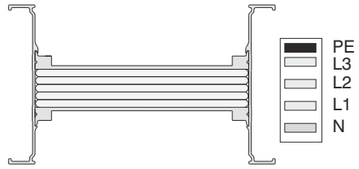
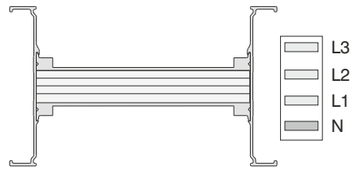
Technical Characteristics

Aluminium Conductor (Al)

Standards	IEC 61439-6, TS EN 61439-6, IEC 61439-1, TS EN 61439-1																
Rated Isolation Voltage	Ui	V	1000	at Cat IV													
Max. Rated Operational Voltage	Ue	Vac	1000														
Rated Impulse Withstand Voltage	Uimp	kV	12														
Rated Frequency	f	Hz	50														
Pollution Degree	III																
Protection Degree	IP55 / IP65 / IP67																
External Mechanical Impacts (IK Code)*	Bolt-on Busbar IK10+, Plug-in Busbar IK08																
Protection for Safety	Basic Protection (HD 60364-4-41, Clause A1)																
Rated Current	**I_n**	**A**	**400**	**500**	**630**	**800**	**1000**	**1250**	**1350**	**1600**	**2000**	**2500**	**2500**	**3150**	**3200**	**4000**	**5000**
Busbar Code			**04**	**05**	**06**	**08**	**10**	**12**	**14**	**17**	**20**	**25**	**27**	**32**	**33**	**40**	**51**
Rated Short-time Withstand Current (1s) (Three phase)	I_{cw}	kA	16	16	25	35	50	60	60	80	80	100	80	100	120	120	120
Rated Peak Withstand Current	I_{pk}	kA	32	32	52,5	73,5	105	132	132	176	176	220	176	220	264	264	264
Rated Short-time Withstand Current for Neutral Conductor (1s) (Single phase)	I_{cw}	kA	9,6	9,6	15	21	30	36	36	48	48	60	48	60	72	72	72
Rated Peak Withstand Current for Neutral Conductor	I_{pk}	kA	16,32	16,32	30	44,1	63	75,6	75,6	100,8	100,8	132	100,8	132	158,4	158,4	158,4
Rated Short-time Withstand Current for PE (Housing) Conductor (1s) (Single phase)	I_{cw}	kA	9,6	9,6	15	21	30	36	36	48	48	60	48	60	72	72	72
Rated Peak Withstand Current for PE (Housing) Conductor	I_{pk}	kA	16,32	16,32	30	44,1	63	75,6	75,6	100,8	100,8	132	100,8	132	158,4	158,4	158,4
MEAN PHASE CONDUCTOR CHARACTERISTICS AT RATED CURRENT In																	
Resistance at a conductor temperature of 20 °C	R_{20}	mΩ/m	0,197	0,163	0,121	0,088	0,061	0,044	0,040	0,031	0,026	0,022	0,021	0,018	0,015	0,012	0,010
Resistance at an ambient air temperature of 35 °C	R	mΩ/m	0,258	0,225	0,159	0,116	0,080	0,058	0,052	0,041	0,034	0,029	0,028	0,024	0,020	0,016	0,013
Reactance (Independent from Temperature)	X	mΩ/m	0,035	0,033	0,027	0,021	0,015	0,013	0,013	0,010	0,008	0,007	0,007	0,005	0,005	0,004	0,003
Positive and negative sequence impedances at an ambient air temperature of 35 °C	Z	mΩ/m	0,260	0,227	0,162	0,118	0,082	0,060	0,053	0,042	0,035	0,030	0,029	0,024	0,020	0,017	0,014
Positive and negative sequence impedances at a conductor temperature of 20 °C	Z_{20}	mΩ/m	0,200	0,167	0,124	0,091	0,063	0,046	0,042	0,033	0,027	0,023	0,022	0,018	0,016	0,013	0,010
Rated Power Loss at 35 °C		W/m	120,5	163,0	189,3	222,7	240,6	271,9	282,7	315,6	412,8	547,5	517,5	708,5	599	787,2	997,5
DC Resistance at a conductor temperature of 20 °C for Phases	R/ort_{ph}	mΩ/m	0,197	0,161	0,124	0,087	0,060	0,043	0,039	0,030	0,024	0,022	0,019	0,018	0,015	0,012	0,010
DC Resistance at a conductor temperature of 20 °C for Neutral	R_N	mΩ/m	0,198	0,164	0,126	0,090	0,061	0,044	0,039	0,031	0,025	0,023	0,020	0,018	0,017	0,013	0,010
