



Eta-com

betobar



PRODUCT CATALOGUE FOR THE BETOBAR RANGE 2021

ABOUT ETA-COM

More than 40 years of experience, know-how and solutions

Since its foundation in 1979, Eta-com has been an established manufacturer of prefabricated electrical busbar systems with integrated high-quality cast resin insulation, offering sophisticated technical products that meet the latest European standards in terms of quality and reliability.

Due to the typical characteristics, the betobar system guarantees the integrity of many projects worldwide, providing safe and maintenance free electrical power supplies in both low voltage and medium voltage installations. Eta-com is the leader in cast resin busway systems in product technology, engineering expertise and installation credentials.



Eta-com in a nutshell

- We are a stable, international company that continues to evolve within our industry.
- We are proud of our reputation of being the first cast resin busbar manufacturer, maintaining an excellent reputation to this very date.
- We work with major international clients and EPC's.
- We offer tailor-made solutions and tackle every problem thanks to our vast know-how and expertise



THE BETOBAR RANGE

betobar is the leading technology in the world for cast resin insulated busbars in low & medium voltage installations.

This concept is unique as it is based on the direct encapsulation of copper or aluminium conductors with an insulation compound, B.I.M. casting mix, consisting of epoxy-resin mixed under vacuum. This B.I.M. casting mix has excellent electrical characteristics and high mechanical withstand with specific physical properties. It is moisture-resistant, fire-resistant and self extinguishing. A flexible fabrication method, universal moulds and an integrated process controlled mixing technique allow the production of an almost unlimited number of element shapes for low voltage as well as for medium voltage applications. The prefabricated elements are self-supporting and are interconnected electrically by joining the conductors with 2-sided compression contacts, ensuring an excess of contact surfaces and a maximum of adjustment. Junctions and element extremities are overcast with a B.I.M. casting mix resulting in a homogeneous insulation over the full length of the connection.

betobar busbars can be supplied in the following standard types:

FOR LOW VOLTAGE

LA-LB-LC series
 Up to 1000 V AC/1500 V DC
 Three phase conductors and/or
 Protective earth/50, 100, 150 % neutral

Al-conductors range up to 6143 A
 Cu-conductors range up to 7964 A

DC application on request
 Other frequencies on request

IP66 & IP68
 Degree of protection

IK10
 Mechanical resistance



Explosion proof on request



FOR MEDIUM VOLTAGE

Type	Current rating	Voltage Rating
SH-Series	Al up to 1515 A Cu up to 1885 A	3.6 kV to 7.2 kV
PH-Series	Al up to 5005 A Cu up to 6140 A	3.6 kV to 24 kV

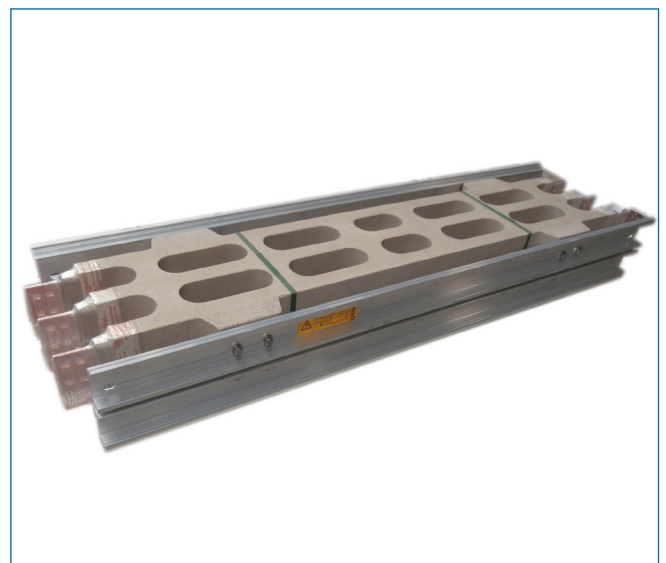
Other current and voltage ratings on request.

IP66 & IP67
 Degree of protection

IK10
 Mechanical resistance



Explosion proof on request
 up to 11 kV



EXTENSIVE APPLICATION AND ELEMENT RANGE

betobar busbars are suitable for application in large buildings, industrial plants, power stations, sub-stations and large switchrooms, such as:

- Factory distribution of low and medium voltage power.
- Rising mains with tap-offs to sub-distribution boards in high rise buildings.
- Transformer switchboard connections.
- Main switchboard feeders to distribution panels.
- Generator and large motor feeders.
- 400 Hz distribution systems.
- Refineries, offshore and onshore platforms.
- Zone 2 & Zone 3 Explosive areas.

For special applications, contact your betobar agent.

betobar busway systems are available in a wide range of standard element shapes, forms, and lengths which are fabricated to suit the typical project requirements. Our element range consists of:

- Straight elements.
- Flat and edge elbows.
- Z (double elbow) and T elements.
- Flanged terminal elements.
- Tap-off facilities and phase-transfer elements.
- Thermal expansion compensation elements.
- Tailor-made terminal elements for transformer or generator and switchboard connection.



HIGH QUALITY PRODUCTION

betobar busbars have been developed as a modern, all-purpose means of efficient and safe transmission of electrical energy. They have been in manufacture for more than thirty-five years.

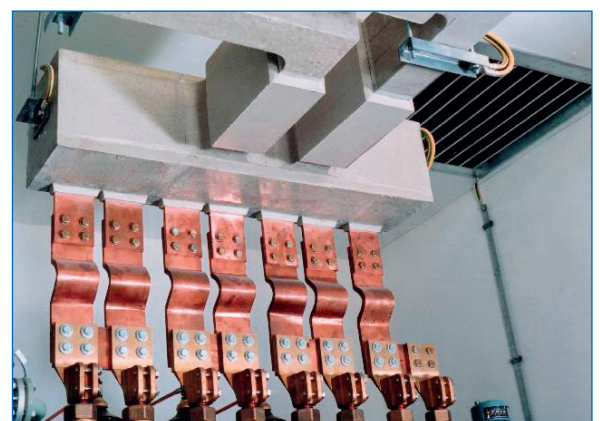
betobar systems comply with all the requirements for current distribution at low and medium voltage.

The busbar consists of copper or aluminium conductors, embedded in an enclosure of a fire retardant, self extinguishing and homogeneous insulation mix based on epoxy cast-resin with mineral fillers, ensuring high mechanical strength and chemical withstand.

Standard types are available for current ratings up to 6140 A and voltage ratings up to 24 kV. Systems for higher current ratings or DC applications are possible on request.

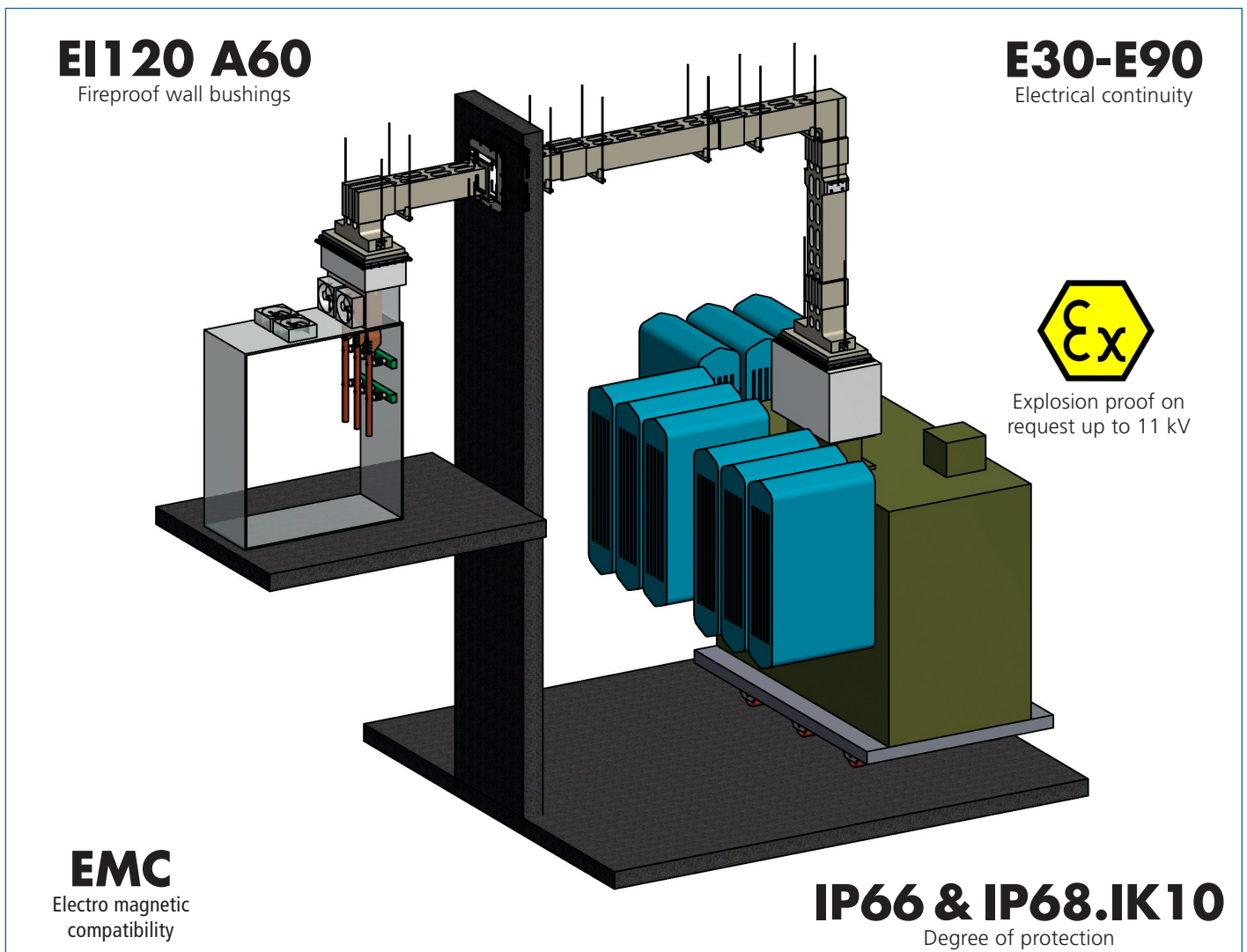
The busbar line consists of a number of prefabricated elements. The electrical joining of the conductors is achieved by means of double fish plates and high tensile steel bolts.

The junctions and the element ends are overcast with the same insulation mix as used for the elements. In this way an integral insulating enclosure to IP68.IK10 (LV) and IP67.IK10 (MV) is guaranteed over the full length of the busbar run. Straight junctions and also elbow junctions are available, each facilitating installation adjustments of $-10/+10$ mm per standard junction.



MAJOR ADVANTAGES FOR LOW AND MEDIUM VOLTAGE CAST-RESIN BUSBARS

- Compact dimensions.
- Easy installation.
- Low voltage drop and high short-circuit withstand capacity.
- Degree of protection of IP66 & IP68 for LV busducts and IP66 & IP67 for MV busducts as per IEC 60529.
- Fire proof property:
 - Tested for 750°C for 3 hours in accordance with IEC 60331-21.
 - Tested for 850°C for 2 hours in accordance with pre-BS 7346.
- Fire wall bushings of EI120 in accordance with EN1366-3.
- Fire retardant bushings A60 for normal fire and H60 for hydrocarbon fire in offshore applications.
- Self-extinguishing insulation as per IEC 60332-3-10 and IEC 61439-6 (10.101).
- Electrical continuity E30-E90 finishing available under fire conditions as per DIN 4102-12 (for LV busducts).
- EMC compatible (for sensitive environment).
- Explosion proof ATEX, & IEC Ex certified on request.
- Excellent resistance to atmospheric pollution & wide range of chemicals.





LOW VOLTAGE

TECHNICAL SPECIFICATIONS FOR LOW VOLTAGE

Compliance Standard	IEC 61439 (1&6)
Independent Certification	DEKRA, MPA (Germany), ISSeP, LCE, ASTA, IPH
Type of series	LA - Single Duct & Double Duct - 3, 4 & 5 Pole LB - Single Duct & Double Duct - 6 & 7 Pole LC - Single Duct & Double Duct - 8 & 9 Pole
Busbar Configuration	3 Phase 3 Phase + 100% Neutral 3 Phase + 100% Neutral + 100% Isolated Earth
Ratings	<p>LA Copper Series Up to 3224 A (Single Duct) Up to 6013 A (Double Duct)</p> <p>LB Copper Series Up to 4300 A (Single Duct) Up to 7964 A (Double Duct)</p> <p>LC Copper Series Up to 4200 A (Single Duct) Up to 7836 A (Double Duct)</p> <p>LA Aluminium Series Up to 2487 A (Single Duct) Up to 4638 A (Double Duct)</p> <p>LB Aluminium Series Up to 3294 A (Single Duct) Up to 6143 A (Double Duct)</p> <p>LC Aluminium Series Up to 3241 A (Single Duct) Up to 6044 A (Double Duct)</p>
Rated Operating Voltage	1000 V, AC ; 1500 V, DC
Rated Insulation Voltage	1000 V, AC ; 1500 V, DC
Rated Impulse withstand Voltage (U_{imp})	12 kV (1.2/50 μ s)
Rated Frequency	50 Hz/60 Hz (400 Hz on request)
Busbar Material	Copper - 99.9 % Pure ETP Grade Aluminium - 99.5 % Pure Grade
Insulation	CLASS 'F'
Degree of Protection	IP66 & IP68 as per IEC 60529
Mechanical Impact Strength	IK10 as per DIN 52453 & IEC 62262
Tap Off Box	Up to 400 A - Pluggable (LA Series) Up to 400 A - Fixed type (LB & LC Series)
Conditions of Use	Altitude up to 5000 m, indoor as well as outdoor Ambient temperature ; -50° C/+55° C Ambient humidity: 0 % - 100 %

Type	3-5 Cond W x H (mm x mm)	Cross Section Area (mm ²)	Busbar Size (mm x mm)	In (A)	Icw (kA)	Ipk (kA)	R20 (μΩ/m)	R35 (μΩ/m)	X (μΩ/m)	Z (μΩ/m)	P (W/m)	Element Weight (kg/m)*		
												3 Cond	4 Cond	5 Cond
ALUMINIUM CONDUCTOR, Type LA, Single Duct, 1000 V, 50 Hz														
LA 04EA	104 x 80	240	40 x 6	678	22	46,2	116,26	152,28	59,42	159,82	210	20	20	20
LA 08EA	104 x 120	480	80 x 6	1040	35	73,5	58,73	76,95	37,53	82,83	250	28	28	29
LA 12EA	104 x 160	720	120 x 6	1466	47	98,7	39,24	51,36	26,73	55,81	331	37	37	38
LA 16EA	104 x 200	960	160 x 6	1832	59	129,8	29,53	38,92	21,3	42,63	392	47	47	48
LA 20EA	104 x 240	1200	200 x 6	2202	69	151,8	24,38	32,16	17,14	35,07	468	56	57	58
LA 24EA	104 x 285	1440	120 x 6 x 2	2487	80	176	19,58	25,83	15,04	28,6	479	64	65	66
ALUMINIUM CONDUCTOR, Type LA, Double Duct, 1000 V, 50 Hz														
LA 04DA	348 x 80	480	40 x 6 x 2	1282	41	86,1	58,13	76,14	29,71	79,91	375	39	40	40
LA 08DA	348 x 120	960	80 x 6 x 2	1964	63	138,6	29,36	38,48	18,76	41,41	445	56	56	57
LA 12DA	348 x 160	1440	120 x 6 x 2	2772	88	193,6	19,62	25,68	13,37	27,9	592	74	75	76
LA 16DA	348 x 200	1920	160 x 6 x 2	3465	111	244,2	14,81	18,8	8,25	19,97	677	92	94	95
LA 20DA	348 x 240	2400	200 x 6 x 2	4107	132	290,4	12,19	16,08	8,57	17,54	814	112	113	115
LA 24DA	348 x 285	2880	120 x 6 x 4	4638	149	327,8	10,45	13,65	9,52	15,71	881	128	130	132

Type	6-7 Cond W x H (mm x mm)	Cross Section Area (mm ²)	Busbar Size (mm x mm)	In (A)	Icw (kA)	Ipk (kA)	R20 (μΩ/m)	R35 (μΩ/m)	X (μΩ/m)	Z (μΩ/m)	P (W/m)	Element Weight (kg/m)*	
												6 Cond	7 Cond
ALUMINIUM CONDUCTOR, Type LB, Single Duct, 1000 V, 50 Hz													
LB 08EA	138 x 120	960	80x6x2	1696	54	118,8	30,18	39,41	20,56	42,84	340	38	38
LB 12EA	138 x 160	1440	120x6x2	2217	72	158,4	20,23	26,42	14,38	28,91	390	49	50
LB 16EA	138 x 200	1920	160x6x2	2733	88	193,6	15,36	19,98	11,31	22,01	448	61	62
LB 20EA	138 x 240	2400	200 x 6 x 2	3294	105	231	12,05	15,67	9,23	17,39	510	74	75
ALUMINIUM CONDUCTOR, Type LB, Double Duct, 1000 V, 50 Hz													
LB 12DA	416 x 160	2880	120x6x4	4180	135	297	10,12	13,21	7,19	14,46	693	99	100
LB 16DA	416 x 200	3840	160x6x4	5206	165	363	7,68	9,99	5,65	11	812	123	124
LB 20DA	416 x 240	4800	200x6x4	6143	197	433,4	6,03	7,84	4,62	8,7	887	148	150

Type	8-9 Cond W x H (mm x mm)	Cross Section Area (mm ²)	Busbar Size (mm x mm)	In (A)	Icw (kA)	Ipk (kA)	R20 (μΩ/m)	R35 (μΩ/m)	X (μΩ/m)	Z (μΩ/m)	P (W/m)	Element Weight (kg/m)*	
												8 Cond	9 Cond
ALUMINIUM CONDUCTOR, Type LC, Single Duct, 1000 V, 50 Hz													
LC 08EA	168 x 120	960	80x6x2	1667	53	116,6	29,58	38,48	21,09	42,16	321	45	45
LC 12EA	168 x 160	1440	120x6x2	2178	69	151,8	19,83	25,8	14,75	28,47	367	59	60
LC 16EA	168 x 200	1920	160x6x2	2665	85	187	15,05	19,5	11,6	21,68	416	74	75
LC 20EA	168 x 240	2400	200 x 6 x 2	3241	104	228,8	12,05	15,67	9,23	17,39	494	90	91
ALUMINIUM CONDUCTOR, Type LC, Double Duct, 1000 V, 50 Hz													
LC 08DA	476 x 120	1920	80x6x4	3152	101	222,2	14,79	19,24	10,55	21,08	573	89	90
LC 12DA	476 x 160	2880	120x6x4	4106	130	286	9,92	12,9	7,38	14,24	652	119	120
LC 16DA	476 x 200	3840	160x6x4	5039	161	354,2	7,53	9,75	5,8	10,84	743	149	150
LC 20DA	476 x 240	4800	200 x 6 x 4	6044	194	426,8	6,03	7,84	4,62	8,7	859	180	182

