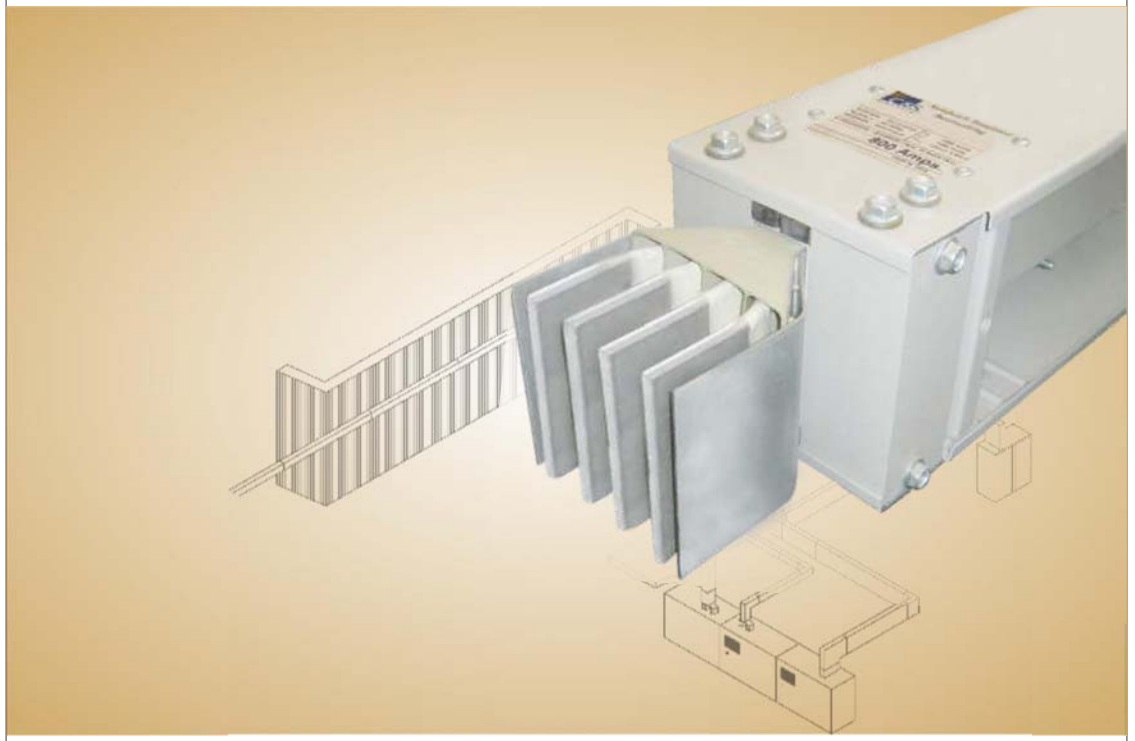
We touch your electricity everyday!



Busbar Trunking System

SB-Sandwich Trunking

C&S electric

C&S Electric Ltd.

OUR MISSION

- To create a unique alchemy of outstanding products, operational excellence, path breaking customer service, and compelling marketing.
- To create and relish a vibrant workplace where employees are empowered, cared for, developed, and most of all, provided unlimited opportunity to discover their full potential.
- To continously enhance our core technologies, and develop new world class technologies and products to expand our offering to customers.
- To consolidate and strengthen our position as India's largest exporter of Industrial power distribution and control equipment.
- To earn a healthy return on investment for the shareholders.
- To everyday experience, the sheer joy of delighting our internal and external customers, and to relish the thrill of participation in India's infrastructure boom.

OUR VISION

- C&S shall be the most trusted, respected and preferred brand, for electrical and electronic equipment that finds application in power generation, distribution, control and final consumption.
- In its major businesses C&S shall not only command a domestic market share ranging from 12% to 50% or more, but be known widely as the company "**closest to its Customers**"
- C&S products shall be used to manage power in india's biggest industries, in its highest buildings, in its most critical infrastructure and in millions of its homes.
- The C&S name shall be recognized widely as a benchmark, and shall serve as a role model and an inspiration to other Indian engineering products companies.
- C&S shall be cited as a company that played an important role in making "**Made in India**" a label that is trusted and respected the world over.

