BUSDUCT

CE

GUARDEX

RR GLOBAL

RR Busduct is part of RR Global, a USD 1.4 Billion conglomerate in the electrical sector with a presence in over 90 countries globally. Spread across multiple business verticals including Busducts, RR Global has always endeavored to create products of the highest quality using the latest in innovative technology.

RR Busduct's - GUARDEX range of bus way systems is the most comprehensive system in the market as it offers both alternating as well as direct current distribution system and is designed to meet global requirements. Our Busducts also have a high short circuit withstanding capacity with low electromagnetic interference which makes it more efficient. In addition to this, extruded aluminum housing and sandwich construction design makes RR Busduct products robust, compact and one of the lightest sandwich products in the market.

Developed and manufactured at our state-of-the-art facility in Dubai, UAE, we are certified by Intertek for ISO 9001, ISO 14001 and ISO 45001 (Previously OHSAS 18001). Our products are of the finest quality and accredited by ASTA as per IEC 61439 -1 & 6, IEEE 693 – 2005 standards and by UL as per IEC 60331-1 standard.

We at RR Busduct are technology-driven inspired by innovation, ensuring our customers the most reliable and efficient electrical distribution system.

CONTENTS

PHYSICAL DATA

STRAIGHT LENGTH (FEEDER)

800Amps - 6300 Amps. (Cu.)
800Amps - 5000 Amps. (Al.)

- Minimum 400mm - Maximum 4000mm
- Panel to Panel
- Transformer to Panel
- DG to Panel

Guardex by RR Busduct is a fully type tested and certified by ASTA UK as per IEC 61439 -1 & 6. Our manufacturing facility is certified by Intertek for quality management system (ISO 9001:2015), Environmental (ISO 14001:2015) & health and safety standard (OHSAS 18001:2007).

Guardex by RR Busduct has been successfully tested for Seismic Zone - 5 compliance as per IEE 693-2005 standards. It is also tested for circuit Integrity for fire rated applications by UL as per IEC 60331-1 for 200 minutes.

STRAIGHT LENGTH (PLUG-IN)

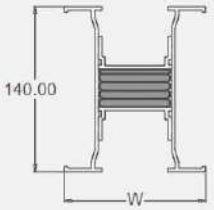
Tap Off Unit Rating	Straight Length (Plug-in) Size	
	Minimum Size (mm)	Maximum Size (mm)
16 A to 100 A	900	4000
125 A to 160 A	1000	4000
200 A to 250 A	1100	4000
300 A to 400 A	1300	4000
500 A to 630 A	1400	4000
800 A to 1000 A	1600	4000

- For tapping power from main line through plug-in boxes.
- Rating and number of plug-in points shall be as per site requirment.

BUSBAR DIMENSIONS - GUARDEX / GUARDEX PLUS

COPPER GUARDEX PLUS

Rating in Amps	Copper size in mm	Dimension W
800	1 x 45(P) x 6	105
1000	1 x 45 x 6	105
1250	1 x 55 x 6	115
1600	1 x 80 x 6	140
2000	1 x 110 x 6	170
2000	1 x 140 x 6	200
2500	1 x 150 x 6	210

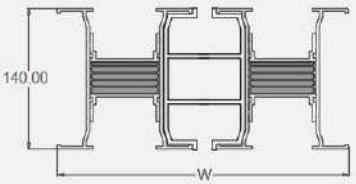


COPPER GUARDEX

Rating in Amps	Copper size in mm	Dimension W
800	1 x 50 x 6	110
1000	1 x 60 x 6	120
1250	1 x 70 x 6	130
1400	1 x 80 x 6	140
1400	1 x 100 x 6	160
1600	1 x 100 x 6	160
2000	1 x 125 x 6	185
2000	1 x 150 x 6	210
2000	1 x 175 x 6	235
2500	1 x 200 x 6	260

COPPER GUARDEX PLUS

Rating in Amps	Copper size in mm	Dimension W
3200	2 x 95 x 6	340
4000	2 x 120 x 6	390
5000	2 x 160 x 6	470
4000	2 x 140 x 6	430
5000	2 x 175 x 6	500

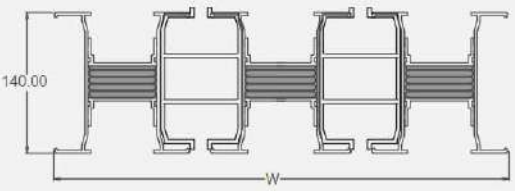


COPPER GUARDEX

Rating in Amps	Copper size in mm	Dimension W
2500	2 x 80 x 6	310
3200	2 x 110 x 6	370
4000	2 x 150 x 6	450
5000	2 x 200 x 6	550

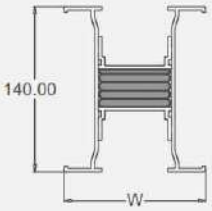
COPPER GUARDEX

Rating in Amps	Copper size in mm	Dimension W
6300	3 x 150 x 6	690

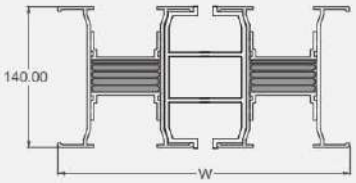


BUSBAR DIMENSIONS - ALUMINIUM

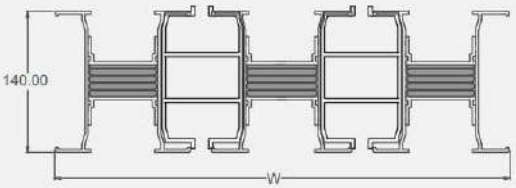
Rating in Amps	Aluminium size in mm	Dimension W
800	1 x 60 x 6	120
1000	1 x 80 x 6	140
1250	1 x 110 x 6	170
1600	1 x 150 x 6	210
2000	1 x 200 x 6	260



Rating in Amps	Aluminium size in mm	Dimension W
2500	2 x 125x 6	400
3200	2 x 150 x 6	450
4000	2 x 200 x 6	550

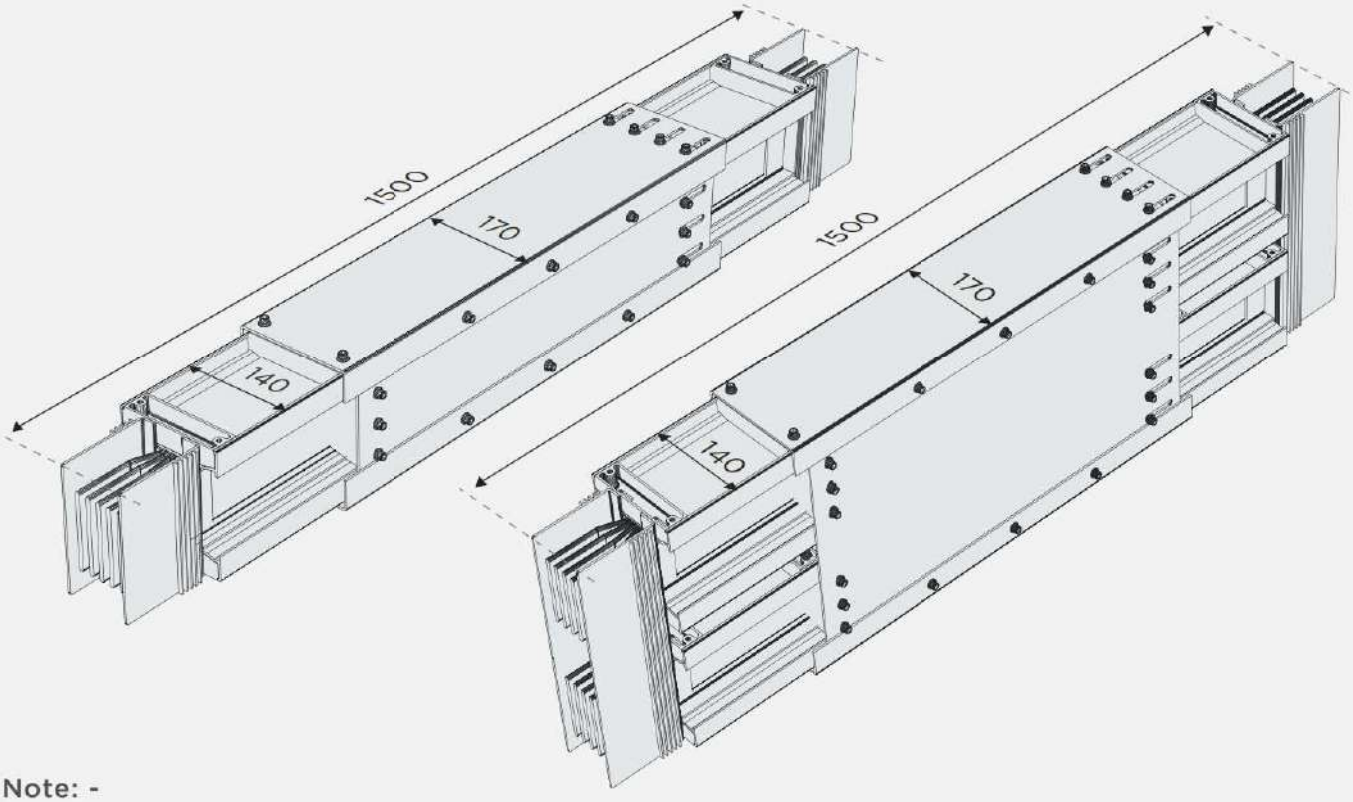


Rating in Amps	Aluminium size in mm	Dimension W
5000	3 x 200x 6	840



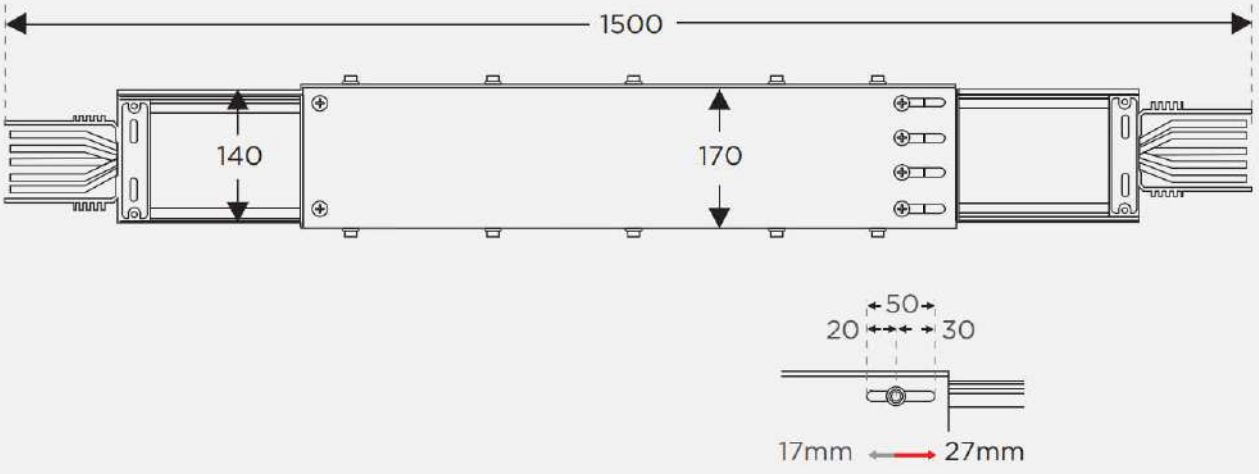
HORIZONTAL EXPANSIONS

- Horizontal Expansion Joint should be utilized if Busbar line is crossing in an adjacent manner through building expansion joints.
- Expansion unit is IP55 for all ratings.
- RR Busduct requests to be consulted during design stage
- Total length of the module should be adjusted to 1500mmm, after Busbar installation.



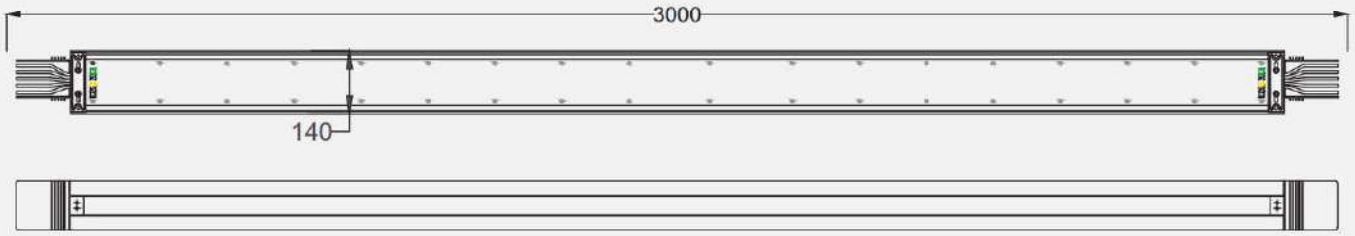
Note: -

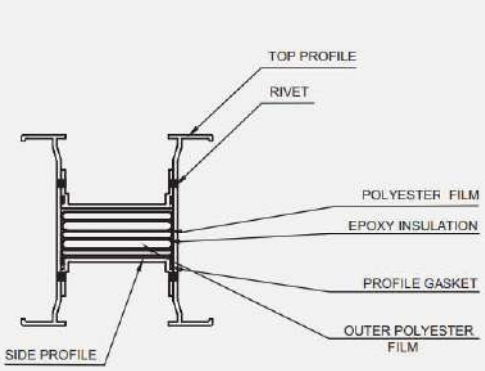
The total length of the module should be adjusted to 1500mm, after busbar installation.