DC Resistance at a conductor temperature of 20 °C for PE (Housing)	R_{PE}	mΩ/m	0,038	0,033	0,028	0,024	0,028	0,024	0,026	0,033	0,035	0,018	0,020	0,026	0,023	0,018	0,018
SECTIONS																	
L1,L2,L3,N		mm²	150	180	240	330	480	660	750	960	1200	1320	1500	1680	1920	2400	3000
PE (4 ½ Conductors)		mm²	75	90	120	165	240	330	375	480	600	660	750	840	960	1200	1500
PE (5 Conductors)		mm²	150	180	240	330	480	660	750	960	1200	1320	1500	1680	1920	2400	3000
Aluminium Housing Section (Aluminium)		mm²	1449	1509	1686	1788	1894	2050	2128	2314	2518	3912	2764	4224	4411	4848	5275
Conductor Dimensions		mmxmm	6x25	6x30	6x40	6x55	6x80	6x110	6x125	6x160	6x200	2(6x110)	6x250	2(6x140)	2(6x160)	2(6x200)	2(6x250)
Busbar Weight (4 Conductors)		kg/m	7,0	7,4	7,9	9,2	11,3	13,9	15,2	18,3	21,7	27,3	28,5	32,5	35,9	42,9	70,0
Busbar Weight (5 Conductors)		kg/m	7,4	7,9	8,6	10,2	12,8	15,9	17,5	21,1	25,3	31,2	34,2	37,5	41,6	50	81,6
MEAN FAULT-LOOP CHARACTERISTICS																	
Zero-sequence Impedance																	
Zero-sequence impedance at a conductor temperature of 20 °C	$Z_{(0)b20phN}$	mΩ/m	0,873	0,748	0,572	0,419	0,291	0,214	0,194	0,153	0,130	0,108	0,103	0,086	0,074	0,060	0,048
Zero-sequence impedance at a conductor temperature of 20 °C (Housing)	$Z_{(0)b20phPE}$	mΩ/m	0,430	0,398	0,326	0,268	0,245	0,208	0,199	0,161	0,158	0,101	0,131	0,092	0,101	0,084	0,078
Zero-sequence impedance at an ambient temperature of 35 °C	$Z_{(0)bphN}$	mΩ/m	1,129	1,011	0,742	0,540	0,371	0,274	0,245	0,195	0,167	0,140	0,135	0,113	0,094	0,078	0,064
Zero-sequence impedance at an ambient temperature of 35 °C (Housing)	$Z_{(0)bphPE}$	mΩ/m	0,528	0,507	0,406	0,331	0,303	0,260	0,245	0,199	0,199	0,126	0,168	0,119	0,127	0,108	0,102
Resistances and Reactances																	
Resistance at a conductor temperature of 20 °C	$R_{b20phph}$	mΩ/m	0,399	0,337	0,249	0,184	0,125	0,092	0,083	0,065	0,054	0,046	0,042	0,036	0,031	0,025	0,020
Resistance at a conductor temperature of 20 °C	R_{b20phN}	mΩ/m	0,408	0,347	0,255	0,192	0,131	0,096	0,087	0,069	0,057	0,049	0,044	0,038	0,033	0,027	0,021
Resistance at a conductor temperature of 20 °C (Housing)	$R_{b20phPE}$	mΩ/m	0,252	0,223	0,175	0,137	0,112	0,093	0,086	0,068	0,065	0,053	0,050	0,039	0,049	0,035	0,031
Resistance at an ambient air temperature of 35 °C	R_{bphph}	mΩ/m	0,523	0,464	0,328	0,241	0,164	0,120	0,107	0,086	0,072	0,059	0,057	0,049	0,040	0,033	0,027
Resistance at an ambient air temperature of 35 °C	R_{bphN}	mΩ/m	0,534	0,477	0,336	0,252	0,171	0,126	0,113	0,090	0,076	0,062	0,060	0,052	0,043	0,035	0,029
Resistance at an ambient air temperature of 35 °C (Housing)	R_{bphPE}	mΩ/m	0,330	0,307	0,231	0,180	0,146	0,122	0,112	0,089	0,086	0,067	0,068	0,052	0,064	0,046	0,042
Reactance (Independent from temperature)	X_{bphph}	mΩ/m	0,073	0,065	0,043	0,042	0,032	0,024	0,023	0,018	0,017	0,012	0,013	0,010	0,009	0,008	0,005
Reactance (Independent from temperature)	X_{bphN}	mΩ/m	0,102	0,092	0,075	0,058	0,045	0,034	0,032	0,026	0,023	0,018	0,020	0,014	0,013	0,012	0,009
Reactance (Independent from temperature)	X_{bphPE}	mΩ/m	0,102	0,093	0,069	0,061	0,050	0,041	0,039	0,032	0,030	0,024	0,023	0,017	0,019	0,015	0,014



