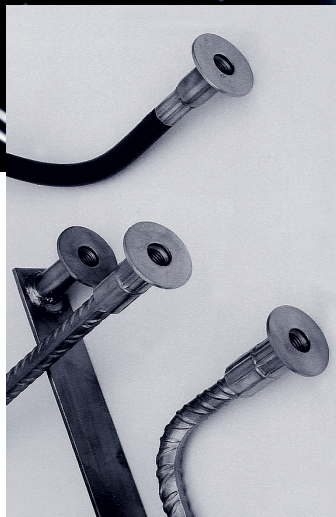


PFEIFER



02/2004

Electrically tested by
DB and ÖBB
Approved by
the Federal Railway Office
Approved by
Deutsche Bahn AG

PFEIFER
Concrete Earthing Bridges BEB

PFEIFER
Concrete Earthing Connectors BEB

PFEIFER
SEIL- UND HEBE TECHNIK
GMBH

DR.-KARL-LENZ-STRASSE 66
D-87700 MEMMINGEN

TEL. Support +49(0)8331-937-262

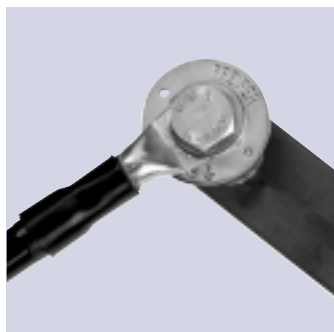
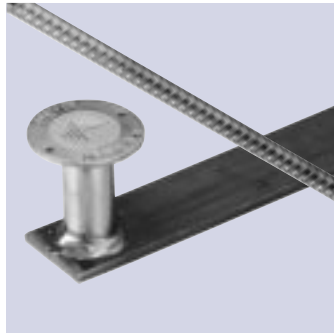
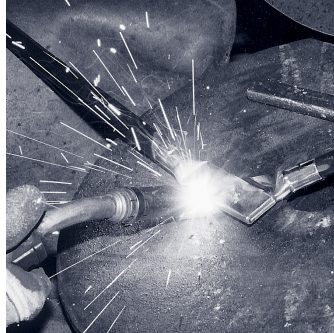
Sales +49(0)8331-937-312

FAX +49(0)8331-937-342

E-MAIL export-bt@pfeifer.de

[http:// www.pfeifer.de](http://www.pfeifer.de)

The correct way of earthing: Concrete earthing for traffic engineering, in kit form



General

Some important points have to be taken into account when earthing reinforced concrete components.

Earth connections may either be fed through the concrete, or the existing reinforcement can be used for earthing – assuming that the reinforcing steel has an adequate cross-section of 200 mm². In such cases, the earth conductors must always have freely accessible connecting points.

The task of the PFEIFER Concrete Earthing Bridges (BEB), which have been tested by Deutsche Bahn, is to earth the reinforcement of concrete components in the vicinity of electrical equipment carrying high voltages. The sufficiently large cross sections allow immediate potential equalisation to be achieved with the lowest possible earthing impedance. This provides protection for the technical equipment as well as for the supporting reinforcement, and simultaneously protects human beings in the vicinity of this equipment. At the same time, the inductive effect on telecommunications systems, DB signalling systems, pipework and third party electrical equipment is reduced.

Unlike other processes, a secure and rapid earth connection can be made with PFEIFER Earthing Bridges by simple electric welding.

The extensive product range also allows the user to make use of a number of possible combinations and therefore gives him great flexibility when laying out the earthing.

Kit system

The PFEIFER BEB range consists of a kit system with variable end fixings and connection elements.

The following end fixings are available:

- Sockets, consisting of precision steel tube with a welded-on stainless steel disc
 - welded socket (copper plated)
 - pressed sleeve (copper plated)
- Welding tongue
- Cable lug
- Cable lug (insulated connection)

These end fixings are connected via:

- Flat steel (40 mm x 5 mm)
- Reinforcing steel (Ø 16 mm)
- Insulated copper cable with cross sections 50 mm², 70 mm² and 95 mm²

Advantages for the designer

- Approved by the Federal Railway Office (Approval No. 736017)
- Tested by DB (Ebs drawing number: 3 Ebs 15.03.19 Sht. 2, Sht. 3, Sht. 4, Sht. 5) and ÖBB
- Variants for every application
- Special lengths available, i.e. variable design

Advantages for the construction site

- Designs using easily welded reinforcing rods
- Anti-twist locking for tightening bolts under torque
- No corrosion due to washers made from non-rusting materials
- Insulation of cable lugs against ingress of water into the cable
- Easy fixing to the framework using stainless steel nails