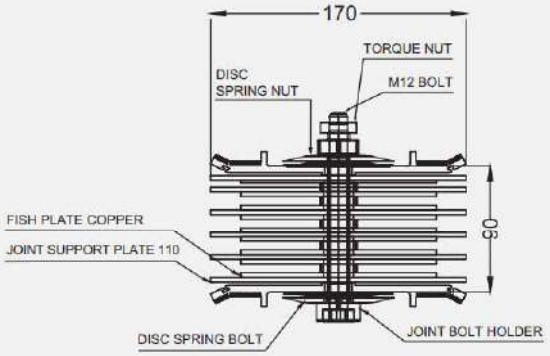


JOINT BLOCK

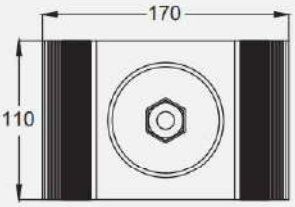
- The joint block is used to connect two elements of the busbar systems, it can be fitted or removed in an installed condition without the removal of the adjacent sections or elements.
- The torque nut ensures tightness of joints at desired torque and eliminates the need of torque wrench during the installation process.
- Heavy duty side plates and Belleville washers ensures uniform distribution of pressure. Joints can be tightened easily with the help of a spanner only on one side.







Side View



Top View

BUSBAR INSULATION DETAILS

The compact structure is considered as the 'perfect' design for high current busduct systems, which means Busbar conductors are tin plated and insulated with class F polyester film and are epoxy coated.

Construction of sandwich design in extruded aluminum makes the system efficient with low hysteresis losses and better heat dissipation. There is no space filled with air and heat is easily transferred to the environment by the housing that works like a heat dissipater.

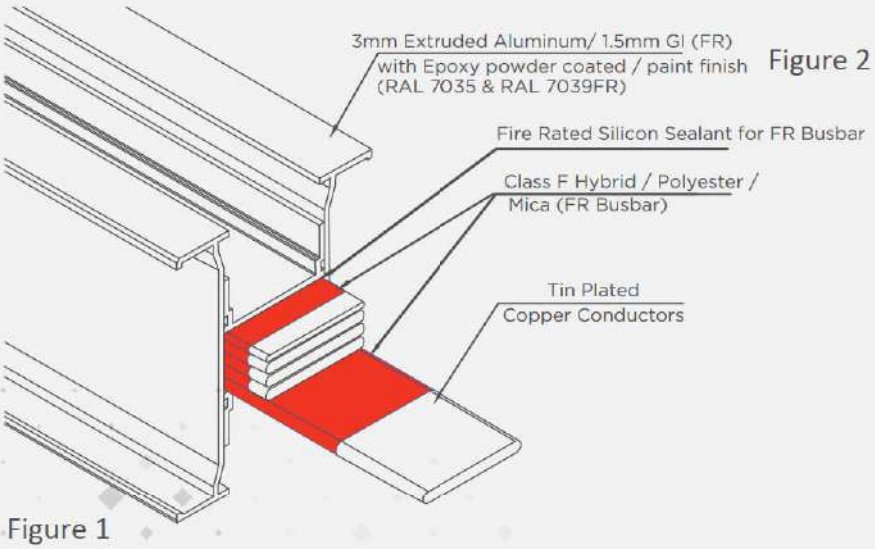
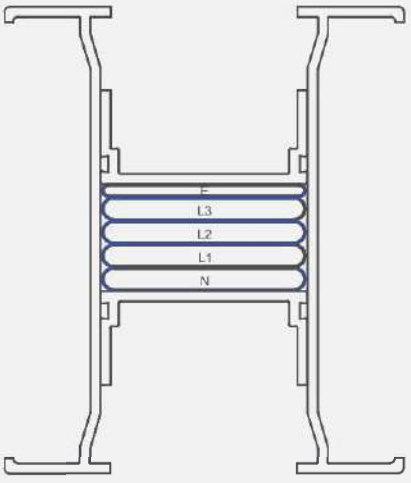


Figure 1

Figure 2



Technical Data of Guardex Sandwich Busway Systems

Copper Conductor (Cu)

Standards	IEC 61439-6 / 1																	
Rated Insulation Voltage	Ui 1000 V																	
Rated Operational Voltage	Ue 1000 V																	
Rated Impulse Withstand Voltage	Uimp 8 kV																	
Rated Frequency	fn 50/60 Hz																	
Pollution Degree	III																	
Protection Degree	IP54 / IP55 / IP65/ IP66 / IP67																	
External Mechanical Impacts (IK Code)	IK10																	
Rated Current In	Ampere		800	1000	1250	1400	1600	1400	2000	2000	2500	2000	2500	3000	3200	4000	5000	6300
Rated Short-time Withstand Current (1s) 3p	I_{cw}	kA	50	50	50	50	80	80	80	80	100	80	80	80	120	120	120	120
Rated Peak Withstand Current	I_{pk}	kA	105	105	105	105	176	176	176	176	220	176	176	176	264	264	264	264
Rated Short-time Withstand Current for Neutral (1s) 1p	I_{cw}	kA	30	30	30	30	48	48	48	48	60	48	48	48	72	72	72	72
Rated Peak Withstand Current for Neutral	I_{pk}	kA	63	63	63	63	105.6	105.6	105.6	105.6	132	105.6	105.6	105.6	158.4	158.4	158.4	158.4
Rated Short-time Withstand Current for PE Conductor (1s) 1p	I_{cw}	kA	30	30	30	30	48	48	48	48	60	48	48	48	72	72	72	72
Rated Peak Withstand Current for PE Conductor	I_{pk}	kA	63	63	63	63	105.6	105.6	105.6	105.6	132	105.6	105.6	105.6	158.4	158.4	158.4	158.4

Cross Section

L1 L2 L3 N	mm^2		300	360	420	480	600	660	750	900	960	1050	1200	1380	1320	1800	2400	2700
Internal Earth (50%)	mm^2		150	180	210	240	300	330	375	450	480	525	600	690	660	900	1200	1350
Internal Earth (100%)	mm^2		300	360	420	480	600	660	750	900	960	1050	1200	1380	1320	1800	2400	2700
Aluminium Housing Cross Section	mm^2		1856	1916	1976	2036	2156	2278	2306	2456	4072	2607	4072	2930	4432	4912	5512	7368
Overall Dimension	WxH		110x140	120x140	130x140	140x140	160x140	170x140	185x140	210x140	310x140	235x140	260x140	270x140	370x140	450x140	550x140	690x140

Weight / Meter

Busbar Trunking Weight (4 Conductors)	kg/m		16.2	17.9	20.1	23.9	27.3	32.2	34.2	42.7	46.7	48.1	55.8	54.4	59.1	79	102.4	110.5
Busbar Trunking Weight (4.5 Conductors)	kg/m		17.5	19.5	22	26	30	35.1	37.5	46.7	51	52.7	61.1	60.5	65	87	113	122.5
Busbar Trunking Weight (5 Conductors)	kg/m		18.8	21.1	23.9	28.1	32.7	38	40.8	50.7	55.3	57.4	66.4	66.6	70.9	95	123.6	134.5

Mean Phase Conductor Characteristics At Rated Current In

Resistance at a conductor temp of 20 °C	R_{20}	mΩ/m	0.0582	0.042	0.038	0.033	0.024	0.0236	0.022	0.0195	0.0182	0.0178	0.0165	0.016	0.012	0.009	0.0081	0.0064
Resistance at an ambient air temp of 50 °C	R	mΩ/m	0.0651	0.0470	0.0425	0.0369	0.0268	0.0264	0.0246	0.0218	0.0203	0.0199	0.0184	0.0179	0.0134	0.0101	0.0091	0.0072
Reactance (independent from temp)	X	mΩ/m	0.025	0.024	0.02	0.018	0.014	0.012	0.009	0.008	0.007	0.007	0.006	0.006	0.005	0.004	0.0034	0.003
(+) & (-) sequence impedances at an ambient air temp of 50 °C	Z	mΩ/m	0.0972	0.0652	0.1030	0.0591	0.0584	0.0522	0.0412	0.0381	0.0337	0.0302	0.0335	0.0058	0.0251	0.0333	0.0313	0.0298
(+) & (-) sequence impedances at a conductor temp of 20 °C	Z_{20}	mΩ/m	0.0857	0.0575	0.0909	0.0522	0.0636	0.0460	0.0364	0.0336	0.0297	0.0266	0.0296	0.0051	0.0221	0.0294	0.0276	0.0263

Voltage Drop / Ampere / Meter

Voltage Drop mV at 1.0 Power Factor	mV/A/m		0.0504	0.0364	0.0329	0.0286	0.0208	0.0204	0.0191	0.0169	0.0158	0.0154	0.0143	0.0139	0.0104	0.0078	0.0070	0.0055
Voltage Drop mV at 0.9 Power Factor	mV/A/m		0.0548	0.0418	0.0372	0.0325	0.0240	0.0229	0.0205	0.0182	0.0168	0.0165	0.0151	0.0147	0.0112	0.0085	0.0076	0.0061
Voltage Drop mV at 0.8 Power Factor	mV/A/m		0.0533	0.0416	0.0367	0.0322	0.0239	0.0226	0.0199	0.0177	0.0162	0.0160	0.0145	0.0142	0.0109	0.0083	0.0074	0.0060
Voltage Drop mV at 0.7 Power Factor	mV/A/m		0.0507	0.0403	0.0354	0.0311	0.0232	0.0217	0.0189	0.0168	0.0154	0.0151	0.0137	0.0134	0.0104	0.0079	0.0070	0.0057
Voltage Drop mV at 0.6 Power Factor	mV/A/m		0.0476	0.0385	0.0336	0.0296	0.0222	0.0206	0.0177	0.0157	0.0143	0.0141	0.0127	0.0125	0.0097	0.0074	0.0066	0.0054
Voltage Drop mV at 0.5 Power Factor	mV/A/m		0.0439	0.0362	0.0315	0.0278	0.0209	0.0192	0.0163	0.0144	0.0131	0.0130	0.0116	0.0114	0.0089	0.0069	0.0061	0.0050

Voltage Drop / Meter

Voltage Drop mV at 1.0 Power Factor	V/m		0.0403	0.0364	0.0411	0.0400	0.0333	0.0286	0.0381	0.0338	0.0394	0.0385	0.0357	0.0416	0.0333	0.0312	0.0351	0.0349
Voltage Drop mV at 0.9 Power Factor	V/m		0.0438	0.0418	0.0465	0.0455	0.0384	0.0321	0.0411	0.0364	0.0421	0.0413	0.0378	0.0442	0.0360	0.0341	0.0380	0.0386
Voltage Drop mV at 0.8 Power Factor	V/m		0.0426	0.0416	0.0459	0.0451	0.0382	0.0316	0.0398	0.0353	0.0406	0.0399	0.0364	0.0426	0.0349	0.0333	0.0369	0.0378
Voltage Drop mV at 0.7 Power Factor	V/m		0.0406	0.0403	0.0443	0.0436	0.0371	0.0304	0.0378	0.0335	0.0384	0.0378	0.0343	0.0402	0.0332	0.0317	0.0351	0.0361
Voltage Drop mV at 0.6 Power Factor	V/m		0.0380	0.0385	0.0420	0.0415	0.0355	0.0288	0.0353	0.0313	0.0358	0.0352	0.0318	0.0374	0.0310	0.0298	0.0328	0.0340
Voltage Drop mV at 0.5 Power Factor	V/m		0.0352	0.0362	0.0393	0.0389	0.0334	0.0269	0.0326	0.0289	0.0328	0.0324	0.0291	0.0343	0.0286	0.0276	0.0303	0.0316

Technical Data of Guardex Sandwich Busway Systems

Aluminium Conductor (Al)