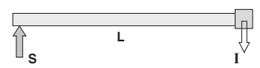


Voltage Drop Calculation

Generally Voltage drop of a busbar system can be calculated with the following formula.

$$\Delta U = \sqrt{3}.L.I.(R.\cos\varphi + X.\sin\varphi)10^{-3}\ [V]$$

ΔU = Voltage Drop (V)
L = Line Length (m)
I = Line Current or Load (A)
R = Resistance (mΩ/m)
X = Reactance (mΩ/m)



S = Supply Point

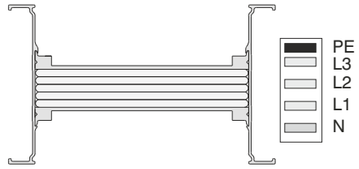
- All phase conductor characteristics had been determined according to Annex BB of IEC / EN 61439-6.
- Fault-loop zero-sequences impedances had been determined according to Annex CC of IEC / EN 61439-6.
- Fault-loop resistances and impedances had been determined according to Annex DD of IEC / EN 61439-6.

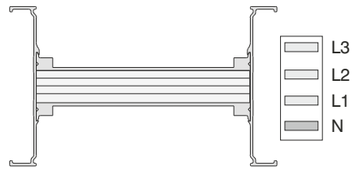
* IK10 corresponds to impact energy of 20J according to IEC 62262.

▶▶Technical Characteristics

Copper Conductor (Cu)