Manufacturing Plant at Hardwar

Major Manufacturing Facilities

CNC TURRET PUNCH PRESS

BUSBAR CUTTING MACHINE

POWDER COATING PLANT

BUSBAR SLEEVING MACHINE

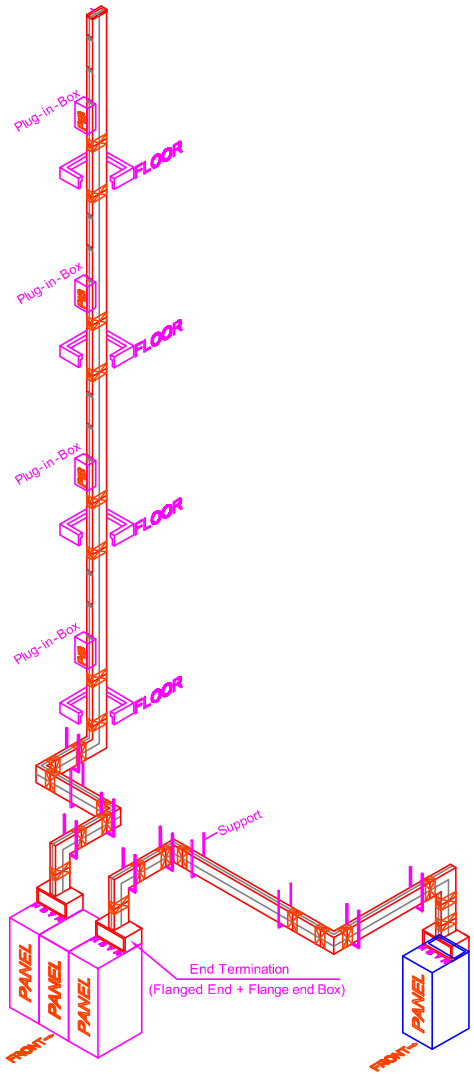
LASER INSULATION CUTTING MACHINE

Index

Bustrunking System

General

- Busbar Trunking System for electrical distribution is an alternative to cumbersome conventional cable distribution system.
- Busbar Trunking System has the advantage of expansions, Changes, replacement and reusing capability in the future.
- Loads can be fed from Plug-in Box unlike cables, where each floor/ machine is to be fed separately from the main switchboard. Repositioning of distribution points is simpler.
- Installation time is much shorter then cable system. This provides low installation and manpower costs and help for better time management.
- Busbar Trunking systems have a modern and aesthetic look.
- System is maintenance free.



Salient Features

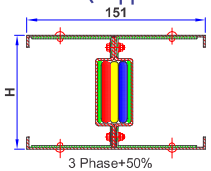
- Close proximity of busbars reduces inductive reactance, resistance, impedance and voltage drop is much lower than cable & any other busbar system.
- Specially designed housing act as a heat sink to yield improved thermal characteristic, high mechanical and short circuit strength.
- Busbar System has no chimney effect, hence provide a better resistance to the spread of fire.
- Automatic polarity is maintained during installation.
- System can be mounted edgewise OR flat wise horizontally or vertically in any direction with all kinds of bends and tees etc.
- The compact structure and steel housing allows much lower electromagnetic field around busbar system then cable.Busbars does not generate electromagnetic interference on data system.

C&S electric

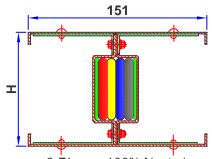
Specifications

Compliance of Standard	IEC 60439 (1&2) & IS 8623 (1&2)
Independent Certification Authority	ASTA-UK, CPRI-India
Busbar Arrangement	Sandwich Type
Busbar Ratings	Copper 630 ~ 6600A Aluminium 400 ~ 5000A
Busbar Configuration	3 Phase+50% Internal Earth 3 Phase+100% Neutral+50% Internal Earth 3 Phase+200% Neutral+50% Internal Earth 3 Phase+100%Neutral+100% Isolated Earth +50%Internal Earth
Rated Operational Voltage (Ue)	1000 Volt, AC
Rated Insulation Voltage (Ui)	1000 Volt, AC
Rated Dielectric Voltage	3.5 KV r.m.s
Rated Impulse Withstand Voltage (Uimp)	12 kV (1.2/50 µs)
Rated Frequency	50 Hz / 60 Hz
Enclosure Material	1.6mm G.I
Surface Coating on Enclosure	Epoxy polyster powder coated (RAL-7032)
Busbar Material (Phase/Neutral)	Copper (full round edge),99.9% pure ETP grade Aluminium (full round edge), 99.5% pure.
Busbar Material (Internal Earth)	G.I 1.5mm / Copper 1.5 mm.
Busbar Material (External Earth)	Copper / Aluminium (Optional)
Busbar Insulation	Multi layer Class- 'F' Insulation (Polyster +Mica)
Degree of Protection	IP 54 for Plug in type. IP55 / IP65 / IP67 for feeder bustrunking.
Fire Rating	240Min.(ISO 834) 55
Seismic Compliance	Zone -5 (IS:1893/IEEE 693)
Joint	Uniblock Joint (With Isolation and tamper proof shear off nut)
Plug -in-Box	32~800 A

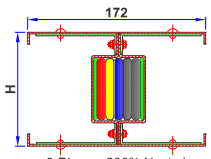
SBC (Copper Sandwich Insulated Bus Trunking)