Standards	IEC 61439-6 / 1										
Rated Insulation Voltage	Ui 1000 V										
Rated Operational Voltage	Ue 1000 V										
Rated Impulse Withstand Voltage	Uimp 8 kV										
Rated Frequency	fn 50/60 Hz										
Pollution Degree	III										
Protection Degree	IP54 / IP55 / IP65/ IP66 / IP67										
External Mechanical Impacts (IK Code)	IK10										
Rated Current In	Ampere		800	1000	1250	1600	2000	2500	3200	4000	5000
Rated Short-time Withstand Current (1s) 3φ	I_{cw}	kA	36	50	50	50	80	100	100	100	100
Rated Peak Withstand Current	I_{pk}	kA	76	105	105	105	176	220	220	220	220
Rated Short-time Withstand Current for Neutral (1s) 1φ	I_{cw}	kA	36	50	50	50	80	100	100	100	100
Rated Peak Withstand Current for Neutral	I_{pk}	kA	76	105	105	105	176	220	220	220	220
Rated Short-time Withstand Current for PE Conductor (1s) 1φ	I_{cw}	kA	21.6	30	30	30	48	60	60	60	60
Rated Peak Withstand Current for PE Conductor	I_{pk}	kA	45.6	63	63	63	105.6	132	132	132	132

Cross Section

L1 L2 L3 N	mm^2		360	480	660	900	1200	1500	1800	2400	3600
Internal Earth (100%)	mm^2		360	480	660	900	1200	1500	1800	2400	3600
Aluminium Housing Cross Section	mm^2		1916	2036	2216	2456	2756	4612	4912	5512	7932
Overall Dimension	WxH		120x140	140x140	170x140	210x140	260x140	400x140	450x140	550x140	840x140

Weight / Meter

Busbar Trunking Weight (4 Conductors)	kg/m	kg/m	9	11	13	16	20	29	33	49	62
Busbar Trunking Weight (5 Conductors)	kg/m	kg/m	10	12.5	15	18.5	23	33	38	55	71

Mean Phase Conductor Characteristics At Rated Current In

Resistance at a conductor temp of 20 °C	R_{20}	mΩ/m	0.0155	0.0099	0.0071	0.0039	0.0057	0.0024	0.0016	0.0015	0.0001
Resistance at an ambient air temp of 80 °C	R	mΩ/m	0.0201	0.0127	0.0091	0.0051	0.0076	0.0030	0.0021	0.0020	0.0012
Reactance (Independent from temp)	X	mΩ/m	0.0741	0.0698	0.0564	0.0444	0.0371	0.0323	0.0296	0.0237	0.0189
(+) & (-) sequence impedances at an ambient air temp of 20 °C	Z_{20}	mΩ/m	0.0766	0.0705	0.0568	0.0446	0.0375	0.3240	0.0297	0.0238	0.0190
(+) & (-) sequence impedances at a conductor temp of 35 °C	Z_{35}	mΩ/m	0.0757	0.0709	0.0571	0.0447	0.0378	0.0326	0.0298	0.0239	0.0191

Voltage Drop / Ampere / Meter

Voltage Drop mV at 1.0 Power Factor	mV/A/m		0.0348	0.0220	0.0158	0.0088	0.0132	0.0052	0.0036	0.0035	0.0021
Voltage Drop mV at 0.9 Power Factor	mV/A/m		0.0873	0.0725	0.0568	0.0415	0.0399	0.0291	0.0256	0.0210	0.0161
Voltage Drop mV at 0.8 Power Factor	mV/A/m		0.1049	0.0901	0.0712	0.0532	0.0491	0.0377	0.0337	0.0274	0.0213
Voltage Drop mV at 0.7 Power Factor	mV/A/m		0.1160	0.1017	0.0808	0.0611	0.0551	0.0436	0.0392	0.0317	0.0248
Voltage Drop mV at 0.6 Power Factor	mV/A/m		0.1236	0.1099	0.0876	0.0668	0.0593	0.0479	0.0432	0.0349	0.0274
Voltage Drop mV at 0.5 Power Factor	mV/A/m		0.1286	0.1157	0.0925	0.0710	0.0622	0.0510	0.0462	0.0373	0.0294

Voltage Drop / Meter

Voltage Drop V/m at 1.0 Power Factor	V/m		0.0279	0.0220	0.0197	0.0141	0.0263	0.0130	0.0116	0.0139	0.0104
Voltage Drop V/m at 0.9 Power Factor	V/m		0.0698	0.0725	0.0710	0.0664	0.0797	0.0727	0.0820	0.0840	0.0807
Voltage Drop V/m at 0.8 Power Factor	V/m		0.0839	0.0901	0.0890	0.0851	0.0982	0.0943	0.1077	0.1096	0.1065
Voltage Drop V/m at 0.7 Power Factor	V/m		0.0928	0.1017	0.1010	0.0978	0.1102	0.1090	0.1253	0.1270	0.1242
Voltage Drop V/m at 0.6 Power Factor	V/m		0.0989	0.1099	0.1095	0.1069	0.1186	0.1197	0.1382	0.1397	0.1372
Voltage Drop V/m at 0.5 Power Factor	V/m		0.1028	0.1157	0.1156	0.1136	0.1245	0.1276	0.1479	0.1491	0.1469

Technical Data of Guardex Plus Sandwich Busway Systems

Copper Conductor (Cu)

Standards	IEC 61439-6 / 1													
Rated Insulation Voltage	Ui 1000 V													
Rated Operational Voltage	Ue 1000 V													
Rated Impulse Withstand Voltage	Uimp 8 kV													
Rated Frequency	fn 50/60 Hz													
Pollution Degree	III													
Protection Degree	IP54 / IP55 / IP65/ IP66 / IP67													
External Mechanical Impacts (IK Code)	IK10													
Rated Current In	Ampere		800	1000	1250	1600	2000	2500	3200	4000	5000	2000	4000	5000
Rated Short-time Withstand Current (1s) 3φ	I_{cw}	kA	50*	50**	50	50	80	80	100	120	120	80	120	120
Rated Peak Withstand Current	I_{pk}	kA	105	105	105	105	176	176	220	264	264	176	264	264
Rated Short-time Withstand Current for Neutral (1s) 1φ	I_{cw}	kA	30	30	30	30	48	48	60	72	72	48	72	72
Rated Peak Withstand Current for Neutral	I_{pk}	kA	63	63	63	63	105.6	105.6	132	158.4	158.4	105.6	158.4	158.4
Rated Short-time Withstand Current for PE Conductor (1s) 1φ	I_{cw}	kA	30	30	30	30	48	48	60	72	72	48	72	72
Rated Peak Withstand Current for PE Conductor	I_{pk}	kA	63	63	63	63	105.6	105.6	132	158.4	158.4	105.6	158.4	158.4

Cross Section

L1 L2 L3 N	mm^2		210	270	330	480	660	900	1140	1440	1920	840	1680	2100
Internal Earth (50%)	mm^2		135	135	165	240	330	450	570	720	960	420	840	1050
Internal Earth (100%)	mm^2		210	210	330	480	660	900	1140	1440	1920	840	1680	2100
Aluminium Housing Cross Section	mm^2		1785	1785	1865	2018	2258	2456	4363	4719	5119	2402	4929	5320
Overall Dimension	WxH		105x140	105x140	115x140	140x140	170x140	210x140	340x140	390x140	470x140	200x140	430x140	500x140

Weight / Meter

Busbar Trunking Weight (4 Conductors)	kg/m		12.8	14.9	17.3	23.0	30.1	41.2	52.9	64.5	82.7	36.5	70.0	90.4
Busbar Trunking Weight (4.5 Conductors)	kg/m		13.7	16.5	18.8	25.2	33.0	45.0	57.9	70.9	91.2	40.2	76.5	99.7
Busbar Trunking Weight (5 Conductors)	kg/m		14.7	17.3	20.2	27.3	36.0	48.7	63.0	77.3	99.8	44.0	83.5	109.1

Mean Phase Conductor Characteristics At Rated Current In

Resistance at a conductor temp of 20 °C	R_{20}	mΩ/m	0.08528	0.05746	0.04434	0.03047	0.02319	0.0201	0.01305	0.01201	0.009	0.0215	0.0099	0.097
Resistance at an ambient air temp of 50 °C (IEC mtd)	R_{50}	mΩ/m	0.1116	0.0788	0.0596	0.0420	0.0317	0.0279	0.0174	0.0163	0.0121	0.0241	0.0111	0.0109
Reactance (Independent from temp)	X	mΩ/m	0.02469	0.02529	0.01808	0.01283	0.01273	0.00876	0.00665	0.00566	0.0041	0.0088	0.0044	0.00401
(+) & (-) sequence impedances at an ambient air temp of 50 °C	Z	mΩ/m	0.5429	0.4222	0.3195	0.2078	0.1363	0.1206	0.0968	0.0685	0.0570	0.0452	0.0252	0.0229
(+) & (-) sequence impedances at a conductor temp of 20 °C	Z_{20}	mΩ/m	0.4860	0.3780	0.2860	0.1860	0.1220	0.1080	0.0867	0.0613	0.0510	0.0410	0.0204	0.0186

Voltage Drop / Ampere / Meter

Voltage Drop mV at 1.0 Power Factor	mV/A/m		0.0967	0.0682	0.0516	0.0364	0.0275	0.0242	0.0151	0.0141	0.0105	0.0415	0.0192	0.0105
Voltage Drop mV at 0.9 Power Factor	mV/A/m		0.0963	0.0710	0.0533	0.0376	0.0295	0.0251	0.0161	0.0148	0.0110	0.0440	0.0206	0.0110
Voltage Drop mV at 0.8 Power Factor	mV/A/m		0.0902	0.0677	0.0507	0.0358	0.0286	0.0239	0.0155	0.0142	0.0105	0.0423	0.0199	0.0105
Voltage Drop mV at 0.7 Power Factor	mV/A/m		0.0829	0.0634	0.0473	0.0334	0.0271	0.0223	0.0147	0.0134	0.0099	0.0399	0.0188	0.0099
Voltage Drop mV at 0.6 Power Factor	mV/A/m		0.0751	0.0585	0.0435	0.0307	0.0253	0.0206	0.0136	0.0124	0.0091	0.0371	0.0176	0.0091
Voltage Drop mV at 0.5 Power Factor	mV/A/m		0.0669	0.0531	0.0394	0.0278	0.0233	0.0187	0.0125	0.0113	0.0083	0.0338	0.0161	0.0083

Voltage Drop / Meter

Voltage Drop V/m at 1.0 Power Factor	V/m		0.0773	0.0682	0.0645	0.0582	0.0549	0.0605	0.0482	0.0563	0.0525	0.0831	0.0769	0.0701
Voltage Drop V/m at 0.9 Power Factor	V/m		0.0771	0.0710	0.0666	0.0601	0.0590	0.0627	0.0514	0.0593	0.0550	0.0880	0.0824	0.0750
Voltage Drop V/m at 0.8 Power Factor	V/m		0.0721	0.0677	0.0634	0.0572	0.0572	0.0597	0.0496	0.0568	0.0527	0.0847	0.0796	0.0725
Voltage Drop V/m at 0.7 Power Factor	V/m		0.0664	0.0634	0.0591	0.0534	0.0542	0.0559	0.0469	0.0534	0.0494	0.0798	0.0752	0.0685
Voltage Drop V/m at 0.6 Power Factor	V/m		0.0601	0.0585	0.0544	0.0491	0.0506	0.0514	0.0437	0.0495	0.0457	0.0742	0.0704	0.0642
Voltage Drop V/m at 0.5 Power Factor	V/m		0.0535	0.0531	0.0492	0.0445	0.0465	0.0467	0.0401	0.0452	0.0416	0.0675	0.0644	0.0586

* - Short circuit duration for 0.1 sec
** - Short Circuit duration for 0.5 sec

Technical Data of Guardex (FR) Sandwich Busway Systems

Fire Rated (FR) Busbar System

Manufacturer	RR Busduct
Model Name	Guardex Series (FR)
Ampere Rating Range	800A - 6300A
Short Circuit Rating, kA/s	50kA to 120kA
Certifying Laboratory	ASTA-Intertek-UK
ISO Certification	ISO 9001, ISO 14001, ISO 45001
Factory Certification	ASTA DIAMOND
Busbar Standard	IEC 61439-1&6
Ambient Average/ Peak Temperature	50/55degC
Fire Rated Busbar Standard	IEC 60331-1
Fire Rated Certifying Laboratory	UL
Circuit Integrity Duration	200mins
Conductor	Copper
Configuration	4W/4.5W/5W/6W
Neutral Conductor	100% of Phase Conductor
Earth Conductor	Housing Earth / 50% Cu / 100% Cu
FR Busbar Insulation	Mica Insulation
Insulation Class	Class F 155deg C rated
Protection Degree (Ingress Protection)	IP66/67 (Feeder) IP55 (Plug-in & TOB)
Operating Voltage, Ue	1000V
Insulation Voltage, Ui	1000V
Rated Impulse Withstand, Uimp	8kV
Rated Frequency, Hz	50 / 60Hz
Standard Enclosure & Colour	Extruded Aluminium & RAL 7035
Fire Rated Enclosure & Colour	Sheet Steel & RAL 7039
Country of Origin	United Arab Emirates