Advantages for purchasing

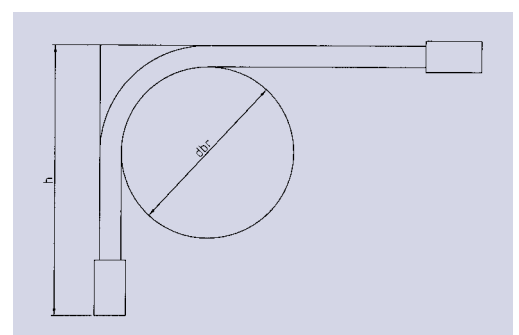
- Cost-effective solution
- Different cross-sections can be combined with different end fixings for an economic solution
- Standard systems can be supplied immediately from stock
- Threads protected and identified by signal foil
- Easy ordering, see page 11

Connection dimensions for end fixings


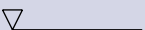

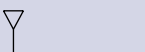



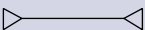

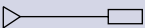



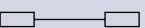




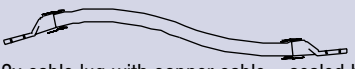

PFEIFER

		Ø D [mm]	M [mm]	H [mm]	t [mm]	b [mm]	l [mm]	Ø d [mm]	d _s	BEB- types
Socket welded		50	16	58	5	40	–	–	–	BEB 1
Socket pressed onto reinforcing steel		50	16	58	–	–	–	–	Ø 16 mm (201mm²)	BEB 2 BEB 3 BEB 8
Socket pressed onto Cu-cable		50	16	60	–	–	–	–	Ø 17 mm (70 mm²) Ø 19 mm (95 mm²)	BEB 4 BEB 5 BEB 6 BEB 7
Welding tongue Steel St 52 copper coated		–	–	–	7,5	30	80	–	Ø 17 mm (70 mm²) Ø 19 mm (95 mm²)	BEB 4 BEB 5 BEB 9 BEB 10
Cable lug		30	–	–	–	–	60	17	Ø 17 mm (70 mm²) Ø 15 mm (50 mm²)	BEB 15 BEB 17 BEB 19 BEB 16 BEB 18 BEB 20

Conductor type	Ø d [mm]	Cross-sectional area [mm²]	min d _{br} [mm]	h min [mm]
Reinforcing steel	16	201	64	$\frac{d_{br}}{2} + (2 \cdot d_s) + H$
Copper cable	15	50	225	$\frac{d_{br}}{2} + H$
Copper cable	17	70	255	$\frac{d_{br}}{2} + H$
Copper cable	19	95	285	$\frac{d_{br}}{2} + H$


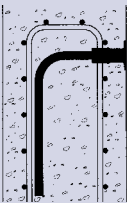
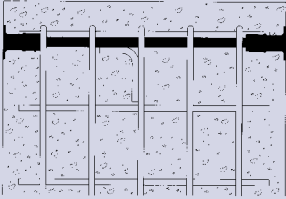
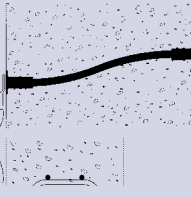
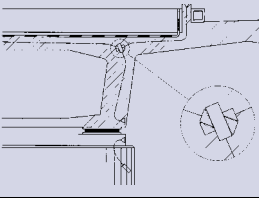
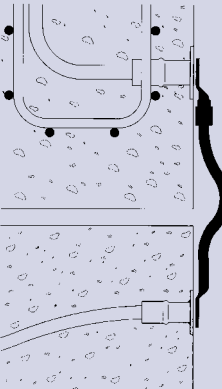


The BEB Range:

Type	Ref. No.	Standard length mm	Weight (approx.) kg/each	Outline	Symbol
BEB 1	05.450.162.040.01	400	0,66	 Threaded socket with flat steel	
BEB 2*	05.450.162.040.02**	400	0,95	 Threaded socket with angled reinforcing bar	
BEB 3*	05.450.162.040.03	400	0,75	 Threaded socket with straight reinforcing bar	
BEB 8*	05.450.162.050.08	500	1,00	 2x threaded socket with reinforcing bar	
BEB 4 (70 mm ²) BEB 5 (95 mm ²)	05.450.162.050.04 05.450.162.050.05	500 500	0,61 0,70	 Threaded socket with copper cable and welding tongue	
BEB 6 (70 mm ²) BEB 7 (95 mm ²)	05.450.162.050.06 05.450.162.050.07	500 500	0,59 0,70	 2x threaded socket with copper cable	
BEB 9 (70 mm ²) BEB 10 (95 mm ²)	05.450.162.050.09 05.450.162.050.10	500 500	0,61 0,70	 2x welding tongue with copper cable	
BEB 15 (70 mm ²) BEB 16 (50 mm ²)	05.450.162.050.15 05.450.162.050.16	500 500	0,61 0,50	 2x cable lug with copper cable	
BEB 17 (70 mm ²) BEB 18 (50 mm ²)	05.450.162.050.17 05.450.162.050.18	500 500	0,61 0,50	 2x cable lug with copper cable – sealed by a shrinkage sleeve on one side	
BEB 19 (70 mm ²) BEB 20 (50 mm ²)	05.450.162.050.19 05.450.162.050.20	500 500	0,61 0,50	 2x cable lug with copper cable – sealed by a shrinkage sleeve on both sides	

