



Product Information
01/2008

Flexible connectors • Solderless terminals • Contact systems

druseidt
Elektrotechnik

Busbars, non-ferrous metal working and accessories.



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Busbars, non-ferrous metal working and accessories

We are specialized in manufacturing of busbars and components for energy distribution consisting out of copper, aluminium or brass. Our wide range of manufacturing processes enables an individual manufacturing of high current components for various kinds of applications.

Modern plants supported by CAD/CAM technique guarantee a repeatable and economic production. So we are able to offer individual items as well as series of punched, bended, milled or welded components designed in coordination with your applications. Our longtime experience in construction and formulation of special solutions for high current applications offers the possibility to realize solutions in cooperation with our customers.

Our product range busbar and non ferrous metal working is complemented by our additional production department of flexible air- and water cooled high current connections. On demand, we'll send with pleasure our complete set of catalogues.

More information about our company and our product ranges are contained in our internet homepage:

www.druseidt.de

Our business activities

- Manufacturing of punched copper and aluminium busbars
- Manufacturing of earth and neutral busbars
- Manufacturing of stamped and punched copper and aluminium parts according to your samples or drawings
- Manufacturing of bended and finished-worked copper- and aluminium bars
- Manufacturing of punched and bended copper- and bimetallic sheets
- Manufacturing of welded copper- and aluminium parts
- Manufacturing of non ferrous metal parts on metal working lathes and milling machines
- Manufacturing of insulating parts consisting out of high performance materials up to a temperature resistance of + 1500° C
- Manufacturing of busbar supports and other accessories



Components for energy distribution

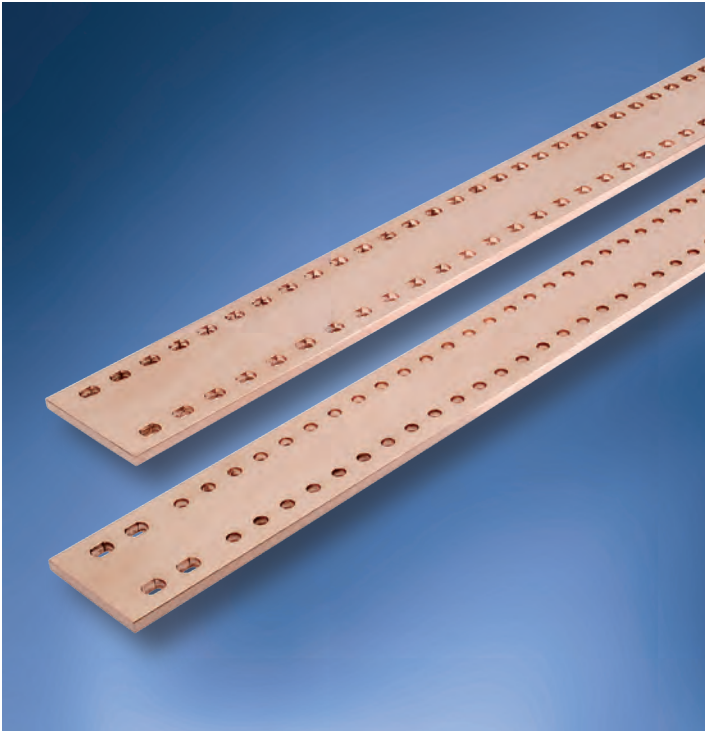
We manufacture and deliver high current components for various kinds of application:

- Busbars and busbar components
- Earth and neutral busbars
- Stamped and punched copper- and aluminium parts according to your samples or drawings
- Punched and bended sheets
- Welded copper- and aluminium components
- Components manufactured out of high performance materials
- Insulating materials up to a temperature resistant of + 1500° C
- Non ferrous metal parts manufactured on metal working lathes and milling machines
- Standoff insulators
- Busbar holders and busbar supports

Busbars with or without punched holes

We manufacture and deliver busbars consisting out of copper, aluminium or aluminium alloys in punched as well as in designs without holes. When working with punched busbars it is possible to make connections with busbars, which have the same or different dimensions, as well as with insulated supple bars

or other flexible connectors. Because a separate drilling is not necessary, you can realize a professional and timesaving installation also inside of existing plants. On request, we deliver also busbars with coated surfaces or threaded holes.



Deliverable designs:

- width 15-200 mm
 - thickness 3-15 mm
 - length up to 4 m
 - with round or slot holes
 - optional with rounded edges
 - with or without threaded holes
- Or according to your requirements
made out of Al 99,5 / AlMgSi0,5/AlMgSi1 etc.

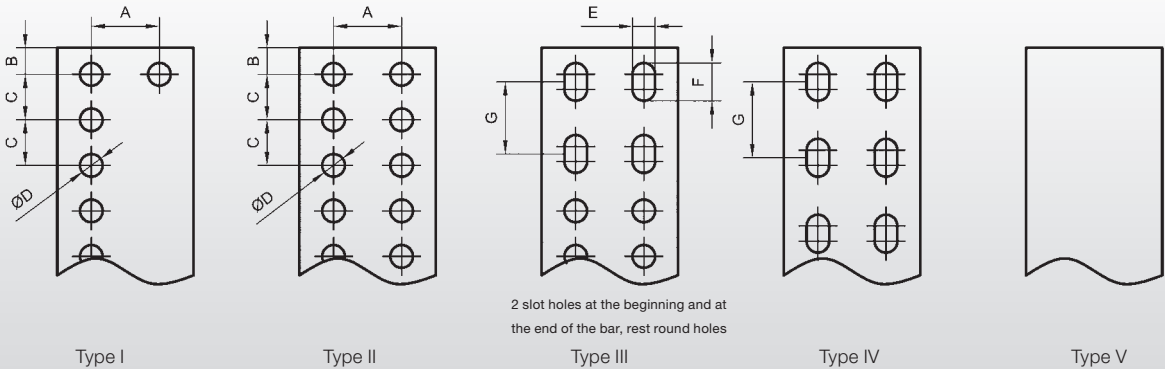
Timesaving installation when connecting:

- busbars which have the same dimensions
- busbars which have different dimensions
- busbars with insulated supple bars
- busbars with flexible connectors
- busbars with assembled leadings

With hole pattern according to your wishes or drawings on request. We deliver individual items as well as small or bigger series according to your instructions.

Possible designs:

- Type I round holes on one side
- Type II round holes on both sides
- Type III 2 slot holes at the beginning and the end of the bar, rest round holes
- Type IV slot holes on both sides
- Type V without holes



Ordering Information

Material:

 E-Copper

Surface coating:

 uncoated

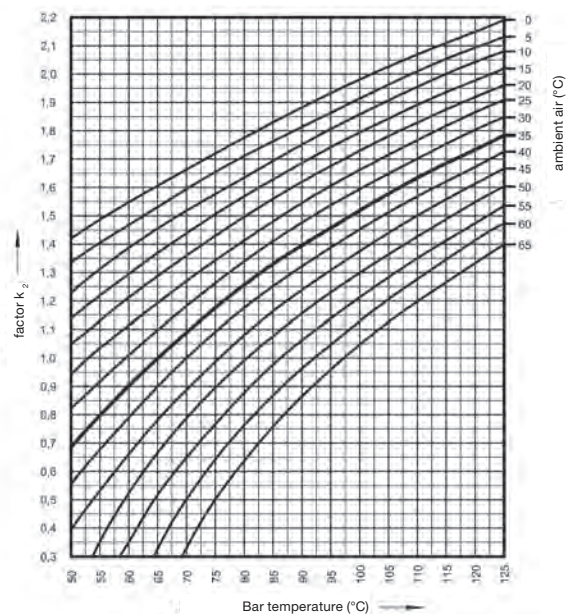
Dimensions:

width:: A: D Ø: AL 99,5 tinnedthickness: B: E : other materials other coatingslength: C: F : G : type: pieces:

Table for the current load of copper- and aluminium busbars acc. to DIN 43671 and 43670

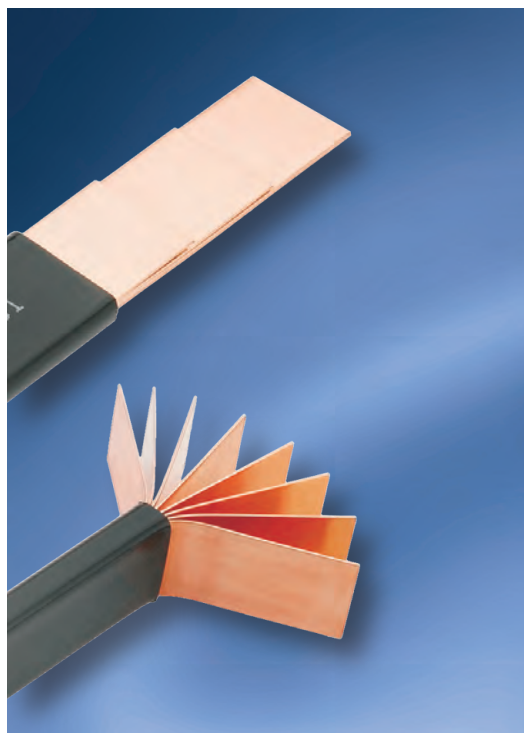
Continuous currents for busbars Cu-ETP/E-Cu according to the DIN regulations for rectangular bars in interior systems at + 35° C air temperature and + 65° C bar temperature and vertical bar position. Values for a changed ambient temperature and reducing factors for changed applications are contained in the DIN 43671 or 43670 respectively in the correction factor diagram K2.

Supported by the correction factor K2 it is possible to correct the current load acc. to the following table to a changed ambient- and bar-temperature. All values for the current load based on the conditions of an unmoved ambient air, uncoated bars, partial oxidized, so that the emission ratio is 0,35 by aluminium, 0,4 by copper resp. 0,9 when working with painted bars. Under changed or other conditions, please take notice to the values of the norms.



		Material E-copper F30 current load in A				Material E-Al current load in A				
width x thick- ness mm	weight kg/ meter	AC up to 60 Hz bar		DC + AC up to 16 2/3 Hz bar		weight kg/ meter	AC up to 60 Hz bar		DC + AC up to 16 2/3 Hz bar	
		uncoated	painted	uncoated	painted		uncoated	painted	uncoated	painted
12 x 2	0,210	108	123	108	123	0,060	84	97	84	97
15 x 2	0,270	128	148	128	148	0,080	100	118	100	118
15 x 3	0,400	162	187	162	187	0,120	126	148	126	148
20 x 2	0,360	162	189	162	189	0,110	127	150	127	150
20 x 3	0,530	204	237	204	237	0,160	159	188	159	188
20 x 5	0,890	274	319	274	320	0,270	214	254	214	254
20 x 10	1,780	427	497	428	499	0,540	331	393	331	393
25 x 3	0,670	245	287	245	287	0,200	190	228	191	228
25 x 5	1,115	327	384	327	384	0,340	255	305	255	305
30 x 3	0,800	285	337	286	337	0,240	222	267	222	268
30 x 5	1,340	379	447	380	448	0,410	295	356	296	356
30 x 10	2,670	573	676	579	683	0,810	445	536	447	538
40 x 3	1,070	366	435	367	436	0,320	285	346	285	346
40 x 5	1,780	482	573	484	576	0,540	376	456	376	457
40 x 10	3,560	715	850	728	865	1,080	557	677	561	682
50 x 5	2,230	583	697	588	703	0,680	455	556	456	558
50 x 10	4,450	852	1020	875	1050	1,350	667	815	674	824
60 x 5	2,670	688	826	696	836	0,810	533	655	536	658
60 x 10	5,340	985	1180	1020	1230	1,620	774	951	787	966
80 x 5	3,560	885	1070	902	1090	1,080	688	851	694	858
80 x 10	7,120	1240	1500	1310	1590	2,160	983	1220	1010	1250
100 x 5	4,450	1080	1300	1110	1340	1,350	846	1050	858	1060
100 x 10	8,900	1490	1810	1600	1940	2,700	1190	1480	1240	1540
120 x 10	10,680	1740	2110	1890	2300	3,240	1390	1730	1460	1830
160 x 10	14,240	2220	2700	2470	3010	4,320	1780	2220	1900	2380
200 x 10	17,800	2690	3290	3040	3720	5,400	2160	2710	2350	2960

PVC insulated supple bars insulated by a black vinyl compound, standard length 2 m



Construction and application

Supple bars are insulated flat electrical conductors. They consist of several layers of uncoated or tin plated Cu-ETP strips (99,9% copper) and are insulated with a flexible high quality vinyl compound.

This special compound is self-extinguishing and free of lead. The flexibility of the bars offers an installation into difficult equipment or small places. They have become particularly well established as connectors in switchgears and between transformers, generators, switching devices and prefabricated power networks up to a operating voltage of 1 kV. As a consequence of their large surface area and hence their favourable thermal radiation properties, they can handle heavier current loads than solid busbars of the same cross-section. So it is possible to use components with smaller dimensions. The elasticity of the vinyl compound realizes a deforming of bars also when working with larger cross-sections.

The connection level can also be changed by bending and twisting through 180°. Our supple bars enable an individual fitting of the components, a reduction of the cross-section and a reduction of the installation time. So they are a very interesting cost-saving product.

Technical data

Electrical conductor

- copper strips Cu-ETP (99,9% copper)
- surface uncoated or tinned
- stability $> 200 \text{ N/mm}^2$
- electrical conductivity 57 S x m/mm^2

Insulation

- special vinyl compound
- black, free of lead
- thickness 1,8-2 mm
- self-extinguishing acc. to UL 94 VO
- shore hardness 85 A
- elasticity 365%
- AC voltage between potential and insulating material 16,5 kV
- AC voltage between two insulated supple bars in contact 33 kV
- operating voltage max 1 kV
- operating temperature -20° C up to $+105^\circ \text{ C}$



Installation

Simple mounting by drilling, punching or underside clamping. The copper strips are sliding when bending the bars, therefore it is necessary to bend the bars before starting the cutting, drilling or punching process.

To prevent a displacement of the copper strips a tightly clamping of the bars is necessary too when carrying out the drilling or punching process.