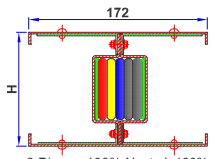
3 Phase+50% Internal Earth



3 Phase+100% Neutral +50% Internal Earth



3 Phase+200% Neutral +50% Internal Earth



3 Phase+100% Neutral+100% Isolated Earth+50% Internal Earth

Rated Current (In)	Amps	630	800	900	1000	1100	1250	1600	1800	2000
Product Code	---	SBC 40N1	SBC 50N1	SBC 60N1	SBC 70N1	SBC 80N1	SBC 100N1	SBC 125N1	SBC 150N1	SBC 175N1
Busbar size per phase (No. of busbars)	mm	6x40(1)	6x50(1)	6x60(1)	6x70(1)	6x80(1)	6x100(1)	6x125(1)	6x150(1)	6x175(1)
Overall Height (H)	mm	85	95	105	115	125	145	170	195	220
Rated Three Phase RMS Short Time Current for 1 Second (Icw)	kA	40	50	50	65	65	85	100	100	100
Rated Three phase Peak short time current (Ipk)	kA	84	105	105	143	143	187	220	220	220
Rated Single Phase RMS Short Time Current for 1 Second (Icw)	kA	24	30	30	39	39	51	60	60	60
Rated Single phase Peak short time current (Ipk)	kA	50.4	63	63	81.9	81.9	112.2	132	132	132
Approximate Weight of Bustrunking										
3 Phase + 50% Internal Earth	kg/mtr.	20	22	24	27	29	34	40	46	52
3 Phase + 100% Neutral + 50% Internal Earth	kg/mtr.	22	25	28	31	34	40	47	55	62
3 Phase + 200% Neutral + 50% Internal Earth	kg/mtr.	25	29	32	36	40	47	56	65	74
3 Phase + 100% Neutral + 100% Isolated Earth + 50% Internal Earth	kg/mtr.	25	29	32	36	40	47	56	65	74
Electrical Characteristics for 50 Hz										
AC Resistance at 20°C (R_{20})	miliohms /mtr.	0.0740	0.0592	0.0499	0.0427	0.0378	0.0311	0.0249	0.0207	0.0179
A.C. Resistance at thermal conditions (R_t)	miliohms /mtr.	0.0959	0.0767	0.0645	0.0553	0.0489	0.0403	0.0322	0.0268	0.0232
Reactance (X)	miliohms /mtr.	0.0417	0.0333	0.0278	0.0238	0.0208	0.0170	0.0136	0.0127	0.0109
Impedance at thermal conditions (Z)	miliohms /mtr.	0.1045	0.0836	0.0703	0.0602	0.0531	0.0437	0.0350	0.0297	0.0256
Composite Voltage drop at full Load concentrated at the end of bustrunking run (ΔV)	mV/mtr./A at 0.7 P.F.	0.1678	0.1342	0.1126	0.0965	0.0850	0.0698	0.0559	0.0482	0.0416
	mV/mtr./A at 0.8 P.F.	0.1761	0.1409	0.1183	0.1014	0.0894	0.0735	0.0588	0.0504	0.0435
	mV/mtr./A at 0.9 P.F.	0.1809	0.1447	0.1216	0.1042	0.0920	0.0756	0.0605	0.0514	0.0444
	mV/mtr./A at 1.0 P.F.	0.1660	0.1328	0.1118	0.0958	0.0847	0.0697	0.0558	0.0465	0.0402
Electrical Characteristics for 60 Hz										
AC Resistance at 20°C (R_{20})	miliohms /mtr.	0.0742	0.0594	0.0500	0.0429	0.0379	0.0313	0.0251	0.0209	0.0181
A.C. Resistance at thermal conditions (R_t)	miliohms /mtr.	0.0961	0.0769	0.0648	0.0556	0.0491	0.0405	0.0325	0.0271	0.0235
Reactance (X)	miliohms /mtr.	0.0500	0.0400	0.0333	0.0286	0.0250	0.0204	0.0163	0.0152	0.0130
Impedance at thermal conditions (Z)	miliohms /mtr.	0.1083	0.0867	0.0729	0.0625	0.0551	0.0454	0.0363	0.0311	0.0268
Composite Voltage drop at full Load concentrated at the end of bustrunking run (ΔV)	mV/mtr./A at 0.7 P.F.	0.1784	0.1427	0.1198	0.1027	0.0905	0.0743	0.0595	0.0516	0.0446
	mV/mtr./A at 0.8 P.F.	0.1851	0.1482	0.1244	0.1067	0.0941	0.0773	0.0619	0.0533	0.0461
	mV/mtr./A at 0.9 P.F.	0.1876	0.1501	0.1262	0.1082	0.0955	0.0785	0.0629	0.0537	0.0464
	mV/mtr./A at 1.0 P.F.	0.1664	0.1332	0.1122	0.0962	0.0851	0.0702	0.0562	0.0469	0.0407

Voltage Drop Calculation Formulae

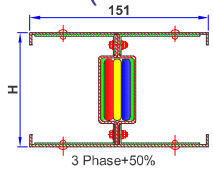
$$\Delta V = k \times \sqrt{3} \times (R_t \cos \Phi + X \sin \Phi) \times I_B \times L$$

Where

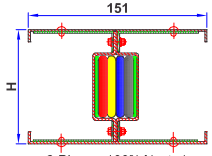
- ΔV is the composite voltage drop of the system (V);
- R_t & X are the mean resistance and reactance values of the system (Ω/m);
- I_B is the actual load current of the circuit being considered (A);
- L is the length of the system being considered (M);
- Cos Ø is the load power factor being considered;
- k is the load distribution factor.
  - k=1, if full load is concentred at the end of the busbar trunking run;
  - k=(n+1)/2n, if the load is uniformly spread between n branches.

