railway applications. This version for earthing large pipes is designed for use with pile and large pipe foundations. The product consists of a copper cable with a pressed-on lug and a StSt connection plate with integrated boreholes for fixing to the formwork at one end and a cable lug at the other end. The cable lug is used to establish a short circuit current resistant connection to the pile or large pipe foundation. The flexibility of the cable makes installation in the reinforcement easier for the user. The earthing bridges also have technical approval from DB Netz AG and can be reliably used in planning.

Type	D BEB 11	D BEB 11 - L1000
Part No.	419 110	419 506 ^{NEW}
Material of plate	StSt	StSt
Material No.	1.4301	1.4301
Material of socket	St / Cu	St / Cu
Material of cable lug	Cu/gal Sn	Cu/gal Sn
Material of cable	Cu	Cu
Short-circuit current	≤ 25 kA	≤ 25 kA
Test current	25 kA / 100 ms	25 kA / 100 ms
Standard	Ril 997.0205A01	Ril 997.0205A01
Thread	M16	M16
Diameter of connection plate	50 mm	50 mm
Cable	NYO	NYO
Cable cross-section	70 mm ²	70 mm ²
Cable diameter	17 mm	17 mm
Borehole cable lug	13 mm	13 mm
Length	500 mm	1000 mm
DB drawing No.	4 Ebs 15.03.27 - 2	4 Ebs 15.03.27 - 2
PU	1 pc(s)	1 pc(s)



Railway earthing system



Steel cable earthing connector

The earthing connectors are designed for earthing, current return circuits and equipotential bonding in railway applications. The halogen-free (sheathed) version D BEB 26 – for external connection of earthing points or other parts to be earthed- consists of a steel cable as an earthing conductor and is thus a preventive anti-theft measure. The earthing connectors also have technical approval from DB Netz AG and can be reliably used in planning.

Type	D BEB 26
Part No.	419 260
Material of cable lug	Cu/gal Sn
Material of rope	St
Short-circuit current	≤ 25 kA
Test current	25 kA / 100 ms
Standard	Ril 997.0205A01
Rope	1-12-12 B 350 sZ PE
Rope cross-section	≥ 95 mm ²
Design	halogen-free
Cable diameter	17 mm
Borehole cable lug	17 mm
Length	500 mm
DB drawing No.	3 Ebs 15.03.17 - 11
PU	1 pc(s)



Copper-steel-aluminium cable earthing connector

The earthing connectors are designed for earthing, current return circuits and equipotential bonding in railway applications. The halogen-free version D BEB 29 / the halogen-free and flame-retardant version D BEB 29-NF – for external connection of earthing points and other connection elements – is a cable lug version for M16 connections. This earthing connector consists of a copper, steel and aluminium cable and is thus a preventive anti-theft measure. The earthing connectors also have technical approval from DB Netz AG and can be reliably used in planning. The halogen-free and flame-retardant version can even be used in tunnels according to the EU regulation.

Type	D BEB 29	D BEB 29 - L350	D BEB 29 - L800	D BEB 29-NF
Part No.	419 290	419 507 ^{NEW}	419 508 ^{NEW}	419 291
Material of cable lug	Cu/gal Sn	Cu/gal Sn	Cu/gal Sn	Cu/gal Sn
Material of cable	CuStAl	CuStAl	CuStAl	CuStAl
Short-circuit current	> 25 kA	> 25 kA	> 25 kA	> 25 kA
Test current	40 kA / 100 ms	40 kA / 100 ms	40 kA / 100 ms	40 kA / 100 ms
Standard	Ril 997.0205A01	Ril 997.0205A01	Ril 997.0205A01	Ril 997.0205A01
Cable	(N)2X RF CuStAl	(N)2X RF CuStAl	(N)2X RF CuStAl	B2ca RF CuStAl
Cable cross-section	≥ 70 mm ²	≥ 70 mm ²	≥ 70 mm ²	—
Rope cross-section	—	—	—	≥ 70 mm ²
Design	halogen-free	halogen-free	halogen-free	halogen-free and flame-retardant
Cable diameter	17 mm	17 mm	17 mm	17 mm
Borehole cable lug	17 mm	17 mm	17 mm	17 mm
Length	500 mm	350 mm	800 mm	500 mm
DB drawing No.	4 Ebs 15.03.17 - 6 (Bayka)	4 Ebs 15.03.17 - 6 (Bayka)	4 Ebs 15.03.17 - 6 (Bayka)	4 Ebs 15.03.17 - 6 (Bayka)
PU	1 pc(s)	1 pc(s)	1 pc(s)	1 pc(s)



Railway earthing system

Adhesive pad

The adhesive pad is used to fix railway earthing products to the formwork by means of an adhesive connection. The adhesive pad can be stuck to the StSt connection plate of D BEB 0 and is then connected to the formwork itself.