PVC insulated supple bars

made out of uncoated or tin plated Cu-ETP strips

insulated by a black vinyl compound, standard length 2 m

Part.-No.		technical data										
uncoated	tinned	cross-section mm²	copper-strips number x dimension mm				current load in dependence of the conductor in °C					copper weight kg/% m
							65°	75°	85°	95°	105°	
15650	15650 vz	14,4	2	x	9	x 0,8	95 A	114 A	130 A	144 A	157 A	13,80
15651	51700*	21,6	3	x	9	x 0,8	119 A	141 A	162 A	180 A	196 A	20,70
15652	15652 vz	28,8	4	x	9	x 0,8	139 A	166 A	190 A	211 A	230 A	27,60
15653	15653 vz	36	5	x	9	x 0,8	158 A	189 A	215 A	240 A	262 A	34,50
15654	51705*	43,2	6	x	9	x 0,8	176 A	210 A	240 A	266 A	291 A	41,40
15655	15655 vz	13	2	x	13	x 0,5	97 A	116 A	132 A	147 A	160 A	12,50
15656	51710*	19,5	3	x	13	x 0,5	120 A	143 A	163 A	181 A	198 A	18,70
15657	15657 vz	26	4	x	13	x 0,5	140 A	166 A	190 A	211 A	231 A	25,00
15658	51715*	39	6	x	13	x 0,5	174 A	207 A	237 A	263 A	288 A	37,50
15661	15661 vz	24,8	2	x	15,5	x 0,8	141 A	168 A	192 A	214 A	234 A	23,80
15662	51720*	49,6	4	x	15,5	x 0,8	205 A	244 A	279 A	310 A	339 A	47,60
15663	51725*	74,4	6	x	15,5	x 0,8	257 A	306 A	350 A	389 A	424 A	71,40
15664	15664 vz	99,2	8	x	15,5	x 0,8	303 A	361 A	412 A	458 A	501 A	95,20
15665	51730*	124	10	x	15,5	x 0,8	345 A	411 A	470 A	523 A	571 A	119,00
15666	15666 vz	40	2	x	20	x 1	193 A	230 A	263 A	292 A	319 A	38,30
15667	15667 vz	60	3	x	20	x 1	240 A	286 A	326 A	363 A	396 A	57,50
15668	15668 vz	80	4	x	20	x 1	280 A	334 A	381 A	424 A	463 A	76,60
15669	15669 vz	100	5	x	20	x 1	317 A	377 A	431 A	479 A	523 A	95,80
15670	15670 vz	120	6	x	20	x 1	351 A	418 A	477 A	531 A	580 A	115,00
15671	15671 vz	160	8	x	20	x 1	413 A	492 A	562 A	625 A	683 A	153,30
15672	15672 vz	200	10	x	20	x 1	470 A	560 A	640 A	711 A	777 A	191,60
51731	51732*	240	11	x	20	x 1	497 A	592 A	676 A	752 A	821 A	229,90
15673	15673 vz	48	2	x	24	x 1	223 A	265 A	303 A	337 A	368 A	46,00
15674	15674 vz	72	3	x	24	x 1	276 A	329 A	375 A	417 A	456 A	69,00
15675	15675 vz	96	4	x	24	x 1	322 A	383 A	438 A	487 A	532 A	92,00
15676	15676 vz	120	5	x	24	x 1	363 A	433 A	494 A	550 A	600 A	115,00
15677	15677 vz	144	6	x	24	x 1	402 A	479 A	547 A	608 A	664 A	138,00
15678	15678 vz	192	8	x	24	x 1	471 A	562 A	641 A	713 A	779 A	183,90
15679	51735 *	240	10	x	24	x 1	534 A	637 A	727 A	809 A	883 A	229,90
15690	15690 vz	64	2	x	32	x 1	280 A	334 A	382 A	424 A	463 A	61,30
15691	15691 vz	96	3	x	32	x 1	346 A	413 A	471 A	524 A	572 A	92,00
15692	15692 vz	128	4	x	32	x 1	403 A	480 A	548 A	610 A	666 A	122,60
15693	15693 vz	160	5	x	32	x 1	453 A	540 A	617 A	686 A	749 A	153,30
15694	15694 vz	192	6	x	32	x 1	500 A	596 A	680 A	756 A	826 A	183,90
15695	15695 vz	256	8	x	32	x 1	583 A	695 A	793 A	882 A	963 A	245,30
15696	15696 vz	320	10	x	32	x 1	657 A	783 A	894 A	995 A	1086 A	306,60
15697	15697 vz	120	3	x	40	x 1	415 A	494 A	565 A	628 A	686 A	115,00
15698	15698 vz	160	4	x	40	x 1	481 A	574 A	655 A	729 A	796 A	153,30
15699	15699 vz	200	5	x	40	x 1	541 A	644 A	736 A	818 A	894 A	191,60
15700	15700 vz	240	6	x	40	x 1	594 A	708 A	809 A	900 A	982 A	229,90
15701	15701 vz	320	8	x	40	x 1	690 A	822 A	939 A	1044 A	1140 A	306,60
15702	15702 vz	400	10	x	40	x 1	774 A	922 A	1053 A	1171 A	1279 A	383,20
15703	15703 vz	200	4	x	50	x 1	577 A	688 A	786 A	874 A	954 A	191,60
15704	15704 vz	250	5	x	50	x 1	646 A	770 A	880 A	978 A	1068 A	239,50
15705	15705 vz	300	6	x	50	x 1	709 A	844 A	965 A	1073 A	1171 A	287,40
15706	15706 vz	400	8	x	50	x 1	818 A	975 A	1114 A	1238 A	1352 A	383,20
15707	15707 vz	500	10	x	50	x 1	914 A	1089 A	1244 A	1383 A	1510 A	479,00
15708	15708 vz	252	4	x	63	x 1	698 A	832 A	950 A	1056 A	1153 A	241,40
15709	15709 vz	315	5	x	63	x 1	779 A	929 A	1061 A	1179 A	1288 A	301,80
15710	15710 vz	378	6	x	63	x 1	852 A	1015 A	1159 A	1289 A	1408 A	362,10
15711	15711 vz	504	8	x	63	x 1	978 A	1166 A	1332 A	1481 A	1617 A	482,80
15712	15712 vz	630	10	x	63	x 1	1088 A	1296 A	1481 A	1646 A	1798 A	603,50
15713	15713 vz	400	5	x	80	x 1	947 A	1128 A	1289 A	1433 A	1565 A	383,20
15714	15714 vz	480	6	x	80	x 1	1032 A	1229 A	1404 A	1562 A	1705 A	459,80
15715	15715 vz	640	8	x	80	x 1	1179 A	1405 A	1604 A	1784 A	1948 A	613,10
15716	15716 vz	800	10	x	80	x 1	1305 A	1556 A	1777 A	1976 A	2157 A	766,40
15717	15717 vz	500	5	x	100	x 1	1136 A	1354 A	1546 A	1720 A	1878 A	479,00
15718	15718 vz	600	6	x	100	x 1	1235 A	1471 A	1681 A	1869 A	2041 A	574,80
15720	15720 vz	800	8	x	100	x 1	1404 A	1674 A	1912 A	2126 A	2321 A	766,40
15722	15722 vz	1000	10	x	100	x 1	1550 A	1848 A	2110 A	2347 A	2562 A	958,00

Remark: Stocked standard design bare and the * marked tinned designs. In special design all dimensions are deliverable with a tin coated surface and in variable lengths (e.g. 3 m). All information about current load are approxi-mate values in consideration of the cables heat for single laying of air cooled cables and ambient temperature +35° C. The temperature of the conductor is in dependent on the installation, the application, the cooling, the ambient temperature etc., so that if necessary reducing factors are to be considered. With pleasure our employees assist your company in finding optimal solutions.

Earth and neutral busbars

We manufacture and deliver earth and neutral busbars consisting out of copper or brass with coated as well as uncoated surfaces. Our standardized delivery program is completed by the manufacturing of designs according

to clients wishes or drawings. We deliver busbars up to a length of ca. 4 m with special hole pattern, threads or special coatings.

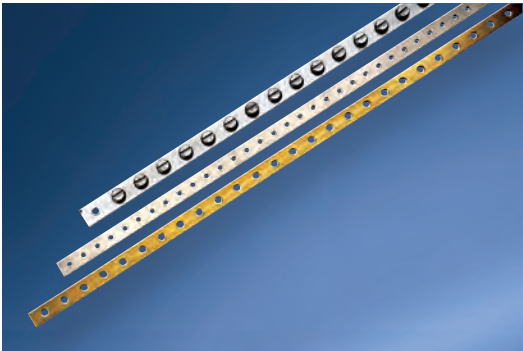
Punched E-Copper bars in customized design



We manufacture punched E-Copper bars with and without screw threads beginning in a width from 15 mm and a thickness of 3 mm. with coated or uncoated surface. We deliver bars coordinated with your application whether with round or slot holes, or with a hole combination of round and slot holes in different dimensions. Additionally to the delivery of mass produced articles we deliver individual items shortly and to a favourable price.

Earth and neutral busbars

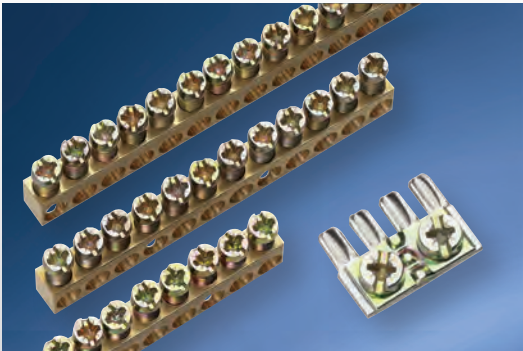
with and without screws
length: 1000 mm
material: brass



Part-No.				dimensions mm B x S	connections	distance hole to hole	weight kg/% pcs.
Type I	Type II	Type III	Type IV				
02700	02715	02730	02745	10 x 2	62 x M 5	16	14,0
02701	02716	02731	02746		90 x M 5	11	12,0
02702	02717	02732	02747	12 x 3	83 x M 4	12	26,0
02703	02718	02733	02748		64 x M 5	15,5	29,0
02704	02719	02734	02749		58 x M 6	17	27,0
02705	02720	02735	02750	15 x 3	105 x M 4	9,5	36,0
02706	02721	02736	02751		86 x M 5	11,5	35,0
02707	02722	02737	02752		50 x M 5	20	37,0
02708	02723	02738	02753		50 x M 6	20	36,0
02709	02724	02739	02754	15 x 4	42 x M 8	24	45,0
02710	02725	02740	02755	25 x 5	31 x M10	34	98,0
Type I = busbar brass uncoated, without screws				Steel-screws DIN 84 not mounted and standard. On request it is possible to deliver a mounted design or screws Made out of Brass.			
Type II = busbar brass nickel uncoated, without screws							
Type III = busbar brass uncoated, with screws							
Type IV = busbar brass nickel coated, with screws							

Earth- and neutral busbars

with self locking protection
rated current 63 A
material: brass



Part-No.	cross-section mm²	connections	dimensions mm			weight kg/% pcs.
			height	width	length	
10535	10	8	9	6,5	51,5	2,5
10536		12			77,5	3,7
10537		18			103,5	5,8
10538		24			155,0	8,1
10539		151			1000,0	43,0
10541	35	Connection terminal for Part-No. 10535-10539				0,3

Earth and neutral busbars with connection clamps

with self locking protection

rated current 63 A

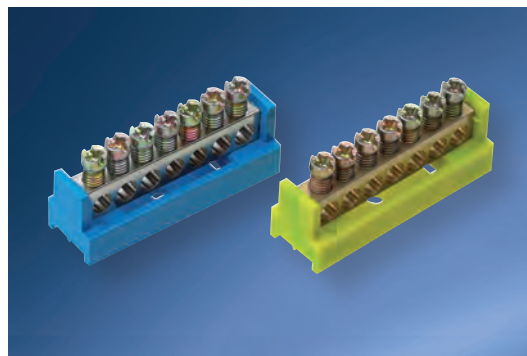
Material: brass



Part-No.	no. of contact positions		dimensions mm			weight kg/% pcs.
	incoming 25 mm²	outgoing 10 mm²	height	width	length	
10526	1 clamp	6	9	6,5	61,5	2,8
10527	1 clamp	12	9	6,5	124,0	6,1
10528	2 clamps	18	9	6,5	186,5	9,4
10529	3 clamps	24	9	6,5	249,0	12,9
10531	4 clamps	30	9	6,5	311,5	16,4
10532	5 clamps	36	9	6,5	374,0	19,4
10533	without clamps	96	9	6,5	1000,0	48,0
10544	Connection terminal 25 mm² for Part-No. 10533					0,3

Insulated earth and neutral terminals

rated current: 63 A



Part-No.	cross-section mm²	connections	colour	weight kg/% pcs.
for fixing to flat busbars 12 x 2 mm				
10555	10	7	blue (neutral)	2,8
10556			yellow/green (earth)	
for clip mounting				
10538	10	7	blue (neutral)	2,8
10539			yellow/green (earth)	

Terminal supports

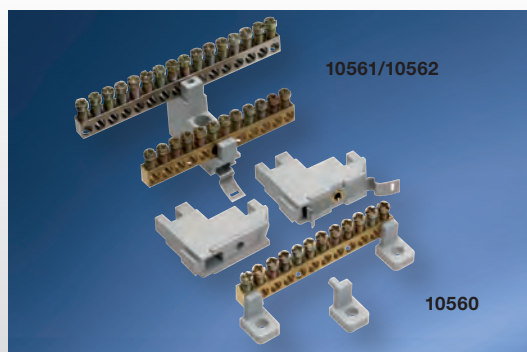
for earth and neutral busbars



Part-No.	description		weight kg/% pcs.
02763	Terminal supports with turnable head for busbars 6 x 6 and 10 x 2 up to 15 x 4 mm.	Rated voltage: 500 V AC (VDE 0110 Gr. C).	1,6

Terminal supports

for earth and neutral busbars 9 x 6,5 mm

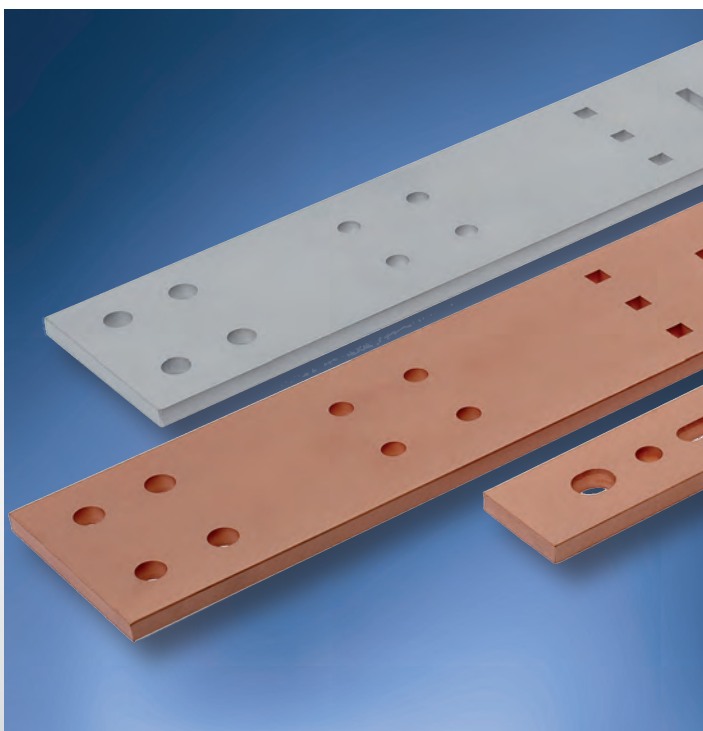
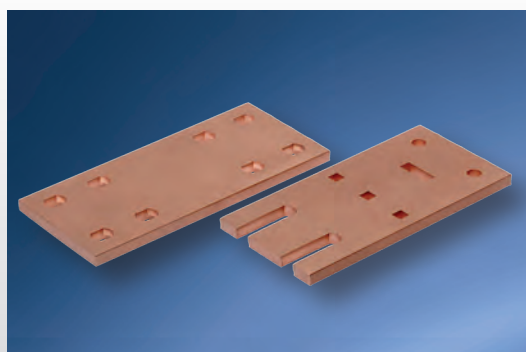
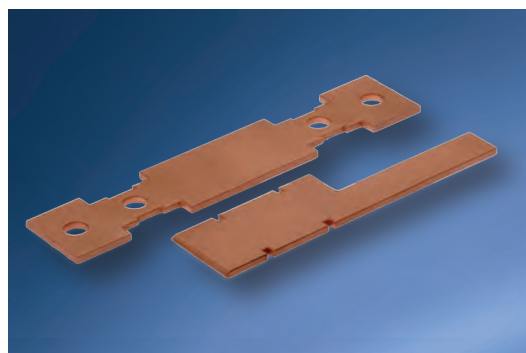
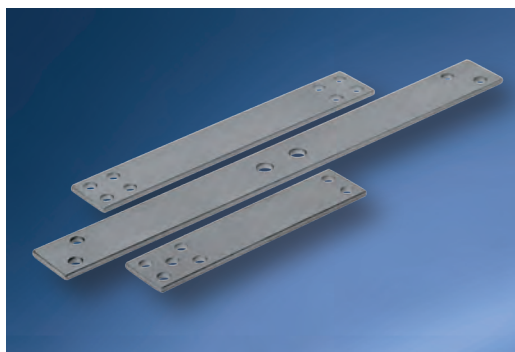
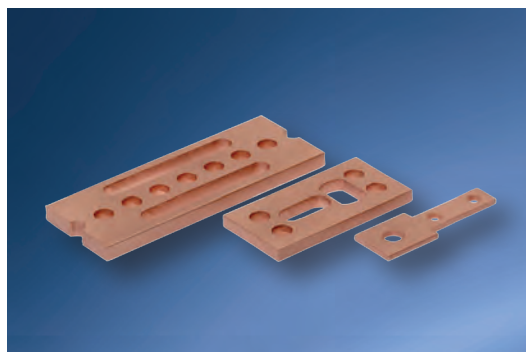
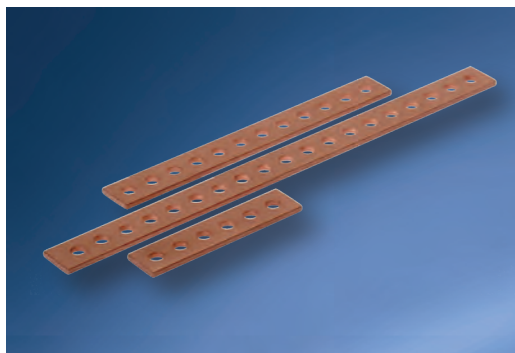
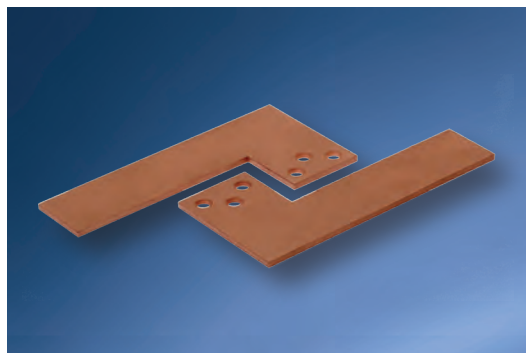


Part-No.	mounting	weight kg/% pcs.
10560	screw mounting	0,1
10561	screw mounting	0,7
10562	clip mounting	0,8

Stamped and punched copper and aluminium parts

We deliver stamped and punched copper and aluminium parts made out of busbars in various designs and forms. Our company offers a lot of economically production processes for the manufacturing of individual – as well as mass-produced-articles in a width of 15 mm up to 200 mm and a thickness of 3 mm up to 15 mm.