Rated Current (In)	Amps	2250	2500	3200	3600	4000	4500	5000	6000	6600
Product Code	---	SBC 200N1	SBC 230N1	SBC 125N2	SBC 150N2	SBC 175N2	SBC 200N2	SBC 230N2	SBC 175N3	SBC 200N3
Busbar size per phase (No. of busbars)	mm	6x200(1)	6x230(1)	6x125(2)	6x150(2)	6x175(2)	6x200(2)	6x230(2)	6x175(3)	6x200(3)
Overall Height (H)	mm	245	275	340	390	440	490	550	660	735
Rated Three Phase RMS Short Time Current for 1 Second (Icw)	kA	100	120	150	150	150	150	150	175	175
Rated Three phase Peak short time current (Ipk)	kA	220	264	330	330	330	330	330	385	385
Rated Single Phase RMS Short Time Current for 1 Second (Icw)	kA	60	72	90	90	90	90	90	105	105
Rated Single phase Peak short time current (Ipk)	kA	132	158.4	198	198	198	198	198	231	231
Approximate Weight of Bustrunking										
3 Phase + 50% Internal Earth	kg/mtr.	58	65	75	87	100	112	127	145	164
3 Phase + 100% Neutral + 50% Internal Earth	kg/mtr.	70	79	90	105	121	136	155	177	200
3 Phase + 200% Neutral + 50% Internal Earth	kg/mtr.	83	94	106	124	142	161	183	209	236
3 Phase + 100% Neutral + 100% Isolated Earth + 50% Internal Earth	kg/mtr.	83	94	106	124	142	161	183	209	236
Electrical Characteristics for 50 Hz										
AC Resistance at 20°C (R_{20})	milliohms /mtr.	0.0157	0.0136	0.0124	0.0104	0.0090	0.0078	0.0068	0.0060	0.0052
A.C. Resistance at thermal conditions (R_t)	milliohms /mtr.	0.0203	0.0177	0.0161	0.0134	0.0116	0.0102	0.0088	0.0077	0.0068
Reactance (X)	milliohms /mtr.	0.0095	0.0083	0.0070	0.0064	0.0055	0.0049	0.0042	0.0038	0.0033
Impedance at thermal conditions (Z)	milliohms /mtr.	0.0224	0.0195	0.0176	0.0149	0.0128	0.0113	0.0098	0.0086	0.0076
Composite Voltage drop at full Load concentrated at the end of bustrunking run (ΔV)	mV/mtr./A at 0.7 P.F.	0.0364	0.0316	0.0282	0.0242	0.0209	0.0183	0.0160	0.0141	0.0123
	mV/mtr./A at 0.8 P.F.	0.0380	0.0331	0.0296	0.0252	0.0218	0.0191	0.0166	0.0147	0.0129
	mV/mtr./A at 0.9 P.F.	0.0389	0.0338	0.0304	0.0257	0.0222	0.0195	0.0170	0.0149	0.0131
	mV/mtr./A at 1.0 P.F.	0.0352	0.0306	0.0279	0.0232	0.0201	0.0176	0.0153	0.0134	0.0117
Electrical Characteristics for 60 Hz										
AC Resistance at 20°C (R_{20})	milliohms /mtr.	0.0159	0.0138	0.0126	0.0106	0.0092	0.0080	0.0070	0.0062	0.0054
A.C. Resistance at thermal conditions (R_t)	milliohms /mtr.	0.0206	0.0179	0.0163	0.0137	0.0119	0.0104	0.0091	0.0080	0.0070
Reactance (X)	milliohms /mtr.	0.0114	0.0099	0.0084	0.0077	0.0066	0.0059	0.0051	0.0046	0.0040
Impedance at thermal conditions (Z)	milliohms /mtr.	0.0235	0.0205	0.0184	0.0157	0.0136	0.0119	0.0104	0.0092	0.0081
Composite Voltage drop at full Load concentrated at the end of bustrunking run (ΔV)	mV/mtr./A at 0.7 P.F.	0.0390	0.0340	0.0302	0.0260	0.0225	0.0199	0.0173	0.0153	0.0135
	mV/mtr./A at 0.8 P.F.	0.0403	0.0351	0.0314	0.0269	0.0233	0.0205	0.0179	0.0158	0.0139
	mV/mtr./A at 0.9 P.F.	0.0407	0.0354	0.0318	0.0271	0.0234	0.0206	0.0180	0.0159	0.0140
	mV/mtr./A at 1.0 P.F.	0.0356	0.0310	0.0283	0.0237	0.0205	0.0180	0.0157	0.0138	0.0122

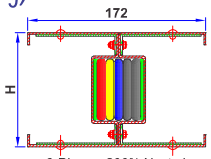
SBA (Aluminium Sandwich Insulated Bus Trunking)