*Total average weight of the system with junctions and standard supports

Type	3-5 Cond W x H (mm x mm)	Cross Section Area (mm ²)	Busbar Size (mm x mm)	In (A)	Icw (kA)	Ipk (kA)	R20 (μΩ/m)	R35 (μΩ/m)	X (μΩ/m)	Z (μΩ/m)	P (W/m)	Element Weight (kg/m)*		
												3 Cond	4 Cond	5 Cond
COPPER CONDUCTOR, Type LA, Single Duct, 1000 V, 50 Hz														
LA 04EC	104 x 80	200	40 x 5	803	31	65,1	84,44	110,6	55,71	119,59	214	23	25	26
		240	40 x 6	880	38	79,8	70,37	92,17	59,42	104,16	214	25	26	28
LA 08EC	104 x 120	400	80 x 5	1300	45	94,5	41,74	55,48	35,05	62,42	281	36	39	42
		480	80 x 6	1400	50	105	35,49	47,35	36,43	55,92	278	38	42	45
LA 12EC	104 x 160	600	120 x 5	1730	65	143	28,5	37,31	25,06	42,55	335	50	54	58
		720	120 x 6	1895	66	145,2	23,75	31,09	26,73	37,98	335	52	57	62
LA 14EC	104 x 200	700	140 x 5	1967	66	145,2	25,09	33,52	22,19	38,1	389	60	65	70
		840	140 x 6	2150	75	165	20,91	27,93	23,67	33,96	387	63	69	75
LA 16EC	104 x 200	800	160 x 5	2175	80	176	21,45	28,27	19,97	32,63	401	63	68	74
		960	160 x 6	2376	83	182,6	17,87	23,56	21,3	29,28	399	67	73	80
LA 17EC	104 x 240	1050	175 x 6	2600	95	209	16,63	22,27	19,63	27,44	452	77	85	92
LA 20EC	104 x 240	1200	200 x 6	2850	100	220	14,76	19,47	17,14	23,97	474	81	90	98
LA 23EC	104 x 285	1380	230 x 6	3100	100	220	12,71	16,74	15,37	20,92	483	95	104	114
LA 24EC	104 x 285	1200	120 x 5 x 2	2940	105	231	14,22	18,76	14,1	22,01	486	87	96	104
		1440	120 x 6 x 2	3224	113	248,6	11,85	15,63	15,04	19,88	487	93	103	113
COPPER CONDUCTOR, Type LA, Double Duct, 1000 V, 50 Hz														
LA 04DC	348 x 80	400	40 x 5 x 2	1518	53	116,6	42,22	55,3	27,85	59,79	382	46	49	52
		480	40 x 6 x 2	1663	58	127,6	35,18	46,08	29,71	52,08	382	49	53	56
LA 08DC	348 x 120	800	80 x 5 x 2	2451	85	187	20,87	27,74	17,52	31,21	500	73	78	84
		960	80 x 6 x 2	2662	100	220	17,74	23,67	18,22	27,96	503	77	83	90
LA 12DC	348 x 160	1200	120 x 5 x 2	3261	114	250,8	14,25	18,65	12,53	21,27	595	99	108	116
		1440	120 x 6 x 2	3572	125	275	11,87	15,54	13,37	18,99	595	104	114	124
LA 14DC	348 x 200	1400	140 x 5 x 2	3707	129	283,8	12,54	16,76	11,09	19,05	691	121	130	140
		1680	140 x 6 x 2	4062	142	312,4	10,45	13,97	11,83	16,98	691	127	138	150
LA 16DC	348 x 200	1600	160 x 5 x 2	4100	144	316,8	10,76	13,66	7,74	15,04	689	126	137	148
		1920	160 x 6 x 2	4491	157	345,4	8,96	11,38	8,25	13,22	689	132	146	159
LA 17DC	348 x 240	2100	175 x 6 x 2	4853	170	374	8,32	11,13	9,81	13,72	787	155	169	184
LA 20DC	348 x 240	2400	200 x 6 x 2	5325	187	411,4	7,38	9,73	8,57	11,99	828	162	178	195
LA 23DC	348 x 285	2760	230 x 6 x 2	5804	200	440	6,36	8,37	7,68	10,46	846	190	209	228
LA 24DC	348 x 285	2400	120 x 5 x 4	5500	193	424,6	7,59	9,92	8,93	12,31	900	175	191	208
		2880	120 x 6 x 4	6013	200	440	6,33	8,26	9,52	11,35	896	186	206	226

* Kindly contact your betobar representative for busbars with metal enclosure

Type	6-7 Cond W x H (mm x mm)	Cross Section Area (mm ²)	Busbar Size (mm x mm)	In (A)	Icw (kA)	Ipk (kA)	R20 (μΩ/m)	R35 (μΩ/m)	X (μΩ/m)	Z (μΩ/m)	P (W/m)	Element Weight (kg/m)*	
												6 Cond	7 Cond
COPPER CONDUCTOR, Type LB, Single Duct, 1000 V, 50 Hz													
LB 08EC	138 x 120	800	80x5x2	1980	70	154	21,49	27,95	19,78	32,28	329	53	56
		960	80x6x2	2200	90	198	18,27	23,85	20,56	29,17	346	57	60
LB 12EC	138 x 160	1200	120x5x2	2647	93	204,6	14,69	19,19	13,48	22,12	403	74	78
		1440	120x6x2	2900	102	224,4	12,25	15,99	14,38	19,84	403	79	84
LB 16EC	138 x 200	1600	160x5x2	3234	113	248,6	11,15	14,51	10,6	16,89	455	93	99
		1920	160 x 6 x 2	3550	124	272,8	9,29	12,09	11,31	15,21	457	100	107
LB 20EC	138 x 240	2400	200 x 6 x 2	4300	149	327,8	7,3	9,49	9,23	12,12	526	123	131
COPPER CONDUCTOR, Type LB, Double Duct, 1000 V, 50 Hz													
LB 08DC	416 x 120	1600	80x5x4	3786	132	290,4	10,96	14,31	9,64	16,33	615	106	112
		1920	80x6x4	4147	145	319	9,13	11,93	10,28	14,58	615	113	120
LB 12DC	416 x 160	2400	120 x 5 x 4	4904	175	385	7,35	9,6	6,74	11,06	692	148	156
		2880	120 x 6 x 4	5372	191	420,2	6,12	8	7,19	9,92	692	158	168
LB 16DC	416 x 200	3200	160 x 5 x 4	6109	200	440	5,58	7,25	5,3	8,45	812	187	198
		3840	160 x 6 x 4	6692	200	440	4,65	6,05	5,65	7,61	812	201	214
LB 20DC	416 x 240	4800	200 x 6 x 4	7964	200	440	3,65	4,74	4,62	6,06	902	245	262

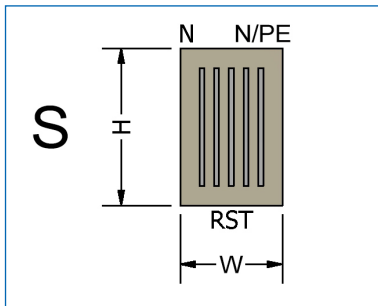
Type	8-9 Cond W x H (mm x mm)	Cross Section Area (mm ²)	Busbar Size (mm x mm)	In (A)	Icw (kA)	Ipk (kA)	R20 (μΩ/m)	R35 (μΩ/m)	X (μΩ/m)	Z (μΩ/m)	P (W/m)	Element Weight (kg/m)*	
												8 Cond	9 Cond
COPPER CONDUCTOR, Type LC, Single Duct, 1000 V, 50 Hz													
LC 08EC	168 x 120	800	80 x 5 x 2	1980	69	151,8	21,49	27,95	19,78	32,28	329	66	69
		960	80x6x2	2162	76	167,2	17,91	23,29	21,09	28,97	327	71	74
LC 12EC	168 x 160 168 x 160	1200	120x5x2	2550	89	195,8	14,4	18,74	13,83	21,88	366	92	96
		1440	120x6x2	2800	98	215,6	12	15,62	14,75	19,72	367	99	104
LC 16EC	168 x 200 168 x 200	1600	160 x 5 x 2	3150	110	242	10,93	14,17	10,88	16,72	422	117	123
		1920	160 x 6 x 2	3451	121	266,2	9,11	11,81	11,6	15,14	422	126	133
LC 20EC	168 x 240	2400	200 x 6 x 2	4200	147	323,4	7,3	9,49	9,23	12,12	502	155	163
COPPER CONDUCTOR, Type LC, Double Duct, 1000 V, 50 Hz													
LC 08DC	476 x 120	1600	80x5x4	3731	130	286	10,74	13,97	9,89	16,14	584	132	138
		1920	80x6x4	4088	143	314,6	8,95	11,65	10,55	14,48	584	141	148
LC 12DC	476 x 160	2400	120x5x4	4871	168	369,6	7,2	9,37	6,92	10,94	667	184	192
		2880	120 x 6 x 4	5278	184	404,8	6	7,81	7,38	9,86	652	198	208
LC 16DC	476 x 200	3200	160 x 5 x 4	5938	200	440	5,47	7,08	5,44	8,36	749	235	146
		3840	160 x 6 x 4	6505	200	440	4,56	5,9	5,8	7,57	749	253	266

* Total average weight of the system with junctions and standard supports

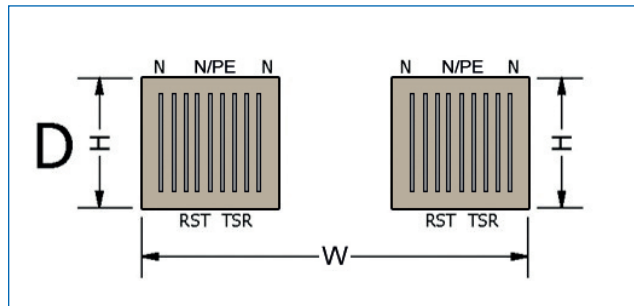
* Kindly contact your betobar representative for busbars with metal enclosure