Type	D KLP D50 BEB
Part No.	419 900
Diameter	50 mm
PU	1 pc(s)



Earthing sticker

The earthing sticker is a spare part for marking installed railway earthing products. It is simply stuck to the StSt connection plate. This kind of marking can be used for earthing bridges D BEB 1 to 8 as well as for the D BEB 11 version for earthing large pipes if the sticker applied in the factory has fallen off or is damaged.

Type	D EAK D50 BEB
Part No.	419 901
Diameter	50 mm
PU	1 pc(s)



Hexagon screw

Type	D SKS M16X30 V4A
Part No.	419 902
Material	StSt A4-70
Thread	M16 x 30 mm
PU	1 pc(s)



Hexagon nut

Type	D SKM M16 V4A
Part No.	419 903
Material	StSt A4-70
Thread	M16
PU	1 pc(s)



Washer

Type	D SCH A17 V4A
Part No.	419 904
Material	StSt A4-70
Outer diameter	30 mm
Inner diameter	17 mm
PU	1 pc(s)



Overview of Ebs regulations for earthing large pipes

Mast earthing at the large pipe for concrete masts and HE wide flange beams		
DEHN type	Part No.	DB Ebs approval drawing
D BEB 40 / EBS 15-03-25 (welded)	419 400	3 Ebs 15.01.50
D BEB 26 / EBS 15-03-17 (screwed)	419 260	3 Ebs 15.01.51
D BEB 29 / EBS 15-03-17 (screwed)	419 290 / 419 507 / 419 508	3 Ebs 15.01.51

Mast earthing at the pile and large pipe foundations for steel masts		
DEHN type	Part No.	DB Ebs approval drawing
D BEB 4 / EBS 15-03-19 (welded)	419 040	3 Ebs 15.01.55
D BEB 4-FLEX / EBS 15-03-19 (welded)	419 041	3 Ebs 15.01.55
D BEB 5 / EBS 15-03-19 (welded)	419 050 / 419 501 / 419 502 / 419 503 / 419 504	3 Ebs 15.01.55
D BEB 5-FLEX / EBS 15-03-19 (welded)	419 051	3 Ebs 15.01.55
D BEB 11 / EBS 15-03-27 (screwed)	419 110 / 419 506	3 Ebs 15.01.56

Approvals by DB Netz AG: Ebs approval drawings

All system components have been approved for use at Deutsche Bahn by Ebs drawings. The latest version of these drawings is available on the Internet at www.dehn-international.com. The following table shows a list of approvals for the relevant products.

Product with relevant Ebs approval drawing		
DEHN type	Part No.	DB Ebs approval drawing
D BEB 0 - 63 / EBS 15-03-19	419 000	3 Ebs 15.03.19 - 37
D BEB 0 - 70 / EBS 15-03-19	419 001	3 Ebs 15.03.19 - 37
D BEB 0 - 77 / EBS 15-03-19	419 002	3 Ebs 15.03.19 - 37
D BEB 1 / EBS 15-03-19	419 010	3 Ebs 15.03.19 - 30
D BEB 1 - L100 / EBS 15-03-1	419 500	3 Ebs 15.03.19 - 30
D BEB 1-L / EBS 15-03-19	419 011	3 Ebs 15.03.19 - 30
D BEB 1 - NR / EBS 15-03-19	419 012	3 Ebs 15.03.19 - 36
D BEB 2 / EBS 15-03-19	419 020	3 Ebs 15.03.19 - 31
D BEB 3 / EBS 15-03-19	419 030	3 Ebs 15.03.19 - 31
D BEB 4 / EBS 15-03-19	419 040	3 Ebs 15.03.19 - 32
D BEB 4-FLEX / EBS 15-03-19	419 041	3 Ebs 15.03.19 - 32
D BEB 5 / EBS 15-03-19	419 050	3 Ebs 15.03.19 - 32
D BEB 5 - L700 / EBS 15-03-19	419 501	3 Ebs 15.03.19 - 32
D BEB 5 - L1000 / EBS 15-03-19	419 502	3 Ebs 15.03.19 - 32
D BEB 5 - L1500 / EBS 15-03-19	419 503	3 Ebs 15.03.19 - 32
D BEB 5 - L2000 / EBS 15-03-19	419 504	3 Ebs 15.03.19 - 32
D BEB 5-FLEX / EBS 15-03-19	419 051	3 Ebs 15.03.19 - 32
D BEB 6 / EBS 15-03-19	419 060	3 Ebs 15.03.19 - 33
D BEB 6-FLEX / EBS 15-03-19	419 061	3 Ebs 15.03.19 - 33
D BEB 7 / EBS 15-03-19	419 070	3 Ebs 15.03.19 - 33
D BEB 7-FLEX / EBS 15-03-19	419 071	3 Ebs 15.03.19 - 33
D BEB 8 / EBS 15-03-19	419 080	3 Ebs 15.03.19 - 33
D BEB 9 / EBS 15-03-19	419 090	3 Ebs 15.03.19 - 33
D BEB 9-FLEX / EBS 15-03-19	419 091	3 Ebs 15.03.19 - 33
D BEB 10 / EBS 15-03-19	419 100	3 Ebs 15.03.19 - 33
D BEB 10 - L800 / EBS 15-03-19	419 505	3 Ebs 15.03.19 - 33
D BEB 10-FLEX / EBS 15-03-19	419 101	3 Ebs 15.03.19 - 33
D BEB 11 / EBS 15-03-27	419 110	4 Ebs 15.03.27 - 2
D BEB 11 - L1000 / EBS 15-03-27	419 506	4 Ebs 15.03.27 - 2
D BEB 26 / EBS 15-03-17	419 260	3 Ebs 15.03.17 - 11
D BEB 29 / EBS 15-03-17	419 290	Bayka drawing 4 Ebs 15.03.17 - 6
D BEB 29 - L350 / EBS 15-03-17	419 507	Bayka drawing 4 Ebs 15.03.17 - 6
D BEB 29 - L800 / EBS 15-03-17	419 508	Bayka drawing 4 Ebs 15.03.17 - 6
D BEB 29-NF / EBS 15-03-17	419 291	Bayka drawing 4 Ebs 15.03.17 - 6
D BEB 40 / EBS 15-03-25	419 400	4 Ebs 15.03.25 - 4