With pleasure we offer a constructive support too when planning projects or new products. Here are some examples to generate ideas for your constructions or inquiries.

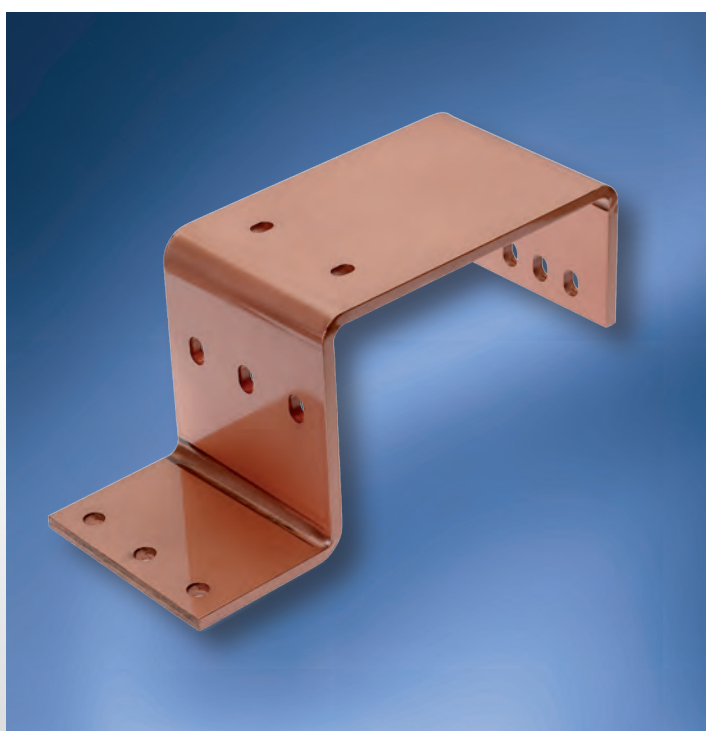
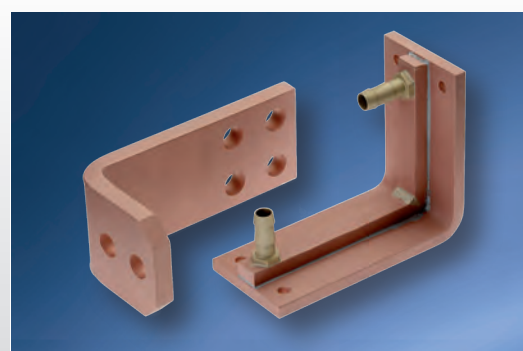
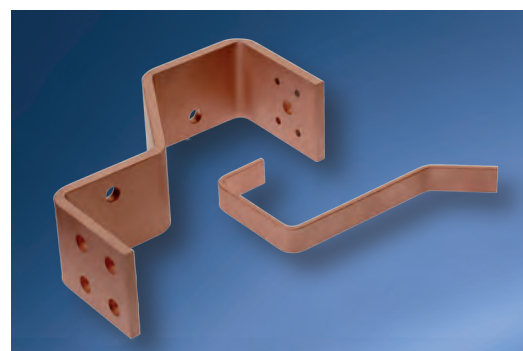
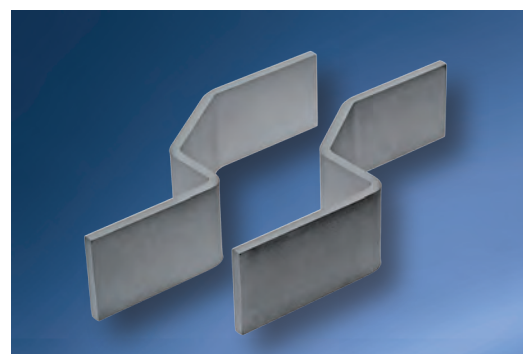


Bended and punched copper and aluminium busbars

Additionally to our delivery program of stamped busbar parts we are able to manufacture bended and punched busbar parts too. We manufacture on high automated machines and are able to deliver dimensions up to cross-sections of 200 x 20 mm in copper as well as aluminium design. The construction is carried out exactly to your wishes or drawings. All processes and forms are repeatable every time without problem.

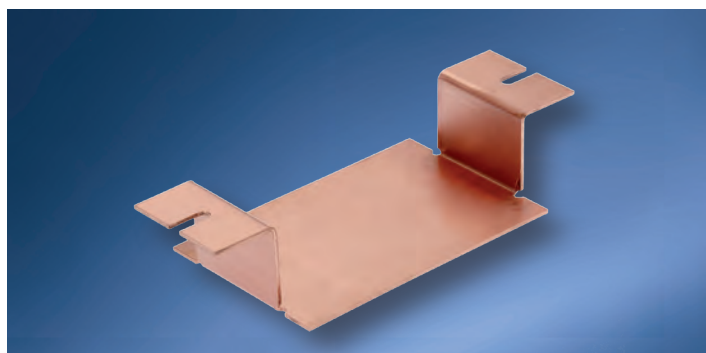
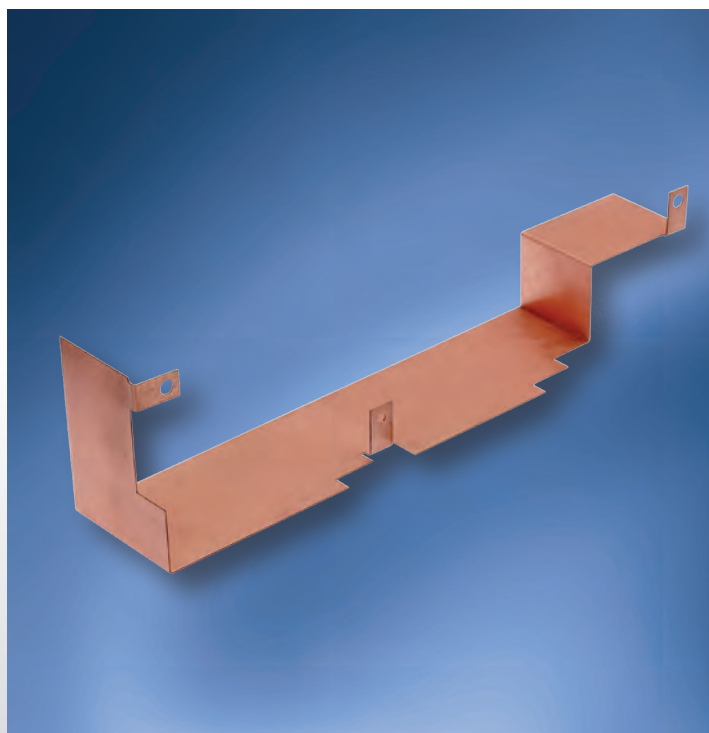
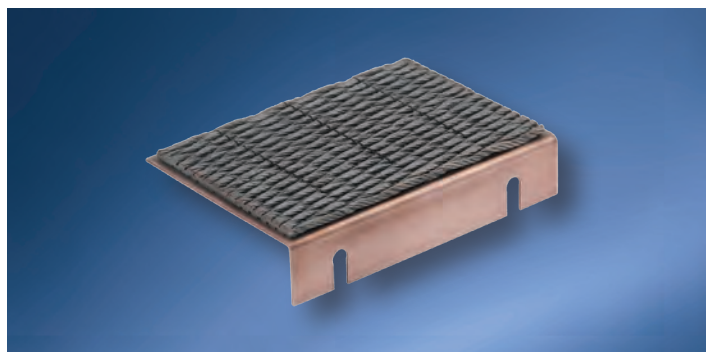
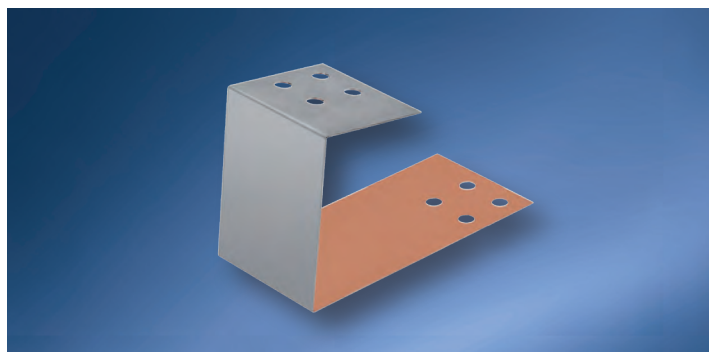
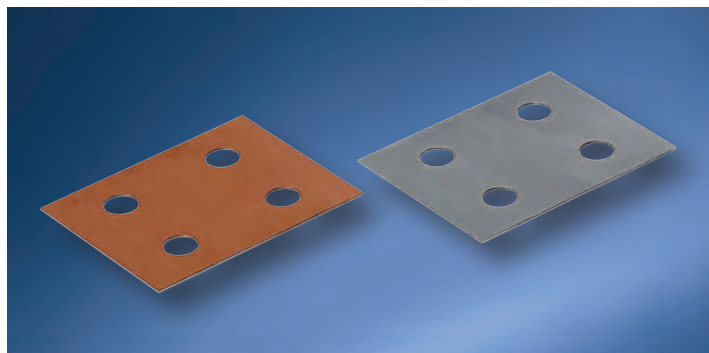
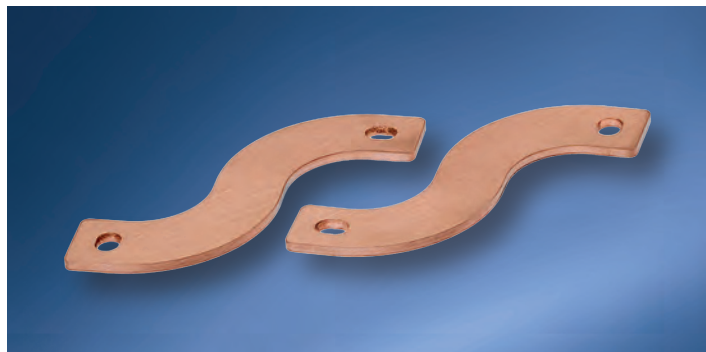
With pleasure we assist your efforts in designing of high current components and busbar-systems.

Our effort is to work together with our customers in the sense of a real partnership.



Punched and bended copper and bimetallic sheets

We manufacture smaller parts of finished sheets. The basic materials are copper sheets in a thickness up to 5 mm or bimetallic sheets in a thickness up to 2 mm. All designs are acc. to your drawings or wishes. On request coated designs as well as designs with soldered contact parts are deliverable too. Following some examples:



Supports

Bimetallic sheets

Bimetallic elements consist of copper plated aluminium plates. Since the connection area of both metals is in the middle, it is kept away from air and humidity.

This material enables a secure contact and a corrosion protected connection between copper and aluminium. Besides bimetallic plates and spacers we can also supply cut-outs with and without drill holes especially for your specific application.

Part-No.	technical data			
	dimensions mm			weight kg/% pcs.
	length	width	thickness	
02670	2000	500	1	4,70
02671			1,5	7,00
02672			2	9,35



Bimetallic washers

Part-No.	technical data				
	dimensions mm for drill hole				weight kg/% pcs.
	M	d ₁	d ₂	S	
13295	3	8	3,5	1	0,02
13296	4	10	4,5	1	0,03
13297	5	12	5,5	1	0,05
02675	6	15	6,5	1	0,07
02676	8	18	8,5	1	0,09
02677	10	22	10,5	1,5	0,18
02678	12	25	13	2	0,68
02679	12	28	13	2	0,44
02680	16	35	17	2	0,66

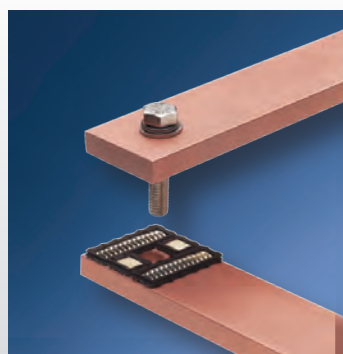


Seal-contact-modules for high current transmission

Seal-contacts are constructed for high current transmission with busbars and plates (copper/copper, Alu/copper or Alu/Alu) in indoor as well as outdoor-installations. It is possible to connect unplated, unmachined and uncleaned busbars or plates also in corrosive atmospheres (e.g. sulphur dioxide, salt laden air, chlorine etc.).

The modules are suitable for bolted joints in busbars according to DIN. By using these elements the high current transmission is made in hermetically sealed chambers, so that no oxidation or corrosion is possible.

So you get low loss over a long time of use. The torsion springlover of the multilam permits the contact force as well as the electrical performance of the busbar joint to remain constant even when the compression force drops to 50 % of its initial value. The torsion springlover of the multilam get through the oxydlayer of the busbar, so that a cleaning or coating of the contact areas is not necessary. So screw connections with low loss and without any servicing over a long time of use are guaranteed.



Part-No.	description	technical data		
		dimensions mm		
		length	width	thickness
02696	contact module	40	13,33	1,4
02697	support module long	40	13,33	1,4
02698	support module short	13,33	13,33	1,4

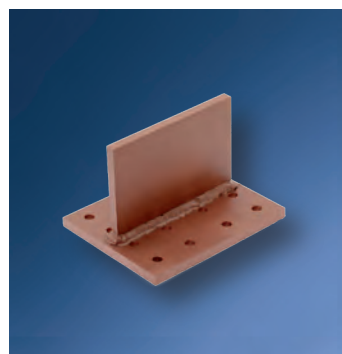
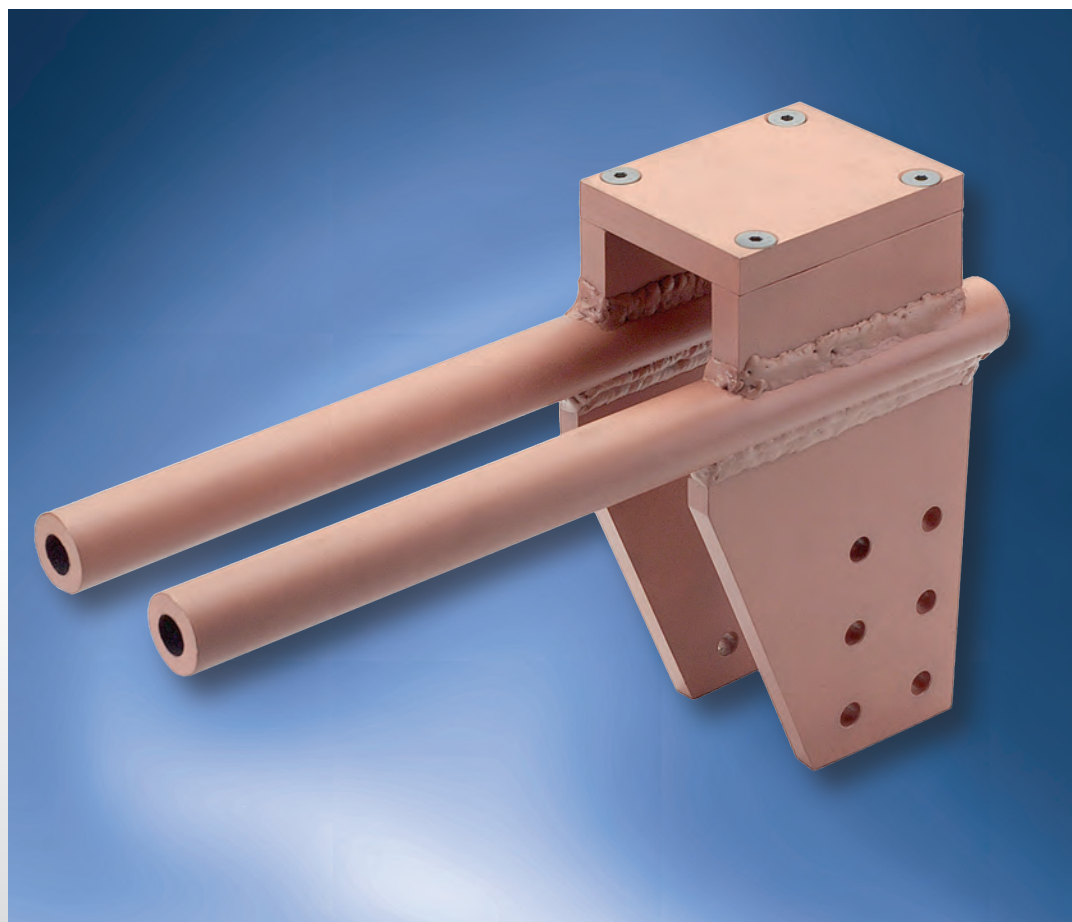
Remark:

Continuous operating temperature up to +100° C,
short circuit current 1 s = 20 kA.