ALUMINIUM betobar

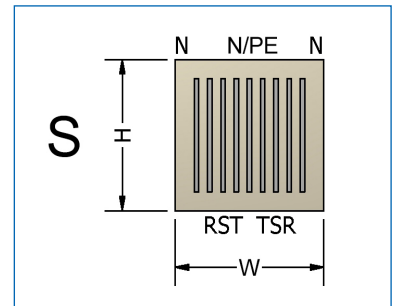
LA SINGLE DUCT



LC DOUBLE DUCT

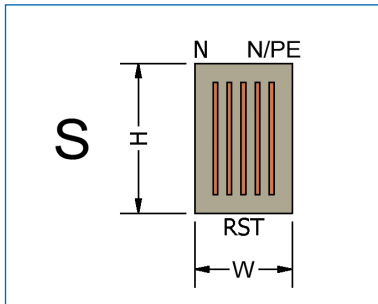


LC SINGLE DUCT

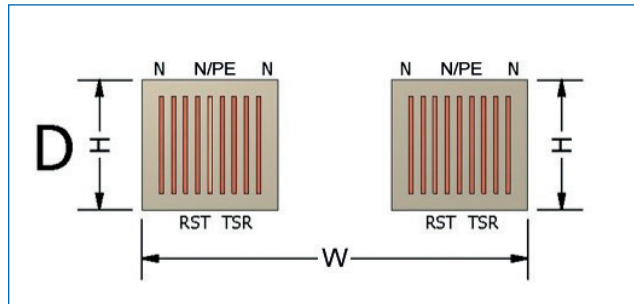


COPPER betobar

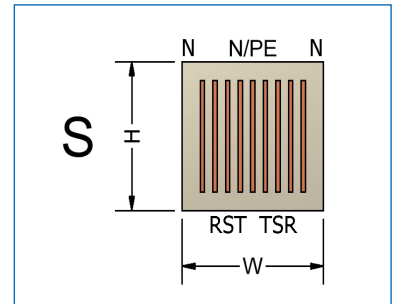
LA SINGLE DUCT



LC DOUBLE DUCT

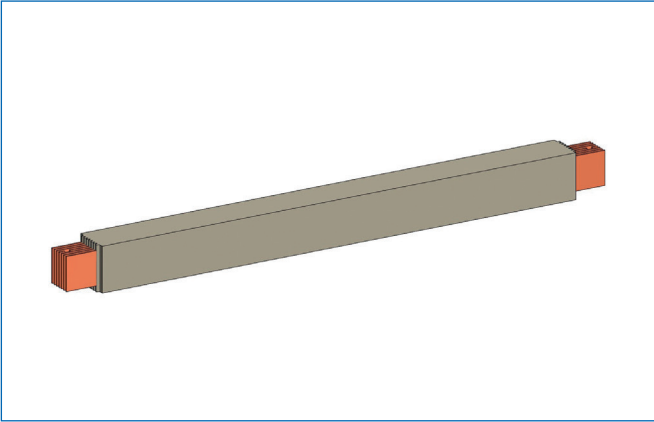


LC SINGLE DUCT

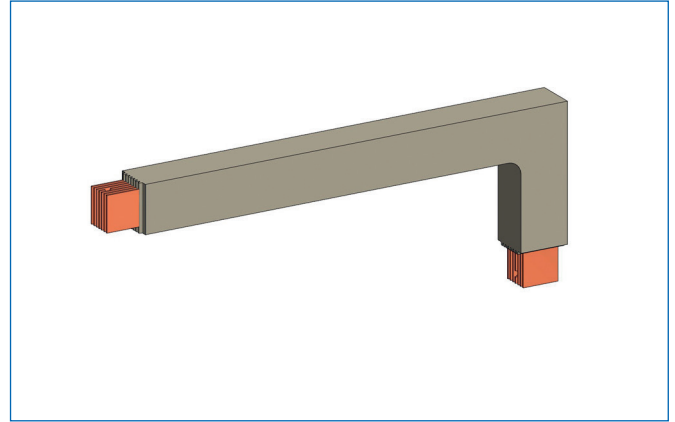


STANDARD ELEMENTS

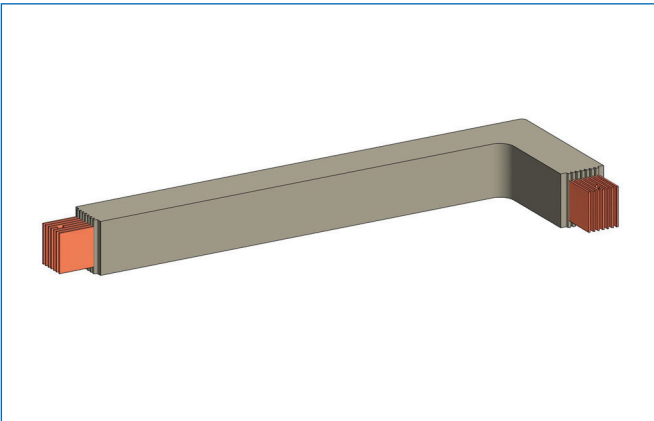
STRAIGHT ELEMENT



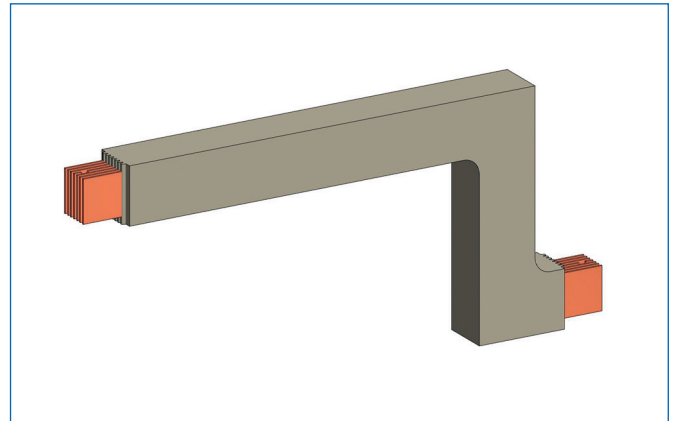
BRAZED ELBOW ELEMENT



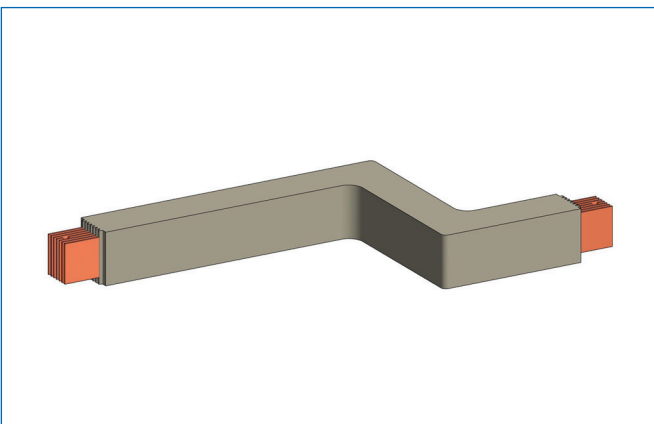
BENT ELBOW ELEMENT



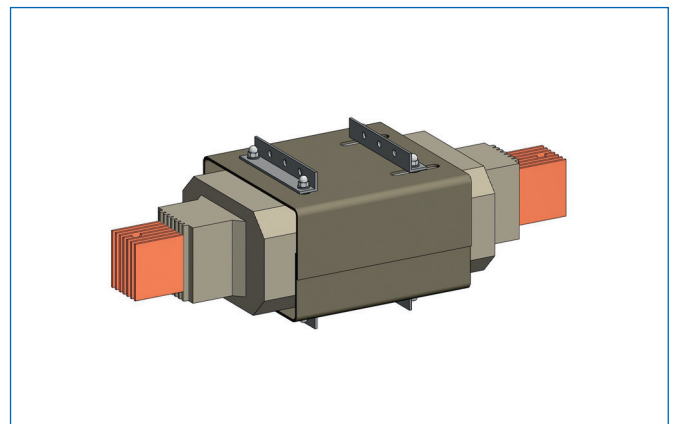
BRAZED 'Z' ELEMENT



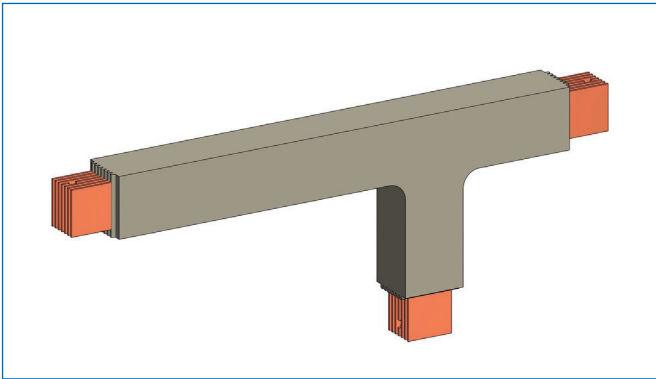
BENT 'Z' ELEMENT



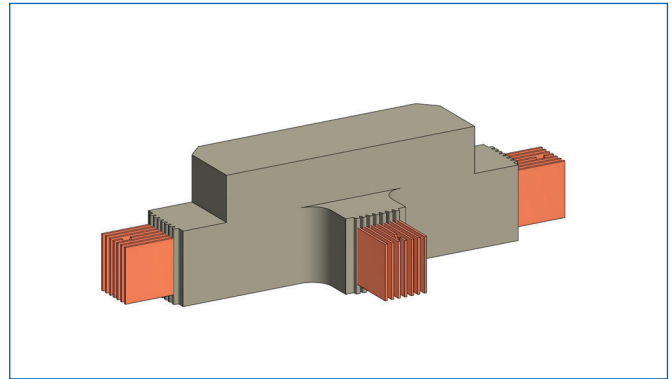
EXPANSION ELEMENT



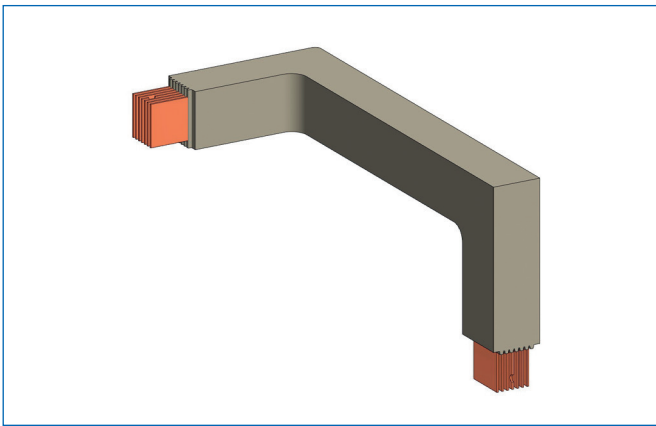
BRAZED 'T' ELEMENT



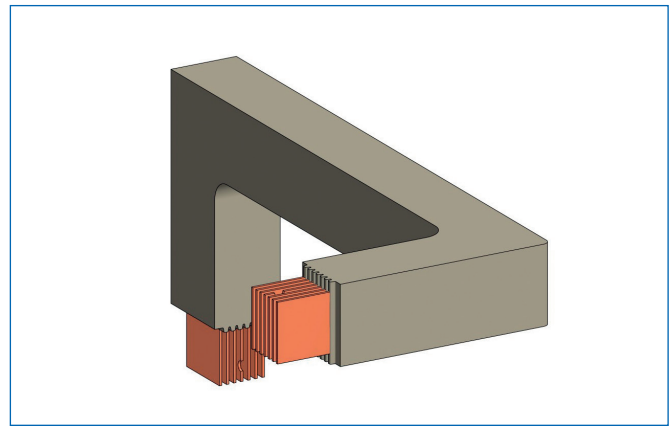
BENT 'T' ELEMENT



DOUBLE ELBOW ELEMENT: 'XR' TYPE

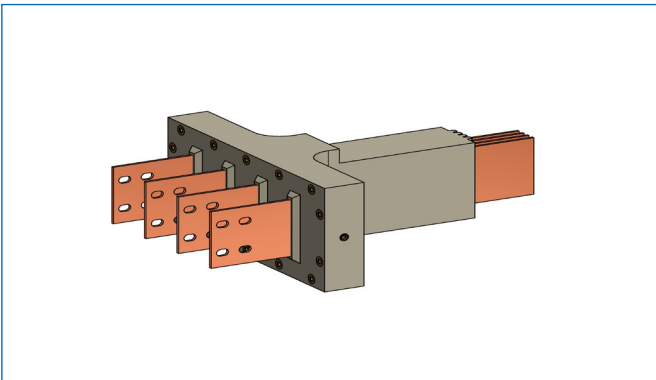


DOUBLE ELBOW ELEMENT: 'XL' TYPE

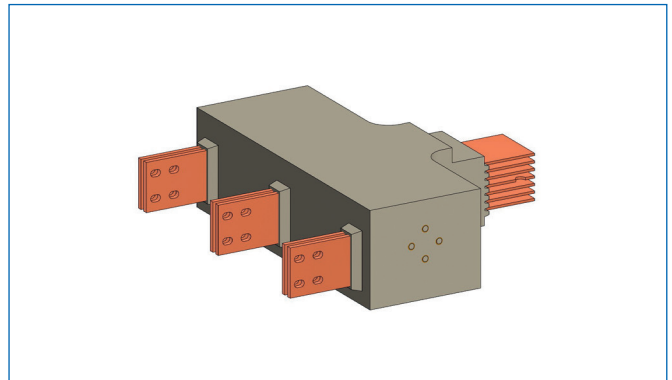


TERMINAL ELEMENTS

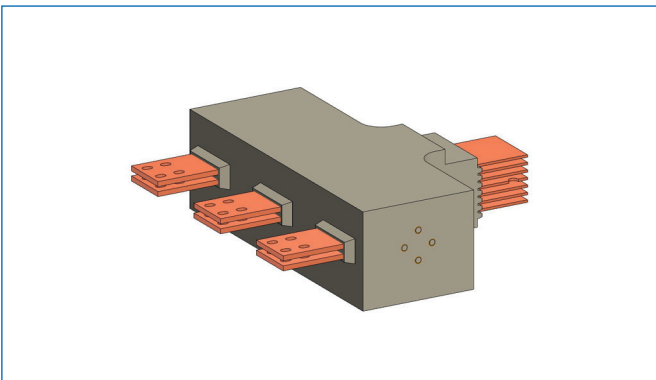
'NG' STANDARD TERMINAL ELEMENT



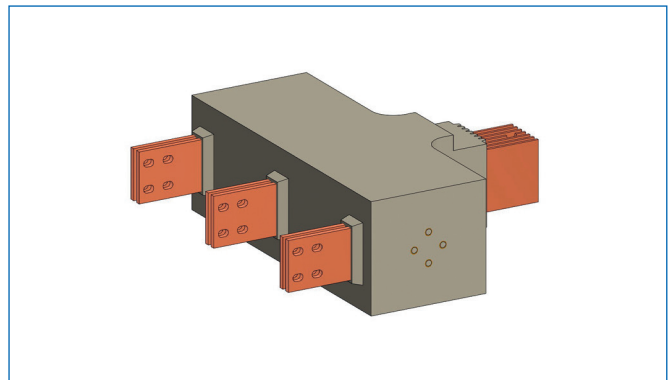
TYPE 'AF'



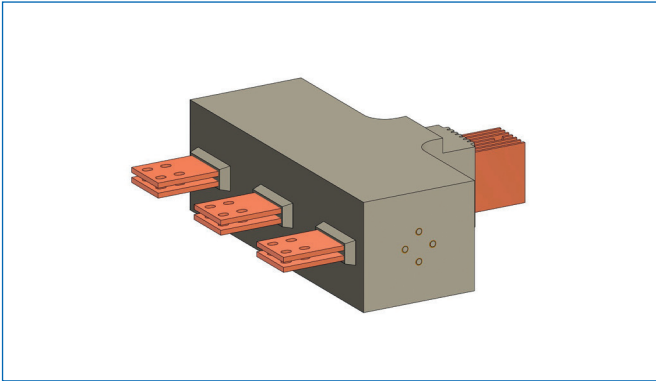
TYPE 'AH'



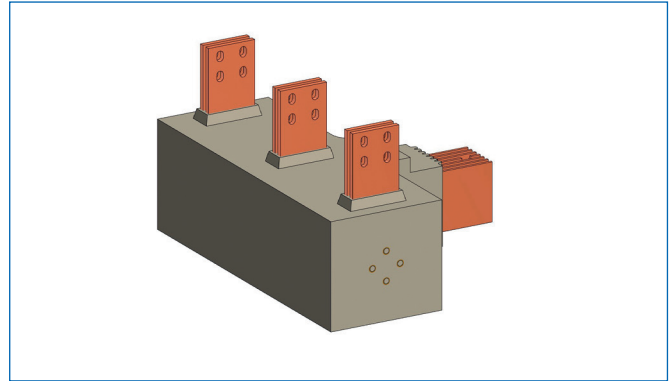
TYPE 'AG'



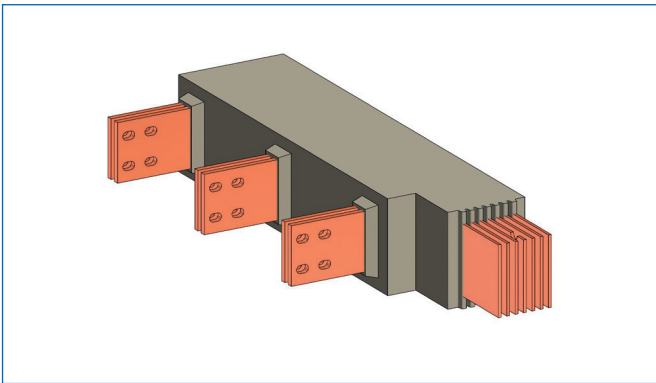
TYPE 'AJ'



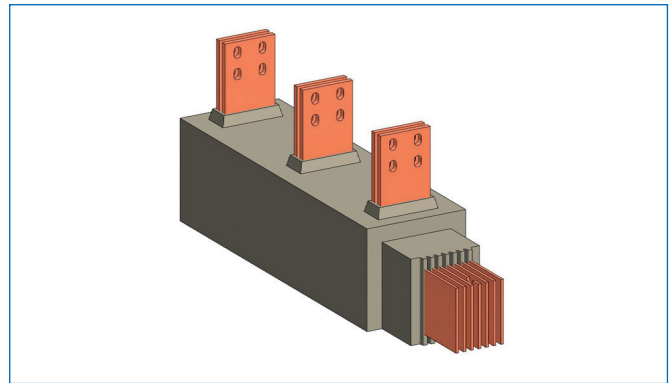
TYPE 'AO'



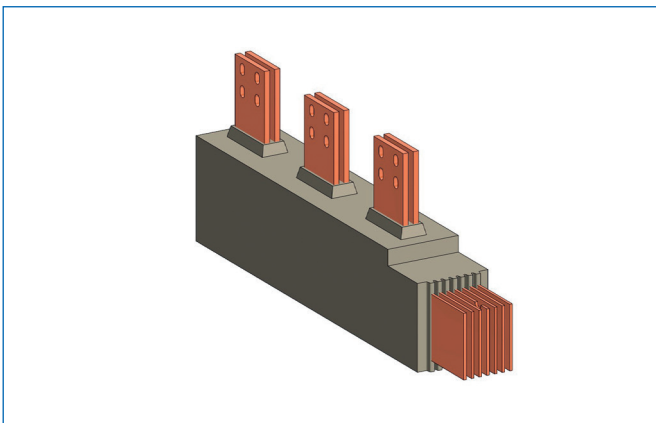
TYPE 'AC'



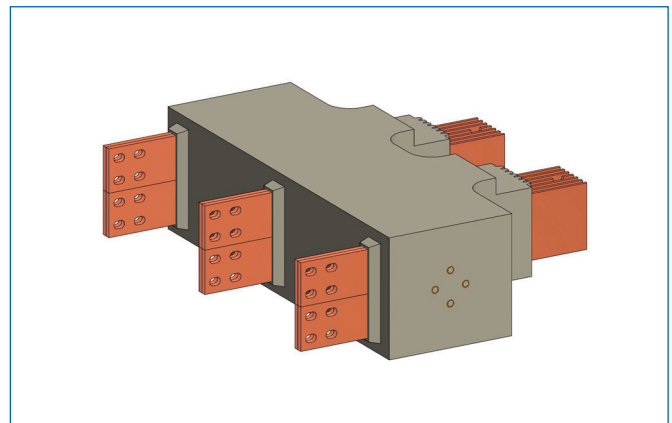
TYPE 'AP'



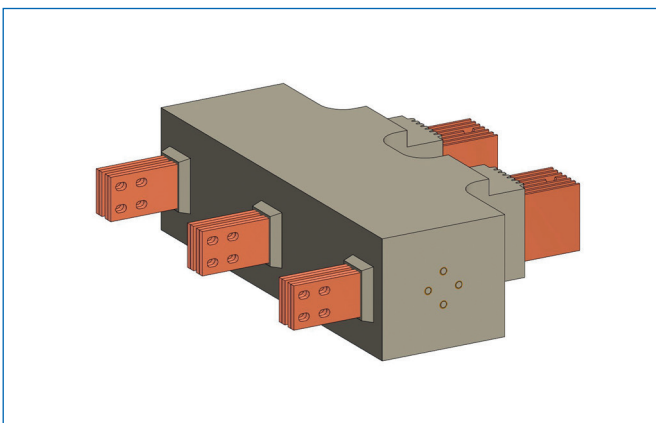
TYPE 'AE'



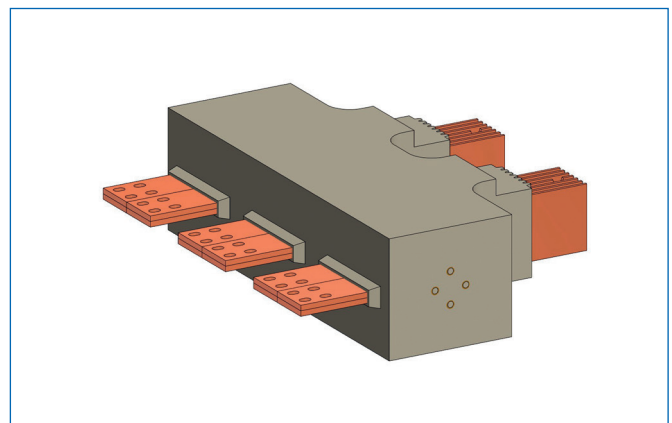
TYPE 'DGD'



TYPE 'DGF'

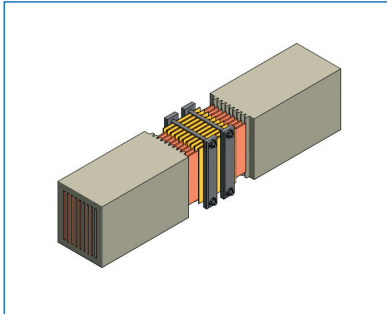


TYPE 'DJD'

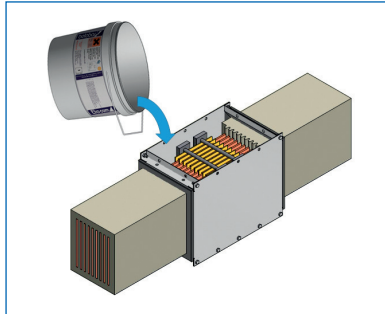


JOINTS FOR LOW VOLTAGE

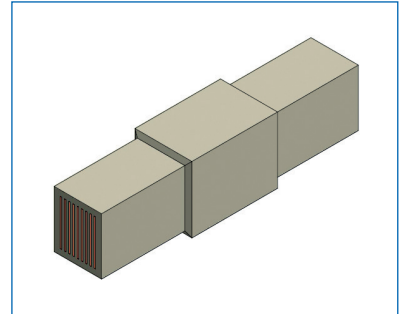
ASSEMBLE



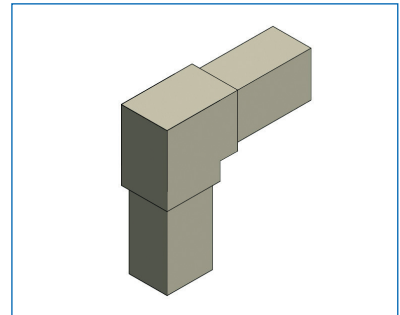
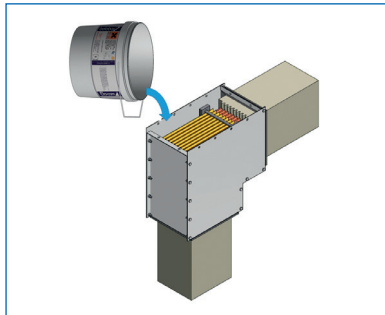
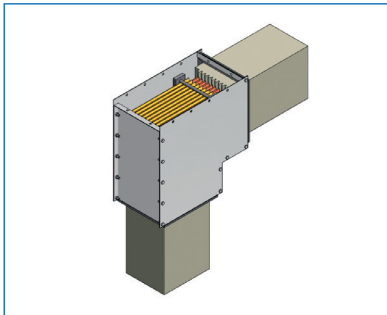
CAST



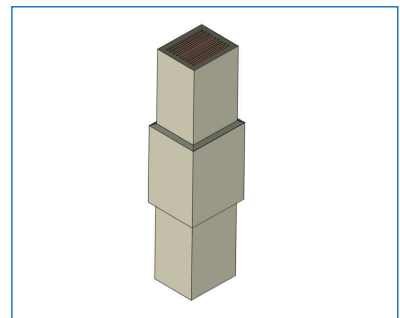
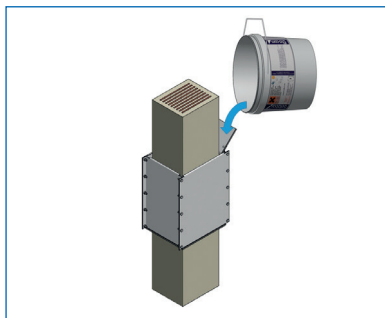
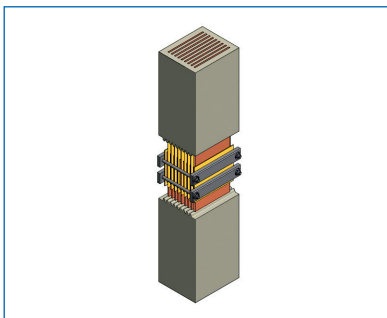
RESULT



ST 26 JOINT

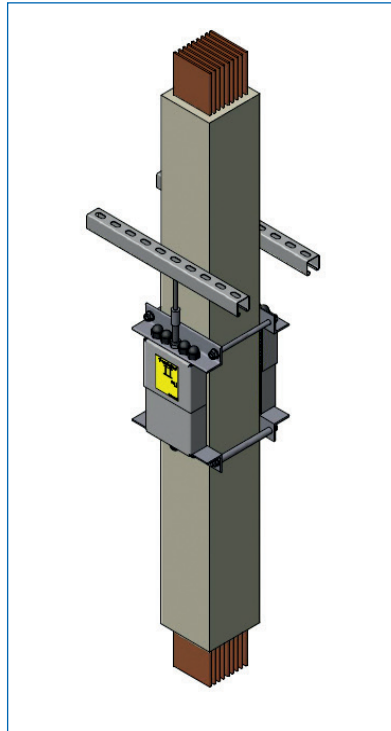


ST 27 JOINT

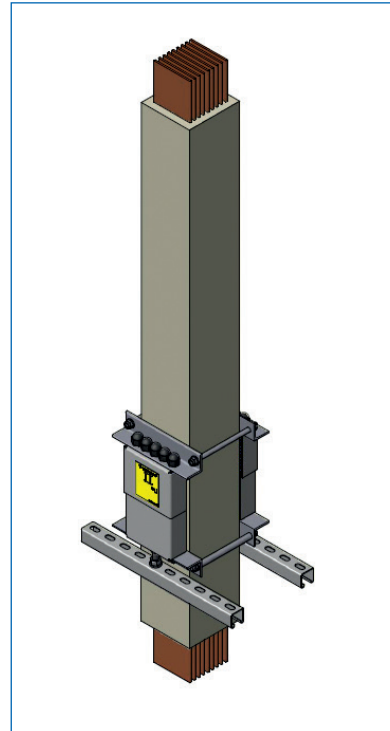


ST 29 JOINT

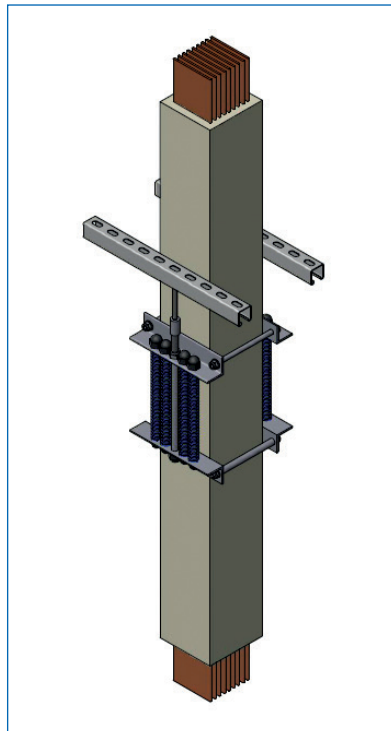
SPRING SUPPORTS



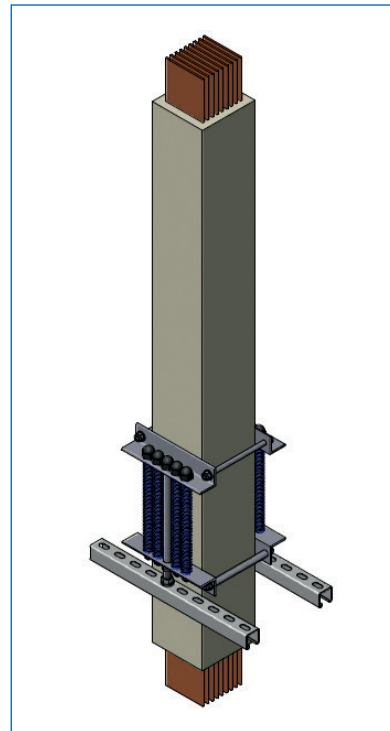
**CLOSED SPRING SUPPORT
IN HANGING ARRANGEMENT**