BUSBAR SYSTEM

Introduction

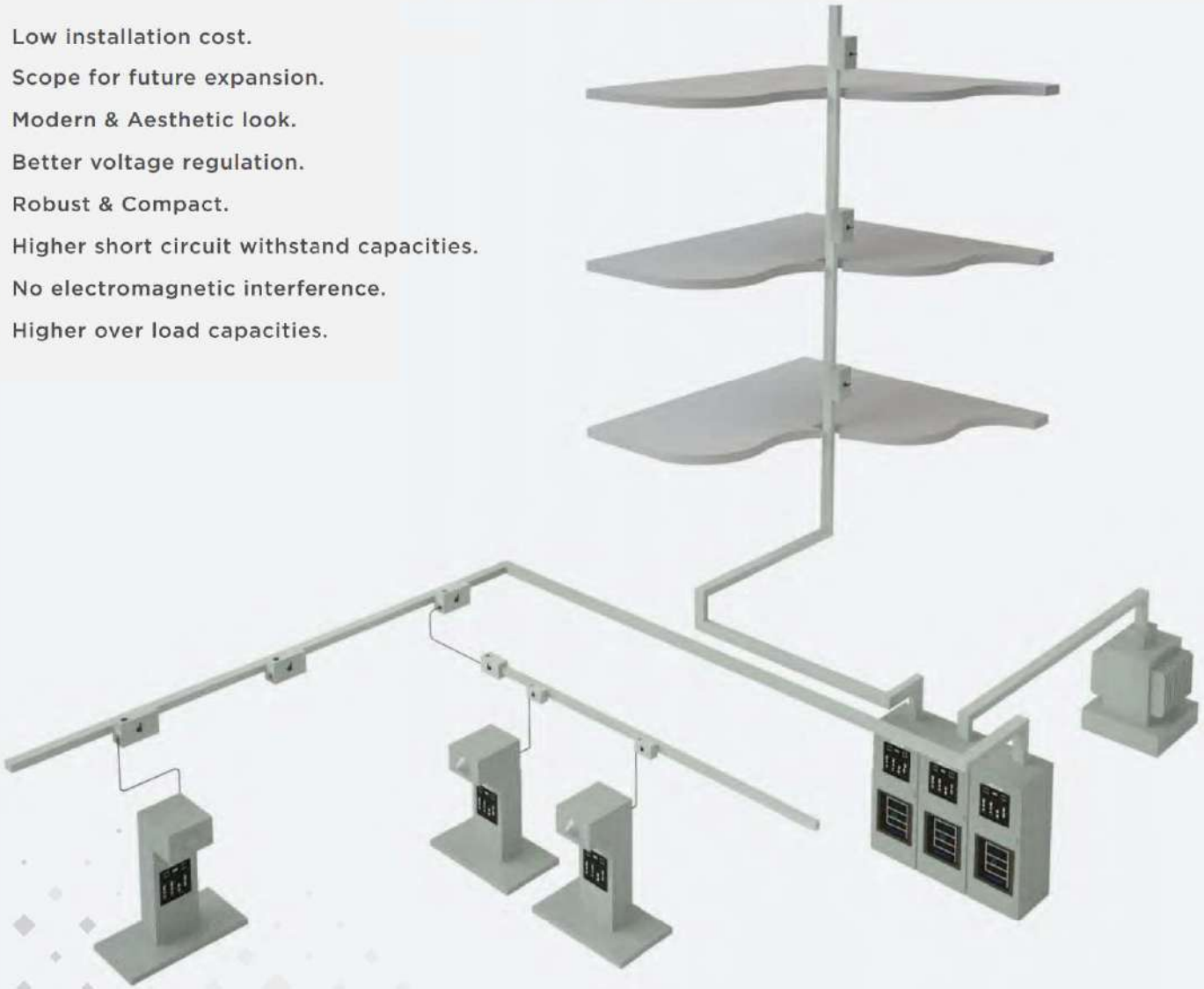
Guardex by RR Busduct is the most comprehensive system to meet the requirement of a global market. Our system is suitable for alternate current and direct current distribution. Current ratings offered are from 800A to 6300A. Rated operational voltage up to 1000V, IP degree up to IP 67 and frequency 50/60 Hz.

Construction of the sandwich design in extruded aluminum housing makes the system efficient with low hysteresis losses and better heat dissipation.

Standard Busduct Systems type tested as per IEC 61439-1&6 and Fire Rated Busduct systems as per IEC 60331-1 follow the similar characteristics. Fire Rated Busbar construction employs Mica Insulation to cater the Fire Rating circuit integrity requirement in line with IEC 60331-1.

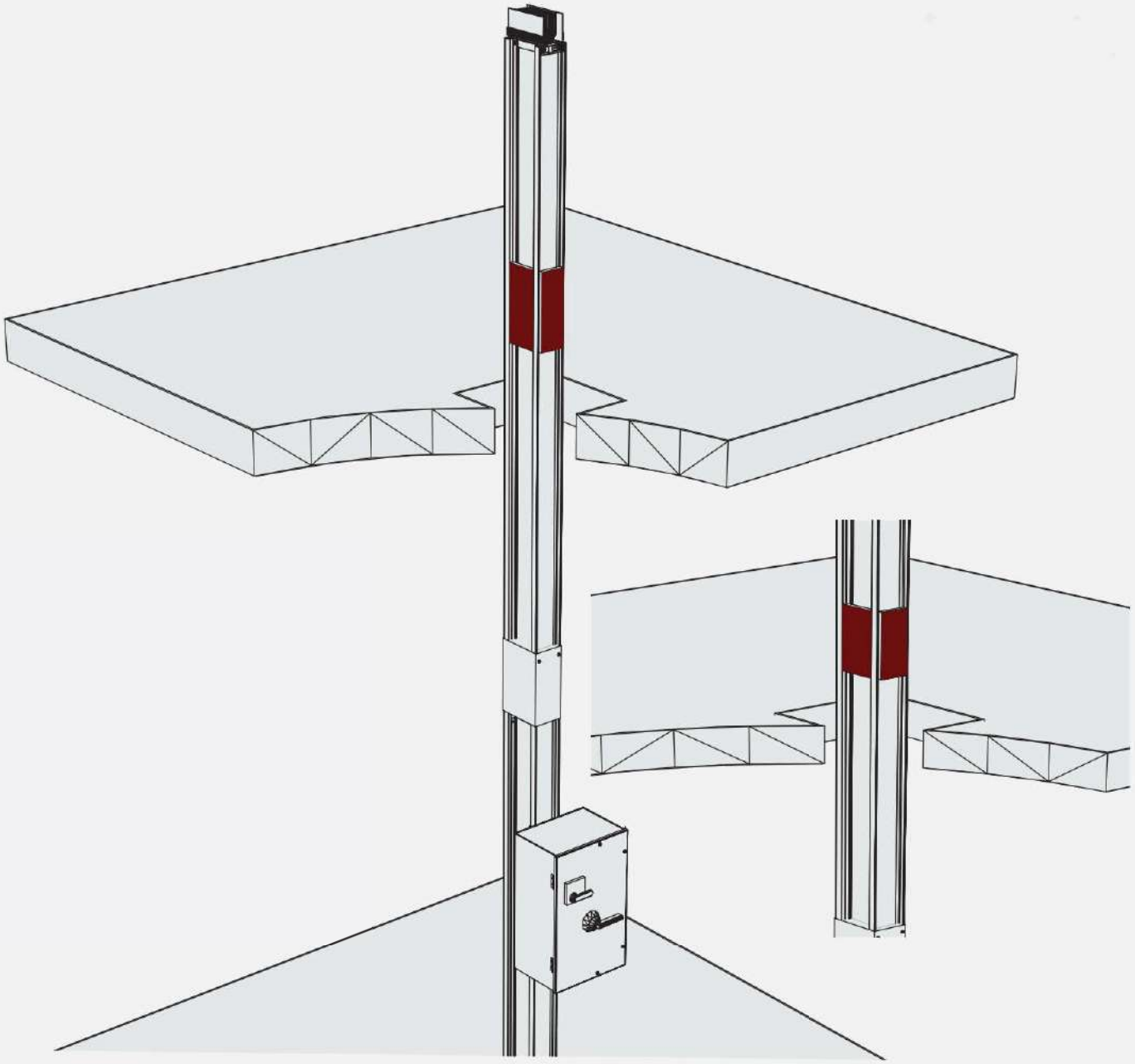
Advantages of the RR Busducts over Cable

- **Low installation cost.**
- **Scope for future expansion.**
- **Modern & Aesthetic look.**
- **Better voltage regulation.**
- **Robust & Compact.**
- **Higher short circuit withstand capacities.**
- **No electromagnetic interference.**
- **Higher over load capacities.**

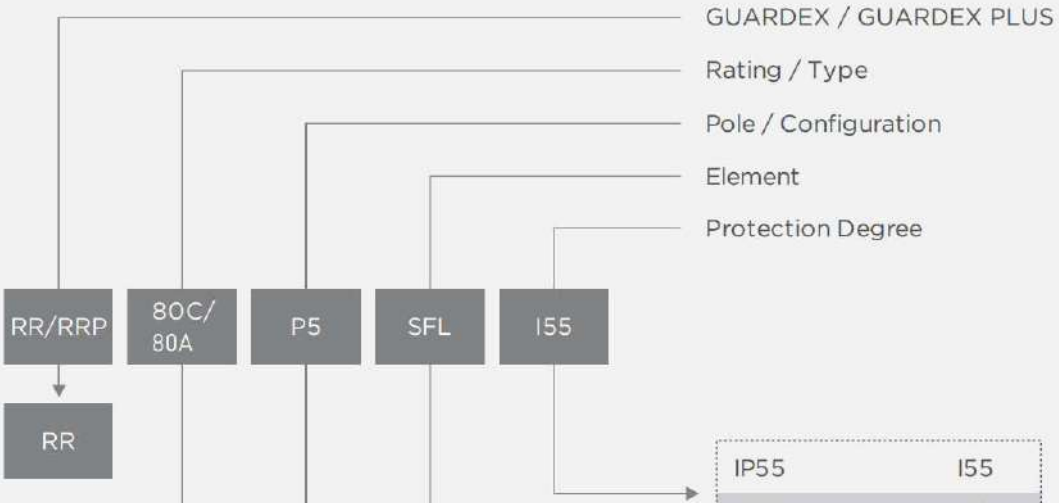


BUSBAR RISER

RR Busduct Busbar riser is designed according to the structure of the building and requires less space compared to cables.



ORDER CODING SYSTEM



IP55	I55
IP65	I65
IP67	I67

Copper	
800	80C
1000	100C
1250	125C
1400	140C
1600	160C
2000	200C
2500	250C
3200	320C
4000	400C
5000	500C
6300	630C

Aluminium	
800	80A
1000	100A
1250	125A
1400	140A
1600	160A
2000	200A
2500	250A
3200	320A
4000	400A
5000	500A

RYB	P3
NRYB	P4
NNRYB	P5
NRYBE	PE
NRYB (50% Earth)	PH
NNRYBE	P6

Straight Feeder	SFL
Straight Plug in	SPL
Edge Elbow	EEL
Flat Elbow	FEL
Offset Edge Elbow	OEL
Offset Flat Elbow	OFL
Edge T	EDT
Flat T	FLT
Flanged End	FLE
Flanged End with Edge Elbow	FEE
Flanged End with Flat Elbow	FFE
End feed (Direct)	EFD
End feed (Switchgear)	EFS
Centre Feed (Direct)	CFD
Centre Feed (Switchgear)	CFS
Reducer (Direct)	RDD
Reducer (Switchgear)	RDS
End Cap	ENC
Phase Transposition Unit	PTU
Expansion Joint Unit	XPU
Flanged End Box	FLB

EDGEWISE ELBOWS

COPPER EDGEWISE ELBOWS DIMENSIONS (GUARDEX)

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1 X 50 X 6	250	250	350	350	750	750
1000A	1 X 60 X 6	250	250	350	350	750	750
1250A	1 X 70 X 6	250	250	350	350	750	750
1400A	1 X 80 X 6	250	250	350	350	750	750
1400A	1 X 100 X 6	250	250	350	350	750	750
1600A	1 X 100 X 6	250	250	350	350	750	750
2000A	1 X 125 X 6	250	250	350	350	750	750
2000A	1 X 150 X 6	250	250	350	350	750	750
2000A	1 X 175 X 6	250	250	350	350	750	750
2500A	1 X 200 X 6	250	250	350	350	750	750
2500A	2 X 80 X 6	250	250	350	350	750	750
3200A	2 X 110 X 6	250	250	350	350	750	750
4000A	2 X 150 X 6	250	250	350	350	750	750
5000A	2X 200 X 6	250	250	350	350	750	750
6300A	3 X 150 X 6	250	250	350	350	850	850