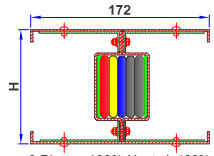
3 Phase+50%
Internal Earth



3 Phase+100% Neutral
+50% Internal Earth



3 Phase+200% Neutral
+50% Internal Earth



3 Phase+100% Neutral+100%
Isolated Earth+50% Internal Earth

Rated Current (In)	Amps	400	500	630	700	800	1000	1250	1350	1600
Product Code	---	SBA 40N1	SBA 50N1	SBA 60N1	SBA 70N1	SBA 80N1	SBA 100N1	SBA 125N1	SBA 150N1	SBA 175N1
Busbar size per phase (No. of busbars)	mm	6x40(1)	6x50(1)	6x60(1)	6x70(1)	6x80(1)	6x100(1)	6x125(1)	6x150(1)	6x175(1)
Overall Height (H)	mm	85	95	105	115	125	145	170	195	220
Rated Three Phase RMS Short Time Current for 1 Second (Icw)	kA	25	30	40	40	50	65	80	85	100
Rated Three phase Peak short time current (Ipk)	kA	52.5	63	84	84	105	143	168	187	220
Rated Single Phase RMS Short Time Current for 1 Second (Icw)	kA	15	18	24	24	30	39	48	51	60
Rated Single phase Peak short time current (Ipk)	kA	30	36	50.4	50.4	63	81.9	100.8	112.2	132
Approximate Weight of Bustrunking										
3 Phase + 50% Internal Earth	kg/mtr.	15	16	17	18	19	22	25	28	30
3 Phase + 100% Neutral + 50% Internal Earth	kg/mtr.	16	17	18	19	21	24	27	30	34
3 Phase + 200% Neutral + 50% Internal Earth	kg/mtr.	17	18	20	22	23	26	30	34	38
3 Phase + 100% Neutral + 100% Isolated Earth + 50% Internal Earth	kg/mtr.	17	18	20	22	23	26	30	34	38
Electrical Characteristics for 50 Hz										
AC Resistance at 20°C (R_{20})	miliohms /mtr.	0.1198	0.0958	0.0806	0.0691	0.0611	0.0503	0.0402	0.0335	0.0290
A.C. Resistance at thermal conditions (R_t)	miliohms /mtr.	0.1553	0.1243	0.1046	0.0896	0.0792	0.0652	0.0522	0.0435	0.0376
Reactance (X)	miliohms /mtr.	0.0417	0.0333	0.0278	0.0238	0.0208	0.0170	0.0136	0.0127	0.0109
Impedance at thermal conditions (Z)	miliohms /mtr.	0.1608	0.1286	0.1082	0.0927	0.0819	0.0674	0.0539	0.0453	0.0392
Composite Voltage drop at full Load concentrated at the end of bustrunking run (ΔV)	mV/mtr./A at 0.7 P.F.	0.2398	0.1919	0.1612	0.1381	0.1218	0.1001	0.0801	0.0684	0.0591
	mV/mtr./A at 0.8 P.F.	0.2585	0.2068	0.1738	0.1490	0.1314	0.1081	0.0864	0.0734	0.0634
	mV/mtr./A at 0.9 P.F.	0.2736	0.2189	0.1840	0.1577	0.1392	0.1145	0.0916	0.0774	0.0669
	mV/mtr./A at 1.0 P.F.	0.2690	0.2152	0.1811	0.1553	0.1372	0.1130	0.0904	0.0753	0.0652
Electrical Characteristics for 60 Hz										
AC Resistance at 20°C (R_{20})	miliohms /mtr.	0.1200	0.0961	0.0809	0.0694	0.0614	0.0506	0.0405	0.0338	0.0293
A.C. Resistance at thermal conditions (R_t)	miliohms /mtr.	0.1557	0.1246	0.1050	0.0900	0.0796	0.0656	0.0526	0.0439	0.0380
Reactance (X)	miliohms /mtr.	0.0500	0.0400	0.0333	0.0286	0.0250	0.0204	0.0163	0.0152	0.0130
Impedance at thermal conditions (Z)	miliohms /mtr.	0.1635	0.1309	0.1101	0.0944	0.0834	0.0687	0.0551	0.0464	0.0402
Composite Voltage drop at full Load concentrated at the end of bustrunking run (ΔV)	mV/mtr./A at 0.7 P.F.	0.2506	0.2006	0.1685	0.1445	0.1274	0.1048	0.0839	0.0720	0.0622
	mV/mtr./A at 0.8 P.F.	0.2677	0.2143	0.1801	0.1544	0.1363	0.1121	0.0898	0.0766	0.0662
	mV/mtr./A at 0.9 P.F.	0.2805	0.2245	0.1888	0.1619	0.1430	0.1177	0.0943	0.0799	0.0691
	mV/mtr./A at 1.0 P.F.	0.2697	0.2159	0.1818	0.1559	0.1379	0.1137	0.0911	0.0760	0.0659

Voltage Drop Calculation Formulae

$$\Delta V = k \times \sqrt{3} \times (R_t \cos \Phi + X \sin \Phi) \times I_B \times L$$