**CLOSED SPRING SUPPORT
IN STANDING ARRANGEMENT**



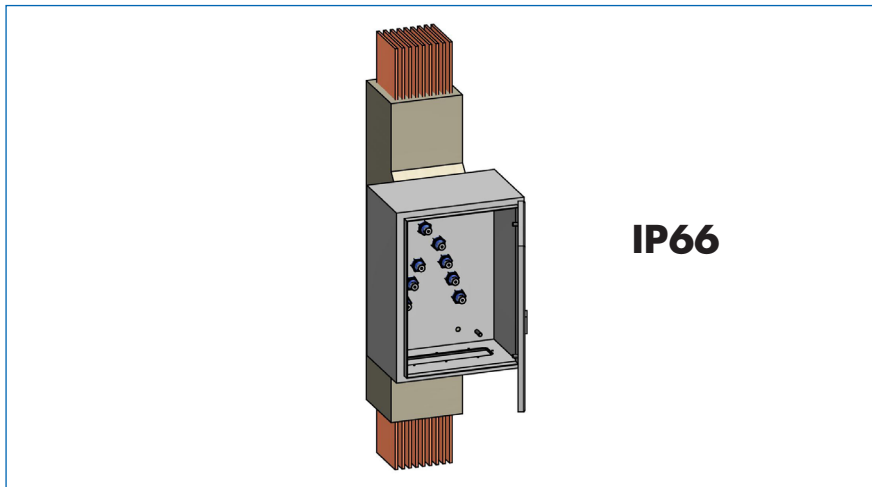
**OPEN SPRING SUPPORT
IN HANGING ARRANGEMENT**



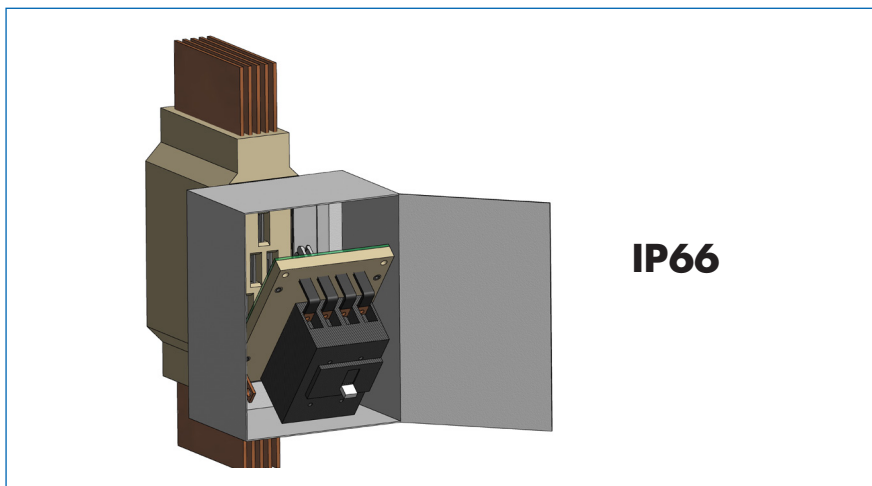
**OPEN SPRING SUPPORT
IN STANDING ARRANGEMENT**

TAP-OFF SOLUTIONS FOR LOW VOLTAGE INSTALLATIONS

Fixed Tap-Off -Bolt-On



Pluggable Tap-Off



Pluggable Tap-Off



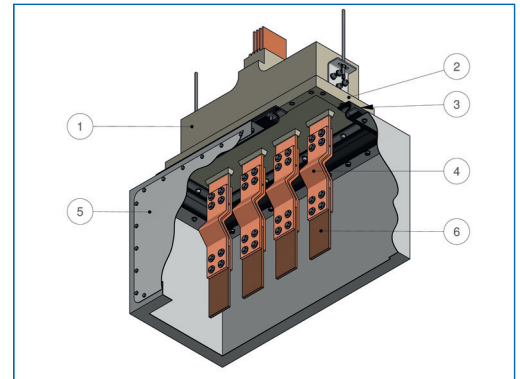
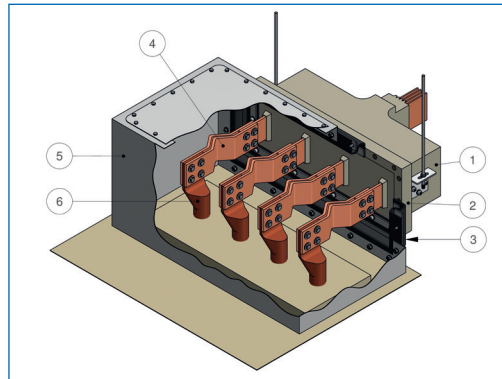
Complete pluggable unit including tap-off box

For more information regarding tap-off solutions, please contact your Eta-com sales representative.

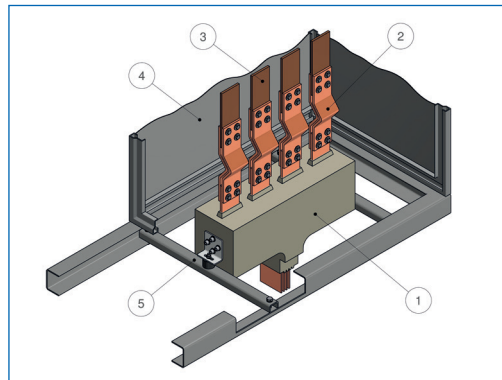
EXAMPLES FOR LV TERMINATIONS

Standard flexible connection with bellow and laminated flexibles

1. *betobar*
2. Flange
3. Bellow
4. Flexibels
5. Switchgear or connection box
6. Terminals

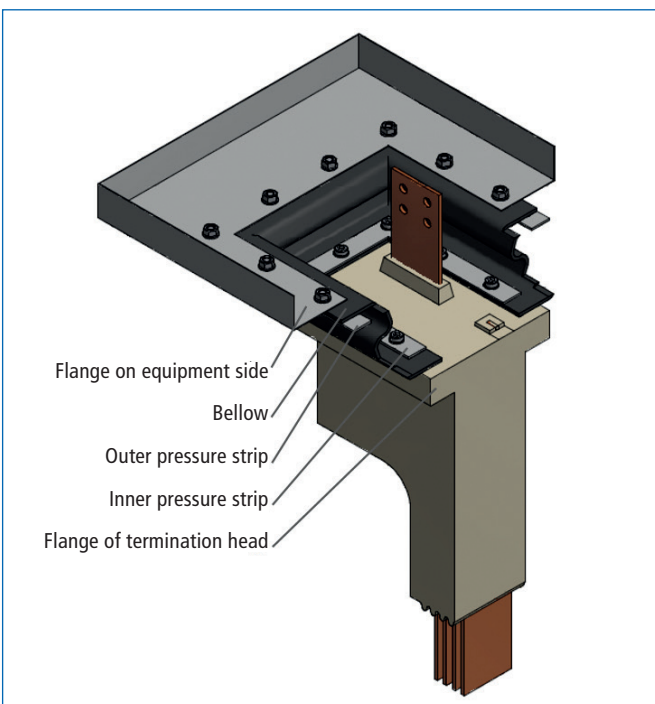


Bottom entry:
with flexibles or shunts
and bottom plate

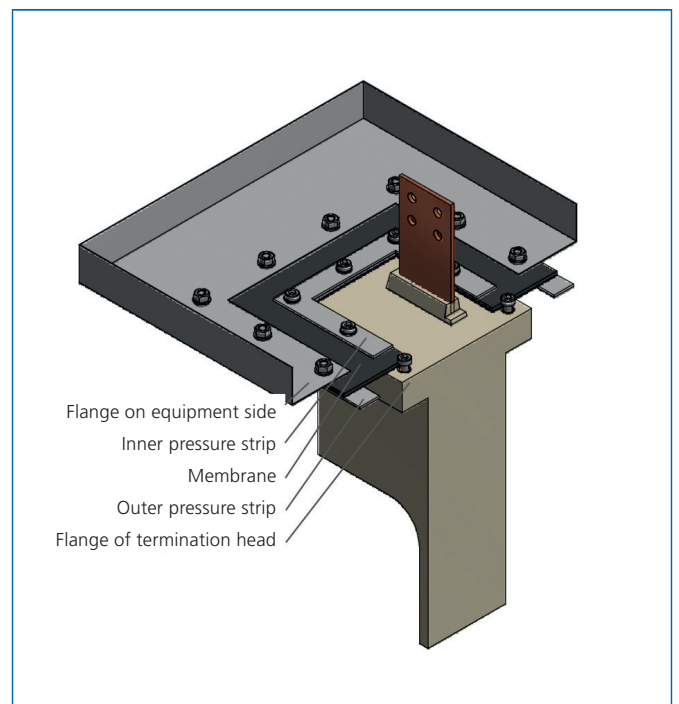


1. *betobar*
2. Flexibels
3. Terminals
4. Switchgear panel
5. Support

Terminations with bellow



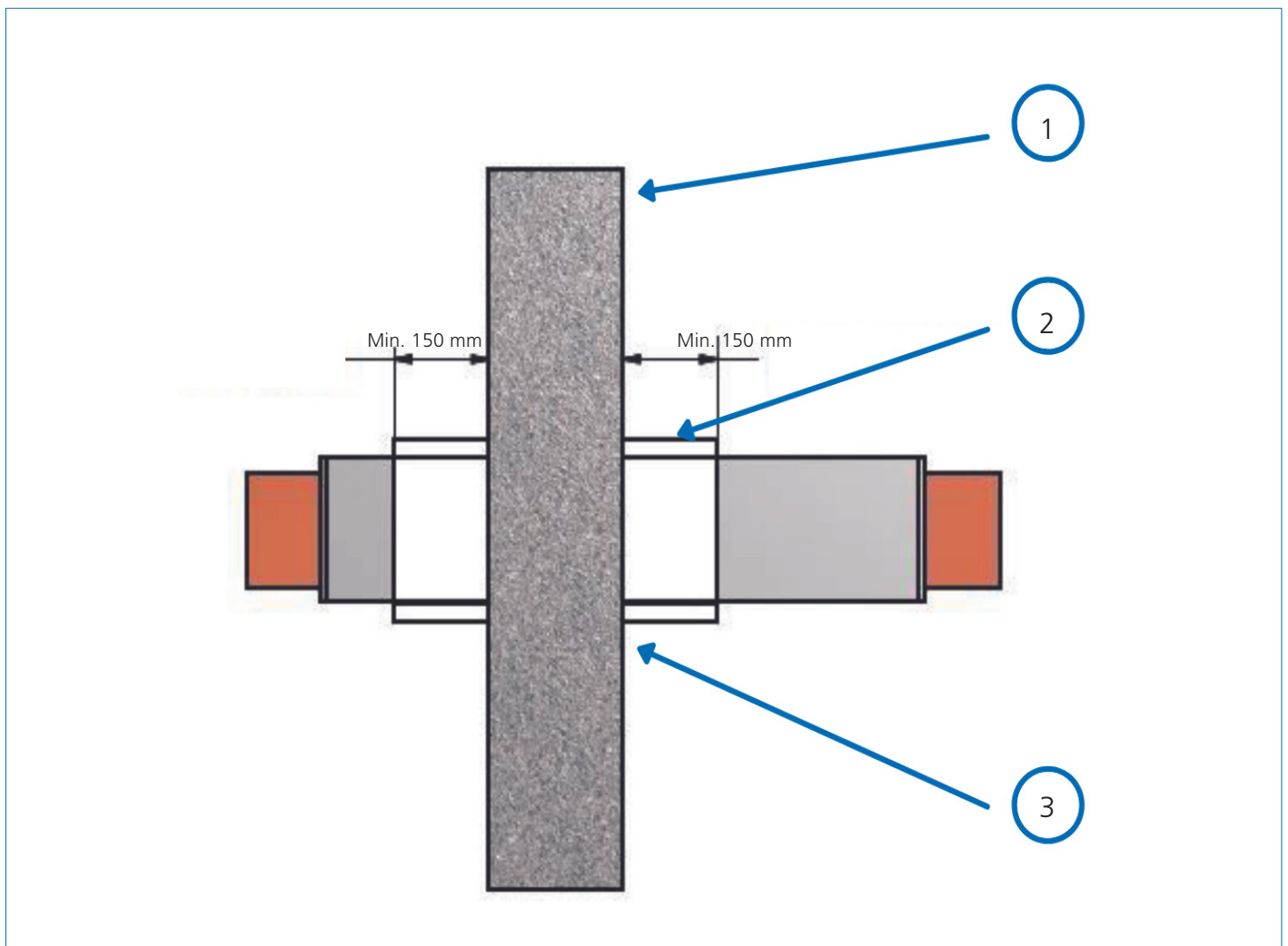
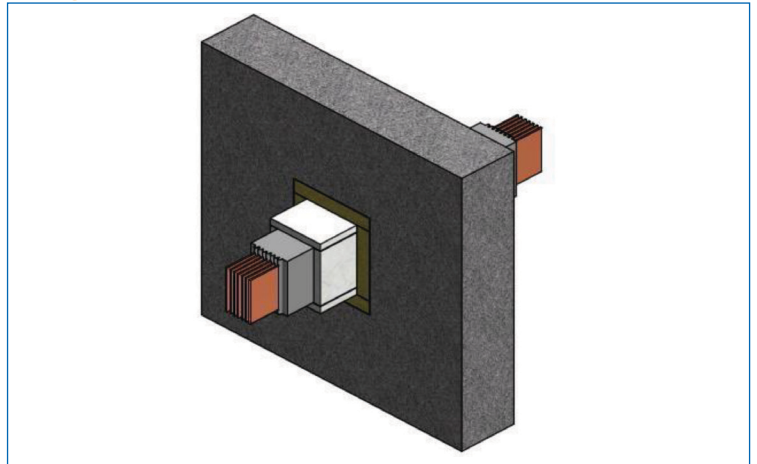
Terminations with membrane



WALL & FLOOR FIRE BARRIER EI120

Low voltage systems

1. Fireproof wall or floor
2. Promatect
3. Promastop-CB Board & Promastop-CC Paint



LV fire barrier EI120

* Other fire barrier solutions on request, ex. Roxtec ...



MEDIUM VOLTAGE

TECHNICAL SPECIFICATIONS FOR MEDIUM VOLTAGE

Compliance Standard	Based on standards MV: without shielding IEC 62271 (1 & 201), with shielding IEC 62271 (1 & 200)
Independent Certification Authority	MPA (Germany), ISSEP, LCE, ASTA, IPH
Type of Series	SH & PH Series
Ratings	<p>SH Series Aluminium - Up to 1515 A Copper - Up to 1885 A</p> <p>PH Series Unshielded Aluminium - Up to 5005 A Copper - Up to 6140 A</p> <p>PH Series Shielded Aluminium - Up to 4404 A Copper - Up to 5403 A</p>
Rated Operating Voltage	SH Series - 3,6 kV to 7.2 kV PH Series - 3.6 kV to 24 kV
Rated Frequency	50Hz
Busbar Material	Copper - 99.9 % Pure ETP Grade Aluminium - 99.5 % Pure Grade
Insulation	CLASS 'F'
Degree of Protection	IP66 & IP67 as per IEC 60529
Mechanical Impact Strength	IK10 as per IEC 62262 DIN 52453
Conditions of Use	Altitude up to 5000m, indoor as well as outdoor Ambient temperature ; -50° C/ +60° C Ambient Humidity: 0 % - 100 %

SH SERIES

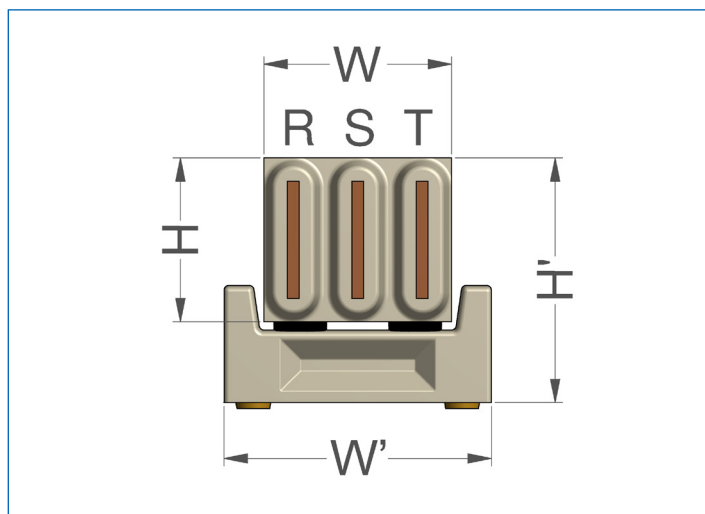
ALUMINIUM betobar

Type	W x H (mm x mm)	W' x H' (mm x mm)	Cross Section Area (mm ²)	Busbar Size (mm x mm)	I _r (A)	I _k (kA)	I _p (kA)	R ₂₀ (μΩ/m)	R ₉₀ (μΩ/m)	X (μΩ/m)	Z (μΩ/m)	P (W/m)	Element weight (kg/m)*
SH Series - Aluminium Betobar, 3.6 - 7.2 KV, 50 Hz													
SH 10A	160 x 140	250 x 195	800	100 x 8	1368	35	87,5	34,83	48,38	81,80	92,80	272	48
			1000	100 x 10	1515	45	112,5	28,29	39,29	81,90	87,50	271	49