COPPER EDGEWISE ELBOWS DIMENSIONS (GUARDEX PLUS)

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1 X 45(P) X 6	250	250	350	350	750	750
1000A	1 X 45 X 6	250	250	350	350	750	750
1250A	1 X 55 X 6	250	250	350	350	750	750
1600A	1 X 80 X 6	250	250	350	350	750	750
2000A	1 X 110 X 6	250	250	350	350	750	750
2500A	1 X 150 X 6	250	250	350	350	750	750
3200A	2 X 95 X 6	250	250	350	350	750	750
4000A	2 X 120 X 6	250	250	350	350	750	750
5000A	2 X 160 X 6	250	250	350	350	750	750
2000A	1 X 140 X 6	250	250	350	350	750	750
4000A	2 X 140 X 6	250	250	350	350	750	750
5000A	2 X 175 X 6	250	250	350	350	750	750

ALUMINIUM EDGEWISE ELBOWS DIMENSIONS

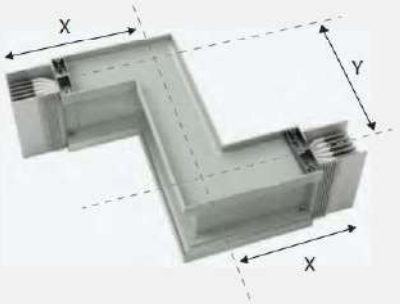
Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1 X 60 X 6	250	250	350	350	750	750
1000A	1 X 80 X 6	250	250	350	350	750	750
1250A	1 X 110 X 6	250	250	350	350	750	750
1600A	1 X 150 X 6	250	250	350	350	750	750
2000A	1 X 200 X 6	250	250	350	350	750	750
2500A	2 X 125 X 6	250	250	350	350	750	750
3200A	2 X 150 X 6	250	250	350	350	750	750
4000A	2 X 200 X 6	250	250	350	350	750	750
5000A	3 X 200 X 6	250	250	350	350	750	750

Note:- Special lengths can be made available according to the site conditions or the client requirements.

EDGEWISE OFFSETS

COPPER EDGEWISE OFFSETS DIMENSIONS (GUARDEX)

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1 X 50 X 6	250	180	350	350	750	750
1000A	1 X 60 X 6	250	180	350	350	750	750
1250A	1 X 70 X 6	250	180	350	350	750	750
1400A	1 X 80 X 6	250	180	350	350	750	750
1400A	1 X 100 X 6	250	180	350	350	750	750
1600A	1 X 100 X 6	250	180	350	350	750	750
2000A	1 X 125 X 6	250	180	350	350	750	750
2000A	1 X 150 X 6	250	180	350	350	750	750
2000A	1 X 175 X 6	250	180	350	350	750	750
2500A	1 X 200 X 6	250	180	350	350	750	750
2500A	2 X 80 X 6	250	180	350	350	750	750
3200A	2 X 110 X 6	250	180	350	350	750	750
4000A	2 X 150 X 6	250	180	350	350	750	750
5000A	2X 200 X 6	250	180	350	350	750	750
6300A	3 X 150 X 6	250	180	350	350	850	850

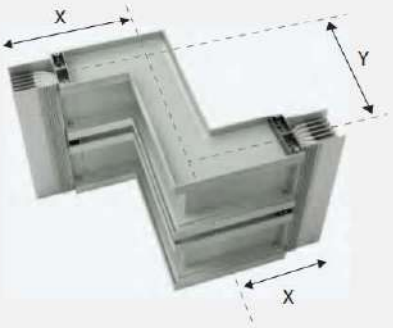


COPPER EDGEWISE OFFSETS DIMENSIONS (GUARDEX PLUS)

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1 X 45(P) X 6	250	180	350	350	750	750
1000A	1 X 45 X 6	250	180	350	350	750	750
1250A	1 X 55 X 6	250	180	350	350	750	750
1600A	1 X 80 X 6	250	180	350	350	750	750
2000A	1 X 110 X 6	250	180	350	350	750	750
2500A	1 X 150 X 6	250	180	350	350	750	750
3200A	2 X 95 X 6	250	180	350	350	750	750
4000A	2 X 120 X 6	250	180	350	350	750	750
5000A	2 X 160 X 6	250	180	350	350	750	750
2000A	1 X 140 X 6	250	180	350	350	750	750
4000A	2 X 140 X 6	250	180	350	350	750	750
5000A	2 X 175 X 6	250	180	350	350	750	750

ALUMINIUM EDGEWISE OFFSETS DIMENSIONS

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1 X 60 X 6	250	180	350	350	750	750
1000A	1 X 80 X 6	250	180	350	350	750	750
1250A	1 X 110 X 6	250	180	350	350	750	750
1600A	1 X 150 X 6	250	180	350	350	750	750
2000A	1 X 200 X 6	250	180	350	350	750	750
2500A	2 X 125 X 6	250	180	350	350	750	750
3200A	2 X 150 X 6	250	180	350	350	750	750
4000A	2 X 200 X 6	250	180	350	350	750	750
5000A	3 X 200 X 6	250	180	350	350	800	800

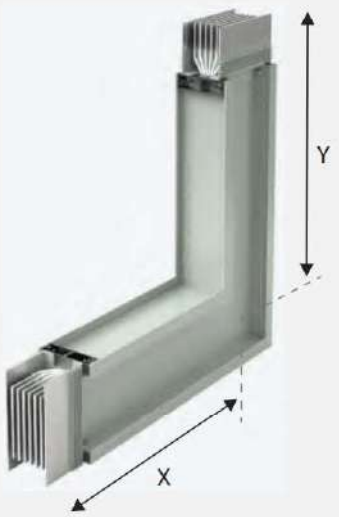


Note: Special length are available according to the site condition.

FLATWISE ELBOWS

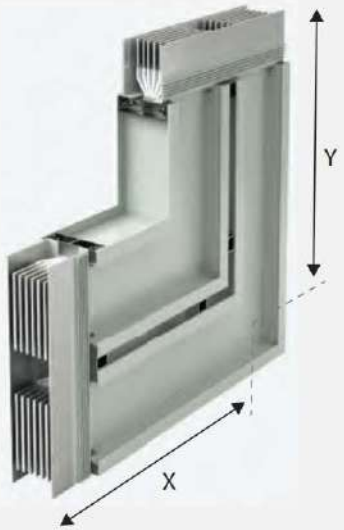
COPPER FLATWISE ELBOW DIMENSIONS (GUARDEX)

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1 X 50 X 6	275	275	350	350	750	750
1000A	1 X 60 X 6	300	300	350	350	750	750
1250A	1 X 70 X 6	300	300	350	350	750	750
1400A	1 X 80 X 6	300	300	350	350	750	750
1400A	1 X 100 X 6	300	300	350	350	750	750
1600A	1 X 100 X 6	300	300	350	350	750	750
2000A	1 X 125 X 6	325	325	350	350	750	750
2000A	1 X 150 X 6	325	325	350	350	750	750
2000A	1 X 175 X 6	350	350	350	350	750	750
2500A	1 X 200 X 6	350	350	350	350	750	750
2500A	2 X 80 X 6	375	375	500	500	750	750
3200A	2 X 110 X 6	425	425	500	500	750	750
4000A	2 X 150 X 6	450	450	500	500	750	750
5000A	2X 200 X 6	500	500	500	500	750	750
6300A	3 X 150 X 6	575	575	600	600	750	750



COPPER FLATWISE ELBOW DIMENSIONS (GUARDEX PLUS)

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1 X 45(P) X 6	275	275	350	350	750	750
1000A	1 X 45 X 6	275	275	350	350	750	750
1250A	1 X 55 X 6	275	275	350	350	750	750
1600A	1 X 80 X 6	300	300	350	350	750	750
2000A	1 X 110 X 6	325	325	350	350	750	750
2500A	1 X 150 X 6	325	325	350	350	750	750
3200A	2 X 95 X 6	400	400	500	500	750	750
4000A	2 X 120 X 6	425	425	500	500	750	750
5000A	2 X 160 X 6	475	475	500	500	750	750
2000A	1 X 140 X 6	325	325	500	500	750	750
4000A	2 X 140 X 6	445	445	500	500	750	750
5000A	2 X 175 X 6	490	490	500	500	750	750



ALUMINIUM FLATWISE ELBOW DIMENSIONS

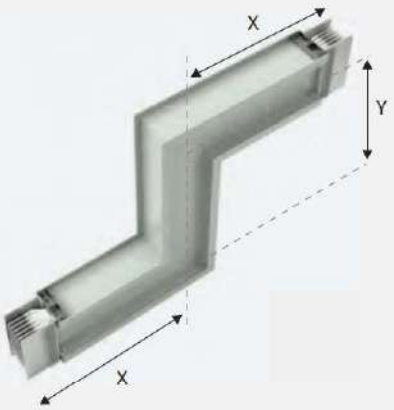
Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1 X 60 X 6	300	300	350	350	750	750
1000A	1 X 80 X 6	300	300	350	350	750	750
1250A	1 X 110 X 6	325	325	350	350	750	750
1600A	1 X 150 X 6	325	325	350	350	750	750
2000A	1 X 200 X 6	350	350	350	350	750	750
2500A	2 X 125 X 6	425	425	500	500	750	750
3200A	2 X 150 X 6	450	450	500	500	750	750
4000A	2 X 200 X 6	500	500	500	500	750	750
5000A	3 X 200 X 6	650	650	700	700	750	750

Note: Special length are available according to the site condition.

FLATWISE OFFSETS

COPPER FLATWISE OFFSETS DIMENSIONS (GUARDEX)

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1 X 50 X 6	275	125	350	350	600	600
1000A	1 X 60 X 6	300	125	350	350	600	600
1250A	1 X 70 X 6	300	150	350	350	600	600
1400A	1 X 80 X 6	300	150	350	350	600	600
1400A	1 X 100 X 6	300	150	350	350	600	600
1600A	1 X 100 X 6	300	150	350	350	600	600
2000A	1 X 125 X 6	325	175	350	350	600	600
2000A	1 X 150 X 6	325	250	350	350	600	600
2000A	1 X 175 X 6	350	300	350	350	600	600
2500A	1 X 200 X 6	350	300	350	350	600	600
2500A	2 X 80 X 6	375	150	500	500	600	600
3200A	2 X 110 X 6	425	150	500	500	600	600
4000A	2 X 150 X 6	450	250	500	500	600	600
5000A	2X 200 X 6	500	300	500	500	600	600
6300A	3 X 150 X 6	575	250	700	700	850	850



COPPER FLATWISE OFFSETS DIMENSIONS (GUARDEX PLUS)

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1 X 45(P) X 6	275	125	350	350	600	600
1000A	1 X 45 X 6	275	125	350	350	600	600
1250A	1 X 55 X 6	275	125	350	350	600	600
1600A	1 X 80 X 6	300	150	350	350	600	600
2000A	1 X 110 X 6	325	150	350	350	600	600
2500A	1 X 150 X 6	325	250	350	350	600	600
3200A	2 X 95 X 6	400	150	500	500	600	600
4000A	2 X 120 X 6	425	175	500	500	600	600
5000A	2 X 160 X 6	475	250	500	500	600	600
2000A	1 X 140 X 6	325	150	500	500	600	600
4000A	2 X 140 X 6	445	175	500	500	600	600
5000A	2 X 175 X 6	490	250	500	500	600	600

ALUMINIUM FLATWISE OFFSETS DIMENSIONS

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1 X 60 X 6	300	125	350	350	600	600
1000A	1 X 80 X 6	300	150	350	350	600	600
1250A	1 X 110 X 6	325	150	350	350	600	600
1600A	1 X 150 X 6	325	250	350	350	600	600
2000A	1 X 200 X 6	350	300	350	350	600	600
2500A	2 X 125 X 6	425	175	500	500	600	600
3200A	2 X 150 X 6	450	250	500	500	600	600
4000A	2 X 200 X 6	500	300	500	500	600	600
5000A	3 X 200 X 6	650	300	700	700	800	800

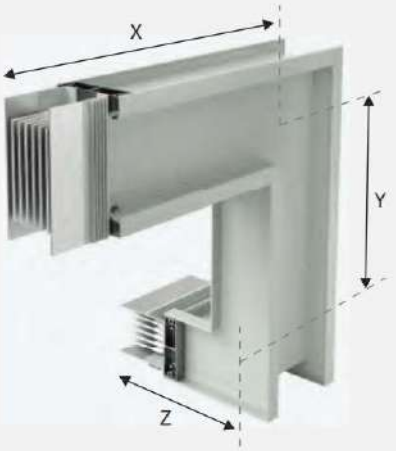
Note: Special length are available according to the site condition.