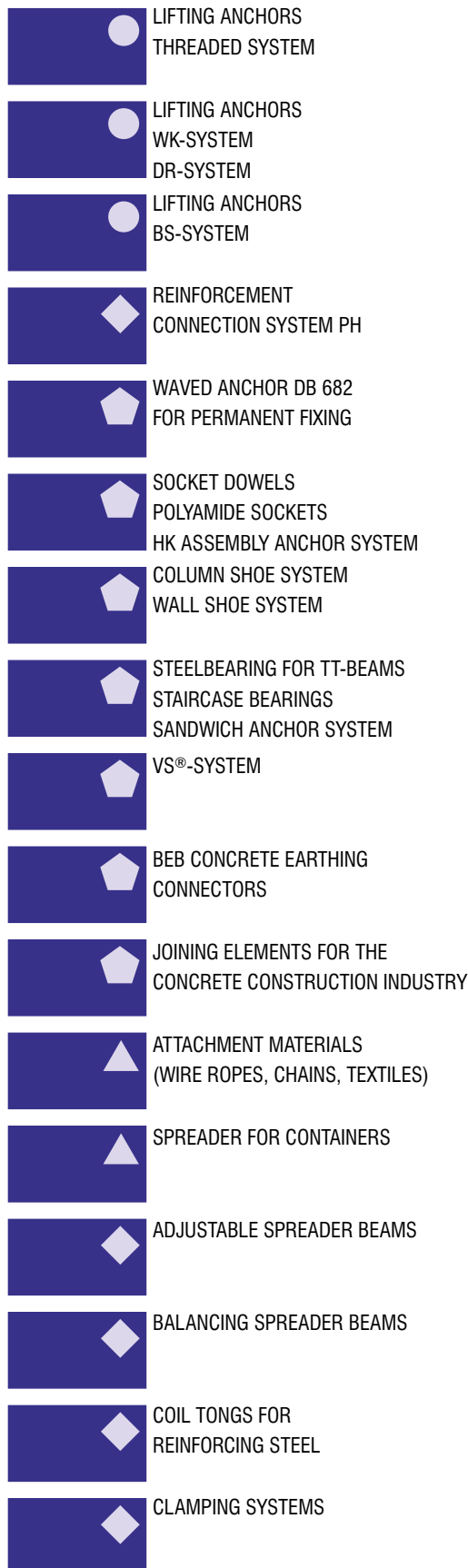
Ordering Example for 700 PFEIFER BEB 6, 150 cm long
700 PFEIFER BEB 6, ref. no. 05.450.162.150.06

* Reinforcing bar, Ø 16 mm with 200 mm² cross-sectional area is equivalent to 95 mm² copper cable
** Please state dimension h when ordering (see order form).