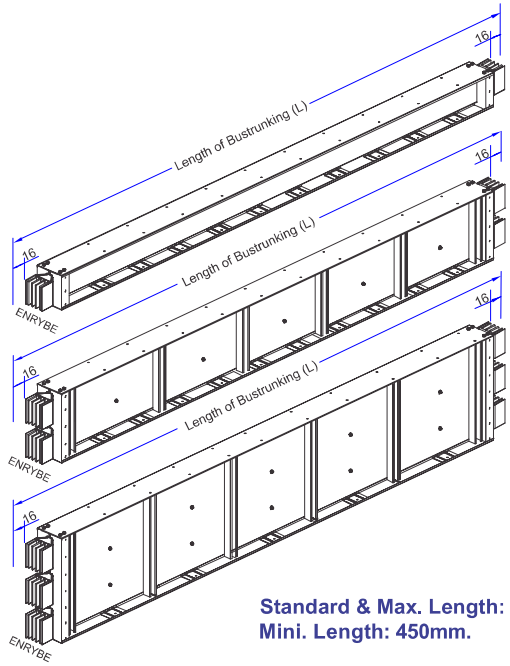
Where

- ΔV is the composite voltage drop of the system (V);
- R_t & X are the mean resistance and reactance values of the system (Ω/m);
- I_B is the actual load current of the circuit being considered (A);
- L is the length of the system being considered (M);
- Cos Ø is the load power factor being considered;
- k is the load distribution factor.
  - k=1, if full load is concentred at the end of the busbar trunking run;
  - k=(n+1)/2n, if the load is uniformly spread between n branches.

Rated Current (In)	Amps	1800	2000	2250	2500	3200	3600	4000	4500	5000
Product Code	---	SBA 200N1	SBA 100N2	SBA 125N2	SBA 150N2	SBA 175N2	SBA 200N2	SBA 150N3	SBA 175N3	SBA 200N3
Busbar size per phase (No. of busbars)	mm	6x200(1)	6x100(2)	6x125(2)	6x150(2)	6x175(2)	6x200(2)	6x150(3)	6x175(3)	6x200(3)
Overall Height (H)	mm	245	290	340	390	440	490	585	660	735
Rated Three Phase RMS Short Time Current for 1 Second (Icw)	kA	100	100	120	120	120	120	175	175	175
Rated Three phase Peak short time current (Ipk)	kA	220	220	264	264	264	264	385	385	385
Rated Single Phase RMS Short Time Current for 1 Second (Icw)	kA	60	60	72	72	72	72	105	105	105
Rated Single phase Peak short time current (Ipk)	kA	132	132	158.4	158.4	158.4	158.4	231	231	231
Approximate Weight of Bustrunking										
3 Phase + 50% Internal Earth	kg/mtr.	33	38	44	50	57	63	71	81	90
3 Phase + 100% Neutral + 50% Internal Earth	kg/mtr.	37	42	49	56	63	71	80	91	101
3 Phase + 200% Neutral + 50% Internal Earth	kg/mtr.	42	46	55	63	71	79	89	101	114
3 Phase + 100% Neutral + 100% Isolated Earth + 50% Internal Earth	kg/mtr.	42	46	55	63	71	79	89	101	114
Electrical Characteristics for 50 Hz										
AC Resistance at 20°C (R_{20})	milliohms /mtr.	0.0254	0.0251	0.0201	0.0168	0.0145	0.0127	0.0112	0.0097	0.0085
A.C. Resistance at thermal conditions (R_t)	milliohms /mtr.	0.0329	0.0326	0.0261	0.0217	0.0188	0.0165	0.0145	0.0125	0.0110
Reactance (X)	milliohms /mtr.	0.0095	0.0088	0.0070	0.0064	0.0055	0.0049	0.0044	0.0038	0.0033
Impedance at thermal conditions (Z)	milliohms /mtr.	0.0343	0.0338	0.0270	0.0227	0.0196	0.0172	0.0152	0.0131	0.0115
Composite Voltage drop at full Load concentrated at the end of bustrunking run (ΔV)	mV/mtr./A at 0.7 P.F.	0.0517	0.0504	0.0403	0.0343	0.0296	0.0260	0.0231	0.0199	0.0174
	mV/mtr./A at 0.8 P.F.	0.0555	0.0543	0.0434	0.0368	0.0318	0.0279	0.0247	0.0213	0.0187
	mV/mtr./A at 0.9 P.F.	0.0585	0.0575	0.0460	0.0387	0.0335	0.0293	0.0260	0.0224	0.0196
	mV/mtr./A at 1.0 P.F.	0.0570	0.0565	0.0452	0.0377	0.0326	0.0285	0.0251	0.0217	0.0190
Electrical Characteristics for 60 Hz										
AC Resistance at 20°C (R_{20})	milliohms /mtr.	0.0257	0.0254	0.0204	0.0171	0.0148	0.0130	0.0115	0.0100	0.0088
A.C. Resistance at thermal conditions (R_t)	milliohms /mtr.	0.0333	0.0330	0.0265	0.0221	0.0192	0.0169	0.0149	0.0129	0.0114
Reactance (X)	milliohms /mtr.	0.0114	0.0105	0.0084	0.0077	0.0066	0.0059	0.0053	0.0046	0.0040
Impedance at thermal conditions (Z)	milliohms /mtr.	0.0352	0.0346	0.0278	0.0234	0.0203	0.0178	0.0158	0.0137	0.0121
Composite Voltage drop at full Load concentrated at the end of bustrunking run (ΔV)	mV/mtr./A at 0.7 P.F.	0.0545	0.0530	0.0425	0.0363	0.0314	0.0277	0.0246	0.0213	0.0187
	mV/mtr./A at 0.8 P.F.	0.0580	0.0566	0.0454	0.0386	0.0334	0.0294	0.0262	0.0227	0.0199
	mV/mtr./A at 0.9 P.F.	0.0606	0.0594	0.0476	0.0403	0.0349	0.0307	0.0272	0.0236	0.0207
	mV/mtr./A at 1.0 P.F.	0.0577	0.0572	0.0459	0.0383	0.0333	0.0292	0.0258	0.0224	0.0197