COPPER betobar

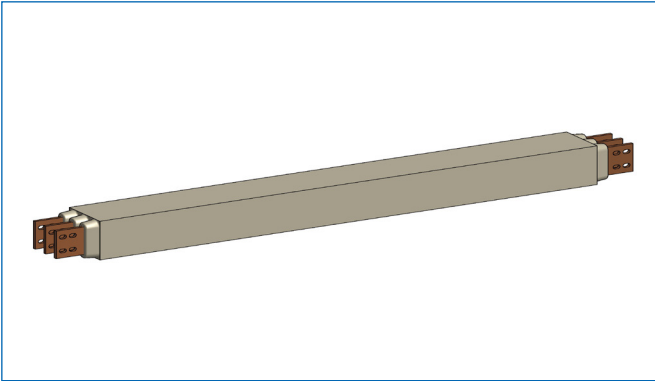
Type	W x H (mm x mm)	W' x H' (mm x mm)	Cross Section Area (mm ²)	Busbar Size (mm x mm)	I _r (A)	I _k (kA)	I _p (kA)	R ₂₀ (μΩ/m)	R ₉₀ (μΩ/m)	X (μΩ/m)	Z (μΩ/m)	P (W/m)	Element weight (kg/m)*
SH Series - Copper Betobar, 3.6 - 7.2 KV, 50 Hz													
SH 06C	160 x 100	250 x 155	480	60 x 8	1347	45	112,5	35,19	48,50	106,84	113,70	264	44
			600	60 x 10	1485	60	150	28,67	39,51	106,35	108,70	261	46
SH 10C	160 x 140	250 x 195	800	100 x 8	1716	50	125	21,65	29,84	81,09	84,90	264	63
			1000	100 x 10	1885	65	162,5	17,85	24,60	81,03	82,00	262	68

*Total average weight of the system with junctions and standard supports

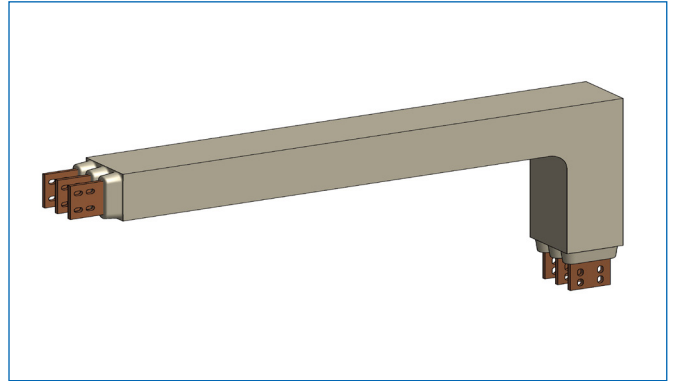


SH SERIES - ELEMENTS

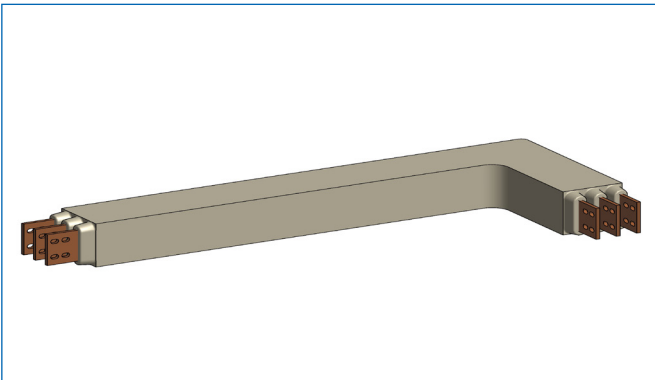
STRAIGHT ELEMENT



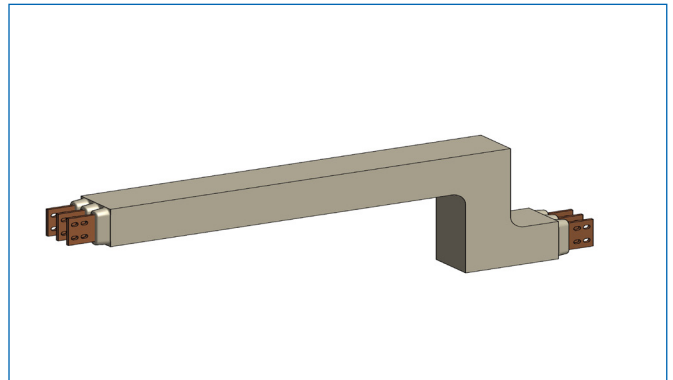
BRAZED ELBOW ELEMENT



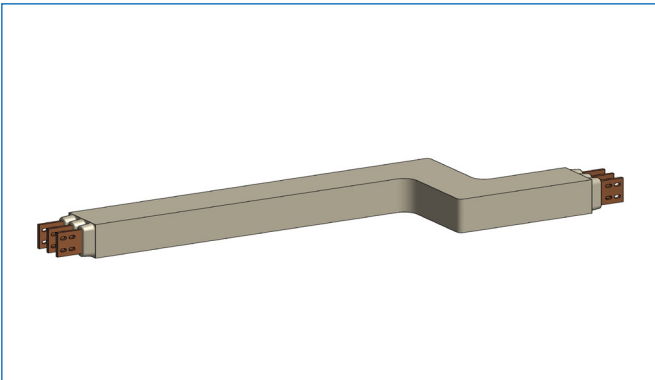
BENT ELBOW ELEMENT



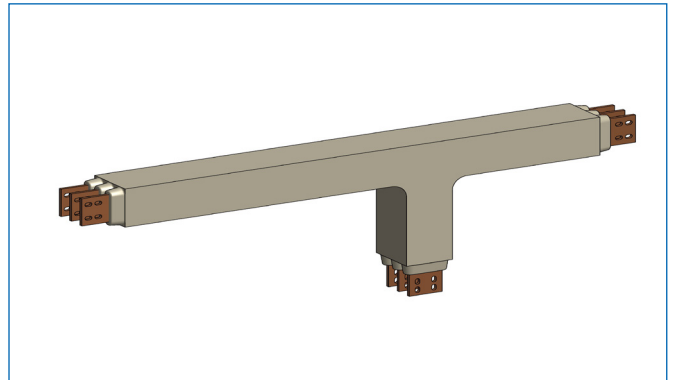
BRAZED 'Z' ELEMENT



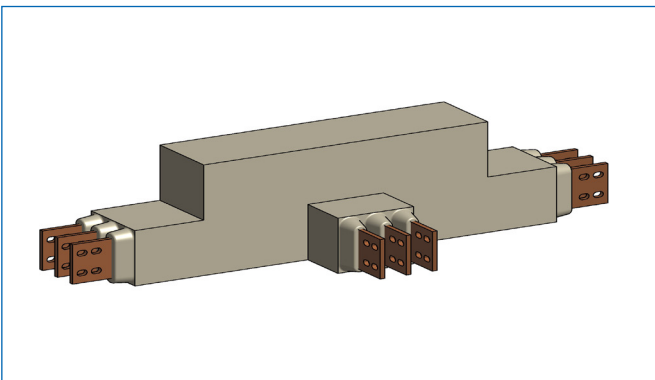
BENT 'Z' ELEMENT



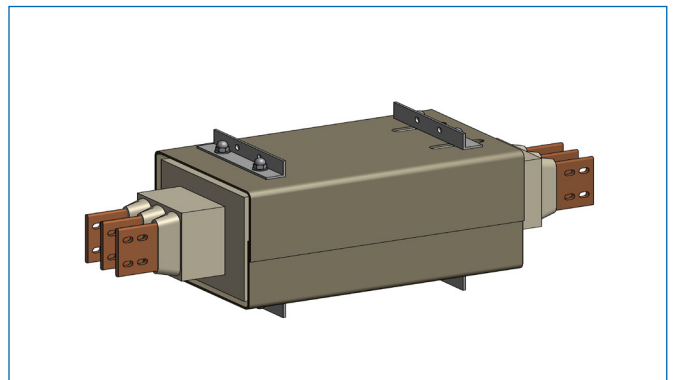
BRAZED 'T' ELEMENT



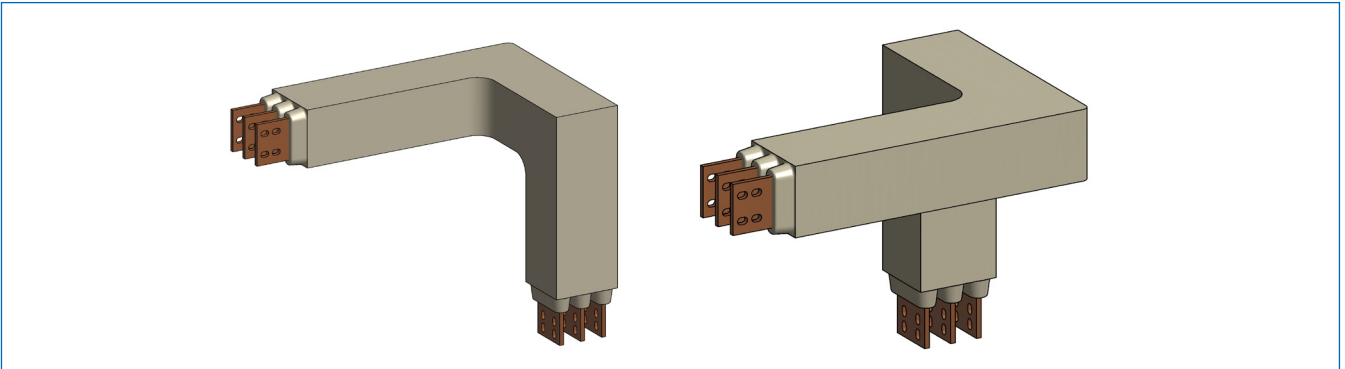
BENT 'T' ELEMENT



EXPANSION ELEMENT

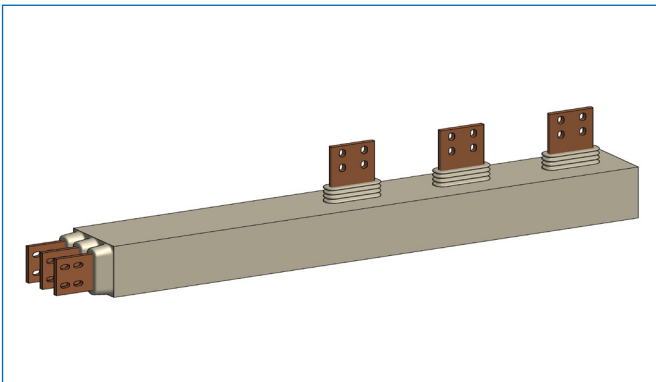


DOUBLE ELBOW ELEMENT: 'XR' TYPE + 'XL' TYPE

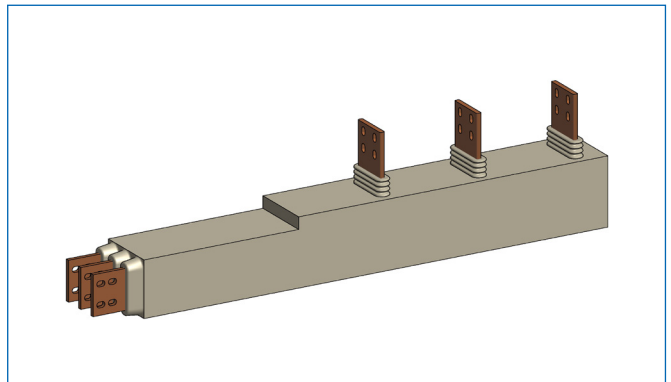


TERMINAL ELEMENTS

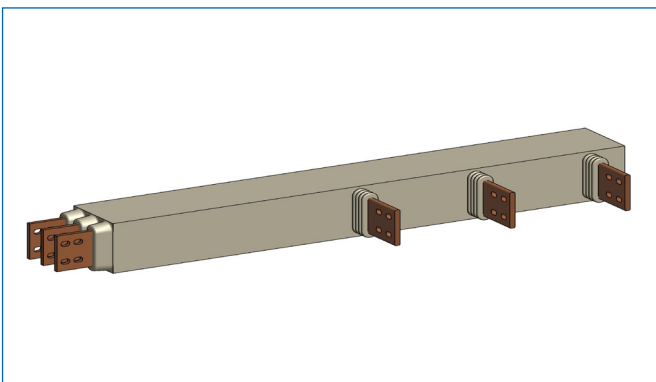
'AE' TYPE



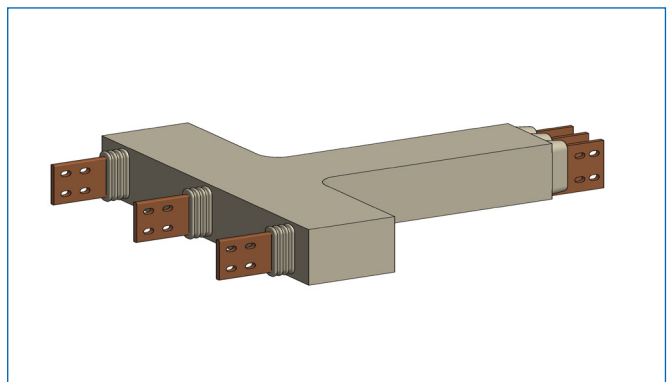
'AP' TYPE



'AC' TYPE



'AG' TYPE



PH SERIES

UNSHIELDED ALUMINIUM betobar

Type	W x H (mm x mm)	W' x H' (mm x mm)	Cross Section Area (mm ²)	Busbar Size (mm x mm)	I _r (A)	I _k (kA)	I _p (kA)	R20 (μΩ/m)	R90 (μΩ/m)	X (μΩ/m)	Z (μΩ/m)	P (W/m)	Element weight (kg/m)*
PH Series - Unshielded Aluminium Betobar, 3.6-7.2-12-17.5 KV, 50 Hz													
PH 08A	322 x 130	390 x 205	480	80 x 6	1380	36	90	57,56	79,95	141,74	161,90	457	61
			640	80 x 8	1587	48	120	43,55	60,49	140,69	152,50	457	62
PH 12A	322 x 170	390 x 245	720	120x6	1666	50	125	38,82	53,91	118,44	131,00	449	80
PH 16A	322 x 210	390 x 285	960	160x6	2266	65	162,5	29,47	40,93	102,32	112,00	630	98
			1280	160x8	2569	86	215	22,64	31,45	101,74	108,30	623	99
PH 20A	322 x 260	390 x 335	1600	100 x 8 x 2	3200	112	280	18,14	25,19	87,23	95,80	774	120
PH 24A	322 x 300	390 x 375	1920	120 x 8 x 2	3775	120	300	15,25	21,18	78,57	86,20	905	139
			2400	120 x 10 x 2	4133	120	300	12,51	17,38	78,38	84,80	891	140
			2880	120 x 12 x 2	4472	120	300	10,71	14,88	78,24	83,80	893	142
			3840	120 x 16 x 2	5005	120	300	8,53	11,85	78,06	82,50	891	145

*Total average weight of the system with junctions and standard supports

SHIELDED ALUMINIUM betobar

Type	W' x H' (mm x mm)	W"x H" (mm x mm)	Cross Section Area (mm ²)	Busbar Size (mm x mm)	I _r (A)	I _k (kA)	I _p (kA)	R20 (μΩ/m)	R90 (μΩ/m)	X (μΩ/m)	Z (μΩ/m)	P (W/m)	Element weight (kg/m)*
PH Series - Shielded Aluminium Betobar, 3.6-7.2-12-17.5 KV, 50 Hz													
PH 08AS	518 x 378	552x380	480	80 x 6	1297	36	90	57,56	79,95	141,74	161,90	403	76
			640	80 x 8	1491	48	120	43,55	60,49	140,69	152,50	403	76
PH 12AS	522 x 418	552x420	720	120x6	1549	50	125	38,82	53,91	118,44	131,00	388	98
PH 16AS	522 x 458	552x460	960	160x6	2062	65	162,5	29,47	40,93	102,32	112,00	522	118
			1280	160x8	2337	86	215	22,64	31,45	101,74	108,30	515	119
PH 20AS	522 x 508	552x510	1600	100 x 8 x 2	2848	112	280	18,14	25,19	87,23	95,80	613	143
PH 24AS	542 x 548	552x550	1920	120 x 8 x 2	3322	120	300	15,25	21,18	78,57	86,20	701	166
			2400	120 x 10 x 2	3637	120	300	12,51	17,38	78,38	84,80	690	167
			2880	120 x 12 x 2	3935	120	300	10,71	14,88	78,24	83,80	691	169
			3840	120 x 16 x 2	4404	120	300	8,53	11,85	78,06	82,50	689	172
PH Series - Shielded Aluminium Betobar, 24 KV, 50 Hz													
PH 08AS	558 x 380	592x382	480	80 x 6	1297	36	90	57,56	79,95	141,74	161,90	403	76
			640	80 x 8	1491	48	120	43,55	60,49	140,69	152,50	403	76
PH 12AS	558 x 380	592x382	720	120x6	1549	50	125	38,82	53,91	118,44	131,00	388	98
PH 16AS	563 x 460	592x462	960	160x6	2062	65	162,5	29,47	40,93	102,32	112,00	522	118
			1280	160x8	2337	86	215	22,64	31,45	101,74	108,30	515	119
PH 20AS	562 x 510	592x512	1600	100 x 8 x 2	2848	112	280	18,14	25,19	87,23	95,80	613	143
PH 24AS	562 x 550	592x552	1920	120 x 8 x 2	3322	120	300	15,25	21,18	78,57	86,20	701	166
			2400	120 x 10 x 2	3637	120	300	12,51	17,38	78,38	84,80	690	167
			2880	120 x 12 x 2	3935	120	300	10,71	14,88	78,24	83,80	691	169
			3840	120 x 16 x 2	4404	120	300	8,53	11,85	78,06	82,50	689	172

PH SERIES

UNSHIELDED COPPER betobar

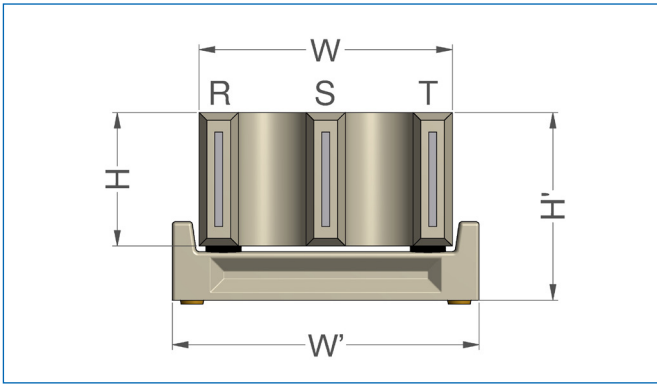
Type	W x H (mm x mm)	W' x H' (mm x mm)	Cross Section Area (mm ²)	Busbar Size (mm x mm)	I _r (A)	I _k (kA)	I _p (kA)	R20 (μΩ/m)	R90 (μΩ/m)	X (μΩ/m)	Z (μΩ/m)	P (W/m)	Element weight (kg/m)*
PH Series - Unshielded Copper Betobar, 3.6-7.2-12-17.5 KV, 50 Hz													
PH 08C	322 x 130	390 x 205	480	80 x 6	1765	50	125	35,31	48,67	141,17	149,90	455	71
			640	80 x 8	2000	67	167,5	27,09	37,34	139,88	145,30	448	75
PH 12C	322 x 170	390 x 245	720	120 x 6	2100	75	187,5	24,16	33,30	117,57	124,20	441	95
PH 16C	322 x 210	390 x 285	960	160 x 6	2832	90	225	18,47	25,45	101,34	107,50	612	118
			1280	160 x 8	3200	120	300	14,37	19,80	100,65	105,50	608	126
PH 20C	322 x 260	390 x 335	1600	100 x 8 x 2	4125	120	300	11,46	15,80	86,41	93,70	807	145
PH 24C	322 x 300	390 x 375	1920	120 x 8 x 2	4674	120	300	9,65	13,30	77,82	84,50	872	168
			2400	120 x 10 x 2	5105	120	300	8,01	11,04	77,62	83,60	863	191
			2880	120 x 12 x 2	5500	120	300	6,95	9,58	77,49	82,90	869	203
			3840	120 x 16 x 2	6140	120	300	5,73	7,90	77,26	82,00	893	226