COMBINATION ELBOW

Combination elbow provides freedom to design all possible layouts of a Busbar system. Special length are available according to the site condition.

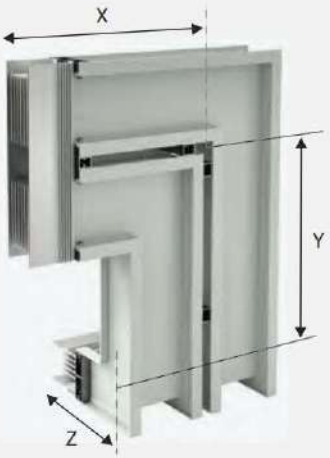
COPPER COMBINATION ELBOW DIMENSIONS (GUARDEX)

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)			Standard Size (mm)			Maximum size (mm)		
		X	Y	Z	X	Y	Z	X	Y	Z
800A	1 X 50 X 6	300	200	250	350	350	350	700	700	700
1000A	1 X 60 X 6	300	225	250	350	350	350	700	700	700
1250A	1 X 70 X 6	300	225	250	350	350	350	700	700	700
1400A	1 X 80 X 6	325	225	250	350	350	350	700	700	700
1400A	1 X 100 X 6	325	225	250	350	350	350	700	700	700
1600A	1 X 100 X 6	325	225	250	350	350	350	700	700	700
2000A	1 X 125 X 6	325	250	250	350	350	350	700	700	700
2000A	1 X 150 X 6	350	250	250	350	350	350	700	700	700
2000A	1 X 175 X 6	375	275	250	350	350	350	700	700	700
2500A	1 X 200 X 6	375	275	250	500	500	350	700	700	700
2500A	2 X 80 X 6	400	325	250	500	500	350	700	700	700
3200A	2 X 110 X 6	425	350	250	500	500	350	700	700	700
4000A	2 X 150 X 6	475	375	250	500	500	350	700	700	700
5000A	2X 200 X 6	525	425	250	600	500	350	700	700	700
6300A	3 X 150 X 6	600	500	250	600	500	350	700	700	700



COPPER COMBINATION ELBOW DIMENSIONS (GUARDEX PLUS)

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)			Standard Size (mm)			Maximum size (mm)		
		X	Y	Z	X	Y	Z	X	Y	Z
800A	1 X 45(P) X 6	300	200	250	350	350	350	700	700	700
1000A	1 X 45 X 6	300	200	250	350	350	350	700	700	700
1250A	1 X 55 X 6	300	225	250	350	350	350	700	700	700
1600A	1 X 80 X 6	325	225	250	350	350	350	700	700	700
2000A	1 X 110 X 6	325	250	250	350	350	350	700	700	700
2500A	1 X 150 X 6	350	250	250	350	350	350	700	700	700
3200A	2 X 95 X 6	425	325	250	500	500	350	700	700	700
4000A	2 X 120 X 6	450	350	250	500	500	350	700	700	700
5000A	2 X 160 X 6	500	400	250	500	500	350	700	700	700
2000A	1 X 140 X 6	350	250	250	500	500	350	700	700	700
4000A	2 X 140 X 6	470	370	250	500	500	350	700	700	700
5000A	2 X 175 X 6	515	430	250	500	500	350	700	700	700



ALUMINIUM COMBINATION ELBOW DIMENSIONS

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)			Standard Size (mm)			Maximum size (mm)		
		X	Y	Z	X	Y	Z	X	Y	Z
800A	1 X 60 X 6	300	125	250	350	350	350	700	700	700
1000A	1 X 80 X 6	300	150	250	350	350	350	700	700	700
1250A	1 X 110 X 6	325	150	250	350	350	350	700	700	700
1600A	1 X 150 X 6	325	250	250	350	350	350	700	700	700
2000A	1 X 200 X 6	350	300	250	350	350	350	700	700	700
2500A	2 X 125 X 6	425	175	250	500	500	350	700	700	700
3200A	2 X 150 X 6	450	250	250	500	500	350	700	700	700
4000A	2 X 200 X 6	500	300	250	500	500	350	700	700	700
5000A	3 X 200 X 6	650	300	250	700	700	350	700	700	700

Note: Special length are available according to the site condition.

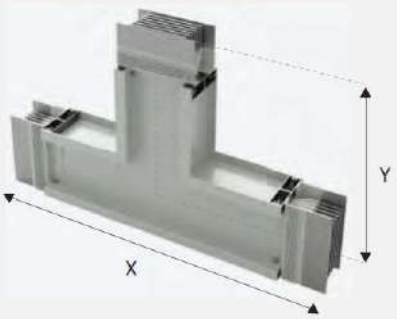
FLATWISE TEE

COPPER FLATWISE TEE DIMENSIONS (GUARDEX)

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1 X 50 X 6	550	275	750	350	1500	600
1000A	1 X 60 X 6	575	300	750	350	1500	600
1250A	1 X 70 X 6	575	300	750	350	1500	600
1400A	1 X 80 X 6	600	300	750	350	1500	600
1400A	1 X 100 X 6	600	300	750	350	1500	600
1600A	1 X 100 X 6	600	300	750	350	1500	600
2000A	1 X 125 X 6	625	325	750	350	1500	600
2000A	1 X 150 X 6	650	325	750	350	1500	600
2000A	1 X 175 X 6	700	350	750	350	1500	600
2500A	1 X 200 X 6	700	350	750	350	1500	600
2500A	2 X 80 X 6	750	375	1000	500	1500	600
3200A	2 X 110 X 6	825	425	1000	500	1500	600
4000A	2 X 150 X 6	900	450	1000	500	1500	600
5000A	2X 200 X 6	1000	500	1000	500	1500	600
6300A	3 X 150 X 6	1150	575	1200	600	1500	600

COPPER FLATWISE TEE DIMENSIONS (GUARDEX PLUS)

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1X 45(P) X 6	550	275	750	350	1500	600
1000A	1 X 45 X 6	550	275	750	350	1500	600
1250A	1 X 55 X 6	575	275	750	350	1500	600
1600A	1 X 80 X 6	600	300	750	350	1500	600
2000A	1 X 110 X 6	625	325	750	350	1500	600
2500A	1 X 150 X 6	650	325	750	350	1500	600
3200A	2 X 95 X 6	800	400	1000	1000	1500	600
4000A	2 X 120 X 6	850	425	1000	1000	1500	600
5000A	2 X 160 X 6	925	475	1000	1000	1500	600
2000A	1 X 140 X 6	650	325	1000	1000	1500	600
4000A	2 X 140 X 6	850	425	1000	1000	1500	600
5000A	2 X 175 X 6	925	475	1000	1000	1500	600



ALUMINIUM FLATWISE TEE DIMENSIONS

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1 X 60 X 6	575	300	750	350	1500	600
1000A	1 X 80 X 6	600	300	750	350	1500	600
1250A	1 X 110 X 6	625	325	750	350	1500	600
1600A	1 X 150 X 6	650	325	750	350	1500	600
2000A	1 X 200 X 6	700	350	750	350	1500	600
2500A	2 X 125 X 6	850	425	1000	1000	1500	600
3200A	2 X 150 X 6	900	450	1000	1000	1500	600
4000A	2 X 200 X 6	1000	500	1000	1000	1500	600
5000A	3 X 200 X 6	1300	650	1300	1300	1500	600

EXPANSION UNITS

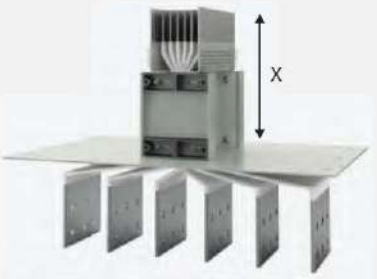
- Expansion unit shall allow (plus/minus) 50mm movement.
- The Expansion Unit is to pass through expanded sections of the building.
- The Expansion Unit is used to counteract irregularities in the building foundation caused by ground subsidence.

Expansion unit standard length (L) 1500mm.

FLANGES

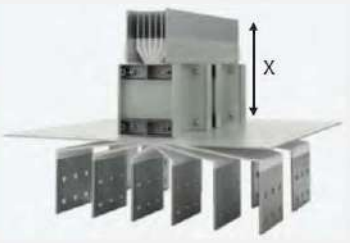
COPPER FLANGES DIMENSIONS (GUARDEX)

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)	Standard Size (mm)	Maximum size (mm)
		X	X	X
800A	1 X 50 X 6	230	300	850
1000A	1 X 60 X 6	230	300	850
1250A	1 X 70 X 6	230	300	850
1400A	1 X 80 X 6	230	300	850
1400A	1 X 100 X 6	230	300	850
1600A	1 X 100 X 6	230	300	850
2000A	1 X 125 X 6	230	300	850
2000A	1 X 150 X 6	230	300	850
2000A	1 X 175 X 6	230	300	850
2500A	1 X 200 X 6	230	300	850
2500A	2 X 80 X 6	230	300	850
3200A	2 X 110 X 6	230	300	850
4000A	2 X 150 X 6	230	300	850
5000A	2X 200 X 6	230	300	850
6300A	3 X 150 X 6	230	300	850



COPPER FLANGES DIMENSIONS (GUARDEX PLUS)

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)	Standard Size (mm)	Maximum size (mm)
		X	X	X
800A	1 X 45(P) X 6	230	300	850
1000A	1 X 45 X 6	230	300	850
1250A	1 X 55 X 6	230	300	850
1600A	1 X 80 X 6	230	300	850
2000A	1 X 110 X 6	230	300	850
2500A	1 X 150 X 6	230	300	850
3200A	2 X 95 X 6	230	300	850
4000A	2 X 120 X 6	230	300	850
5000A	2 X 160 X 6	230	300	850
2000A	1 X 140X 6	230	300	850
4000A	2 X 140 X 6	230	300	850
5000A	2 X 175 X 6	230	300	850



ALUMINIUM FLANGES DIMENSIONS

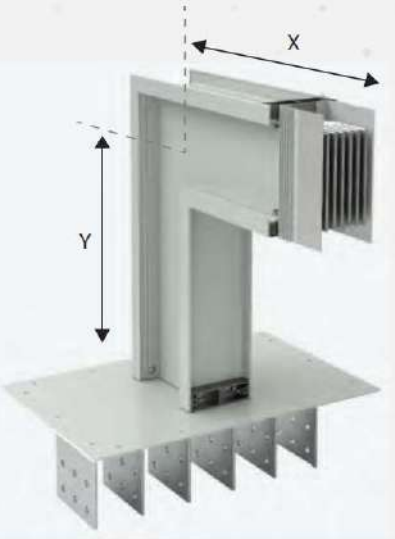
Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)	Standard Size (mm)	Maximum size (mm)
		X	X	X
800A	1 X 60 X 6	230	300	850
1000A	1 X 80 X 6	230	300	850
1250A	1 X 110 X 6	230	300	850
1600A	1 X 150 X 6	230	300	850
2000A	1 X 200 X 6	230	300	850
2500A	2 X 125 X 6	230	300	850
3200A	2 X 150 X 6	230	300	850
4000A	2 X 200 X 6	230	300	850
5000A	3 X 200 X 6	230	300	850

Note: Special length are available according to the site condition.