Welded copper and aluminium parts

We are specialized in the welding of high current components made out of copper or aluminium materials. This part of our production is supported by our construction department and a modern metal-cutting fabrication. So we are able to offer suitable components and solutions in the field of high current

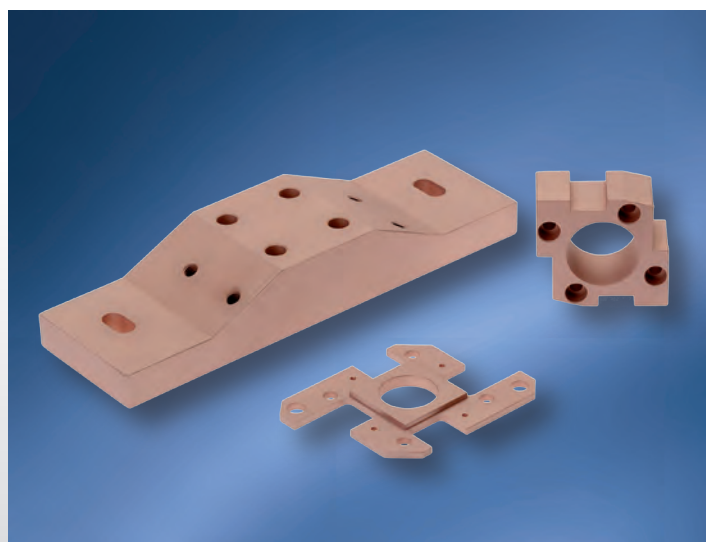
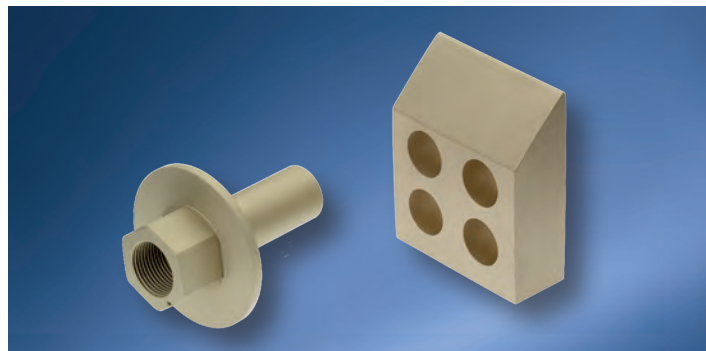
distribution and other applications. Combined with our different production-lines for the manufacturing of flexible connectors we offer also solutions for welded components in conjunction with flexible requirements or expansion compensation.



Non-ferrous metal parts manufactured on milling machines and metal working lathes

We are specialized in designing and producing of high current components made out of non ferrous metals. We work with modern machines for milling, turning, drilling and grinding processes. We attach importance of highest quality and

repeatable processes. Therefore we work with modern CAD/CAM systems. We are able to manufacture individual items as well as mass-produced-articles. Our modular machine concept places us in a position to work efficiently in a very short time.



Heat resistant insulating materials

Heat resistant insulating materials up to + 1500° C

Additionally to our non-ferrous metal working we are specialized too in the delivery of heat resistant insulating, sliding and high performance materials. We deliver such materials in plates or tubes as well as in finished components according to your drawings. With pleasure we support your construction department in finding the right material and the right design.

Product overview:

Special wooden materials up to + 130° C

Wooden plates compressed with high pressure by using phenolic resin. Assign to a specified use in the field of transformers, busbar holders or similar applications.

High performance materials up to + 260° C

Well balanced resin compounds based on phenol, epoxide, melamine, polyester, silicone and polyamide combined with high quality substrates like cellulose or cotton, aramid or glass filament fabrics.

Sliding materials up to + 600° C

High performance materials consisting of organic fibres, special resins as well as sliding additives, all pressed together.

Electrical insulating materials up to + 800° C

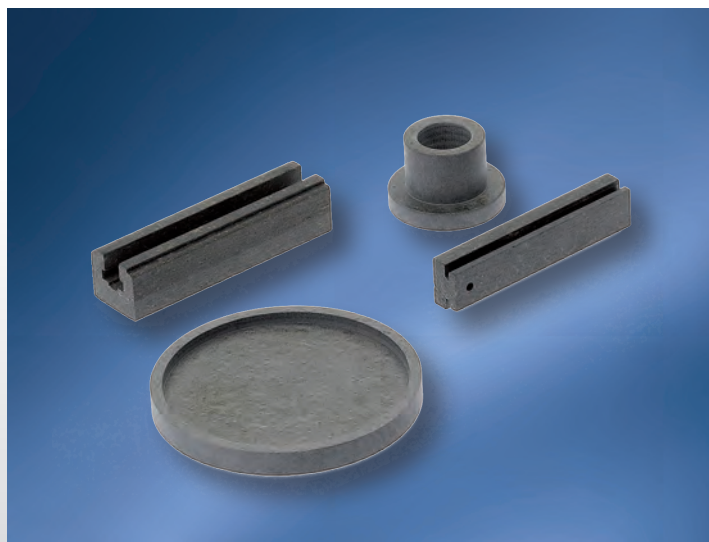
Based on mica materials in various crystal structures. So muscovite and phlogopite as well as silicone impregnated mica paper compressed under high pressure are used.

Engineering ceramics up to + 1000° C

Special materials for sliding application, also for hot working areas.

Insulating materials up to + 1500° C

Asbestos free insulating materials with high strength characteristics up to + 1500° C based on fibre elements, mica, calcium-silicates or aluminium-oxyd ceramics. With a special adhesive temperature resistant up to + 1000° C it is possible to stick the material together.



Finished articles consisting out of high performance materials

Additionally to our production processes for high current components and components for energy distribution, we deliver and design suitable insulating components consisting out of high performance materials too.

Deliverable are finished components manufactured on milling machines up to 1300 mm x 3000 mm plate format as well as work pieces manufactured on working lathes up to a diameter of 500 mm and 1500 mm length. We deliver shortly individual items as well as mass-produced articles according to your drawings or wishes.

Fields and branches of applications are:

Generator-, transformer- or switchgear application

e.g. insulating cases, insulating plates or insulating discs.

High current application

e.g. insulating material for high current tubes, cable and busbar supports.

Welding and soldering devices

e.g. temperature resistant insulating plates, spacer or distance pieces.

Chemical industry

e.g. chemical and heat resistance components according to your wishes or drawings.

Engine building and construction

e.g. sliding bars, sliding profiles or –strips for various kinds of temperatures.

Foundries- and electrical steel works

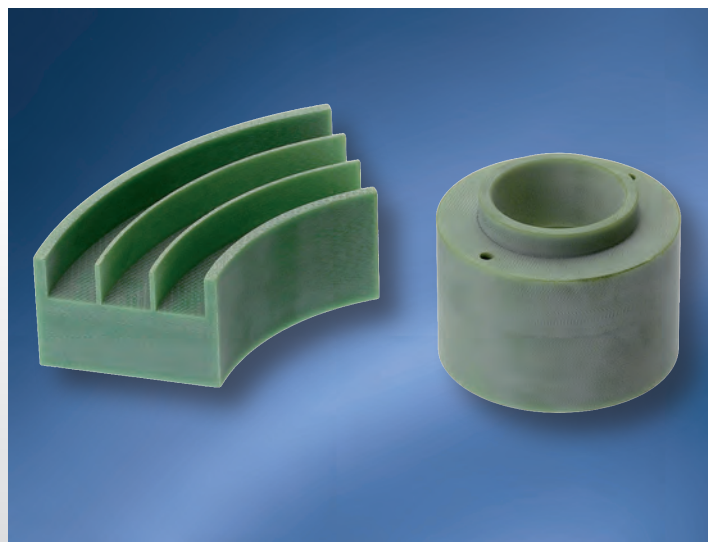
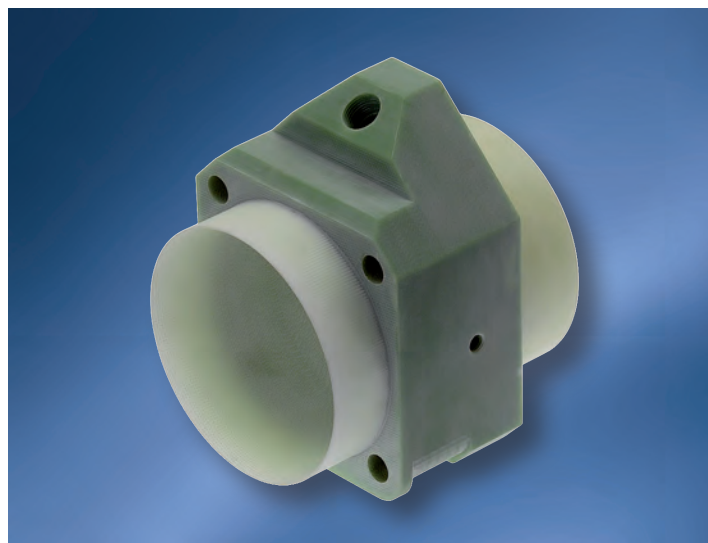
e.g. insulation materials for electric- arc- and ladle furnaces, insulating materials for high current tubes, electrodes holders and pot-, furnace- or oven-caps.

Inductive heating plants

e.g. plates- and spacers for inductor boxes, brace supports, insulating flanges and tube insulations for induction plants.

Foundries and forging lines

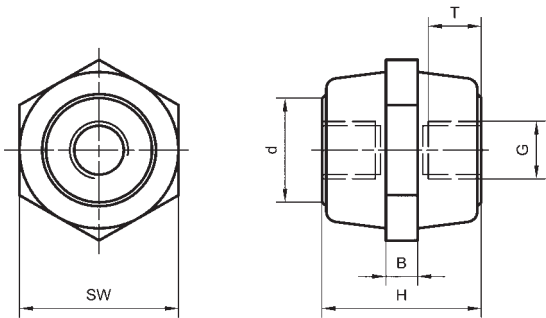
e.g. highly heat resistant clamping- and holding devices, insulating plates, insulation parts for screw connections, etc.



Standoff insulators 1-3 kV made out of Polyamide
with spanner flat for indoor applications

Standoff insulators manufactured out of reinforced, flame protected and heat stabilized Polyamide. The compound is free of halogen and Phosphor. The material can be converted efficiently and is characterized by his excellent values for tensile strength (Z) and the rated load limit on the upper

insulator edge (F).The differences to the design made out of glass-fibre reinforced unsaturated polyester resin are basically in the values for the behaviour in case of fire (class V2 to V-0) and the temperature range - 25° C up to + 120° C to - 40° C up to + 130° C.



Technical data of the material

• Behaviour in case of fire	UL 94	Class V2
• Density	ISO 1183	ca. 1,45 g/ccm
• Special throughout resistance	IEC 60093	10 ¹⁰ Ohm
• Dielectric strength	IEC 60243	25 kV/mm
• Deposit tracking	IEC 60/112	CTI 550
• Colour	natural coloured	
• Inserts	steel zinc coated	
• Temperature range	- 25° C up to + 120° C	

Part-No.	dimensions mm													weight
	H	SW	G	T	d	B	Md/Nm	F/kN	Z/kN	D/kN	BWS/kV	PWS/kV	kg/% pcs.	
06100	18	15	M 4	6	11	4	3,3	1,1	2,2	13	1,0	5	0,60	
06103	25	25	M 6	8	16	6	17	2,2	5,5	38	1,0	10	2,00	
06105	30	30	M 6	8	20	6	22	2,6	6,8	49	1,5	15	3,00	
06106			M 8	9			44	4,2	13,0	63			5,00	
06109	35	30	M 6	8	20	6	30	3,2	10,0	50	1,5	15	5,00	
06110			M 8	9			50	4,0	18,0	60			6,00	
06111			M 10	9			55	4,4	20,0	66			6,00	
06115	40	40	M 8	9	28	8	60	8,8	18,0	95	2,0	20	8,00	
06116			M 10	14			95	10,0	28,0	100			10,00	
06117			M 12	14			105	12,0	30,0	122			10,00	
06120	50	40	M 8	9	28	8	60	5,5	18,0	92	3,0	25	10,00	
06121			M 10	14			95	8,0	28,0	100			12,00	
06122			M 12	16			105	9,5	30,0	122			14,00	
06125	50	50	M 10	14	32	10	132	12,0	25,0	140	3,0	25	18,00	
06126			M 12	16			220	14,0	30,0	180			19,50	
06129	60	40	M 8	9	28	8	55	6,0	16,0	92	3,0	25	12,00	
06130			M 10	14			99	8,0	22,0	100			14,00	
SW = wrench size Z = tensile force PWS = testing voltage (AC) Md = torque D = compressive force F = rated load Limit on Upper insulator edge BWS = operating voltage (AC)														



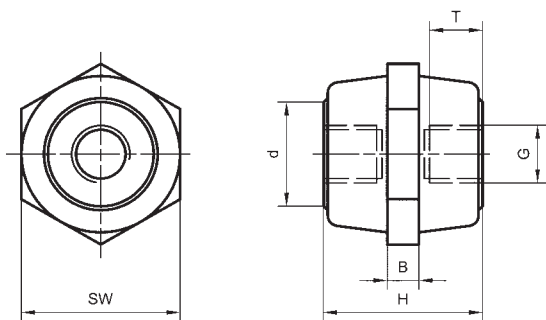
High heat resistant standoff insulators

For applications which require a continuously heat resistance up to ca. + 220° C we offer standoff insulators in special design. The material is Polyphenylensulfide with 40 % fibre glass (PPS GF 40) in a black colour. The behaviour in case of fire is in accordance with the UL 94 class V-0. Please contact us for further information.

Standoff insulators 1-3 kV made out of polyester resin material (UPE)

with spanner flat for indoor applications

Standoff insulators manufactured out of a glass fibre reinforced unsaturated polyester resin (UPE). The characteristic of the material is in accordance with DIN 16911 type 803. The compound is free of halogen with an excellent behaviour in case of fire (UL 94 V-0) and a very good strength of shape.



Technical data of the material

- Strength of shape ISO 75 + 250° C
- Behaviour in case of fire UL 94 Class V-0
- Density ISO 1183 Ca. 1,80 g/ccm
- Special throughout resistance IEC 60093 10¹⁰ Ohm
- Dielectric strength IEC 60243 20-30 kV/mm
- Deposit tracking IEC 60112 CTI 600
- Colour brown
- Inserts steel zinc coated
- Temperature range - 40° C up to + 130° C

Part-No.	dimensions mm												weight
	H	SW	G	T	d	B	Md/Nm	F/kN	Z/kN	D/kN	BWS/kV	PWS/kV	kg/% pcs.
06135	18	15	M 4	6	11	-	3	1,0	2	12	1,0	5	0,70
06138	20	20	M 5	7	14	5	6	1,3	3	20	1,0	5	1,20
06140	25	25	M 6	8	16	6	15	2,0	5	35	1,0	10	2,40
06143	30	30	M 6	8	20	6	20	2,5	6	45	1,5	15	3,80
06144			M 8	9			40	4,0	12	60			5,40
06147	35	30	M 6	8	20	6	20	2,0	6	45	1,5	15	4,50
06148			M 8	9			40	3,5	12	60			6,00
06149			M10	9			50	4,0	16	75			7,00
06152	40	30	M 6	8	20	6	20	1,5	6	45	2,0	20	5,00
06153			M 8	9			40	3,0	12	60			6,60
06156	40	40	M 8	9	28	8	50	6,0	14	90	2,0	20	10,00
06157			M10	14			90	8,0	20	100			12,00
06158			M12	14			100	10,0	22	120			13,50
06161	40	50	M10	14	32	8	120	12,5	23	140	2,0	20	16,00
06162			M12	14			200	14,0	28	180			17,00
06165	50	40	M 8	9	28	8	50	5,0	14	90	3,0	25	12,00
06166			M10	14			90	7,0	20	100			14,00
06167			M12	16			100	8,5	22	120			16,00
06170	50	50	M10	14	32	10	120	11,0	23	140	3,0	25	20,00
06171			M12	16			200	13,0	28	180			21,50
06174	60	40	M 8	9	28	8	50	4,0	14	90	3,0	25	14,00
06175			M10	14			90	6,0	20	100			16,00
06178	60	50	M10	14	32	10	120	9,0	23	140	3,0	25	23,00
06179			M12	16			200	11,0	28	180			25,00
06182	60	60	M12	16	40	12	200	15,0	32	220	3,0	25	33,00
06183			M16	20			300	18,0	37	240			35,00
06186	80	60	M12	16	40	12	200	11,0	32	220	3,0	25	41,00
06187			M16	20			300	15,0	37	240			43,00

Part-No. 06135 cylindrical design without spanner flat

SW = wrench size

Z = tensile force

PWS = testing voltage (AC)

Md = torque

D = compressive force

F = rated load Limit on Upper insulator edge

BWS = operating voltage (AC)

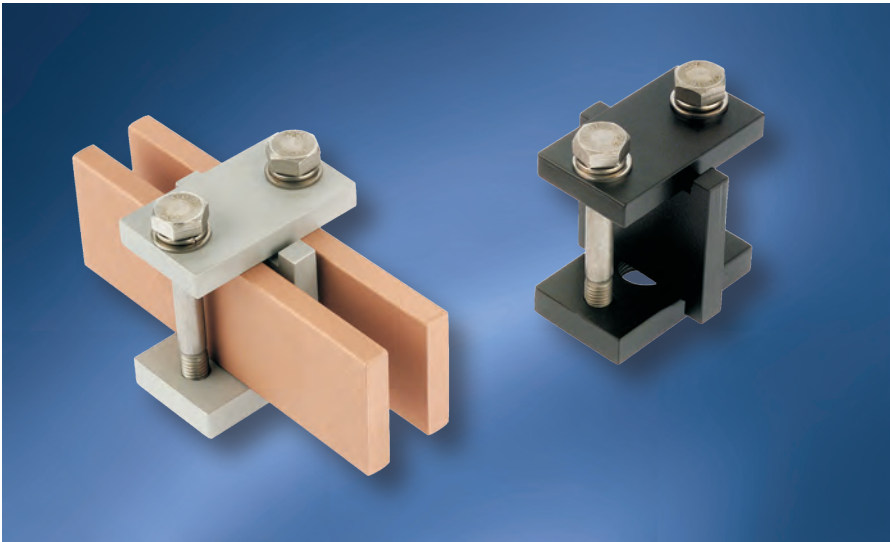
Busbar holders

for vertical busbar laying
and mounting on insulators

Busbar holders for clamping of one or two
short busbars securely in the holder.