Straigth Length (Feeder)

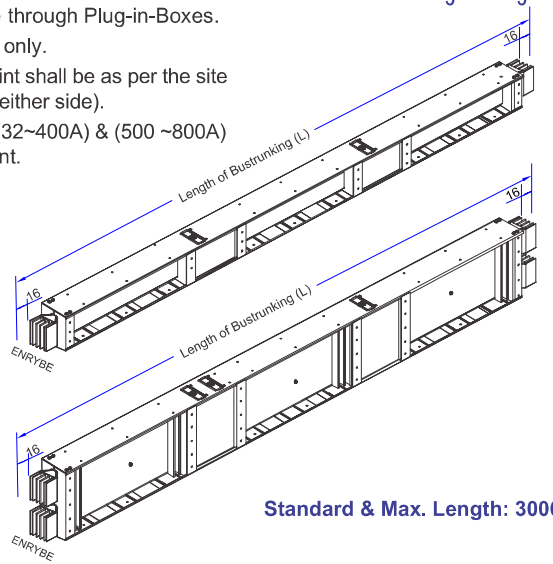
- Transformer to Panel.
- Panel to Panel.
- Generator to Panel.
- Panel to Rising mains.



Standard & Max. Length: 3000mm.
Mini. Length: 450mm.

Straigth Length (PIP)

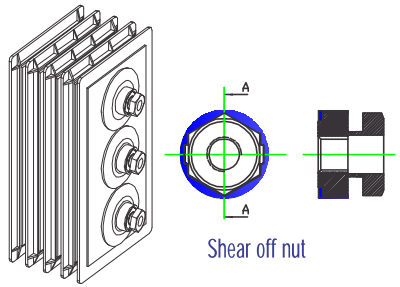
- For tapping Power from Main Line through Plug-in-Boxes.
- Plug-in point shown are indicative only.
- Rating and number of plug-in -point shall be as per the site requirement (up to 5 Nos max on either side).
- Two type of Plug-in Points(PIP): (32~400A) & (500 ~800A) can be provided as per requirement.



Standard & Max. Length: 3000mm.

Uniblock Joint

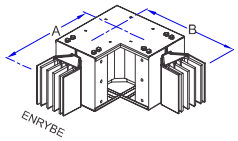
- Joint can be fitted / removed in installed condition without removal of section.
- Heavy duty disc spring used on both sides for unifrom distribution of pressure.
- Joint can be tightened easily with help of spanner on nut side only.(spanner not required on bolt head side)
- Shear off nut ensure tightness of joint at desired torque and eliminates the need of torque wrench during installation.
- Tamper proof cap over shear off nut prevents opening of nut after achieving desired torque. Nut can only be opened after breaking the cap.

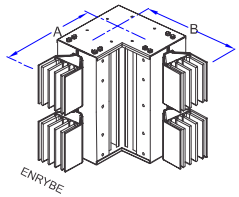


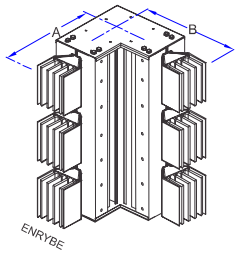
Shear off nut

Edge Elbow

Current Rating	Standard Dimn. A x B (mm)
Copper 630~6600A Aluminum 400~5000A	300 x 300

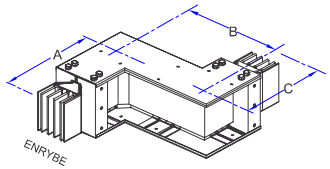


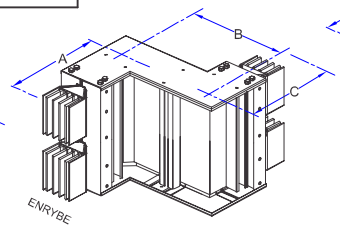


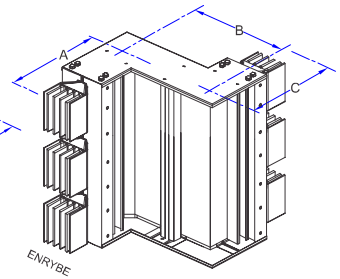


Offset Edge Elbow

Current Rating	Standard Dimn.AxBxC (mm)
Copper 630~6600A Aluminum 400~5000A	300 x 300 x 300