*Total average weight of the system with junctions and standard supports

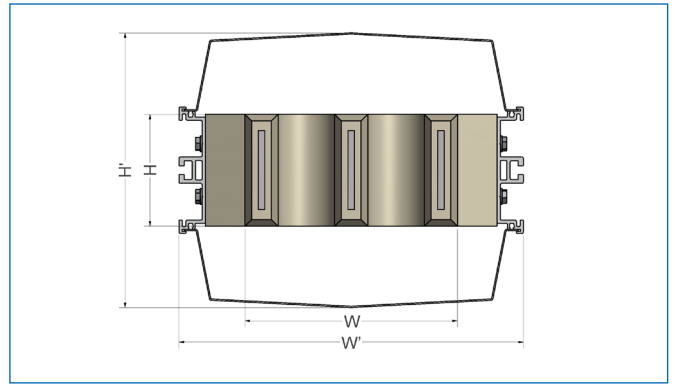
SHIELDED COPPER betobar

Type	W' x H' (mm x mm)	W'' x H'' (mm x mm)	Cross Section Area (mm ²)	Busbar Size (mm x mm)	I _r (A)	I _k (kA)	I _p (kA)	R20 (μΩ/m)	R90 (μΩ/m)	X (μΩ/m)	Z (μΩ/m)	P (W/m)	Element weight (kg/m)*
PH Series - Unshielded Copper Betobar, 3.6-7.2-12-17.5 KV, 50 Hz													
PH 08CS	518 x 378	552x380	480	80 x 6	1659	50	125	35,31	48,67	141,17	149,90	402	86
			640	80 x 8	1880	67	167,5	27,09	37,34	139,88	145,30	396	90
PH 12CS	522 x 418	552x420	720	120 x 6	1953	75	187,5	24,16	33,30	117,57	124,20	381	114
PH 16CS	522 x 458	552x460	960	160 x 6	2577	90	225	18,47	25,45	101,34	107,50	507	139
			1280	160 x 8	2912	120	300	14,37	19,80	100,65	105,50	504	147
PH 20CS	522 x 508	552x510	1600	100 x 8 x 2	3671	120	300	11,46	15,80	86,41	93,70	639	168
PH 24CS	542 x 548	552x550	1920	120 x 8 x 2	4113	120	300	9,65	13,30	77,82	84,50	675	196
			2400	120 x 10 x 2	4492	120	300	8,01	11,04	77,62	83,60	668	219
			2880	120 x 12 x 2	4840	120	300	6,95	9,58	77,49	82,90	673	231
			3840	120 x 16 x 2	5403	120	300	5,73	7,90	77,26	82,00	692	254
PH Series - Shielded Copper Betobar, 24 KV, 50 Hz													
PH 08CS	558 x 380	592x382	480	80 x 6	1659	50	125	35,31	48,67	141,17	149,90	402	86
			640	80 x 8	1880	67	167,5	27,09	37,34	139,88	145,30	396	90
PH 12CS	562 x 420	592x422	720	120 x 6	1953	75	187,5	24,16	33,30	117,57	124,20	381	114
PH 16CS	565 x 460	592x462	960	160 x 6	2577	90	225	18,47	25,45	101,34	107,50	507	139
			1280	160 x 8	2912	120	300	14,37	19,80	100,65	105,50	504	147
PH 20CS	562 x 510	592x512	1600	100 x 8 x 2	3671	120	300	11,46	15,80	86,41	93,70	639	168
PH 24CS	562 x 550	592x552	1920	120 x 8 x 2	4113	120	300	9,65	13,30	77,82	84,50	675	196
			2400	120 x 10 x 2	4492	120	300	8,01	11,04	77,62	83,60	668	219
			2880	120 x 12 x 2	4840	120	300	6,95	9,58	77,49	82,90	673	231
			3840	120 x 16 x 2	5403	120	300	5,73	7,90	77,26	82,00	692	254

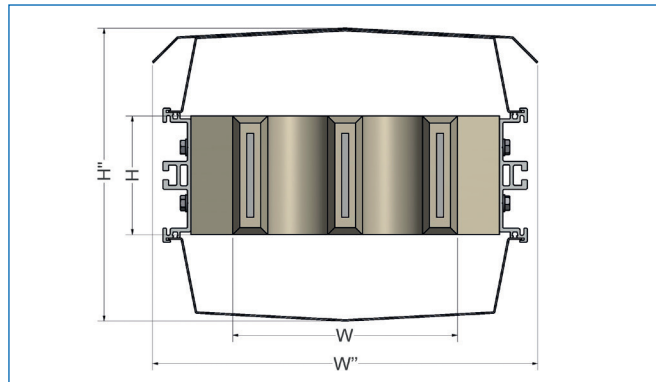
UNSHIELDED ALUMINIUM



SHIELDED ALUMINIUM

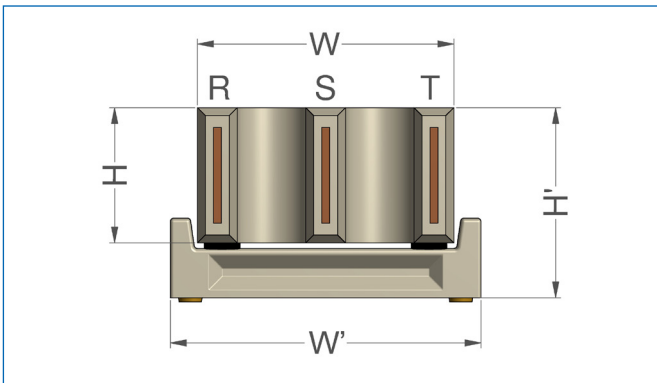


SHIELDED ALUMINIUM + CLIMATE SCREEN

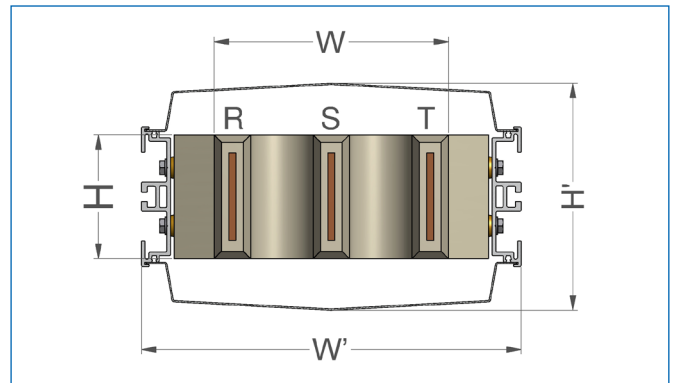


For more information about shielded busbars and climate screen, please contact your Eta-com sales representative

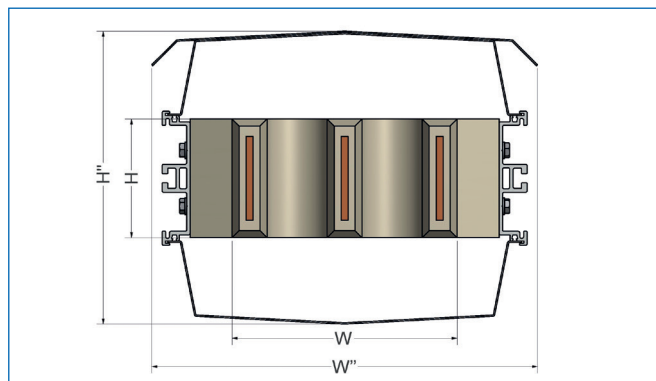
UNSHIELDED COPPER



SHIELDED COPPER



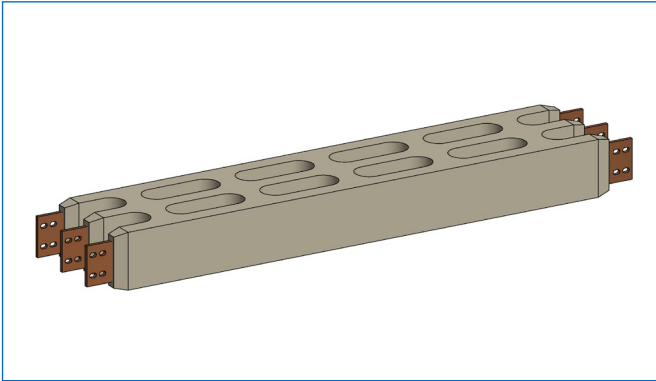
SHIELDED COPPER + CLIMATE SCREEN



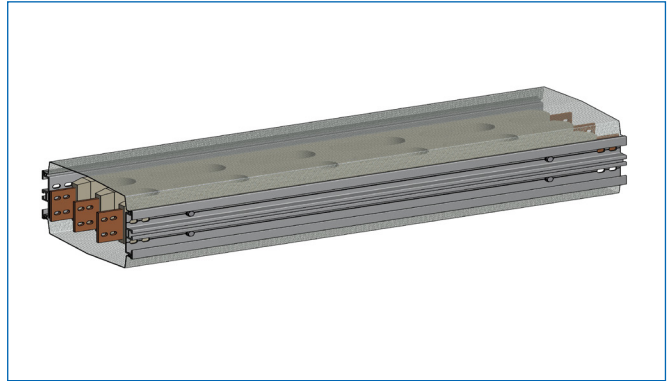
For more information about shielded busbars and climate screen, please contact your Eta-com sales representative