Standards	IEC 61439-6, TS EN 61439-6, IEC 61439-1, TS EN 61439-1																	
Rated Isolation Voltage	Ui	V	1000	at Cat IV														
Max. Rated Operational Voltage	Ue	Vac	1000															
Rated Impulse Withstand Voltage	Uimp	kV	12															
Rated Frequency	f	Hz	50															
Pollution Degree	III																	
Protection Degree	IP55 / IP65 / IP67																	
External Mechanical Impacts (IK Code)*	Bolt-on Busbar IK10+, Plug-in Busbar IK08																	
Protection for Safety	Basic Protection (HD 60364-4-41, Clause A1)																	
Rated Current	**I_n**	**A**	**550**	**650**	**800**	**1000**	**1250**	**1350**	**1600**	**2000**	**2500**	**2000**	**2500**	**3300**	**3600**	**4000**	**5000**	**6300**
Busbar Code			**05**	**06**	**08**	**10**	**12**	**14**	**17**	**23**	**25**	**22**	**27**	**32**	**36**	**40**	**50**	**63**
Rated Short-time Withstand Current (1s) (Three phase)	I_{cw}	kA	24	24	40	50	60	60	80	80	100	80	100	120	120	120	120	120
Rated Peak Withstand Current	I_{pk}	kA	50,4	50,4	84	105	132	132	176	176	220	176	220	264	264	264	264	264
Rated Short-time Withstand Current for Neutral Conductor (1s) (Single phase)	I_{cw}	kA	14,4	14,4	24	30	36	36	48	48	60	48	60	72	72	72	72	72
Rated Peak Withstand Current for Neutral Conductor	I_{pk}	kA	28,8	28,8	50,4	63	75,6	75,6	100,8	100,8	132	100,8	132	158,4	158,4	158,4	158,4	158,4
Rated Short-time Withstand Current for PE (Housing) Conductor (1s) (Single phase)	I_{cw}	kA	14,4	14,4	24	30	36	36	48	48	60	48	60	72	72	72	72	72
Rated Peak Withstand Current for PE (Housing) Conductor	I_{pk}	kA	28,8	28,8	50,4	63	75,6	75,6	100,8	100,8	132	100,8	132	158,4	158,4	158,4	158,4	158,4
MEAN PHASE CONDUCTOR CHARACTERISTICS AT RATED CURRENT In																		
Resistance at a conductor temperature of 20 °C	R_{20}	mΩ/m	0,123	0,100	0,074	0,055	0,044	0,038	0,032	0,024	0,016	0,028	0,021	0,014	0,012	0,011	0,008	0,005
Resistance at an ambient air temperature of 35 °C	R	mΩ/m	0,162	0,137	0,097	0,071	0,057	0,050	0,044	0,033	0,021	0,036	0,028	0,019	0,016	0,015	0,010	0,006
Reactance (Independent from Temperature)	X	mΩ/m	0,044	0,034	0,028	0,023	0,019	0,016	0,015	0,010	0,008	0,012	0,009	0,007	0,006	0,005	0,004	0,003
Positive and negative sequence impedances at an ambient air temperature of 35 °C	Z	mΩ/m	0,168	0,141	0,101	0,075	0,060	0,053	0,047	0,034	0,022	0,038	0,030	0,020	0,017	0,016	0,011	0,007
Positive and negative sequence impedances at a conductor temperature of 20 °C	Z_{20}	mΩ/m	0,130	0,106	0,079	0,060	0,047	0,041	0,035	0,026	0,018	0,030	0,023	0,016	0,014	0,012	0,009	0,006
Rated Power Loss at 35 °C		W/m	143,5	166,8	185,5	213,6	264,8	274,5	325,1	383,3	384,4	436,8	528,8	604,4	633,7	705,6	772,5	750,1
DC Resistance at a conductor temperature of 20 °C for Phases	R/ort_{ph}	mΩ/m	0,118	0,097	0,072	0,053	0,041	0,036	0,031	0,022	0,014	0,025	0,021	0,013	0,012	0,010	0,007	0,005
DC Resistance at a conductor temperature of 20 °C for Neutral	R_N	mΩ/m	0,120	0,099	0,074	0,054	0,042	0,036	0,031	0,023	0,014	0,026	0,021	0,015	0,012	0,009	0,008	0,005
DC Resistance at a conductor temperature of 20 °C for PE (Housing)	R_{PE}	mΩ/m	0,036	0,034	0,027	0,029	0,024	0,028	0,028	0,039	0,031	0,019	0,022	0,018	0,023	0,021	0,021	0,011