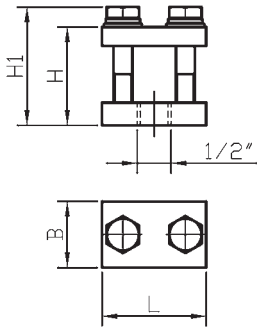
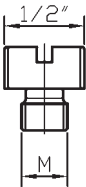
Type A: Suitable for aluminium-bars.
Material of the holder AlMgSi 1,0.
Fastening material stainless-steel.

Type B: Suitable for copper-bars or outdoor
installations.
Material of the holder AlMgSi 1,0 with coated
surface. Fastening material stainless-steel.

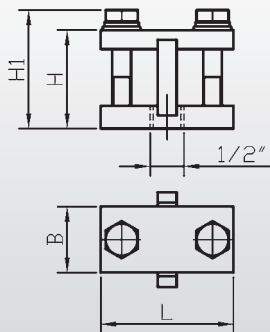


Deliverable threaded reducing-nipples made
out of stainless-steel:

Part-No.	
16020	M 8
16021	M 10
16022	M 12
16023	M 16



Part-No.		technical data						
type A	type B	number	bar-width	thickness	L	dimensions mm		
						B	H	H ₁
15900	15920	1	30	3 - 20	55	35	52	63
15901	15921	1	40	3 - 20	55	35	62	73
15902	15922	1	50	5 - 20	55	40	72	83
15903	15923	1	60	5 - 20	55	40	82	93
15904	15924	1	80	5 - 20	55	40	107	118
15905	15925	1	100	5 - 20	65	50	127	140
15908	15926	1	120	5 - 20	85	50	147	160



Part-No.		technical data						
type A	type B	number	bar-width	thickness	L	dimensions mm		
						B	H	H ₁
15910	15930	2	30	3 - 10	70	35	52	63
15911	15931	2	40	3 - 10	70	35	62	73
15912	15932	2	50	5 - 10	70	40	72	83
15913	15933	2	60	5 - 10	70	40	82	93
15914	15934	2	80	5 - 10	70	40	107	118
15915	15935	2	100	5 - 10	80	50	127	140
15916	15936	2	120	5 - 10	80	50	147	160

Busbar holders

for vertical busbar laying
and mounting on insulators

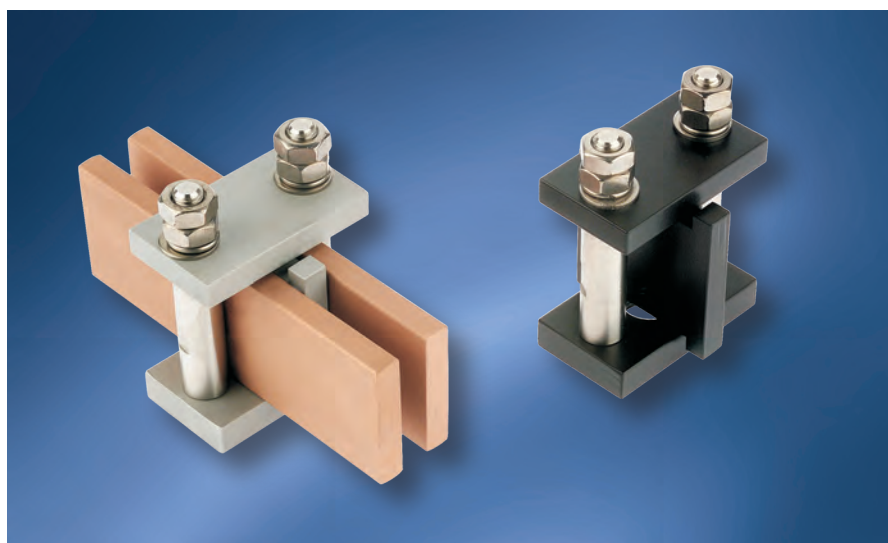
Busbar supports for use as sliding support for long busbars which must slide in the holder to allow the thermal expansion.

By using this design the lower part of the holder is fastened to the support by means of the stay bolts prior to assembly.

Now a simple insertion of the busbars between the stay bolts is possible and a time saving assembly is realized.

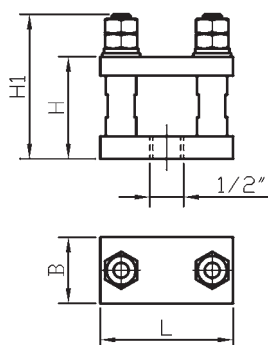
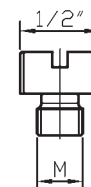
Type A: Suitable for aluminium-bars.
Material of the holder AlMgSi 1,0.
Fastening material stainless-steel.

Type B: Suitable for copper-bars or outdoor installations.
Material of the holder AlMgSi 1,0 with coated surface.
Fastening material stainless-steel.

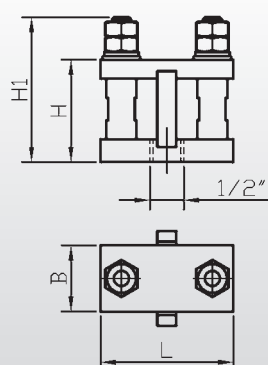


Deliverable threaded reducing-nipples made out of stainless-steel:

Part-No.	
16020	M 8
16021	M 10
16022	M 12
16023	M 16



Part-No.		technical data						
type A	type B	number	bar-width	thickness	L	dimensions mm		
						B	H	H ₁
16420	16540	1	30	3 - 20	70	35	54	77
16421	16541	1	40	3 - 20	70	35	64	87
16422	16542	1	50	5 - 20	70	40	74	97
16423	16543	1	60	5 - 20	70	40	84	107
16424	16544	1	80	5 - 20	70	40	109	132
16425	16545	1	100	5 - 20	80	50	129	157
16426	16546	1	120	5 - 20	80	50	149	177



Part-No.		technical data						
type A	type B	number	bar-width	thickness	L	dimensions mm		
						B	H	H ₁
16430	16550	2	30	3 - 10	70	35	54	77
16431	16551	2	40	3 - 10	70	35	64	87
16432	16552	2	50	5 - 10	70	40	74	97
16433	16553	2	60	5 - 10	70	40	84	107
16434	16554	2	80	5 - 10	70	40	109	132
16435	16555	2	100	5 - 10	80	50	129	157
16436	16556	2	120	5 - 10	80	50	149	177

Busbar holders

for horizontal busbar laying
and mounting on insulators

Busbar holders for clamping of one or two
short busbars securely in the holder.

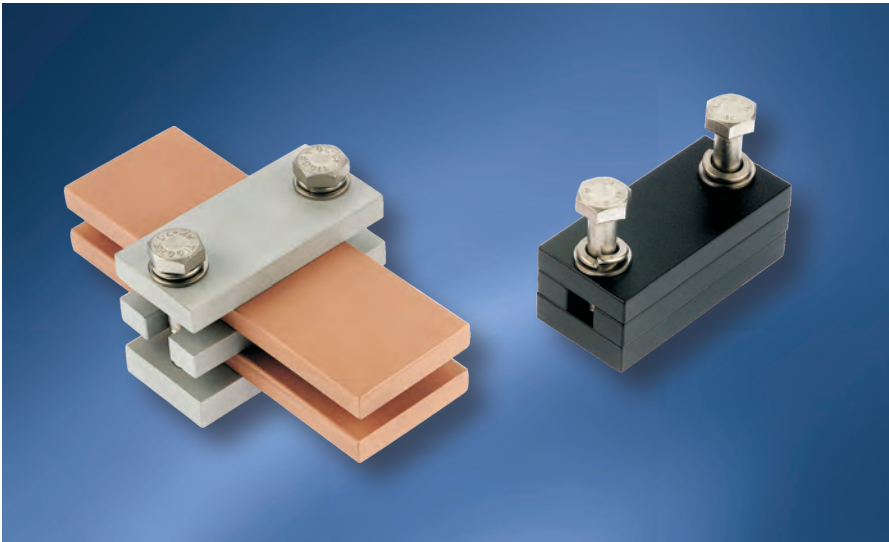
Type A: Suitable for aluminium-bars.

Material of the holder AlMgSi 1,0.

Fastening material stainless-steel.

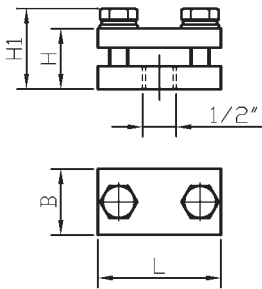
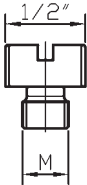
Type B: Suitable for copper-bars or outdoor
installations.

Material of the holder AlMgSi 1,0 with coated
surface. Fastening material stainless-steel.

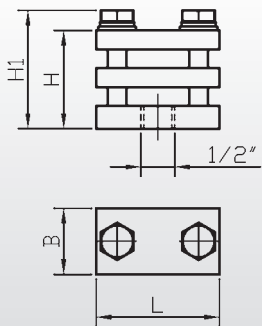


Deliverable threaded reducing-nipples made
out of stainless-steel:

Part-No.	
16020	M 8
16021	M 10
16022	M 12
16023	M 16



Part-No.		technical data						
type A	type B	number	bar-width	thickness	L	dimensions mm		
						B	H	H ₁
15960/5	15980/5	1	30	5	65	35	27	38
15960/10	15980/10	1	30	10	65	35	32	43
15961/5	15981/5	1	40	5	75	35	27	38
15961/10	15981/10	1	40	10	75	35	32	43
15962/5	15982/5	1	50	5	85	40	27	38
15962/10	15982/10	1	50	10	85	40	32	43
15963/5	15983/5	1	60	5	95	40	27	38
15963/10	15983/10	1	60	10	95	40	32	43
15964/5	15984/5	1	80	5	115	40	27	38
15964/10	15984/10	1	80	10	115	40	32	43
15965/5	15985/5	1	100	5	145	50	35	48
15965/10	15985/10	1	100	10	145	50	40	53
15966/10	15986/10	1	120	10	165	50	40	53



Part-No.		technical data						
type A	type B	number	bar-width	thickness	L	dimensions mm		
						B	H	H ₁
15970/5	15990/5	2	30	5	65	35	27	38
15970/10	15990/10	2	30	10	65	35	32	43
15971/5	15991/5	2	40	5	75	35	27	38
15971/10	15991/10	2	40	10	75	35	32	43
15972/5	15992/5	2	50	5	85	40	27	38
15972/10	15992/10	2	50	10	85	40	32	43
15973/5	15993/5	2	60	5	95	40	27	38
15973/10	15993/10	2	60	10	95	40	32	43
15974/5	15994/5	2	80	5	115	40	27	38
15974/10	15994/10	2	80	10	115	40	32	43
15975/5	15995/5	2	100	5	145	50	35	48
15975/10	15995/10	2	100	10	145	50	40	53
15976/10	15996/10	2	120	10	165	50	40	53

Busbar holders

for horizontal busbar laying
and mounting on insulators

Busbar supports for use as sliding support for long busbars which must slide in the holder to allow the thermal expansion. By using this design the lower part of the holder is fastened to the support by means of the stay bolts prior to assembly. Now a simple insertion of the busbars between the stay bolts is possible and a time saving assembly is realized.

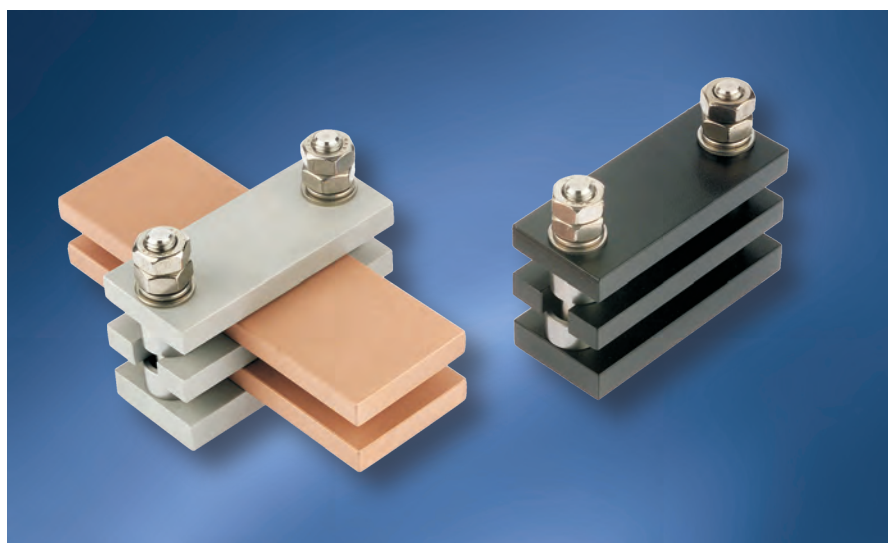
Type A: Suitable for aluminium-bars.

Material of the holder AlMgSi 1,0.

Fastening material stainless-steel.

Type B: Suitable for copper-bars or outdoor installations.

Material of the holder AlMgSi 1,0 with coated surface. Fastening material stainless-steel.



Deliverable threaded reducing-nipples made out of stainless-steel:

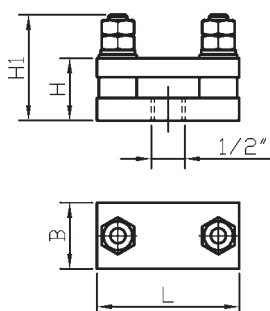
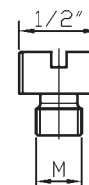
Part-No.

16020 M 8

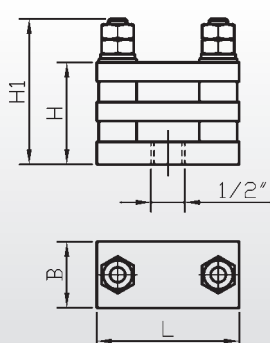
16021 M 10

16022 M 12

16023 M 16



Part-No.		technical data						
type A	type B	number	bar-width	thickness	L	dimensions mm		
						B	H	H ₁
16470/5	16580/5	1	30	5	75	35	28	56
16470/10	16580/10	1	30	10	75	35	33	56
16471/5	16581/5	1	40	5	85	40	28	56
16471/10	16581/10	1	40	10	85	40	33	56
16472/5	16582/5	1	50	5	95	40	28	56
16472/10	16582/10	1	50	10	95	40	33	56
16473/5	16583/5	1	60	5	105	40	28	56
16473/10	16583/10	1	60	10	105	40	33	56
16474/5	16584/5	1	80	5	135	50	36	69
16474/10	16584/10	1	80	10	135	50	41	69
16475/5	16585/5	1	100	5	155	50	36	69
16475/10	16585/10	1	100	10	155	50	41	69
16476/10	16586/10	1	120	10	175	50	41	69



Part-No.		technical data						
type A	type B	number	bar-width	thickness	L	dimensions mm		
						B	H	H ₁
16480/5	16590/5	2	30	5	75	35	44	77
16480/10	16590/10	2	30	10	75	35	54	77
16481/5	16591/5	2	40	5	85	40	44	77
16481/10	16591/10	2	40	10	85	40	54	77
16482/5	16592/5	2	50	5	95	40	44	77
16482/10	16592/10	2	50	10	95	40	54	77
16483/5	16593/5	2	60	5	105	40	44	77
16483/10	16593/10	2	60	10	105	40	54	77
16484/5	16594/5	2	80	5	135	50	52	90
16484/10	16594/10	2	80	10	135	50	62	90
16485/5	16595/5	2	100	5	155	50	52	90
16485/10	16595/10	2	100	10	155	50	62	90
16486/10	16596/10	2	120	10	175	50	62	90

Busbar supports

type tested acc. to VDE 0660 part 500,
operating voltage 1 kV AC, temperature range - 40° C up to + 130° C

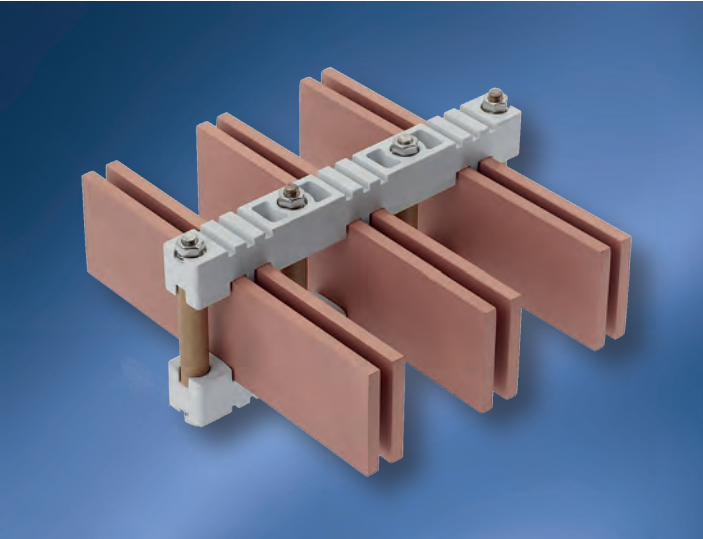
Busbar supports made out of glass fibre reinforced unsaturated polyester (UPE) similar to DIN 16911 type 803. Free of halogen, in light grey colour. Three-phase supports, phasing-distance 100 mm (Part-No. 15645), resp. 125 mm (Part-No. 15646). Two-phase supports with a phasing-distance of 70 mm (Part-No. 15647) suitable for N- and PE-bars. The supports offer a vertical clamping of busbars with a thickness of 5 mm or 10 mm resp. 10 mm or 12,7 mm (1/2 "). The adjustment of the height can be regulated by the length of the distance bushings.