PH SERIES - ELEMENTS

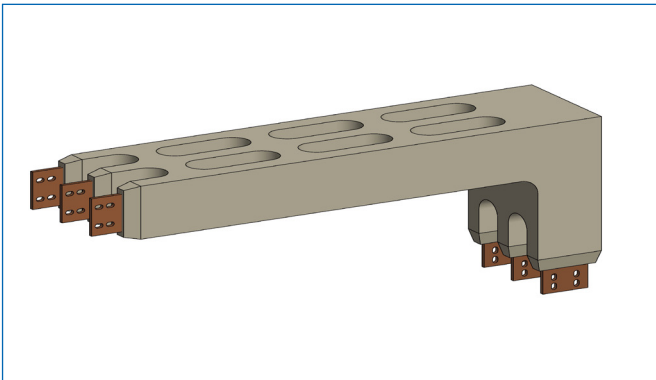
STRAIGHT ELEMENT



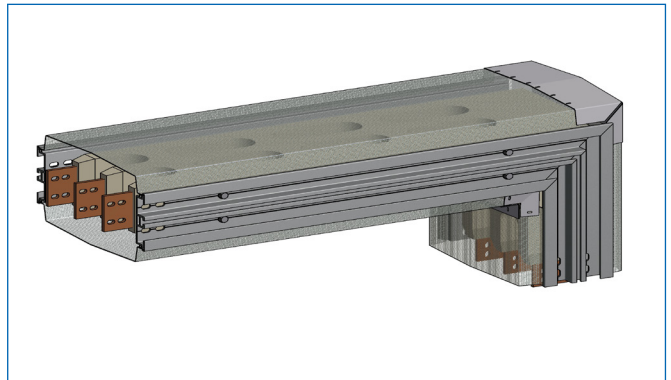
STRAIGHT ELEMENT - SHIELDED



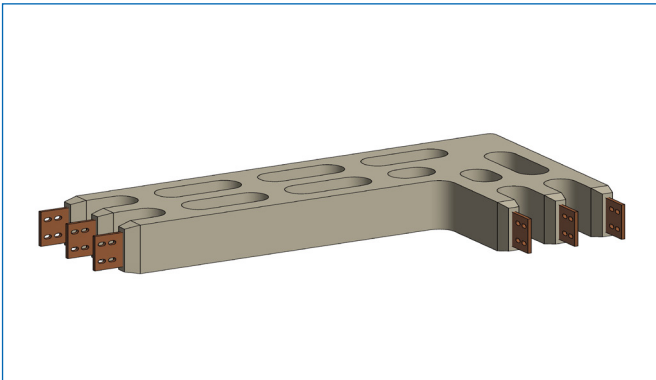
BRAZED ELBOW ELEMENT



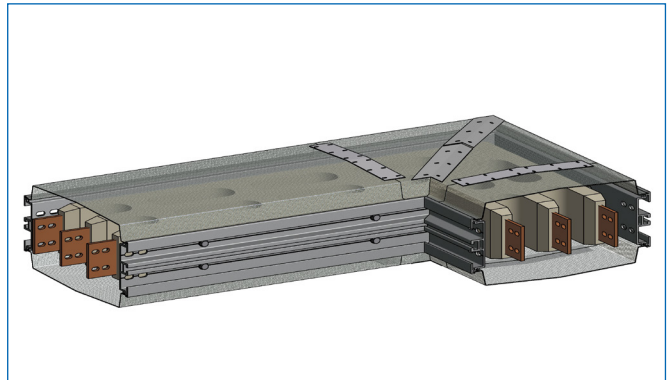
BRAZED ELBOW ELEMENT - SHIELDED



BENT ELBOW ELEMENT

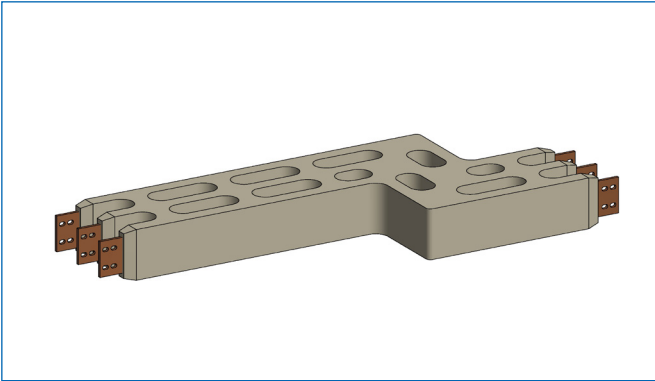


BENT ELBOW ELEMENT - SHIELDED

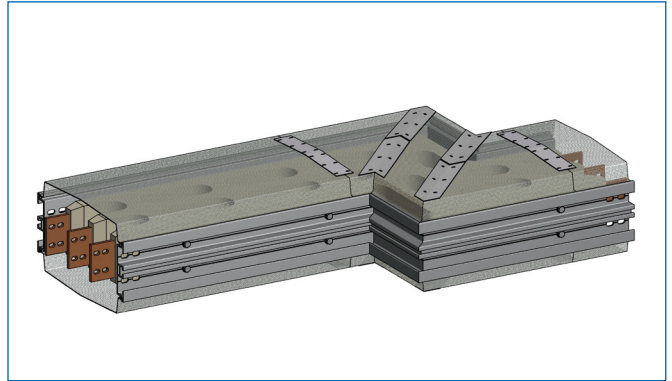


PH SERIES - ELEMENTS

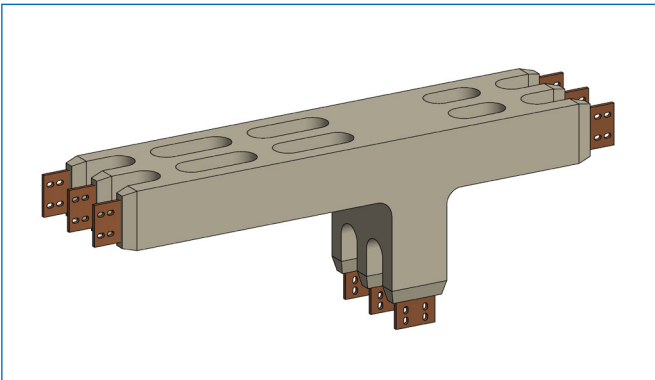
BENT 'Z' ELEMENT



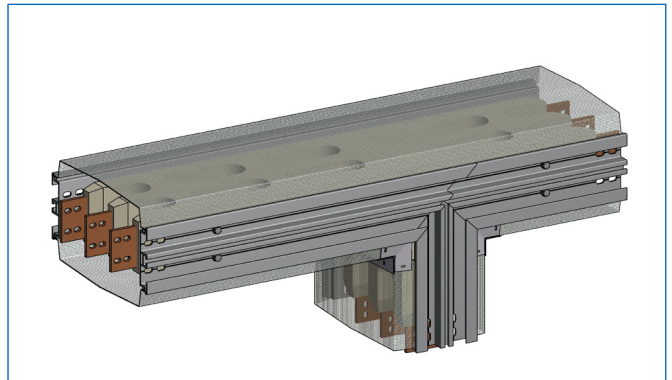
BENT 'Z' ELEMENT - SHIELDED



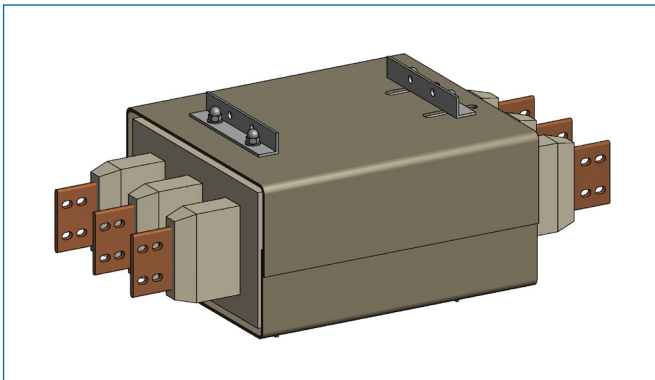
BRAZED 'T' ELEMENT



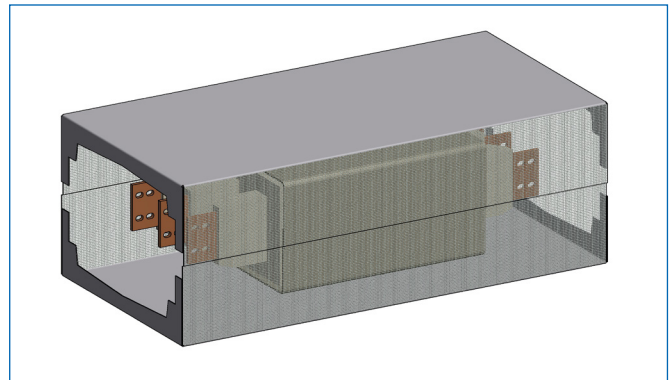
BRAZED 'T' ELEMENT



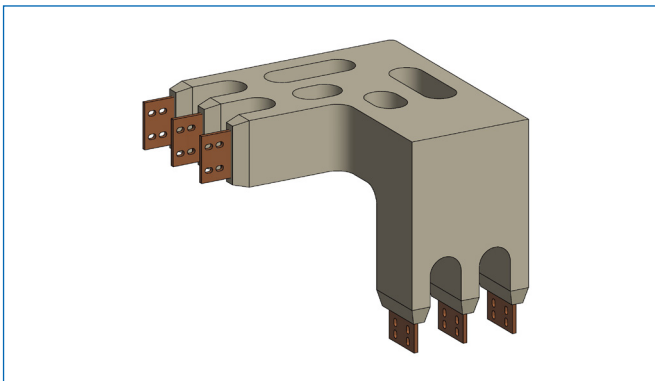
EXPANSION ELEMENT



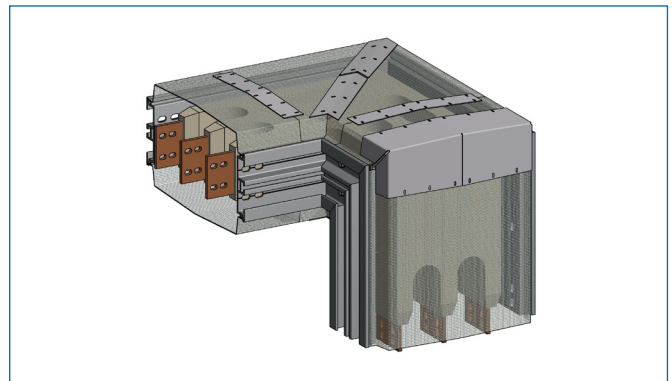
EXPANSION ELEMENT



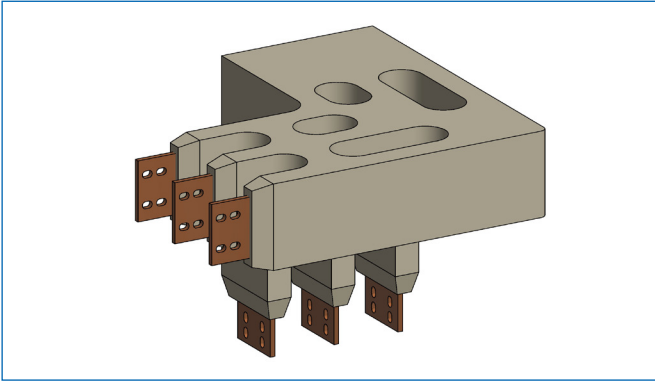
**DOUBLE ELBOW ELEMENT
'XR' ELEMENT**



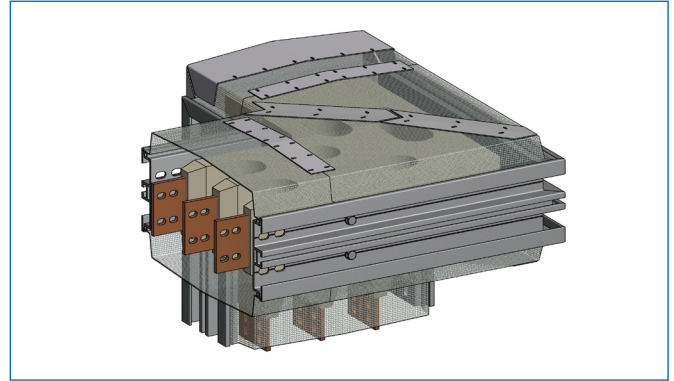
**DOUBLE ELBOW ELEMENT
'XR' ELEMENT - SHIELDED**



**DOUBLE ELBOW ELEMENT
'XL' ELEMENT**

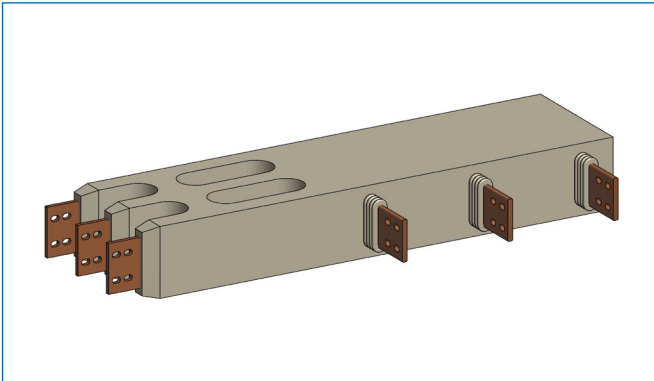


**DOUBLE ELBOW ELEMENT
'XL' ELEMENT - SHIELDED**

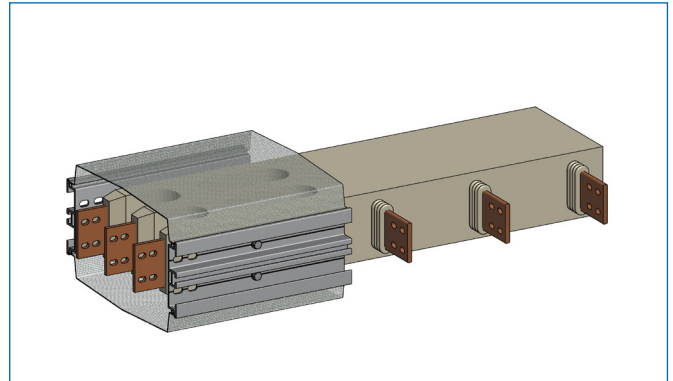


TERMINAL ELEMENTS

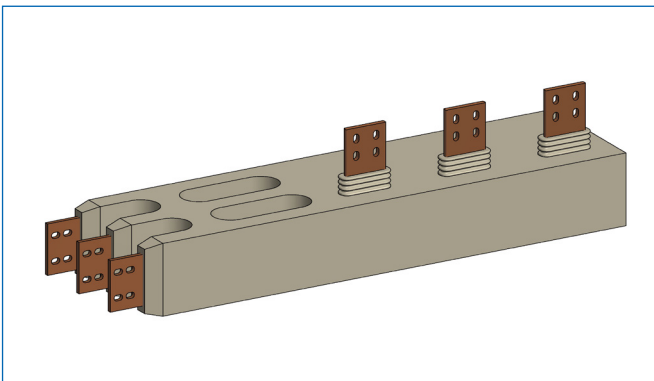
'AC' TYPE



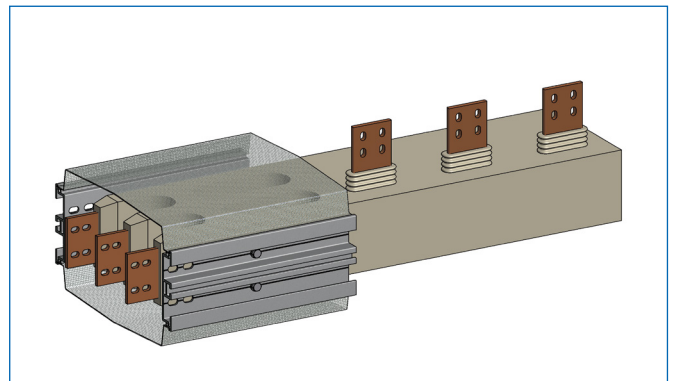
'AC' TYPE - SHIELDED



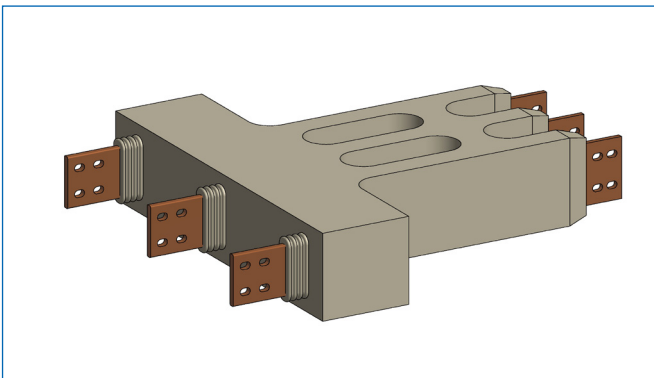
'AE' TYPE



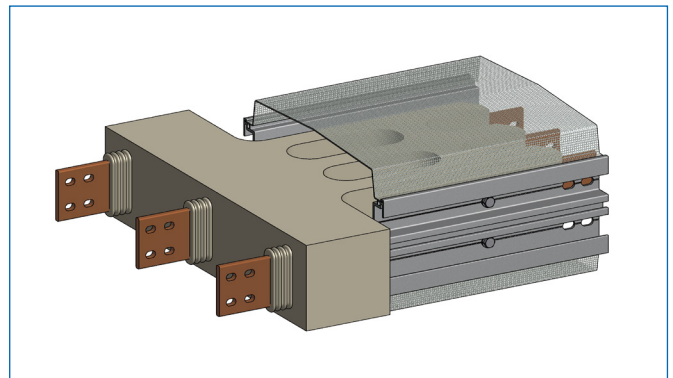
'AE' TYPE - SHIELDED



'AG' TYPE



'AG' TYPE - SHIELDED

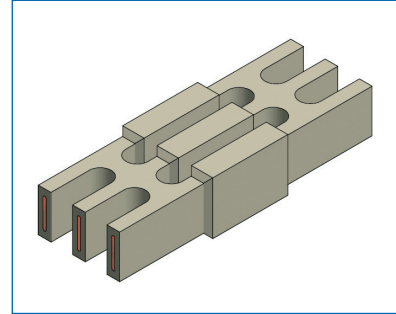
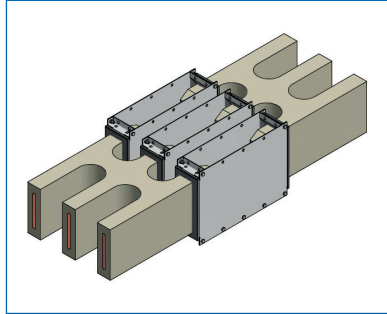
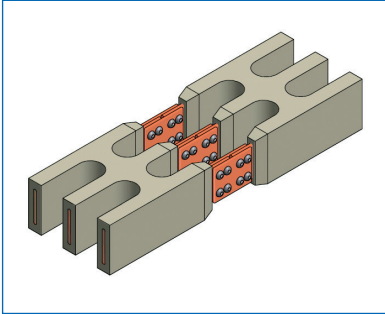


JUNCTIONS FOR MEDIUM VOLTAGE

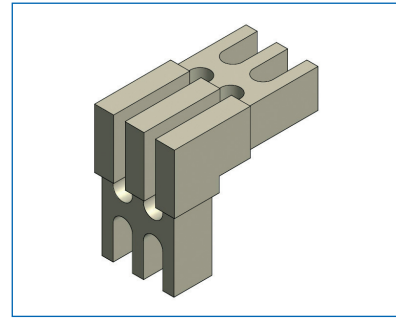
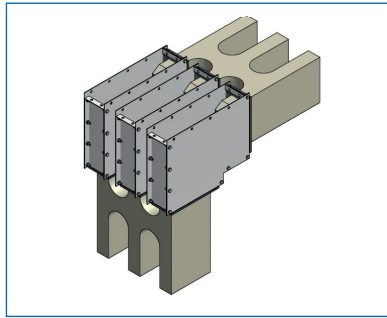
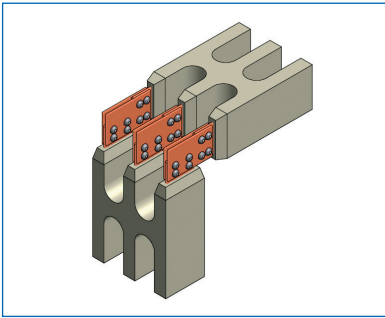
ASSEMBLE

CAST

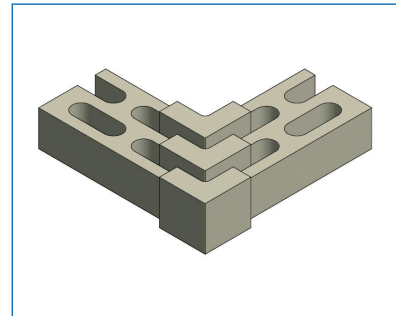
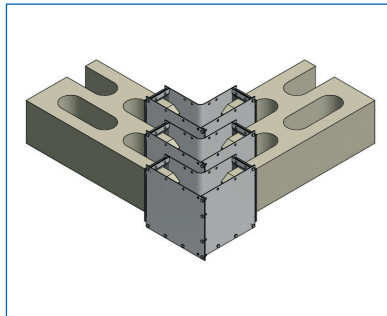
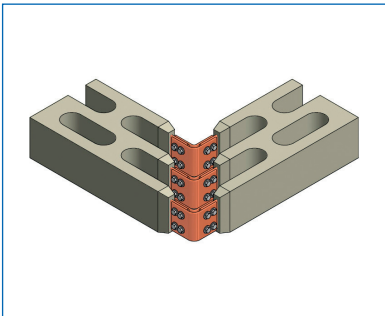
RESULT



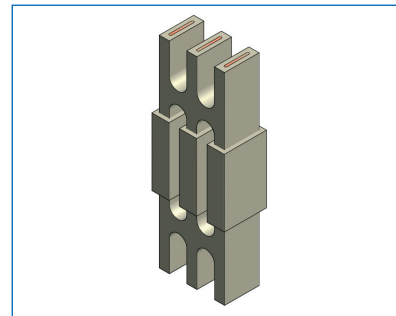
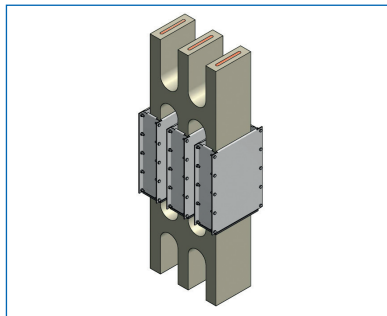
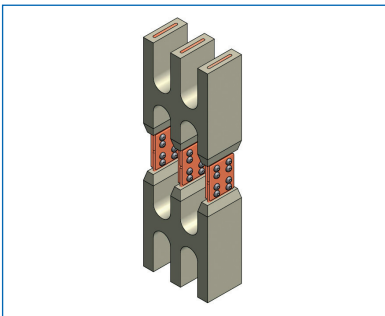
ST 26 JUNCTION



ST 27 JUNCTION



ST 28 JUNCTION



ST 29 JUNCTION

EXAMPLES FOR MV TERMINATIONS

Standard flexible connection with bellow and laminated flexibles

1. betobar

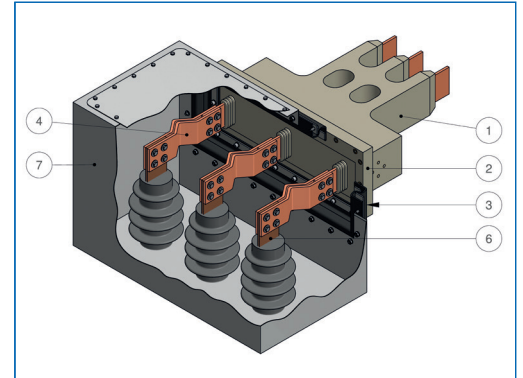
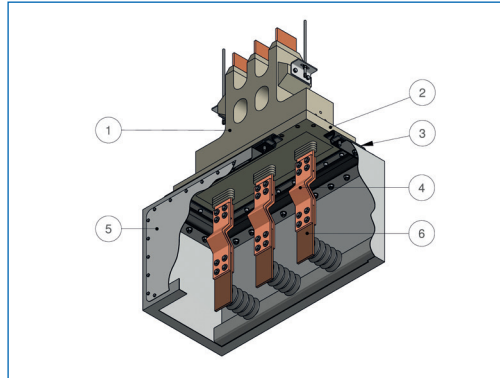
2. Flange