Installation Outline	Description of application
	<p>The BEB 1 Concrete Earthing Bridge is used for earthing the reinforcement of concrete structures in the vicinity of electrical equipment carrying high voltages. The Concrete Earthing Socket is fitted flush so that an earth cable lug can be connected to the structure. For perfect earthing, the reinforcement is welded to the flat bar inside the concrete structure. The 200 mm² cross section of the flat bar enables an immediate equalisation of potential as the resistances are extremely low.</p>
	<p>The BEB 2, 3 and 8 Concrete Earthing Bridges enable their use as an earthing connection in concrete structures to be particularly user-friendly. The reinforcing bar can be welded to the continuous reinforcement so that reliable potential equalisation can occur. Special lengths of reinforcing bar are available here to enable individual adaptation to the particular component.</p> <p>In addition, by means of the threaded sockets fitted on both sides, the BEB 8 Concrete Earthing Bridge provides the facility to earth the reinforcement of a component by welding while at the same time acting as a through conductor.</p>
	<p>The BEB 4 and 5 Concrete Earthing Bridges are designed as earthing connections for the particular application where earthing cables have to be fed through a component without earthing the component itself or its reinforcement.</p> <p>This is particularly the case with pre-stressed concrete components and also with similar components where it is compulsory to earth the upper structure and the carriageway supports but not the piers.</p> <p>Here, the concrete earthing socket is built into the upper edge of the component and the cable, manufactured to the required length, is fed through the component, brought out from the lower edge and fed into the foundations or similar where it is welded.</p>
	<p>The BEB 6 and 7 Concrete Earthing Bridges are designed for applications where an insulated earthing cable is fed through a component without earthing the component and its reinforcement. This is often the case with supports and pre-stressed concrete components.</p> <p>In this case, the BEB is installed in such a way that the cable, manufactured to the required length, runs through the component and emerges from two surfaces. The earthing connections can then be made to these sockets.</p>
	<p>The BEB 9 and 10 Concrete Earthing Bridges are designed as earthing connections for the particular application where earthing cables have to be extended or branched within a component.</p> <p>The advantage of these BEB's is that one can be very flexible when carrying out the earthing due to this facility for extending and branching. Simple electrode welding is sufficient for ensuring the earth connection. This gives rise to a number of different possible earthing designs and enables changes to be made on site at short notice and allows for many combinations without any problem.</p>
	<p>The BEB 15 to 20 Concrete Earthing Bridges are designed for the case where a connection has to be made between two components or earthing points.</p> <p>Here, there are two cross sections available of 50 mm² and 70 mm² copper according to DB drawing No. 4 Ebs 15.03.17, which guarantee a safe equalisation of potential for railway Earthing Bridges of cross section 70 mm² and 95 mm² in concrete. Compared to Earthing Bridges, the smaller cross section can be used here as these Earthing Connectors are used in the open air and a significantly better heat exchange can take place.</p> <p>The way in which the BEB 15 to 20 is used determines the type of insulation required. If the cable runs from the cable lug in a downwards direction, the version that is insulated by a shrinkage sleeve against water penetrating the cable according to 3 Ebs 15.03.01 and 4 Ebs 15.03.17 must be provided.</p>

PFEIFER

T H E S E A R E O U R P R O D U C T L I N E S



P F E I F E R A N C H O R I N G A N D L I F T I N G S Y S T E M S W O R L D W I D E

Our products are sold by

■ in Germany

Headquarters:

PFEIFER SEIL- UND
HEBETECHNIK GMBH
Dr.-Karl-Lenz-Straße 66
D-87700 MEMMINGEN
Tel +49-8331-937-312
Fax +49-8331-937-342
E-Mail export-bt@pfeifer.de
Internet www.pfeifer.de

Distribution in Germany through:



J&P: Die Baupartner.

■ in Austria

GHL Bautechnik
Produktions- und Handels GmbH
Caracallastraße 16
A-4470 ENNS
Tel +43-7223-81919-0
Fax +43-7223-81919-33
E-Mail office@ghl-bau.at

■ in Czechia

J&P STAVEBNÍ TECHNIKA s.r.o.
Prumyslová 5
CZ-10821 PRAHA 10
Tel +420-272-701026
Fax +420-272-703737
E-Mail info@jpcz.cz

■ in Denmark

JORDAHL & PFEIFER
BYGGETEKNIK A/S
Risgårdvej 66, Risgård
DK-9640 FARSØ
Tel +45-9863-1900
Fax +45-9863-1939
E-Mail info@jordahl-pfeifer.dk

■ in Hungary

PFEIFER GARANT KFT.
Gyömrői út 128
HU-1103 BUDAPEST
Tel +36-1-2601014
Fax +36-1-2620927
E-Mail pfeifer.garant@axelero.hu

■ in Poland

J&P TECHNIKA BUDOWLANA
Sp.z.o.o.
Ul. Wroclawska 68
PL-55-330 KREPICE k/Wrocław
Tel +48-71-3968264
Fax +48-71-3968105
E-Mail biuro@jordahl-pfeifer.com.pl

■ in Singapore

J&P BUILDING SYSTEMS PTE LTD
5 Toh Guan Road East #02-03
Freight Links Express Distripark
SG-SINGAPORE 608831
Tel +65-6569-6131
Fax +65-6569-5286
E-Mail jandpsgp@singnet.com.sg

■ in Spain

J&P TECNICAS DE ANCLAJE S.L.
Avda. de los Pirineos, 25, nave 20
San Sebastian de los Reyes
ES-28700 MADRID
Tel +34-916593185
Fax +34-916593139
E-Mail jp@jp-anclajes.com

■ in Switzerland

ANKABA Ankertechnik
und Bauhandel AG
Zürichstr. 38a
CH-8306 Brüttisellen
Tel +41-18071717
Fax +41-18071718
E-Mail info@ankaba.ch

■ in the United Kingdom/Ireland

J&P BUILDING SYSTEMS Ltd.
Unit 5 Thame Forty
Jane Morbey Road
GB-THAME, OXON OX9 3RR
Tel +44-1844-215200
Fax +44-1844-263257
E-Mail enquiries@jandpbuildingsystems.com

■ For other countries
please contact the
headquarters in Germany