SECTIONS																		
L1,L2,L3,N		mm²	150	180	240	330	420	480	570	750	1200	660	840	1320	1500	1680	2400	3600
PE (4 ½ Conductors)		mm²	75	90	120	165	210	240	285	375	600	330	420	660	750	840	1200	1800
PE (5 Conductors)		mm²	150	180	240	330	420	480	570	750	1200	660	840	1320	1500	1680	2400	3600
Aluminium Housing Section (Aluminium)		mm²	1449	1509	1686	1788	1842	1894	1996	2128	2518	3340	3580	3912	4068	4224	4848	7128
Conductor Dimensions		mmxmm	6x25	6x30	6x40	6x55	6x70	6x80	6x95	6x125	6x200	2(6x55)	2(6x70)	2(6x110)	2(6x125)	2(6x140)	2(6x200)	3(6x200)
Busbar Weight (4 Conductors)		kg/m	10,7	11,9	14,4	18,3	22	24,5	27,7	36,2	54,7	35,9	44	63,5	71,1	78,6	108,8	162,8
Busbar Weight (5 Conductors)		kg/m	12,2	13,52	16,8	21,5	26,1	29,2	33,7	43,8	66,5	42,4	52	76,5	85,8	95,2	132,4	198,2
MEAN FAULT-LOOP CHARACTERISTICS																		
Zero-sequence Impedance																		
Zero-sequence impedance at a conductor temperature of 20 °C	$Z_{(0)b20phN}$	mΩ/m	0,585	0,489	0,393	0,295	0,250	0,198	0,168	0,130	0,086	0,148	0,107	0,073	0,067	0,060	0,038	0,029
Zero-sequence impedance at a conductor temperature of 20 °C (Housing)	$Z_{(0)b20phPE}$	mΩ/m	0,365	0,338	0,268	0,281	0,229	0,209	0,154	0,153	0,146	0,144	0,090	0,091	0,090	0,100	0,086	0,061
Zero-sequence impedance at an ambient temperature of 35 °C	$Z_{(0)bphN}$	mΩ/m	0,750	0,646	0,499	0,371	0,309	0,251	0,221	0,167	0,107	0,189	0,136	0,092	0,084	0,077	0,046	0,034
Zero-sequence impedance at an ambient temperature of 35 °C (Housing)	$Z_{(0)bphPE}$	mΩ/m	0,442	0,419	0,324	0,345	0,286	0,259	0,197	0,193	0,181	0,176	0,111	0,113	0,112	0,128	0,106	0,075
Resistances and Reactances																		
Resistance at a conductor temperature of 20 °C	$R_{b20phph}$	mΩ/m	0,248	0,206	0,159	0,119	0,091	0,077	0,066	0,050	0,033	0,059	0,044	0,029	0,025	0,023	0,016	0,011
Resistance at a conductor temperature of 20 °C	R_{b20phN}	mΩ/m	0,256	0,214	0,167	0,126	0,097	0,083	0,071	0,054	0,035	0,063	0,047	0,031	0,027	0,025	0,017	0,012
Resistance at a conductor temperature of 20 °C (Housing)	$R_{b20phPE}$	mΩ/m	0,176	0,155	0,123	0,112	0,137	0,083	0,065	0,059	0,053	0,061	0,040	0,035	0,034	0,044	0,032	0,023
Resistance at an ambient air temperature of 35 °C	R_{bphph}	mΩ/m	0,328	0,283	0,209	0,154	0,118	0,103	0,091	0,067	0,043	0,077	0,058	0,038	0,033	0,030	0,020	0,013
Resistance at an ambient air temperature of 35 °C	R_{bphN}	mΩ/m	0,339	0,294	0,219	0,163	0,126	0,110	0,098	0,073	0,046	0,083	0,062	0,041	0,036	0,033	0,022	0,015
Resistance at an ambient air temperature of 35 °C (Housing)	R_{bphPE}	mΩ/m	0,233	0,213	0,161	0,145	0,178	0,111	0,089	0,080	0,070	0,080	0,052	0,047	0,044	0,059	0,041	0,028
Reactance (Independent from temperature)	X_{bphph}	mΩ/m	0,079	0,069	0,052	0,043	0,036	0,032	0,026	0,022	0,014	0,022	0,016	0,012	0,011	0,010	0,008	0,005
Reactance (Independent from temperature)	X_{bphN}	mΩ/m	0,105	0,094	0,071	0,059	0,050	0,045	0,037	0,032	0,022	0,029	0,023	0,018	0,015	0,014	0,011	0,008
Reactance (Independent from temperature)	X_{bphPE}	mΩ/m	0,101	0,093	0,070	0,061	0,054	0,050	0,036	0,035	0,028	0,033	0,022	0,020	0,018	0,018	0,014	0,010