COMBINATION FLANGES

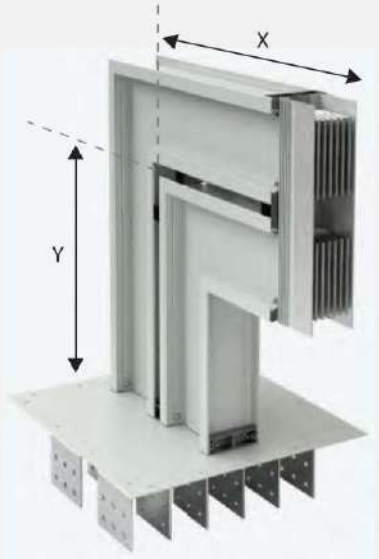
COPPER FLATWISE ELBOW FLANGE DIMENSIONS (GUARDEX)

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1 X 50 X 6	275	175	350	350	700	700
1000A	1 X 60 X 6	300	175	350	350	700	700
1250A	1 X 70 X 6	300	175	350	350	700	700
1400A	1 X 80 X 6	300	175	350	350	700	700
1400A	1 X 100 X 6	300	175	350	350	700	700
1600A	1 X 100 X 6	300	175	350	350	700	700
2000A	1 X 125 X 6	325	175	350	350	700	700
2000A	1 X 150 X 6	325	200	350	350	700	700
2000A	1 X 175 X 6	350	225	350	350	700	700
2500A	1 X 200 X 6	350	225	350	350	700	700
2500A	2 X 80 X 6	375	250	500	500	700	700
3200A	2 X 110 X 6	425	275	500	500	700	700
4000A	2 X 150 X 6	450	325	500	500	700	700
5000A	2X 200 X 6	500	375	500	500	700	700
6300A	3 X 150 X 6	575	425	600	600	700	700



COPPER FLATWISE ELBOW FLANGE DIMENSIONS (GUARDEX PLUS)

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1 X 45(P) X 6	275	175	350	350	700	700
1000A	1 X 45 X 6	275	175	350	350	700	700
1250A	1 X 55 X 6	275	175	350	350	700	700
1600A	1 X 80 X 6	300	175	350	350	700	700
2000A	1 X 110 X 6	325	175	350	350	700	700
2500A	1 X 150 X 6	325	200	350	350	700	700
3200A	2 X 95 X 6	400	250	500	500	700	700
4000A	2 X 120 X 6	425	275	500	500	700	700
5000A	2 X 160 X 6	475	325	500	500	700	700
2000A	1 X 140 X 6	325	200	350	350	700	700
4000A	2 X 140 X 6	425	275	500	500	700	700
5000A	2 X 175 X 6	475	325	500	500	700	700



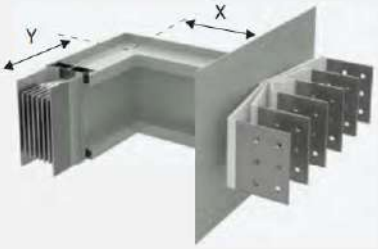
ALUMINIUM FLATWISE ELBOW FLANGE DIMENSIONS

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1 X 60 X 6	300	175	350	350	700	700
1000A	1 X 80 X 6	300	175	350	350	700	700
1250A	1 X 110 X 6	325	175	350	350	700	700
1600A	1 X 150 X 6	325	200	350	350	700	700
2000A	1 X 200 X 6	350	225	350	350	700	700
2500A	2 X 125 X 6	425	300	500	500	700	700
3200A	2 X 150 X 6	450	300	500	500	700	700
4000A	2 X 200 X 6	500	350	500	500	700	700
5000A	3 X 200 X 6	650	500	700	700	700	700

ELBOW FLANGES

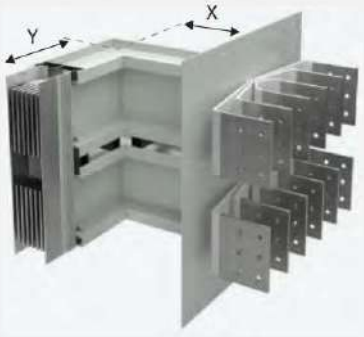
COPPER EDGEWISE ELBOW FLANGE DIMENSIONS (GUARDEX)

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1 X 50 X 6	200	250	350	350	700	700
1000A	1 X 60 X 6	200	250	350	350	700	700
1250A	1 X 70 X 6	200	250	350	350	700	700
1400A	1 X 80 X 6	200	250	350	350	700	700
1400A	1 X 100 X 6	200	250	350	350	700	700
1600A	1 X 100 X 6	200	250	350	350	700	700
2000A	1 X 125 X 6	200	250	350	350	700	700
2000A	1 X 150 X 6	200	250	350	350	700	700
2000A	1 X 175 X 6	200	250	350	350	700	700
2500A	1 X 200 X 6	200	250	350	350	700	700
2500A	2 X 80 X 6	200	250	350	350	700	700
3200A	2 X 110 X 6	200	250	350	350	700	700
4000A	2 X 150 X 6	200	250	350	350	700	700
5000A	2X 200 X 6	200	250	350	350	700	700
6300A	3 X 150 X 6	200	250	350	350	700	700



COPPER EDGEWISE ELBOW FLANGE DIMENSIONS (GUARDEX PLUS)

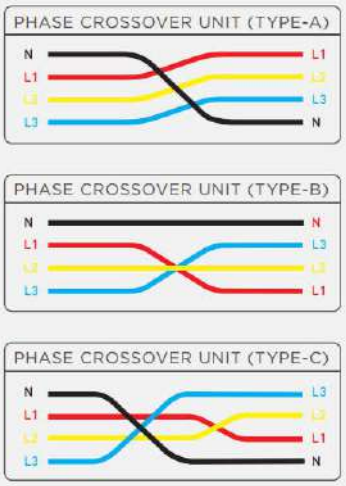
Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1 X 45(P) X 6	200	250	350	350	700	700
1000A	1 X 45 X 6	200	250	350	350	700	700
1250A	1 X 55 X 6	200	250	350	350	700	700
1600A	1 X 80 X 6	200	250	350	350	700	700
2000A	1 X 110 X 6	200	250	350	350	700	700
2500A	1 X 150 X 6	200	250	350	350	700	700
3200A	2 X 95 X 6	200	250	350	350	700	700
4000A	2 X 120 X 6	200	250	350	350	700	700
5000A	2 X 160 X 6	200	250	350	350	700	700
2000A	1 X 140 X 6	200	250	350	350	700	700
4000A	2 X 140 X 6	200	250	350	350	700	700
5000A	2 X 175 X 6	200	250	350	350	700	700

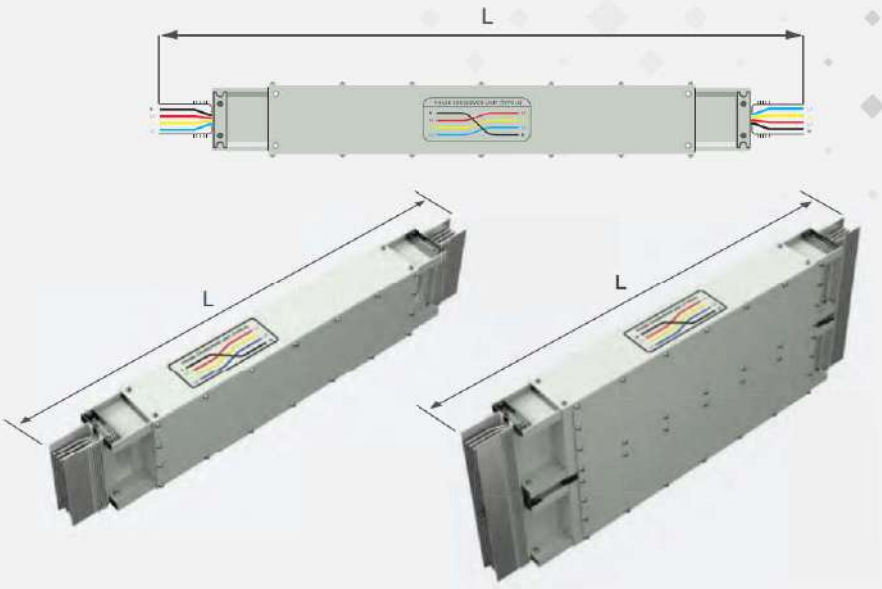


ALUMINIUM EDGEWISE ELBOW FLANGE DIMENSIONS

Busbar Rating (Amps)	Conductor Size in mm	Minimum Size (mm)		Standard Size (mm)		Maximum size (mm)	
		X	Y	X	Y	X	Y
800A	1 X 60 X 6	200	250	350	350	700	700
1000A	1 X 80 X 6	200	250	350	350	700	700
1250A	1 X 110 X 6	200	250	350	350	700	700
1600A	1 X 150 X 6	200	250	350	350	700	700
2000A	1 X 200 X 6	200	250	350	350	700	700
2500A	2 X 125 X 6	200	250	350	350	700	700
3200A	2 X 150 X 6	200	250	350	350	700	700
4000A	2 X 200 X 6	200	250	350	350	700	700
5000A	3 X 200 X 6	200	250	350	350	700	700

PHASE CROSSOVER UNIT

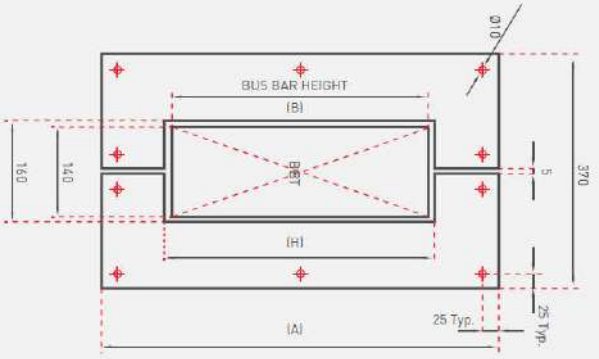




Phase-crossover unit standard length (L) 1500mm.

Phase-crossover unit to be used when the application requires a phase rotation in the power supply. Phase-crossover unit are used to change the relative position of the phase conductor in order to balance the inductive reactance or to transpose the phase.

WALL / FLOOR FLANGE



SYSTEM COMPONENTS

Busbar Rating (Amps)	WALL FLANGE / FLOOR FLANGE DIMENSIONS		
	Size (mm)	Size (mm)	Size (mm)
	B	H	A
800A	120	140	340
1000A	140	160	360
1250A	170	190	390
1600A	210	230	430
2000A	260	280	480
2500A	400	420	620
3200A	450	470	670
4000A	550	570	770
5000A	840	860	1060

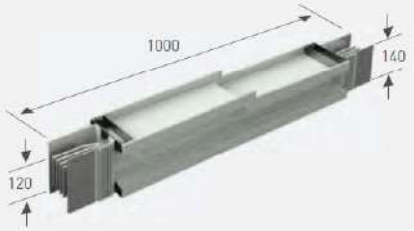
REDUCER UNIT

SYSTEM COMPONENTS

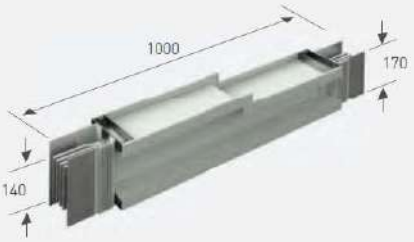
Reducers are used to decrease the current-carrying capacity of busducts in the same route. Reducers can be used in vertial as well as horizontal power

COPPER AND ALUMINIUM REDUCERS DIMENSIONS

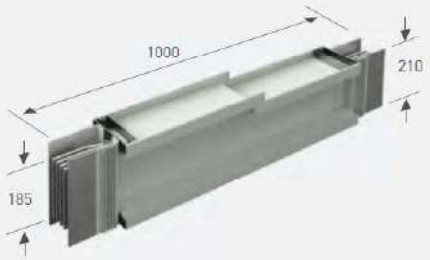
	Busbar Rating (Amps)	Size (mm) L
Standard	1000A to 800A	1000
Based on requirement	-	-



	Busbar Rating (Amps)	Size (mm) L
Standard	1250A to 800A	1000
Based on requirement	-	-

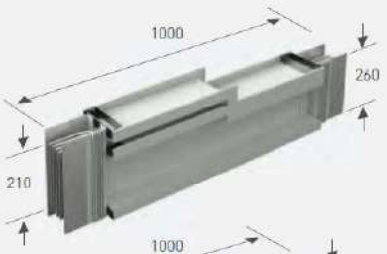


	Busbar Rating (Amps)	Size (mm) L
Standard	1600A to 1250A	1000
Based on requirement	1600A to 800A	1000



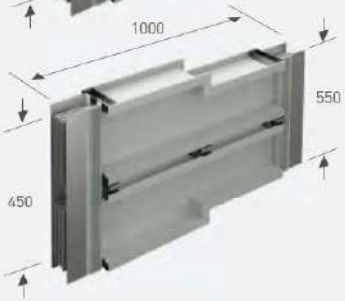
COPPER REDUCERS DIMENSIONS & ALUMINIUM REDUCERS DIMENSIONS

	Busbar Rating (Amps)	Size (mm) L
Standard	2000A to 1600A	1000
Based on requirement	-	-



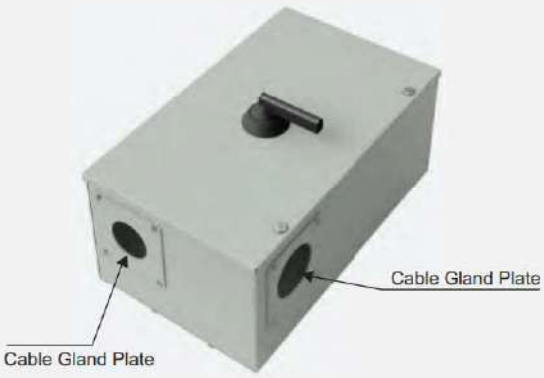
	Busbar Rating (Amps)	Size (mm) L
Standard	3200A to 2500A	1000
Based on requirement	3200A to 4000A	1000

	Busbar Rating (Amps)	Size (mm) L
Standard	4000A to 3200A	1000
Based on requirement	-	-



TAP - OFF BOXES

- Tap-off boxes are used to draw upto 800Amps (plug-in type) & 1000A - 1200A (inline) power from a busbar.
- Positioning of Tap off location can be made as per site requirments.