Part-No. 15645

Busbar supports, phasing-distance 100 mm. For two busbars with a thickness of 10 mm or three busbars with a thickness of 5 mm per phase. The values for the short-circuit-strength and the necessary support distances are listed on page 32.

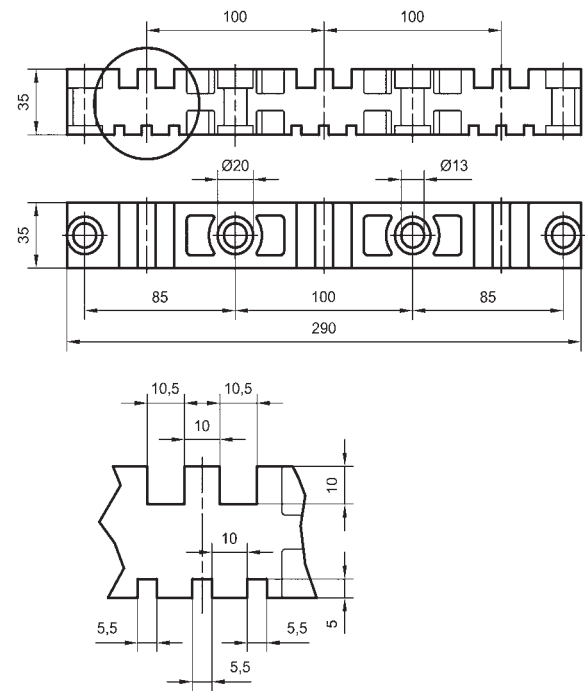
Part-No. 15639

Distance bushings length 1 m in a paper laminate.



Technical data of the material

• Deformation resistance	ISO 75	+ 250° C
• Behaviour in case of fire	UL 94	Class V-0
• Density	ISO 1183	Ca. 1,80 g/ccm
• Special throughout resistance	IEC 60093	10 ¹⁰ Ohm
• Dielectric strength	IEC 60243	20-30 kV/mm
• Deeposit tracking	IEC 60112	CTI 600

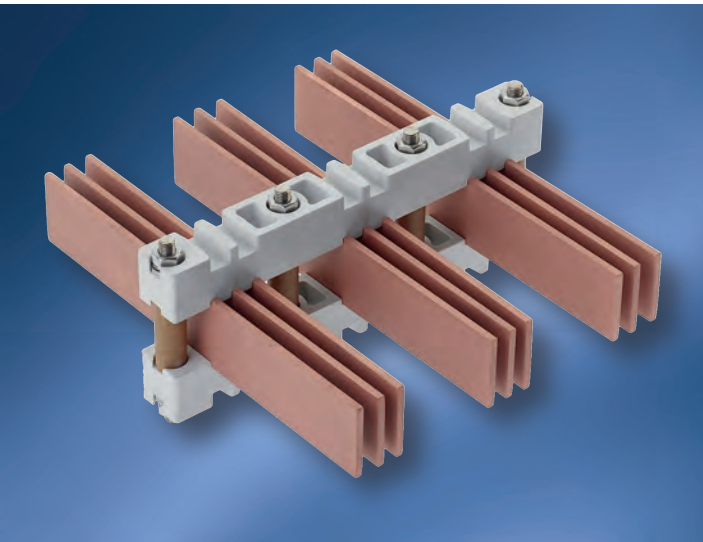


Current load

AC up to 60 Hz

E-copper bars dimensions mm	continuously current load by no. of busbars		
	1	2	3
20 x 5	320 A	590 A	210 A
30 x 5	445 A	790 A	1050 A
40 x 5	565 A	980 A	1280 A
50 x 5	685 A	1170 A	1475 A
20 x 10	500 A	965 A	-
30 x 10	670 A	1240 A	-
40 x 10	840 A	1510 A	-
50 x 10	1000 A	1770 A	-
60 x 10	1155 A	2015 A	-
80 x 10	1450 A	2470 A	-
100 x 10	1745 A	2900 A	-
120 x 10	2035 A	3350 A	-
160 x 10	2700 A	4350 A	-

All values in acc. with DIN 43671 by an ambient temperature of + 35° C and a busbar temperature of + 75° C



Busbar supports

type tested acc. to VDE 0660 part 500,

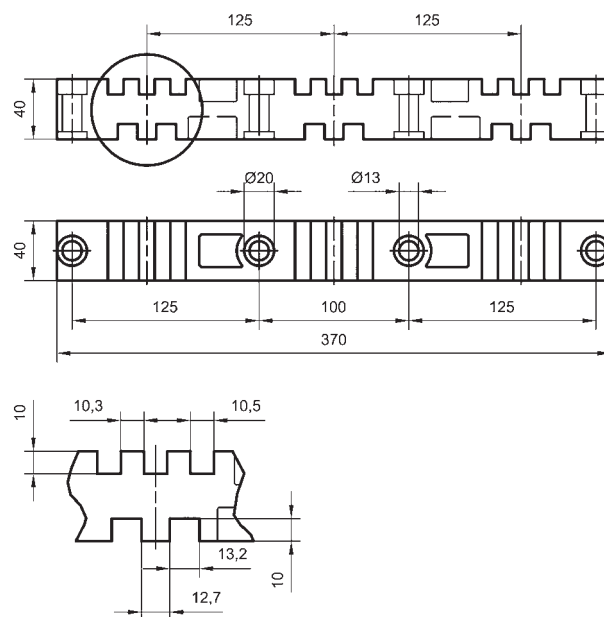
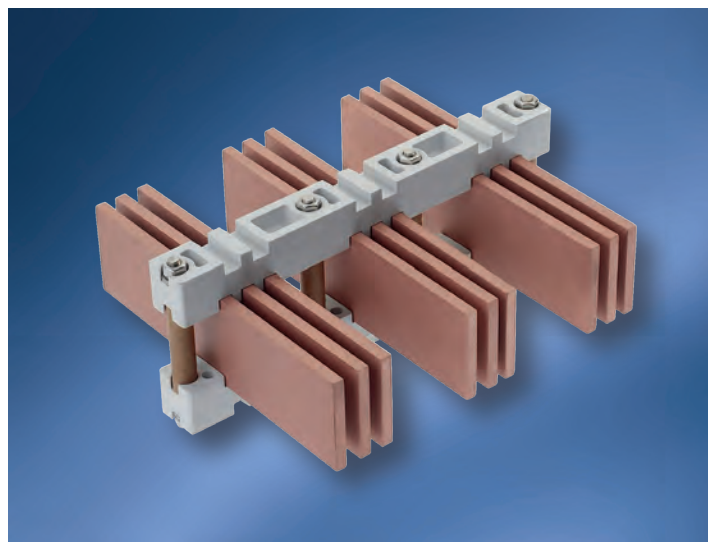
operating voltage 1 kV AC, temperature range - 40° C up to + 130° C

Part-No. 15646

Busbar supports, phasing-distance 125 mm. For three busbars with a thickness of 10 mm or two busbars with a thickness of 12,7 mm (1/2 ") per phase. The values for the short-circuit-strength and the necessary support distances are listed on page 32.

Part-No. 15639

Distance bushings length 1 m in paper laminate.



Current load

AC up to 60 Hz

E-copper bars dimensions mm	continuously current load by no. of busbars		
	1	2	3
40 x 10	840 A	1510 A	2070 A
50 x 10	1000 A	1770 A	2390 A
60 x 10	1155 A	2015 A	2690 A
80 x 10	1450 A	2470 A	3265 A
100 x 10	1745 A	2900 A	3815 A
120 x 10	2035 A	3350 A	4375 A
160 x 10	2700 A	4350 A	5500 A

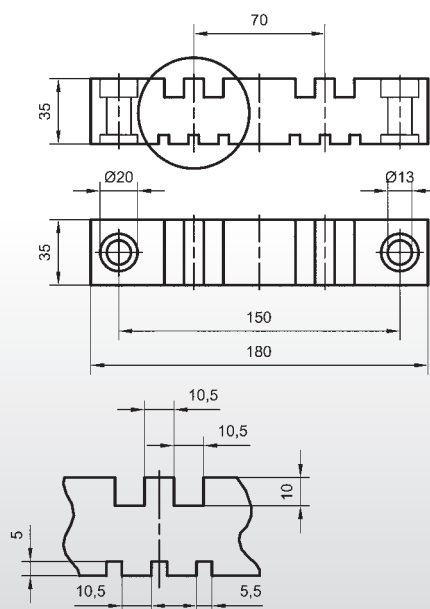
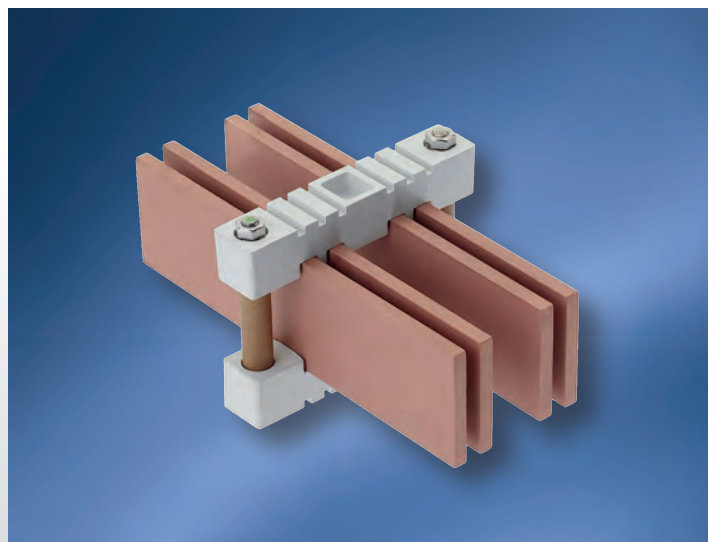
All values in acc. with DIN 43671 by an ambient temperature of + 35° C and a busbar temperature of + 75° C

Part-No. 15647

Busbar supports, phasing distance 70 mm for N + PE bars, suitable for 2 busbars with a thickness of 10 mm or 3 busbars with a thickness of 5 mm per phase.

Part-No. 15639

Distance bushings length 1 m in paper laminate.



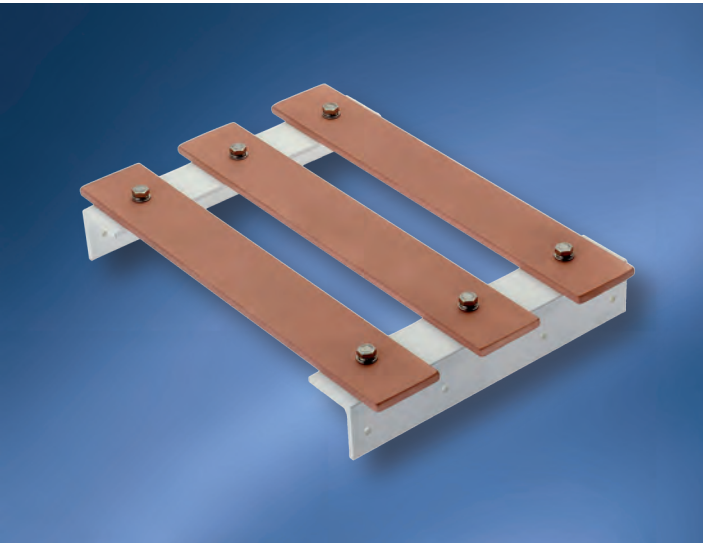
Busbar supports in L-shaped design

type tested acc. to VDE 0660 part 500,
operating voltage 1 kV AC, temperature range - 40 up to + 130° C

Busbar supports in L-shaped design made out of glass fibre reinforced unsaturated polyester (UPE). Suitable for a horizontal laying of busbars with a thickness of 10 mm. When working with two busbars per phase it is necessary to assemble an adapter-piece between the bars.

Part-No. 15610

Busbar supports in L-shaped design, phasing-distance 100 mm with one screw connection M8 per phase. Suitable for 1 or 2 busbars with a thickness of 10 mm per phase. The values for the short-circuit-strength and the necessary support-distances are listed on page 33.



Technical data of the material

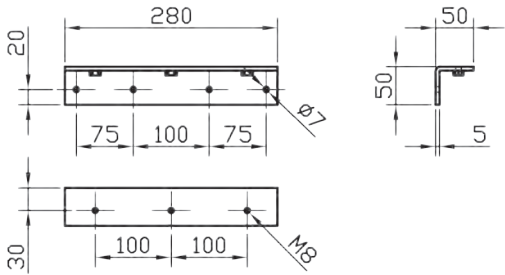
Deformation resistance HDT-A	ISO 75	+ 250° C
Density	ISO 1183	ca. 1,70 g/cm³
Behaviour in case of fire	UL 94	class HB
Special throughout resistance	IEC 60093	10 ¹² Ohm
Dielectric strength	IEC 60243	20-30 kV/mm
Deposit tracking	IEC 60112	CTI 600

Current load

AC up to 60 Hz

E-copper bars dimensions mm	continuously current load by no. of busbars	
	1	2
30 x 10	670 A	1240 A
40 x 10	840 A	1510 A
50 x 10	1000 A	1770 A
60 x 10	1155 A	2015 A
80 x 10	1450 A	2470 A

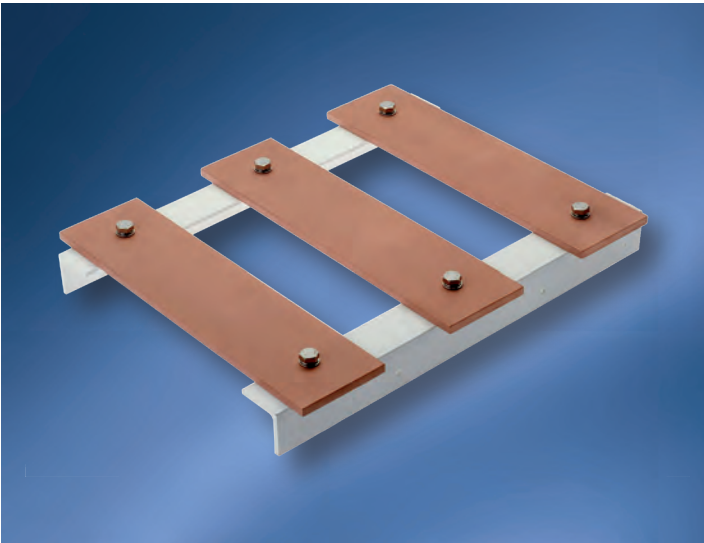
All values in acc. with DIN 46371 by an ambient temperature of + 35° C and a busbar temperature of + 75° C.