Note: Please contact us for ÖBB and/or SBB approvals.

Selection matrix – What should be considered?

Before selecting the right components for your purpose, you should answer the following questions:

1. What has to be earthed?
2. What is the maximum short-circuit current?
3. What type of connection is required (linear, angled)?

Components for use with maximum short-circuit currents > 25 kA



Earthing bridge (invisible, internal connection)				
Rigid type				
Design	DEHN type	Part No.		
	D BEB 0 - 63 / EBS 15-03-19	419 000		
	D BEB 0 - 70 / EBS 15-03-19	419 001		
	D BEB 0 - 77 / EBS 15-03-19	419 002		
	D BEB 1 / EBS 15-03-19	419 010		
	D BEB 1-L / EBS 15-03-19	419 011		
	D BEB 1 - L100 / EBS 15-03-1	419 500		
	D BEB 1-NR / EBS 15-03-19	419 012		
	D BEB 2 / EBS 15-03-19	419 020		
	D BEB 3 / EBS 15-03-19	419 030		
	D BEB 8 / EBS 15-03-19	419 080		
Flexible type				
Design	DEHN type	Part No.	Highly flexible type	Part No.
	D BEB 5 / EBS 15-03-19	419 050	D BEB 5-FLEX / EBS 15-03-19	419 051
	D BEB 5 - L700 / EBS 15-03-19	419 501		
	D BEB 5 - L1000 / EBS 15-03-19	419 502		
	D BEB 5 - L1500 / EBS 15-03-19	419 503		
	D BEB 5 - L2000 / EBS 15-03-19	419 504		
	D BEB 7 / EBS 15-03-19	419 070	D BEB 7-FLEX / EBS 15-03-19	419 071
	D BEB 10 / EBS 15-03-19	419 100	D BEB 10-FLEX / EBS 15-03-19	419 101
	D BEB 10 - L800 / EBS 15-03-19	419 505		







Earthing connector (visible, external connection)				
Flexible type				
Design	Halogen-free		Halogen-free and flame retardant (NF ¹) for use in tunnels	
	DEHN type	Part No.	DEHN type	Part No.
	D BEB 29 / EBS 15-03-17	419 290	D BEB 29-NF / EBS 15-03-17	419 291
	D BEB 29 - L350 / EBS 15-03-17	419 507		
	D BEB 29 - L800 / EBS 15-03-17	419 508		

Components for use with maximum short-circuit currents ≤ 25 kA





Earthing bridge (invisible, internal connection)

Design	Flexible type		Highly flexible type	
	DEHN type	Part No.	DEHN type	Part No.
	D BEB 4 / EBS 15-03-19	419 040	D BEB 4-FLEX / EBS 15-03-19	419 041
	D BEB 6 / EBS 15-03-19	419 060	D BEB 6-FLEX / EBS 15-03-19	419 061
	D BEB 9 / EBS 15-03-19	419 090	D BEB 9-FLEX / EBS 15-03-19	419 091
	D BEB 11 / EBS 15-03-27	419 110		
	D BEB 11 - L1000 / EBS 15-03-27	419 506		



Earthing connector (visible, external connection)

Design	Flexible type	
	Halogen-free DEHN type	Part No.
	D BEB 26 / EBS 15-03-17	419 260
	D BEB 40 / EBS 15-03-25	419 400

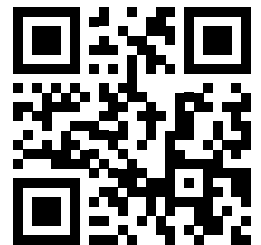
Note: The components are classified according to their short-circuit current resistance. Components which are suitable for use in case of maximum short-circuit currents > 25 kA can, of course, also be used for lower short-circuit currents.

Tip: Remember to incorporate the earthing bridges and connectors (Ebs. No., cable type, cable lug) in your earthing plan.

Surge Protection
Lightning Protection
Safety Equipment
DEHN protects.

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