CABLE FEED UNITS

- Cable feed units are used to connect cable from one end of the bustrunking.
- Undrilled gland plate is provided at the bottom for multiple cable entry.

CENTER FEED UNITS

- Center feed units are used to connect cable from the middle of the bustrunking run.

END CAP

- End Cap is used to terminate and protect the Busbar run and can be removed from Busbar run when future expansion of the Busbar route required.

SPRING HANGER

- Spring Hanger is used to sustain Busbar Trunking Load and to allow expansion of the Busbar.

THE RIGHT PRODUCT AT THE RIGHT PLACE

HOSPITALS

Guardex by RR Busduct is a reliable and efficient electrical distribution system. It is a safe and robust power distribution system with high efficiency, low losses and high mechanical strength.

HOTELS/ HOSPITALITY

Guardex by RR Busduct offers the most comprehensive system to meet the requirements of a global market. Our Systems are suitable for 3 Phase 3 Wire, 3 Phase 4 Wire, 3 Phase 5 Wire and direct current distribution. Current ratings offered are from 800A to 6300A. Rated operational voltage upto 1000 V, IP degree upto IP67 and frequency 50/60Hz.

LARGE PLANTS/FACTORIES

Guardex by RR Busduct offers one of the lightest available sandwich products. The extruded aluminum housing offers a low magnetic system with low hysteresis losses and better efficiency.

SKYSCRAPPERS/TALL BUILDINGS

Guardex by RR Busduct is an obvious choice for various applications including commercial, industrial utilities, wind power, horizontal and vertical power distribution applications.

PRODUCT CERTIFICATION - GUARDEX PLUS

PRODUCT CERTIFICATION


Intertek

Certificate No. 21508

ASTA Certificate

of Verification Tests

IEC 61439-6: Edition 1.0 2012-05


Intertek

Certificate No. 21585

ASTA Certificate

of Selected Verification Tests


Intertek

Certificate No. 21608

ASTA Certificate

of Selected Verification Test

FACTORY CERTIFICATION


intertek

CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

RR BUSDUCT POWER DISTRIBUTION EQUIPMENT MANUFACTURING LLC

ISO 9001:2015

The management system is applicable to:

Calin Moldovean


intertek

CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

RR BUSDUCT POWER DISTRIBUTION EQUIPMENT MANUFACTURING LLC

ISO 14001:2015

The management system is applicable to:

Calin Moldovean


intertek

CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

RR BUSDUCT POWER DISTRIBUTION EQUIPMENT MANUFACTURING LLC

ISO 45001:2018

The management system is applicable to:

Calin Moldovean

EAC CERTIFICATE (GOST)

ТАМОЖЕННЫЙ СОЮЗ

СЕРТИФИКАТ СООТВЕТСТВИЯ

EAC

№ ТС RU C-AE.АУ04.В.06067

Серия RU № 0720726

ОРГАН ПО СЕРТИФИКАЦИИ Общества с ограниченной ответственностью «Сертификация и экспертиза». Место нахождения: 109202, Российская Федерация, город Москва, улица Басовская, дом 16, строение 1, этаж 6, помещение IX, комната № 43. Адрес места осуществления деятельности: 117420, Российская Федерация, город Москва, улица Профсоюзная, дом 57. Телефон: +7 (495) 506-11-60, адрес электронной почты: info@certexp.ru. Аттестат аккредитации регистрационный № РОСС RU.0001.10АУ04 выдан 13.03.2018 года

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ИЗГОТОВИТЕЛЬ «RR Busduct Power Distribution Equipment Manufacturing LLC»
Место нахождения и адрес места осуществления деятельности по изготовлению продукции: Dubai Investment Park - 2 – Dubai, Объединенные Арабские Эмираты

ПРОДУКЦИЯ Соединители электрические промышленного назначения: шинопроводы, тип Guardex Busway System
Продукция изготовлена в соответствии с Директивой 2014/35/EU «Низковольтное оборудование»
Серийный выпуск

КОД ТН ВЭД ТС 8536 90

СООТВЕТСТВУЕТ ТРЕБОВАНИЯМ ТЕХНИЧЕСКОГО РЕГЛАМЕНТА ТАМОЖЕННОГО СОЮЗА: ТР ТС 004/2011 «О БЕЗОПАСНОСТИ НИЗКОВОЛЬТНОГО ОБОРУДОВАНИЯ»

СЕРТИФИКАТ ВЫДАН НА ОСНОВАНИИ - протокола испытаний от 05.07.2018 года № 02129-215-1-18/БМ Испытательной лаборатории Общества с ограниченной ответственностью «Инновационные решения», аттестат аккредитации регистрационный № РОСС RU.0001.21АВ90;
- акта анализа состояния производства от 06.07.2018 года № 4313;
- руководства по эксплуатации;
Схема сертификации: 1с

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ Условия и сроки хранения продукции, срок службы (годности) указаны в прилагаемой к продукции эксплуатационной документации. Стандарты, в результате применения которых на добровольной основе обеспечивается соблюдение требований технического регламента: ГОСТ 12.2.007.0-75 «Система стандартов безопасности труда. Изделия электротехнические. Общие требования безопасности»

СРОК ДЕЙСТВИЯ С 09.07.2018 **ПО** 08.07.2023 **ВКЛЮЧИТЕЛЬНО**

М.П.

Руководитель (уполномоченное лицо) органа по сертификации (подпись) Ефремова Анастасия Анатольевна (инициалы, фамилия)

Эксперт (эксперт-аудитор) (эксперты (эксперты-аудиторы)) (подпись) Лазарева Лидия Николаевна (инициалы, фамилия)

RR BUSDUCT SYSTEMS SPECIFICATIONS

Certification & Standards

The equipment covered by this specification shall unless otherwise stated, be designed, constructed and tested in accordance with the latest revision of relevant International Standards.

IEC 61439-6 : Low Voltage Switchgear and Control Gear Assemblies-Busbar Trunking Systems
IEC 60331-1 : Circuit Integrity Test for Fire Rated Applications
IEC 60332 Prt-3 : Resistance to Flame Propagation
IEC 60695 Prt-2 : Resistance of the Materials to Abnormal Heat
IEC 60529 : Degree of Ingress Protection
IEEE 693 : Recommended Practice for Seismic Design of Substations
ISO 9001:2015 : Quality Management System

Busbar system shall be tested at independent internationally accredited laboratory (ASTA) for below tests and have a third party quality control certification (ASTA DIAMOND):

- Verification of Temperature Rise Limits
- Verification of Dielectric Properties
- Verification of Short Circuit Withstand Strength
- Verification of Effectiveness of The Protective Circuit
- Verification of Clearance & Creepage Distances
- Verification of Mechanical Operation
- Verification of Ability to Withstand Mechanical Loads
- Verification of Degree of Protection
- EMC Tests (not applicable)
- Verification of Resistance of Insulating Materials to Abnormal Heat and Fire
- Verification of Electrical Characteristics
- Verification of Structural Strength
- Verification of Crushing Resistance
- Veirification of Resistance to Flame Propagation
- Verification of Fire Resistance in Building Penetration

- Busbar system shall include a CE MARK on its labels in accordance with the LV directive number 2014/35/EU.
- The system shall confirm the Seismic requirement for Zone-5 as per IEEE 693 & tested by third-party lab (CPRI).
- The system shall confirm the circuit integrity for Fire Rated application as per IEC 60331-1 (200 minutes) and tested by third party lab, UL.
- Products shall be individually labelled and indicate brand, series, electrical details and manufacturing date.
- The manufacturing facility to be certified by third party (Intertek) for Quality Management System (ISO 9001), Environmental (ISO 14001) and Health and Safety Standards (OHSAS 18001)

Electrical Characteristics:

- Busbar system Rated Operational Voltage Ue and Rated Insulation Voltage Ui shall be 1000V.
- Busbar trunking system shall be designed and manufactured to withstand minimum 50 kA r.m.s. symmetrical short circuit current of without damaging the electrical, mechanical and thermal stress under fault condition of the service voltage. The design shall be confirmed by providing the required type test certificates from ASTA Diamond.
- The continuous rated current shall be according to the designed load of each system and temperature compensated to the high ambient temperature at 50 Deg C.

Construction

- Shall be totally enclosed, non-ventilated design busbar and is fully insulated using halogen free, fire retardant Class F Hybrid (Epoxy and Polyester film) or Polyester Film Insulation.
- Enclosure material shall be Extruded Aluminium with epoxy powder coated with thickness not less than 3.0 mm and to be shaped in such a way as to give excellent electromechanical characteristic and heat dissipation and to guarantee total safety against contact with live parts.
- Enclosure material for Fire Rated Busbar shall be Sheet Steel with FR rated paint finish. Insulation for the FR Busbar shall be Mica Insulation.
- The construction shall be 'True Sandwich' System and also at the plug-in points. Conductors shall be so arranged in the enclosure with no air gap to achieve low reactance.
- Each plug-in opening shall be provided with automatic safety shutters to shield the live busbars.
- The construction of housing shall have four-part system, riveted by self-piercing rivets. Enclosure with nuts & bolts are not allowed.

Conductors

- The conductors shall be of high conductivity fully tin plated copper bars. Purity and conductivity of the busbar shall be:

Conductor Type		Purity	Conductivity
Copper	ETP Grade	>99.9%	>100% IACS
Aluminium	EC Grade	>99.5%	>59.5% IACS

- Aluminium / Copper conductors between phases shall be insulated with Epoxy Coating and Polyester Film Coating to minimum Class-F insulation.

- Range for Copper Busbar System : 800A ~ 6300A

- Range for Aluminium Busbar System : 800A ~ 5000A

Configuration Options

1. **3P+100%N*+Housing PE**
2. **3P+100%N*+50% Internal Earth**
3. **3P+200%N*+Housing PE**

** Neutral conductors shall be fully insulated and same cross-section of phase conductors. Other configurations are available upon request.*

Insulation

- Busbar shall be insulated with Class F Hybrid (Epoxy and Polyester film) or Standard Polyester Film Insulation on the conductors. Mica Insulation for FR Busbar Systems. Insulation voltage shall not be less than 1000V.
- Joint plate insulation shall be minimum Class-F, UL 94-V0 Halogen free, Red Phosphorus free and complies with RoHS. Insulating material shall be self-extinguishing and non-fire propagating type.

Joint Construction

- Joints shall be monobloc with shear off nuts so that it shall be possible to remove Joints to allow electrical isolation or physical removal of a Busbar-trunking section without disturbing adjacent Busbar-trunking sections.
- A torque breaking nut (double head) to be used which can be break at pre-determined torque and Joint bolt to be tighten from one side only.
- The side joint shall be of extruded aluminum with cooling fins having minimum thickness of 5 mm.

Ingress Protection

Busbar Trunking System shall be totally enclosed and comply with degree of protection of at least IP65, as specified and defined in IEC 60529. The plug-in outlet and joint cover/plug-in tap off box should comply with IP55.

** Provide final protection to ensure that moisture does not enter bus assembly.*

Indoor Installation	**IP65**
Outdoor Installation*	**IP65 / IP67**
Plug-in Units	**IP55**

** Canopy is highly recommended to enhance product performance and life time .*

Accessories

- Standard range of accessories shall include Horizontal and Vertical elbows, T-Elements, Offsets, Expansion Joints, Phase Crossover Unit, Reducers, Connecting Elements to Switchgear / Transformer / Generator.
- The busbar system shall have standalone expansion element and be fitted at least every 40 mtrs of horizontal run and wherever busbars cross a building expansion.

Tap Off Boxes

- Shall be constructed from Galvanized Sheet Steel with paint finish.
- The tap off box should have hinged front cover. It shall incorporate an external operating handle with ON, OFF, TRIP indication for MCCB, enabling it to be operated with the cover closed.
- The MCCB shall incorporate padlocking facilities in OFF position for maintenance purpose. The plug-in units shall be suitable for mounting on front of the riser as required. The unit shall be supplied with all connections and accessories to enable connection to the busbars and the outgoings cable to be correctly and safely achieved.
- Tap off boxes shall be suitable for any brand of MCCBs.
- Shall be suitable for supplying three phase loads from 63A to 800A (plug-in type) and 1000A - 1200A (in-line type).
- The units shall have clamps with interlocking facility to prevent the unit being removed from the busbar when MCCB is in the ON position.
- The point at which tap off is connected to the busbar shall be formed (press tag) from the main conductor body.
- Additional interlock to be provided to prevent opening of the door of plug in when the MCCB is in the ON position.

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