3. Bellow

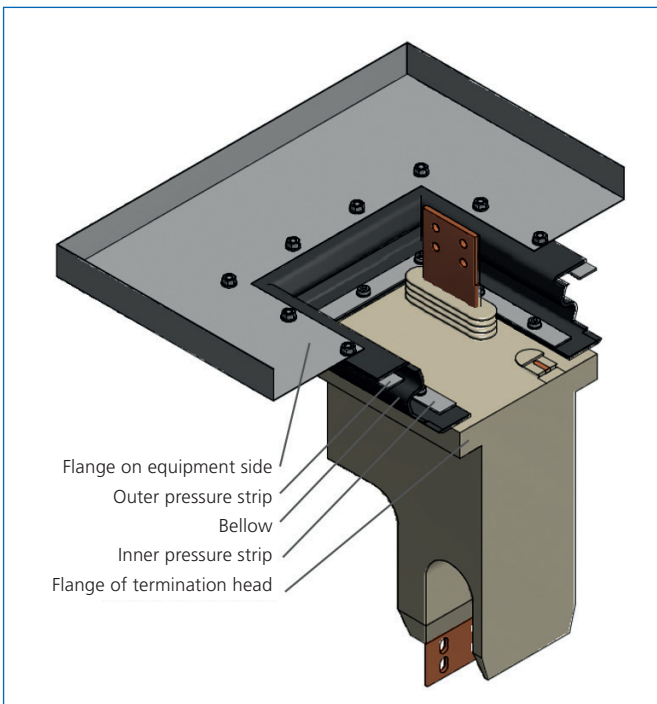
4. Flexibels

5. Switchgear or connection box

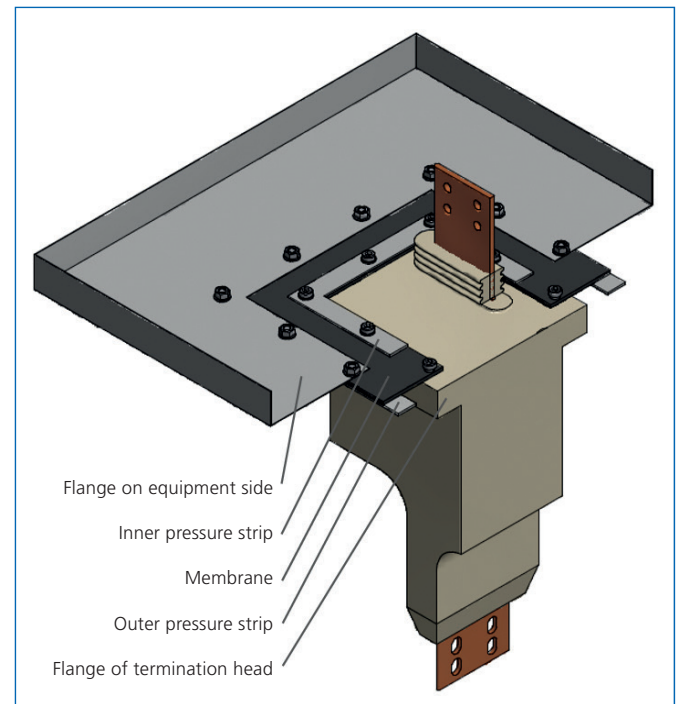
6. Terminals



Terminations with bellow



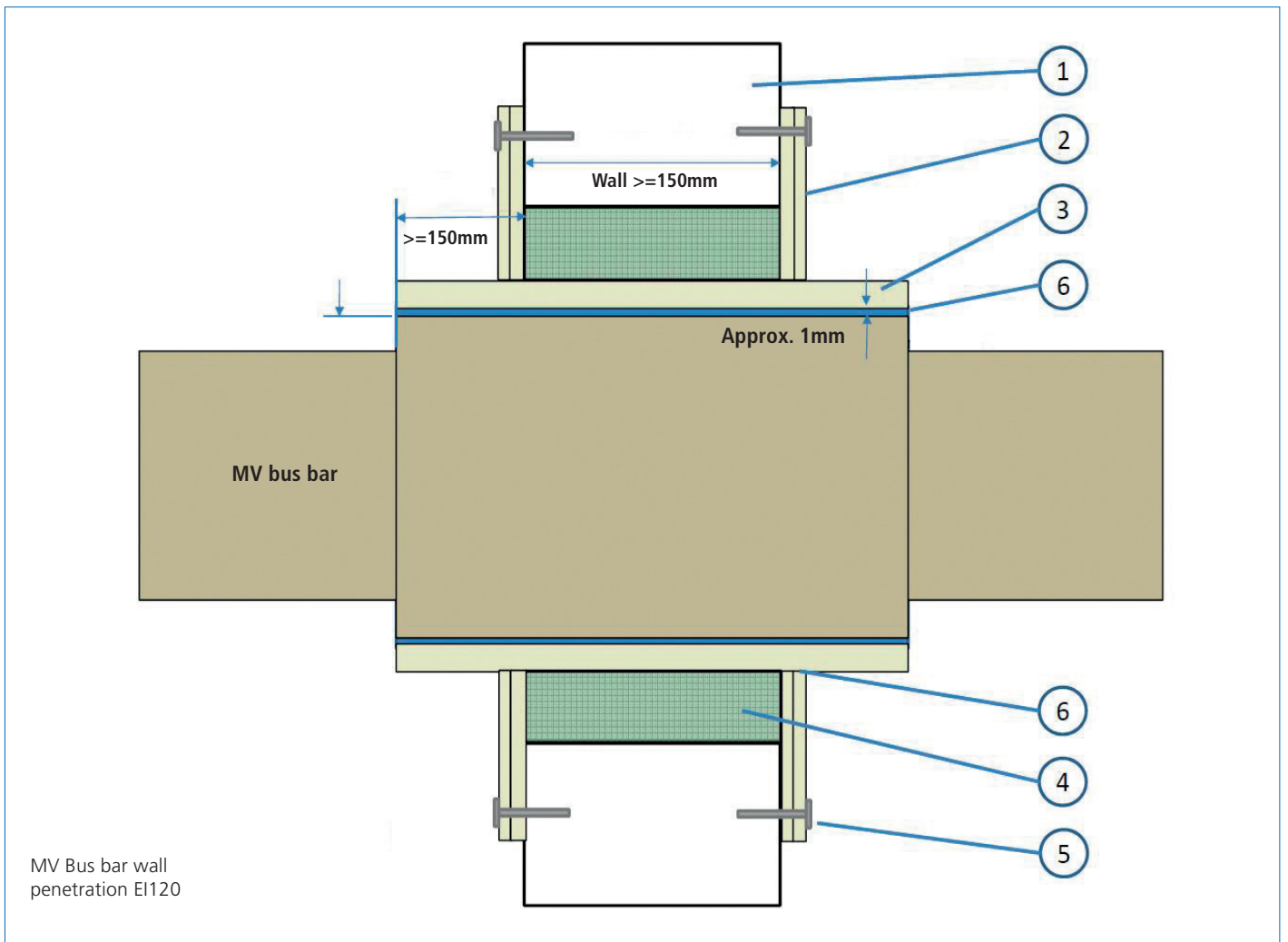
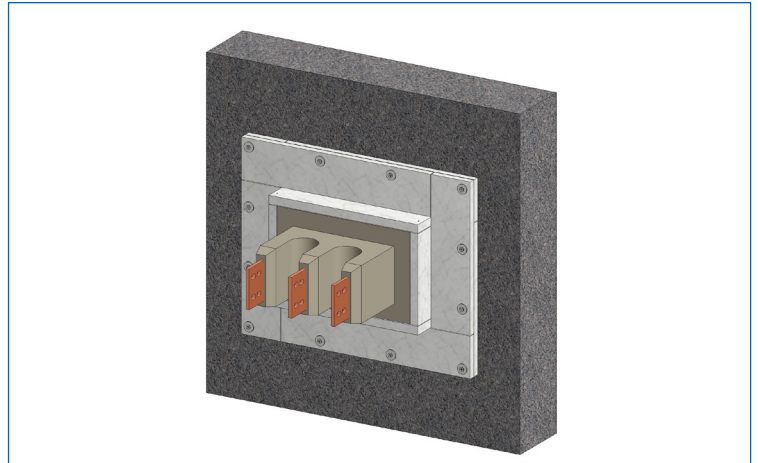
Terminations with membrane



WALL & FLOOR BUSHING TILL EI120

Medium voltage systems

1. Fireproof wall or floor
2. Promaxon plate 20 mm, 2 staggered layers
3. Promaxon plate 25 mm
4. Rockwool, density $\geq 100 \text{ kg/m}^3$
5. Steelbolt anchor
6. Promaseal and promacol

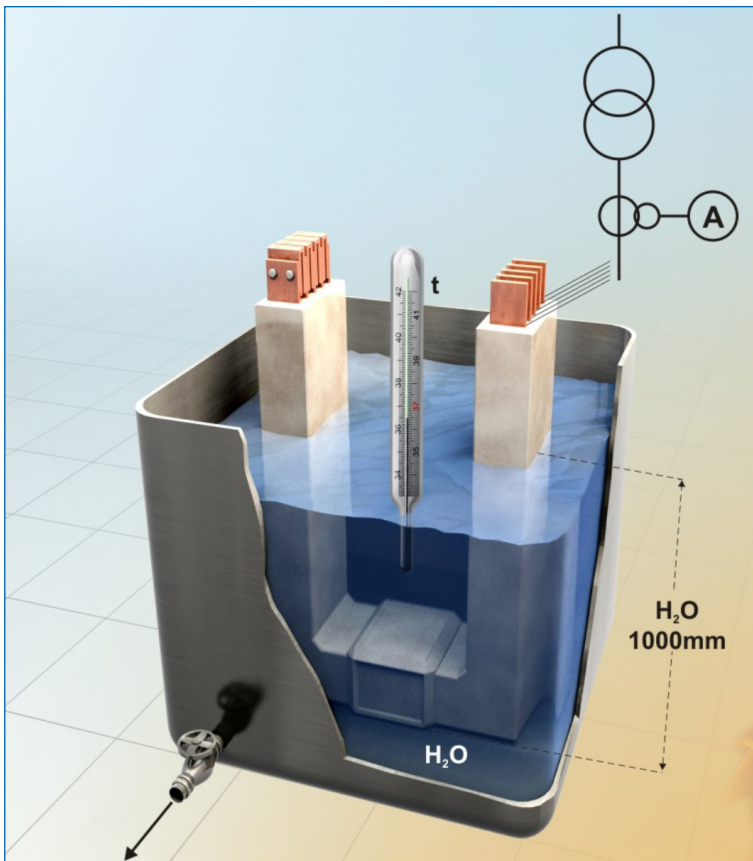


* The fire resistance class is highly dependent on thickness and quality of wall or floor.

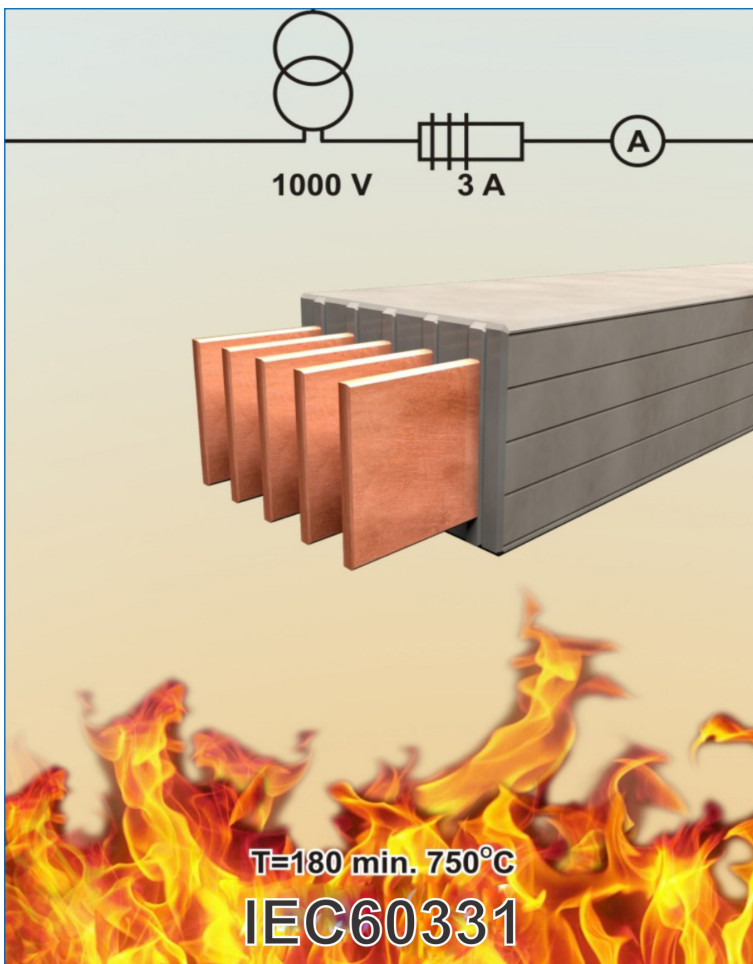


NO	DATE	REMARKS	TIME	STATUS
1	1/15/20	Site inspection	08:00	Completed
2	1/16/20	Material delivery	09:30	In Progress
3	1/17/20	Foundation work	07:00	Not Started
4	1/18/20	Roofing work	08:30	Not Started
5	1/19/20	Interior finishing	09:00	Not Started
6	1/20/20	Final inspection	10:00	Not Started

GENERAL INFORMATION



- **COMBINED TEST**
- **HEAT RUN - IMMERSION**
- **6 CYCLES - TOTAL 2592 HOURS**



- **FIRE RESISTANCE TO IEC 60331**
- **3 HOURS FLAME CONTACT AT 750° C**
- **E30 TO E90 AS PER DIN4102-12**
- **(LAB LUIK BELGIUM)**

GENERAL LOW VOLTAGE/MEDIUM VOLTAGE DESIGN FUNDAMENTALS

1. IEC Standard - Temperature limits

For LV design temperature rise is as per IEC 61439-1 & 6.

For MV design temperature rise is as per IEC 62271-1 & 201 or IEC 62271-1 & 200.

2. Weights

The weights of the betobar for the LV types are the average weights as indicated in the tables including the junction and the casting mix per system length of 2,2 m. For MV-type the supporting insulators and any possible screening is included.

3. System Impedance

All impedances have been calculated with physical values:

For copper:

Specific resistance at 20° C = 0.0175Ωmm²/m Conductivity 57 MS/m

Temperature coefficient = 0.00392 1/K

Standard EN 13601 (2002)

For Aluminium:

Specific resistance at 20° C = 0.029Ωmm²/m Conductivity 35.4 MS/m

Temperature coefficient = 0.0041/K

Standard EN 755-2 (1997)

4. Maximum voltage

betobar is designed for a maximum voltage of 24 kV. Rated voltage 7.2 kV & above is provided with self-supporting safety screen.

5. Short circuit

LV	MV	I _{cc} values in the technical data
I _{cw}	I _k	Symmetrical short circuit current (1 second effective value if no further indications)
I _{pk}	I _p	Asymmetrical (dynamic) short circuit current (peak value)

6. Correction factors

For correction factors on following parameters please consult Eta-com or your betobar agent

- Design ambient temperature
- Shielding
- DC Voltage
- Frequency
- Temperature rise

7. Phase sequence

Phase sequence in documentation and product documents:

is indicated as	R	S	T
to be equal to	R	Y	B
or	L1	L2	L3

CHEMICAL RESISTANCE BETOBAR INSULATION

The results of the tests carried out at the betobar laboratories are given in the table below. They are based upon the conditions prevailing during these tests: carried out at 20°C and fully immersed for at least one year.

The details given in this list have been prepared with maximum care and to the best of our knowledge. However, we cannot assume liability for usage in very specific cases.

Each individual application has to be considered by the factory.

Chemical agents		Results		
		E	G	F
Boric acid	H ₃ BO ₃	x		
Hydrochloric acid 10 %	HCl			x
Citric acid 10 %				x
Lactic acid 10 %	C H ₃ -C HOH- CO ₂ H			x
Alcohol (ethyl-)	C ₂ H ₅ OH		x	
Beer		x		
Ketone (acetone)	H ₃ CCOCH ₃			x
Calcium chloride 50 %	CaCl ₂	x		
Liquid combustibles (petrol,oil ...)		x		
Water (distilled)	H ₂ O	x		
Water (mineral)		x		
Esters			x	
Ether	C ₂ H ₅ OC ₂ H ₅			x
Formalin 37 %	HCOH		x	
Glycerin			x	
Lubricating grease and oil		x		
Greases and oil		x		
Vegetable oil		x		
Aliphatic hydrocarbide (petroleumether)	C ₅ H ₁₂	x		
Aromatic hydrocarbide (toluene)	C ₅ H ₁₂			x
Chloride carbon	CCl ₄			x
Ammonium hydroxide 10 %	NH ₄ OH		x	
Ammonium hydroxide 30 %	NH ₄ OH			x
Milk (fresh and sour)				x
Soda-lime 10 %	NaOH		x	
Soda-lime 50 %	NaOH		x	
Blood		x		
Soap and detergents		x		
Sugar (saturated solution)		x		
Urine		x		
Hydrogen Sulphide	H ₂ S	x		

E = Excellent, suitable even for uninterrupted and prolonged exposure

G = Good, suitable for prolonged exposure

F = Fair, suitable for repeated but brief exposures

In the event of consultations or enquiries regarding chemical resistance, please always state the following:

1. The chemical material, if possible with formula, and in case of trade names, the manufacturer.
2. The mixing ration with a solvent, usually water.
3. The temperature, including temperature changes with the corresponding time intervals.
4. Period of exposure.

INSTALLATION BY EXPERIENCED TECHNICIANS

In order to better assist you in the successful realization of your projects, Eta-com puts its installation & service department at your disposal.

The installation & service department is in charge of the installation of betobar cast-resin insulated and other busduct systems, as well as related cast-resin products. To reach and guarantee the quality of our installation service, the team consists of skilled technicians with an educational background in industrial engineering or electricity.

Throughout their careers, our senior supervisors have gained extensive experience in site supervision for projects worldwide, often involving large-scale and complex installations such as offshore platforms, petrochemical power stations, refineries, oil tankers, nuclear power plants, hydropower plants, desalination plants, etc. Having built up this know-how over 20 years time, the technicians are capable of assessing and handling on-site betobar installation projects with efficiency.

Our installation & service department and our engineers are SHE Checklist Contractors, VCA**2017/6.0 certified.

The installation & service department and engineers can provide following services:

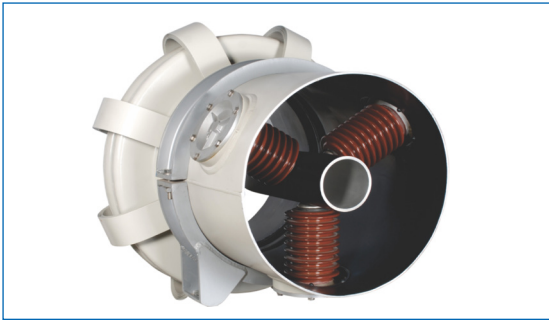
- Supervision to ensure safe and efficient reception of the busbars on-site.
- Installation of betobar cast-resin insulated and other busduct systems, as well as related cast-resin products.
- Realization of casting junctions.
- Connection of the equipment.
- Inspection and testing of the installation, including measuring the insulation and resistance values.

Inspection and testing is carried out on completion of installation and maintenance activities, with results being documented. Should items not be acceptable against the agreed contract criteria, they will either be repaired, replaced or identified for a subsequent evaluation and decision. All repaired items are subject to a re-inspection to ensure acceptability.

On completion of installation and maintenance works, you as customer are also invited to check the work performed, to ensure full acceptability.



isobar

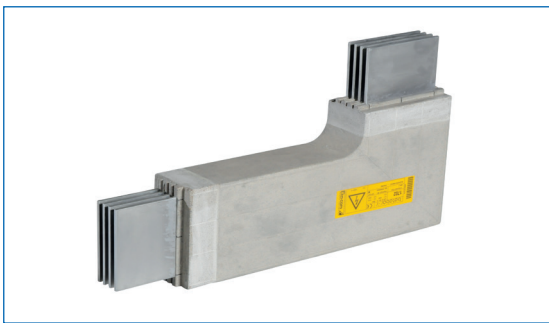


**ISOLATED PHASE BUSDUCTS
(11-36 KV UP TO 30 000 A)**

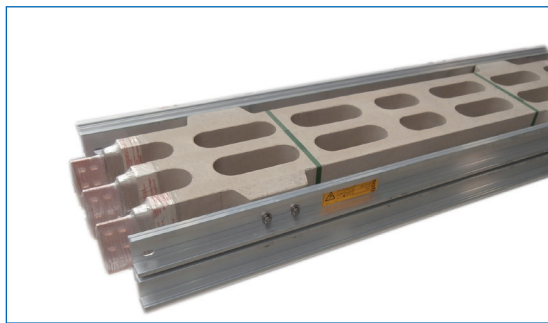


**SEGREGATED/NON-SEGREGATED
PHASE BUSDUCTS
(415-33 KV UP TO 6500 A)**

betobar



LOW VOLTAGE

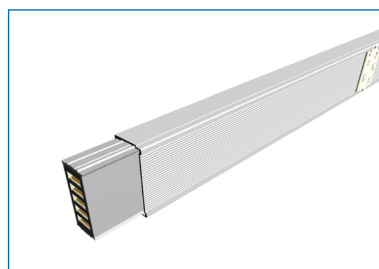


MEDIUM VOLTAGE

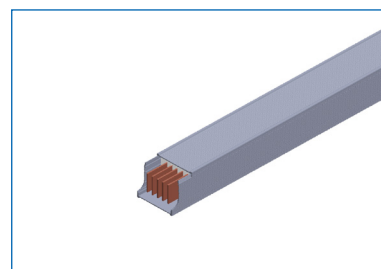
metabar



**LIB SYSTEM
(25-40 A)**



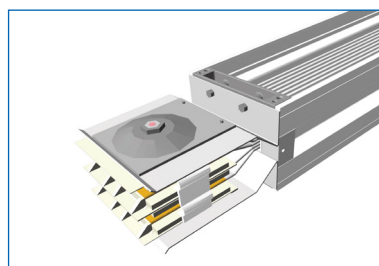
**NB SYSTEM
(40-100 A)**



**MB SYSTEM
(100-225 A)**



**CB SYSTEM
(160-1000 A)**



**SB SYSTEM
(500-6000 A)**

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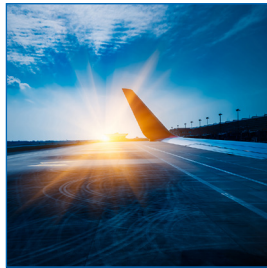
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POWER PLANT



AVIATION



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OIL & GAS



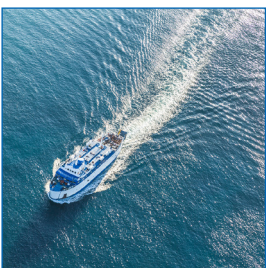
DESALINATION



INDUSTRY



NUCLEAR ENERGY



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UTILITIES



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