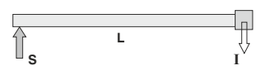


Voltage Drop Calculation

Generally Voltage drop of a busbar system can be calculated with the following formula.

$$\Delta U = \sqrt{3}.L.I.(R.\cos\varphi + X.\sin\varphi)10^{-3}\ [V]$$

ΔU = Voltage Drop (V)
L = Line Length (m)
I = Line Current or Load (A)
R = Resistance (mΩ/m)
X = Reactance (mΩ/m)



S = Supply Point

- All phase conductor characteristics had been determined according to Annex BB of IEC / EN 61439-6.
- Fault-loop zero-sequences impedances had been determined according to Annex CC of IEC / EN 61439-6.
- Fault-loop resistances and impedances had been determined according to Annex DD of IEC / EN 61439-6.

* IK10 corresponds to impact energy of 20J according to IEC 62262.

400A ... 6300A COMPACT BUSBAR
PRODUCT OVERVIEW (E-LINE KX)

1- Standards & Certification:

-Busbar system shall be designed and manufactured as per IEC 61439-6 standard, which requires below listed tests. Each busbar rating shall have a separate type test certificate from an independent internationally accredited laboratory including below tests:
10.2- Strength of material and parts, 10.2.2- Resistance to corrosion, 10.2.3- Properties of insulating materials, 10.2.3.1- Verification of thermal stability of enclosures, 10.2.3.2- Verification of resistance of insulating materials to abnormal heat and fire due to internal electric effects, 10.2.6- Mechanical impact, 10.2.7- Marking, 10.2.101- Ability to withstand mechanical loads , 10.2.101.1- Test procedure for a straight busbar trunking unit, 10.2.101.2- Test procedure for a joint, 10.2.101.3- Resistance of the enclosure to crushing, 10.3- Degree of protection of assembly, 10.4- Clearances and creepage distances, 10.5-Protection against electric shock and integrity of protective circuits, 10.5.2- Effective earth continuity between the exposed conductive parts of the assembly and the protective circuit, 10.5.3- Short-circuit withstand strength of the protective circuit, 10.9- Dielectric properties, 10.9.2- Power-frequency withstand voltage, 10.9.3- Impulse withstand voltage, 10.10- Verification of temperature rise, 10.11- Short-circuit withstand strength, 10.101- Resistance to flame propagation, 10.102- Fire resistance in building penetrations, Annex BB Phase conductor characteristics, Annex CC Fault-loop zero-sequences impedances, Annex DD Fault-loop resistances and reactances.
- Busbar system shall have CE marking.
-The manufacturer of busbar system shall have ISO 9001 and ISO 14001 certification.
-Each product shall have a "Type Label" including coding system, which identifies the brand, type of the unit, number of conductors and electrical details. The same coding shall be on the related certificate and catalogue.

2- Electrical Characteristics

- Busbar systems nominal insulation voltage shall be 1000 V.
- As per ampere rates, minimum short circuit values shall be as given below;

For Aluminium Conductors;

400-500A	:1 sec/rms	16kA, Peak	32kA
630A	:1 sec/rms	25kA, Peak	52,5kA
800A	:1 sec/rms	35kA, Peak	73,5kA
1000A	:1 sec/rms	50kA, Peak	105kA
1250-1350A	:1 sec/rms	60kA, Peak	132kA
1600-2500A	:1 sec/rms	80kA, Peak	176kA
2500-3150A	:1 sec/rms	100kA,Peak	220kA
3200A and above	:1 sec/rms	120kA,Peak	264kA

For Copper Conductors;

550-650A	:1 sec/rms	24kA, Peak	50,4kA
800A	:1 sec/rms	40kA, Peak	84kA
1000A	:1 sec/rms	50kA, Peak	105kA
1250-1350A	:1 sec/rms	60kA, Peak	132kA
1600-2000A	:1 sec/rms	80kA, Peak	176kA
2500A	:1 sec/rms	100kA,Peak	220kA
3300A and above	:1 sec/rms	120kA,Peak	264kA

2.1- Housing

-Busbar system shall have "Sandwich-Compact" structure. Conductors shall be packed and placed into the housing without leaving air gap in order to provide low reactance.
-Housing shall be made of thermal processed, extruded aluminium, RAL7038-Electrostatic painted.
-Compact structure of the housing shall be provided by M6 screws applied at every 19cm along the entire length.
-The sandwich-compact structure shall continue at the plug-in points too. There shall not be air gap between conductors at the plug-in points.