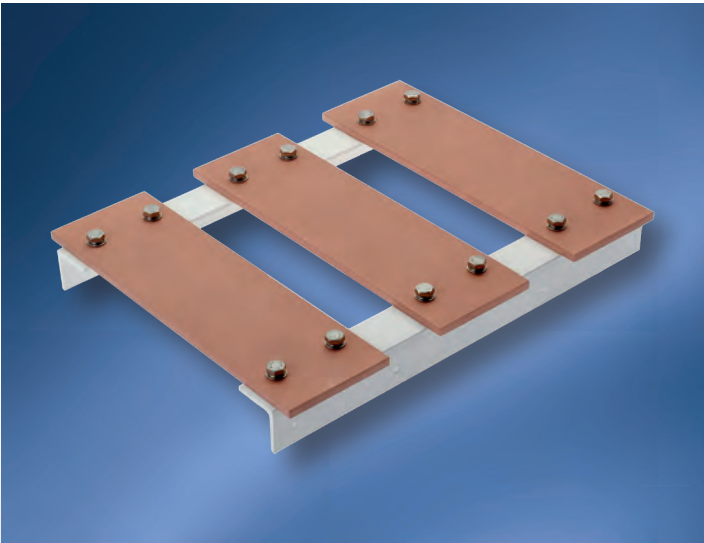
Busbar supports in L-shaped design

type tested acc. to VDE 0660 part 500,
operating voltage 1 kV AC, temperature range - 40° C up to + 130° C

Part-No. 15612
Busbar supports in L-shaped design, phasing-distance 185 mm with one screw connection M10 per phase. Suitable for 1 or 2 busbars with a thickness of 10 mm per phase. The values for the short-circuit- strength and the necessary support-distances are listed on page 33.



Part-No. 15613
Busbar supports in L-shaped design, phasing-distance 185 mm with two screw connections M10 per phase. Suitable for 1 or 2 busbars with a thickness of 10 mm per phase. The values for the short-circuit-strength and the necessary support-distances are listed on page 33.

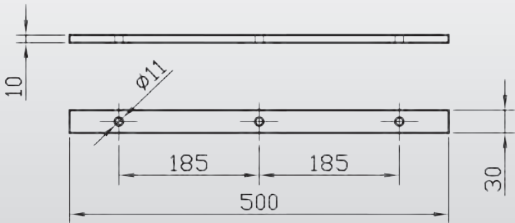
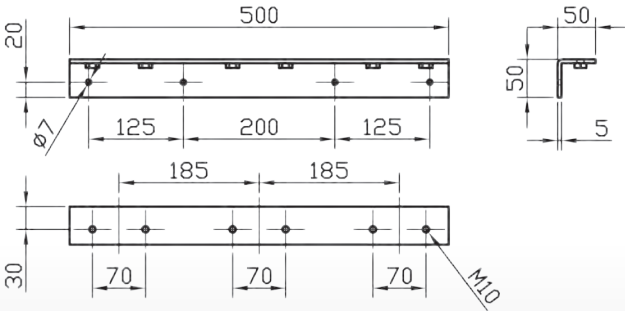
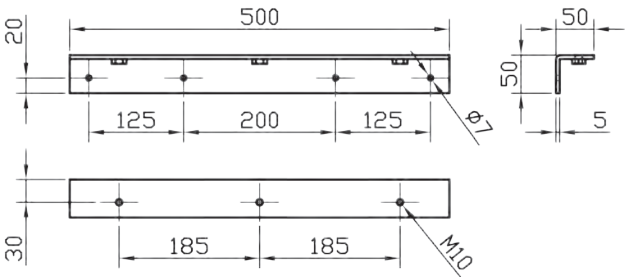


Part-No. 15615
Spacing strip working with two copper bars per phase as well as when working with longer bars.

Current load
AC up to 60 Hz

E-copper bars dimensions mm	continuously current load by no. of busbars	
	1	2
15612		
30 x 10	670 A	1240 A
40 x 10	840 A	1510 A
50 x 10	1000 A	1770 A
60 x 10	1155 A	2015 A
80 x 10	1450 A	2470 A
15612 + 15613		
100 x 10	1745 A	2900 A
120 x 10	2035 A	3350 A
160 x 10	2700 A	4350 A

All values in acc. with DIN 46371 by an ambient temperature of + 35° C and a busbar temperature of + 75° C.



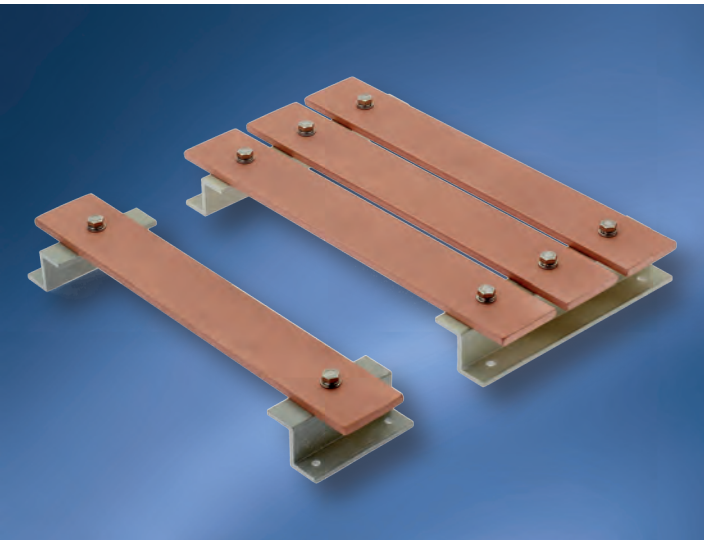
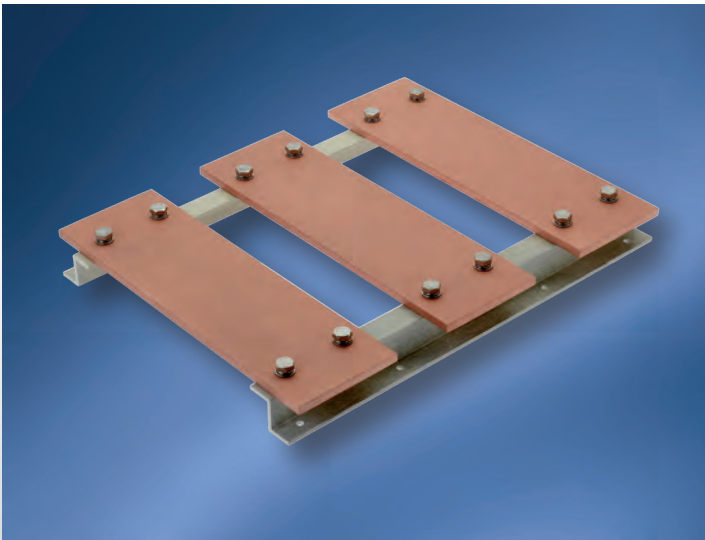
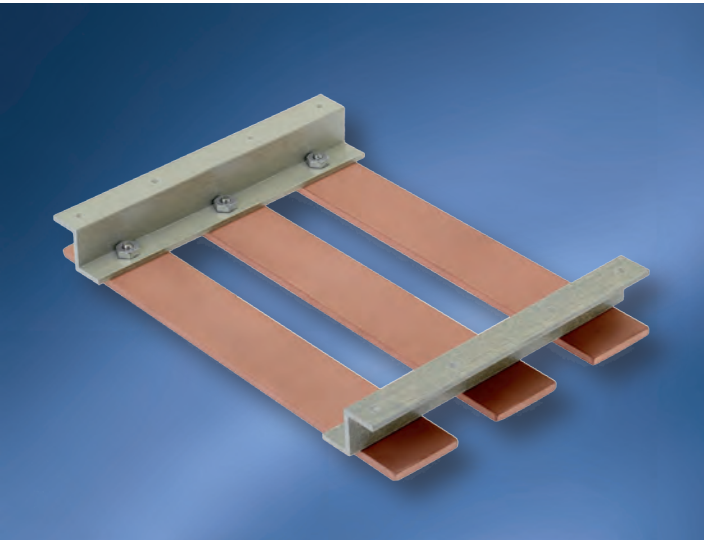
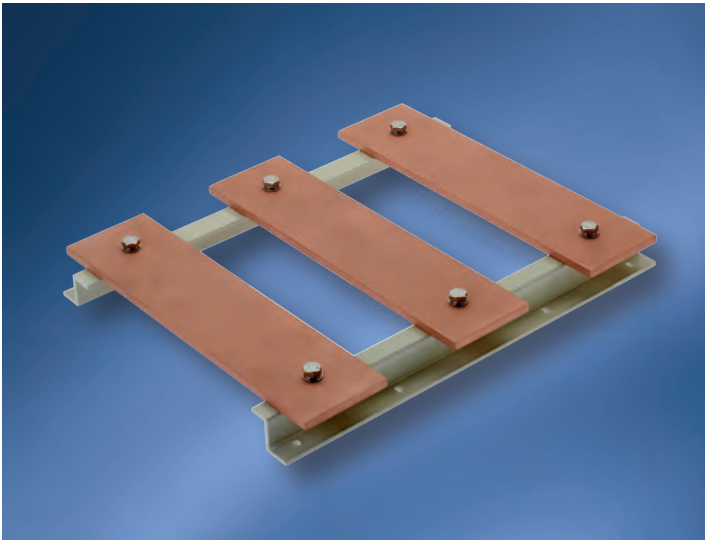
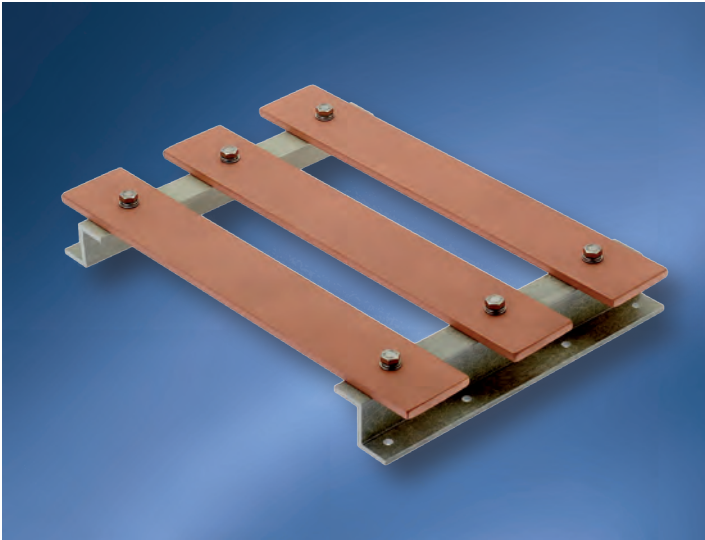
Busbar supports in Z-shaped design

type tested acc. to VDE 0660 Part 500,
operating voltage 1kV AC, temperature range - 40° C up to + 130 ° C

Busbar supports in Z-shaped design, made out of glass fibre reinforced unsaturated polyester (UPE). Suitable for a horizontal laying of busbars with a thickness of 10 mm. When working with two busbars per phase it is necessary to assemble an adapter-piece between the bars.

Technical data of the material

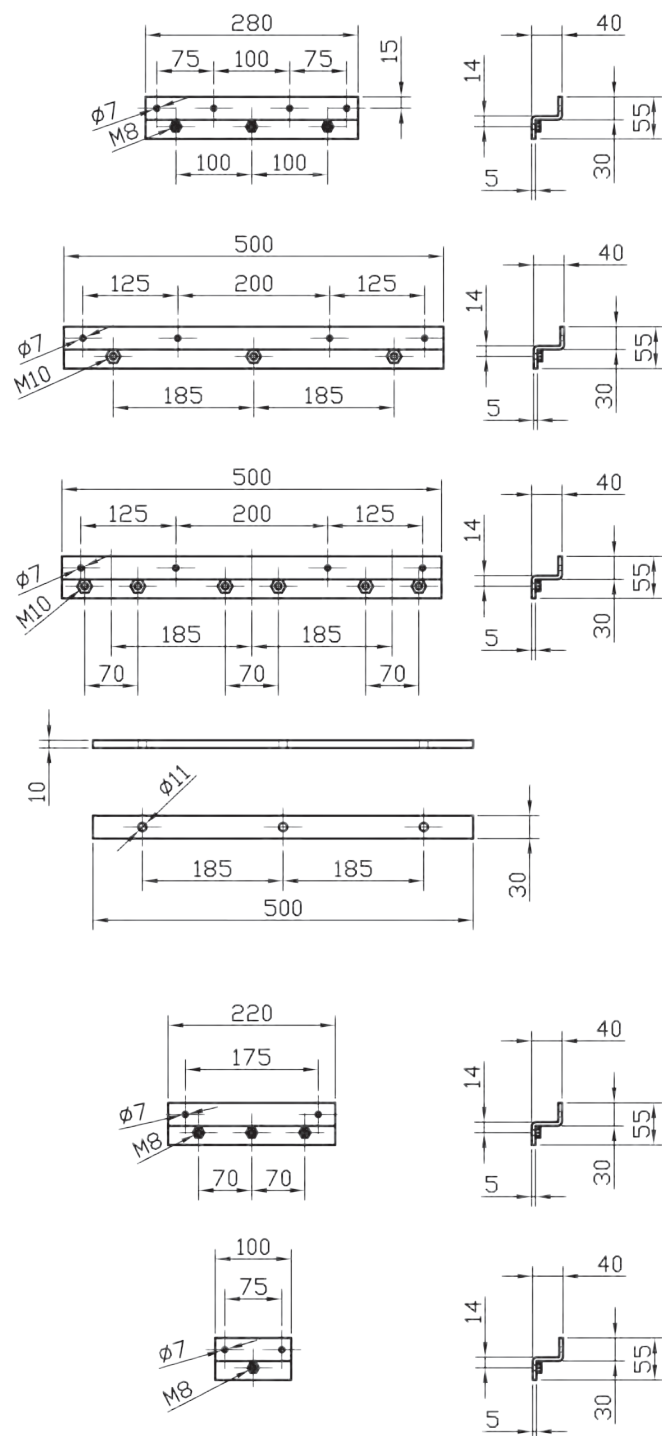
Deformation resistance HDT-A	ISO 75	+ 250° C
Density	ISO 1183	ca. 1,70 g/cm³
Behaviour in case of fire	UL 94	class HB
Special throughout resistance	IEC 60093	10 ¹² Ohm x cm
Dielectric strength	IEC 60243	20-30 kV/mm
Deposit tracking	IEC 60112	CTI 600



Busbar supports in Z-shaped design

type tested acc. to VDE 0660 part 500,

operating voltage 1 kV AC, temperature range - 40° C up to + 130° C



Part-No. 15617

Busbar supports in Z-shaped design, phasing-distance 100 mm with **one screw connection M8** per phase. Suitable for 1 or 2 busbars with a thickness of 10 mm per phase. The values for the short-circuit-strength and the necessary support-distances are listed on page 34.

Part-No. 15619

Busbar supports in Z-shaped design, phasing-distance 185 mm with **one screw connection M10** per phase. Suitable for 1 or 2 busbars with a thickness of 10 mm per phase. The values for the short-circuit-strength and the necessary support-distances are listed on page 34.

Part-No. 15620

Busbar supports in Z-shaped design, phasing-distance 185 mm with **two screw connections M10** per phase. Suitable for 1 or 2 busbars with a thickness of 10 mm per phase. The values for the short-circuit-strength and the necessary support-distances are listed on page 34.

Part-No. 15615

Spacing strip when working with two copper bars per phase as well as when working with longer bars.

Part-No. 15622

Three pole busbar support for N and PE bars.

Part-No. 15623

One pole busbar support for N and PE bars

Current load

AC up to 60 Hz when using our support Part-No. 15619/15620

E-copper bars dimensions mm	continuously current load by no. of busbars	
	1	2
15619		
30 x 10	670 A	1240 A
40 x 10	840 A	1510 A
50 x 10	1000 A	1770 A
60 x 10	1155 A	2015 A
80 x 10	1450 A	2470 A
15619 + 15620		
100 x 10	1745 A	2900 A
120 x 10	2035 A	3350 A
160 x 10	2700 A	4350 A
All values in acc. with DIN 43671 by an ambient temperature of + 35° C and a busbar temperature of + 75° C.		

Current load

AC up to 60 Hz when using our support Part-No. 15617

E-copper bars dimensions mm	continuously current load by no. of busbars	
	1	2
30 x 10	670 A	1240 A
40 x 10	840 A	1510 A
50 x 10	1000 A	1770 A
60 x 10	1155 A	2015 A
80 x 10	1450 A	2470 A
All values in acc. with DIN 43671 by an ambient temperature of + 35° C and a busbar temperature of + 75° C.		