2.2- Conductors

Aluminium or Copper conductors shall be epoxy coated and tin plated at the joints upon the wire configuration and required numbers, which are described below.
-Compact busbar system shall have aluminium conductors between 400A – 5000A.
- Compact busbar system shall have copper conductors between 550A – 6300A.
- Compact busbar system shall have the following number of conductors and wire configuration;
a) 4 Conductors: (4 full size conductors + PE (housing)).
b) 4 ½ Conductors: (4 full size conductors + PE (50% earth conductor + housing)),
c) 5 Conductors: (5 full size conductors + PE (100% earth conductor + housing)),
-Phase conductors and neutral conductor shall have the same cross-section and they shall be insulated.
- Aluminium conductors shall be of EC grade aluminium. Minimum conductivity shall be 34m/mm².W.
-Copper conductors shall be minimum 99,95% electrolytic copper. Minimum conductivity shall be 56m/mm².W.

2.3- Insulation

- Insulation system shall be suitable for 1.000V continuous operation. Conductors shall be minimum thermo-set epoxy coated. Conductor size shall be designed so that temperature rise on the conductors shall not exceed 100C degree at nominal current, which helps to global heating problem. With this reason, insulation class shall be "B class".

2.4- Joint Structure

- Electrical and mechanical connection shall be made by placing conductor joints into the joint blocks of the connected conductors and followed by tightening and fastening of the joint bolts.

2.5- Protection

- Protection degree of the housing and joints shall be IP55/IP65 and IP67.

2.6- Acessories

- Busbar system shall have all necessary accessories (elbows, offsets, panel-transformer connections, reductions, etc.) Manufacturer shall supply special dimensioned units in short time, if the project conditions requires.
-For horizontal runs, a horizontal expansion unit shall be used at every 40m and expansion points of the building.
-For vertical applications, a vertical expansion unit shall be used at every floor. Busbar system shall be rigidly fixed by supports at every floor.

3- Tap Off Boxes

-Both, Feeder and Plug-in busbar systems shall be suitable for bolt-on type tap off box connections at the joints up to 1.000A.
-Bolt-on tap off boxes shall be installed to the joints without changing or adding any piece. Bolt-on tap off boxes shall be able to be moved between different rated busbars.
-Plug-In busbars shall have minimum 2 plug-in points on each 300cm length. Plug-in tap off box sizes shall be up to 630A. Unused plug-in points shall have covers, which can provide IP55 protection degree.
-Plug-in tap off boxes shall be suitable to install or removed from busbars without switching off the power on the busbar.
-Contacts of plug-in tap off box shall be plated by silver.
-Tap off boxes shall be manufactured of sheet steel and epoxy painted RAL3020 colour.
-Plug-in tap off boxes shall have electromechanical safety interlock system. Which means;
a-) Electromechanical interlock mechanism shall ensure that the tap off box cannot be removed mechanically from the busbar, when the switch is at "ON" position.
b-) Electromechanical interlock mechanism shall ensure that, cover of the box can be opened only, when the switch is at "OFF" position.
c-)When the cover is opened, inside protection degree shall be minimum IP2X against accessing to live conductors.
d-) While inserting the contacts of plug-in tap off box, earth contact shall make the first touch. While removing, it shall be disconnected last.
-Tap off boxes shall be suitable for any brand of MCCBs. Electromechanical interlock mechanism shall be suitable for all these MCCBs too.

4- Installation and Commisioning

-Busbar systems shall be installed as per Single-Line drawings respect to required ampere rates and manufacturer installation guide (torque values, lockers, etc.). Electrical installator shall run an insulation test after installation according to manufacturers test procedures. The results of the test shall be reported to the manufacturer. Minimum insulation value shall be 1 Mohm.