Technical appendix

short circuit-values/support-distances

Busbar supports, Part-No. 15645

phasing-distance 100 mm, fixed with 4 screws M12

E-copper bars		max. support-distance mm											
no. and dimensions	rated current	low up to lpk up to	10 kA 21 kA	15 kA 32 kA	20 kA 42 kA	25 kA 53 kA	30 kA 63 kA	40 kA 84 kA	50 kA 105 kA	60 kA 132 kA	65 kA 143 kA	70 kA 154 kA	80 kA 176 kA
1 x 20 x 5	320 A		610	390	300	230	200						
2 x 20 x 5	590 A		860	560	420	330	280	210					
3 x 20 x 5	810 A		1060	690	520	410	340	260	200				
1 x 30 x 5	445 A		750	480	370	290	240						
2 x 30 x 5	790 A		1060	690	520	410	340	260	200				
3 x 30 x 5	1050 A		1200	840	640	500	420	310	250	200			
1 x 40 x 5	565 A		860	560	420	330	280	210					
2 x 40 x 5	980 A		1200	790	600	470	400	300	240				
3 x 40 x 5	1280 A		1200	970	740	580	490	360	290	230	215	200	
1 x 50 x 5	685 A		980	630	470	370	310	230					
2 x 50 x 5	1170 A		1200	890	670	530	450	330	260	210			
3 x 50 x 5	1475 A		1200	1090	830	650	550	410	320	260	240	220	
1 x 20 x 10	500 A		1200	790	600	470	400	300	240				
2 x 20 x 10	965 A		1200	1130	850	670	560	420	340	270	250	230	200
1 x 30 x 10	670 A		1200	970	740	580	490	360	290	230	210	200	
2 x 30 x 10	1240 A		1200	1200	1050	830	690	520	400	330	300	280	220
1 x 40 x 10	840 A		1200	1130	850	670	560	420	340	270	250	230	200
2 x 40 x 10	1510 A		1200	1200	1200	950	800	600	480	380	340	290	220
1 x 50 x 10	1000 A		1200	1200	950	750	630	470	380	300	270	250	220
2 x 50 x 10	1770 A		1200	1200	1200	1200	900	670	530	400	340	290	220
1 x 60 x 10	1155 A		1200	1200	1050	830	690	520	400	330	300	280	220
2 x 60 x 10	2015 A		1200	1200	1200	1200	980	730	580	400	340	290	220
1 x 80 x 10	1450 A		1200	1200	1200	950	800	600	480	380	340	290	220
2 x 80 x 10	2470 A		1200	1200	1200	1200	1130	850	630	400	340	290	220
1 x 100 x 10	1745 A		1200	1200	1200	1200	900	670	530	400	340	290	220
2 x 100 x 10	2900 A		1200	1200	1200	1200	1200	980	630	400	340	290	220
1 x 120 x 10	2035 A		1200	1200	1200	1200	980	730	580	400	340	290	220
2 x 120 x 10	3350 A		1200	1200	1200	1200	1200	980	630	400	340	290	220
1 x 160 x 10	2700 A		1200	1200	1200	1200	1130	850	630	400	340	290	220
2 x 160 x 10	4350 A		1200	1200	1200	1200	1200	980	630	400	340	290	220

Busbar supports Part-No. 15646

Phasing-distance 125 mm, fixed with 4 screws M12

E-copper bars		max. support-distance mm											
no. and dimensions	rated current	low up to lpk up to	15 kA 32 kA	20 kA 42 kA	25 kA 53 kA	30 kA 63 kA	40 kA 84 kA	50 kA 105 kA	60 kA 132 kA	65 kA 143 kA	70 kA 154 kA	80 kA 176 kA	100 kA 220 kA
1 x 40 x 10	840 A		1200	940	750	630	470	380	300	270	260	220	
2 x 40 x 10	1510 A		1200	1200	1070	900	670	530	420	390	360	320	250
3 x 40 x 10	2070 A		1200	1200	1200	1100	820	650	520	480	440	390	270
1 x 50 x 10	1060 A		1200	1070	840	710	530	420	330	310	280	250	200
2 x 50 x 10	1770 A		1200	1200	1190	1000	750	600	470	440	400	350	270
3 x 50 x 10	2390 A		1200	1200	1200	1200	920	730	580	540	500	430	270
1 x 60 x 10	1155 A		1200	1170	920	770	580	460	370	340	310	270	220
2 x 60 x 10	2015 A		1200	1200	1200	1100	820	650	520	480	440	390	270
3 x 60 x 10	2690 A		1200	1200	1200	1200	1010	800	640	590	540	430	270
1 x 80 x 10	1450 A		1200	1200	1070	900	670	530	420	390	360	320	250
2 x 80 x 10	2470 A		1200	1200	1200	1200	950	760	600	550	510	430	270
3 x 80 x 10	3265 A		1200	1200	1200	1200	1160	930	740	650	560	430	270
1 x 100 x 10	1745 A		1200	1200	1190	1000	750	600	470	440	400	350	270
2 x 100 x 10	2900 A		1200	1200	1200	1200	1060	850	670	620	560	430	270
3 x 100 x 10	3815 A		1200	1200	1200	1200	1200	1040	760	650	560	430	270
1 x 120 x 10	2035 A		1200	1200	1200	1100	820	650	520	480	440	390	270
2 x 120 x 10	1200 A		1200	1200	1200	1200	1160	930	740	650	560	430	270
3 x 120 x 10	4375 A		1200	1200	1200	1200	1200	1140	760	650	560	430	270
1 x 160 x 10	2700 A		1200	1200	1200	1200	950	760	600	550	510	430	270
2 x 160 x 10	4350 A		1200	1200	1200	1200	1200	1070	760	650	560	430	270
3 x 160 x 10	5500 A		1200	1200	1200	1200	1200	1200	760	650	560	430	270

Technical appendix

short circuit-values/support-distances

Busbar supports L-shaped design, Part-No. 15610

phasing-distance 100 mm, fixed with 1 x M8 per phase

E-copper bars		max. support-distance mm						
no. and dimensions	rated current	low up to 10 kA I _{pk} up to 21 kA	15 kA 32 kA	20 kA 42 kA	25 kA 53 kA	30 kA 63 kA	40 kA 84 kA	50 kA 105 kA
1 x 30 x 10	670 A	1200	1200	1200	1010	770	430	270
2 x 30 x 10	1240 A	1200	1200	1200	1100	770	430	270
1 x 40 x 10	840 A	1200	1200	1200	1100	770	430	270
2 x 40 x 10	1200 A	1200	1200	1200	1100	770	430	270
1 x 50 x 10	1000 A	1200	1200	1200	1100	770	430	270
2 x 50 x 10	1770 A	1200	1200	1200	1100	770	430	270
1 x 60 x 10	1155 A	1200	1200	1200	1100	770	430	270
2 x 60 x 10	2015 A	1200	1200	1200	1100	770	430	270
1 x 80 x 10	1450 A	1200	1200	1200	1100	770	430	270
2 x 80 x 10	2470 A	1200	1200	1200	1100	770	430	270

Busbar supports L-shaped design, Part-No. 15612

phasing-distance 185 mm, fixed with 1 x M10 per phase

E-copper bars		max. support-distance mm								
no. and dimensions	rated current	low up to 25 kA I _{pk} up to 53 kA	30 kA 63 kA	40 kA 84 kA	50 kA 105 kA	60 kA 132 kA	65 kA 143 kA	70 kA 154 kA	80 kA 176 kA	100 kA 220 kA
1 x 30 x 10	670 A	1200	850	860	690	550	500	460	350	220
2 x 30 x 10	1240 A	1200	1200	1200	1000	630	540	460	350	220
1 x 40 x 10	840 A	1200	1130	1150	1000	630	540	460	350	220
2 x 40 x 10	1510 A	1200	1200	1200	1000	630	540	460	350	220
1 x 50 x 10	1000 A	1200	1200	1200	1000	630	540	460	350	220
2 x 50 x 10	1770 A	1200	1200	1200	1000	630	540	460	350	220
1 x 60 x 10	1155 A	1200	1200	1200	1000	630	540	460	350	220
2 x 60 x 10	2015 A	1200	1200	1200	1000	630	540	460	350	220
1 x 80 x 10	1450 A	1200	1200	1200	1000	630	540	460	350	220
2 x 80 x 10	2470 A	1200	1200	1200	1000	630	540	460	350	220
1 x 100 x 10	1745 A	1200	1200	1200	1000	630	540	460	350	220
2 x 100 x 10	2900 A	1200	1200	1200	1000	630	540	460	350	220
1 x 120 x 10	2035 A	1200	1200	1200	1000	630	540	460	350	220
2 x 120 x 10	3350 A	1200	1200	1200	1000	630	540	460	350	220
1 x 160 x 10	2700 A	1200	1200	1200	1000	630	540	460	350	220
2 x 160 x 10	4350 A	1200	1200	1200	1000	630	540	460	350	220

Busbar supports L-shaped design, Part-No. 15613

Phasing-distance 185 mm, fixed with 2 x M10 per phase

E-copper bars		max. support-distance mm								
no. and dimensions	rated current	low up to 25 kA I _{pk} up to 53 kA	30 kA 63 kA	40 kA 84 kA	50 kA 105 kA	60 kA 132 kA	65 kA 143 kA	70 kA 154 kA	80 kA 176 kA	100 kA 220 kA
1 x 100 x 10	1745 A	1200	1200	1200	1200	1200	1060	910	700	440
2 x 100 x 10	2900 A	1200	1200	1200	1200	1200	1060	910	700	440
1 x 120 x 10	2035 A	1200	1200	1200	1200	1200	1060	910	700	440
2 x 120 x 10	3350 A	1200	1200	1200	1200	1200	1060	910	700	440
1 x 160 x 10	2700 A	1200	1200	1200	1200	1200	1060	910	700	440
2 x 160 x 10	4350 A	1200	1200	1200	1200	1200	1060	910	700	440

Technical appendix

short circuit-values/support-distances

Busbar supports Z-shaped design, Part-No. 15617

phasing-distance 100 mm, fixed with 1 x M8 per phase

E-copper bars		max. support-distance mm							
no. and dimensions mm	rated current	low up to 20 kA l _{pk} up to 42 kA	25 kA 53 kA	30 kA 63 kA	40 kA 84 kA	50 kA 105 kA	60 kA 132 kA	65 kA 143 kA	70 kA 154 kA
1 x 30 x 10	670 A	1200	1010	850	630	500	310	270	230
2 x 30 x 10	1240 A	1200	1200	1200	780	500	310	270	230
1 x 40 x 10	840 A	1200	1200	1130	780	500	310	270	230
2 x 40 x 10	1510 A	1200	1200	1200	780	500	310	270	230
1 x 50 x 10	1000 A	1200	1200	1200	780	500	310	270	230
2 x 50 x 10	1770 A	1200	1200	1200	780	500	310	270	230
1 x 60 x 10	1155 A	1200	1200	1200	780	500	310	270	230
2 x 60 x 10	2015 A	1200	1200	1200	780	500	310	270	230
1 x 80 x 10	1450 A	1200	1200	1200	780	500	310	270	230
2 x 80 x 10	2470 A	1200	1200	1200	780	500	310	270	230

Busbar supports Z-shaped design, Part-No. 15619

phasing-distance 185 mm, fixed with 1 x M10 per phase

E-copper bars		max. support-distance mm							
no. and dimensions mm	rated current	low up to 25 kA l _{pk} up to 53 kA	30 kA 63 kA	40 kA 84 kA	50 kA 105 kA	60 kA 132 kA	65 kA 143 kA	70 kA 154 kA	80 kA 176 kA
1 x 30 x 10	670 A	1200	1160	860	650	410	350	300	230
2 x 30 x 10	1240 A	1200	1200	1020	650	410	350	300	230
1 x 40 x 10	840 A	1200	1200	1020	650	410	350	300	230
2 x 40 x 10	1510 A	1200	1200	1020	650	410	350	300	230
1 x 50 x 10	1000 A	1200	1200	1020	650	410	350	300	230
2 x 50 x 10	1770 A	1200	1200	1020	650	410	350	300	230
1 x 60 x 10	1155 A	1200	1200	1020	650	410	350	300	230
2 x 60 x 10	2015 A	1200	1200	1020	650	410	350	300	230
1 x 80 x 10	1450 A	1200	1200	1020	650	410	350	300	230
2 x 80 x 10	2470 A	1200	1200	1020	650	410	350	300	230
1 x 100 x 10	1745 A	1200	1200	1020	650	410	350	300	230
2 x 100 x 10	2900 A	1200	1200	1020	650	410	350	300	230
1 x 120 x 10	2035 A	1200	1200	1020	650	410	350	300	230
2 x 120 x 10	3350 A	1200	1200	1020	650	410	350	300	230
1 x 160 x 10	2700 A	1200	1200	1020	650	410	350	300	230
2 x 160 x 10	4350 A	1200	1200	1020	650	410	350	300	230

Busbar supports Z-shaped design, Part-No. 15620

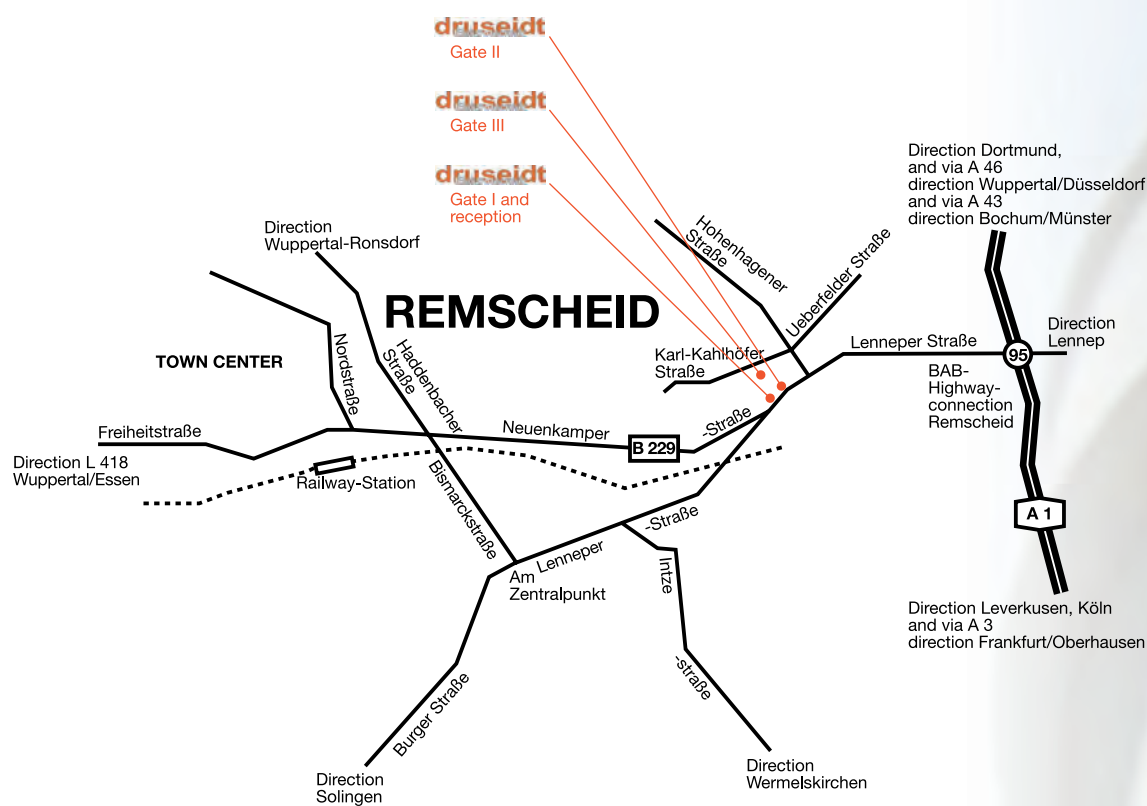
phasing-distance 185 mm, fixed with 2 x M10 per phase

E-copper bars		max. support-distance mm							
no. and dimensions mm	rated current	low up to 30 kA l _{pk} up to 63 kA	40 kA 84 kA	50 kA 105 kA	60 kA 132 kA	65 kA 143 kA	70 kA 154 kA	80 kA 176 kA	100 kA 220 kA
1 x 100 x 10	1745 A	1200	1200	1200	830	710	610	460	290
2 x 100 x 10	2900 A	1200	1200	1200	830	710	610	460	290
1 x 120 x 10	2035 A	1200	1200	1200	830	710	610	460	290
2 x 120 x 10	3350 A	1200	1200	1200	830	710	610	460	290
1 x 160 x 10	2700 A	1200	1200	1200	830	710	610	460	290
2 x 160 x 10	4350 A	1200	1200	1200	830	710	610	460	290

- Notice and explanations of the tables of pages 32-34:
- All values in acc. with DIN 43671 by an ambient temperature of + 35° C and a busbar temperature of + 75° C.
 - Values refer to the use of copper (Rp 0,2) with a strength of 300 N/mm².
 - l_{cw} = Rated short-time withstand current
 - l_{pk} = Rated peak withstand current

General advice

The measurements and technical information written in this catalogue have been determined with greatest care and are updated continuously in our documentation. We reserve us the right to make technical as well as changes of measurements, colours or formats after print. **Our information especially the values for possible current-loads are not binding, they are only approximate values under optimized conditions. The relation between conductor cross-section and current-load fixed in national or international regulations are not cancelled through our information.** Only the values in our written order confirmations are binding for us.



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