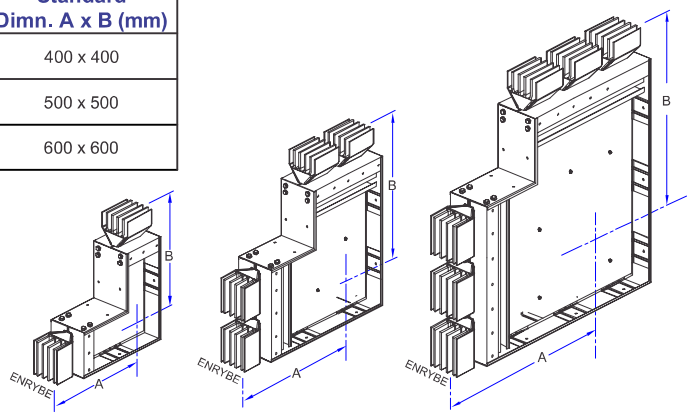






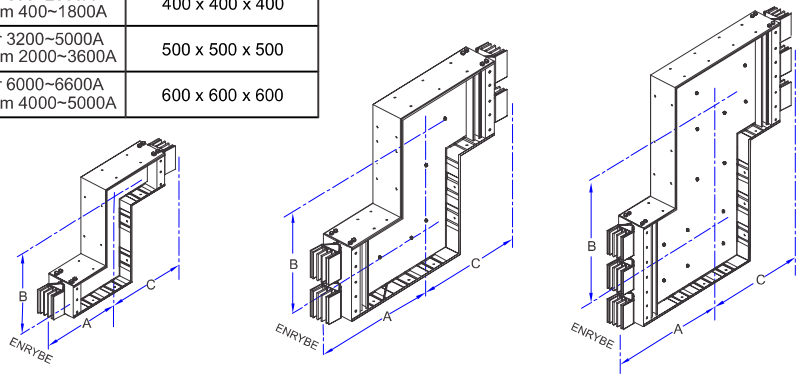
Flat Elbow

Current Rating	Standard Dimn. A x B (mm)
Copper 630~2500A Aluminum 400~1800A	400 x 400
Copper 3200~5000A Aluminum 2000~3600A	500 x 500
Copper 6000~6600A Aluminum 4000~5000A	600 x 600



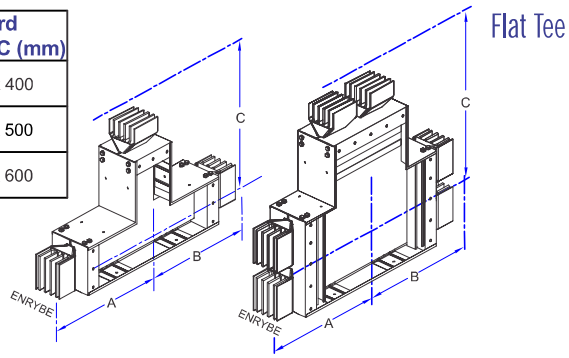
Offest Flat Elbow

Current Rating	Standard Dimn. AxBxC (mm)
Copper 630~2500A Aluminum 400~1800A	400 x 400 x 400
Copper 3200~5000A Aluminum 2000~3600A	500 x 500 x 500
Copper 6000~6600A Aluminum 4000~5000A	600 x 600 x 600

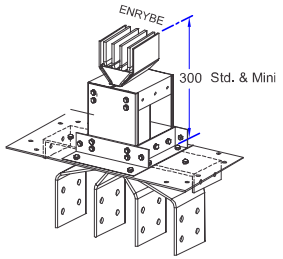


Flat Tee

Current Rating	Standard Dimn. AxBxC (mm)
Copper 630~2500A Aluminum 400~1800A	400 x 400 x 400
Copper 3200~5000A Aluminum 2000~3600A	500 x 500 x 500
Copper 6000~6600A Aluminum 4000~5000A	600 x 600 x 600



Flanged End



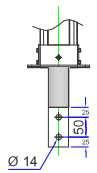


Fig. 1
BUSBAR WIDTH
40 ~ 80mm

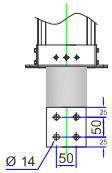


Fig. 2
BUSBAR WIDTH
100 ~ 125mm

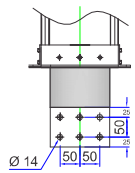


Fig. 3
BUSBAR WIDTH
150 ~ 175mm

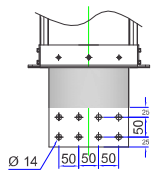


Fig. 4
BUSBAR WIDTH
200 ~ 230mm

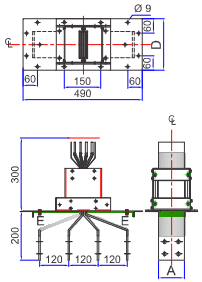


Fig. 5

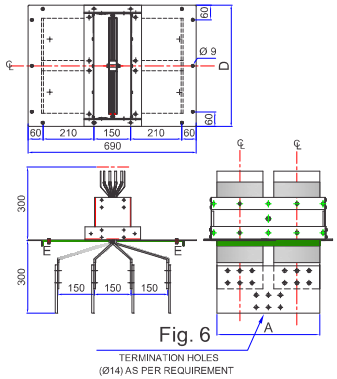


Fig. 6

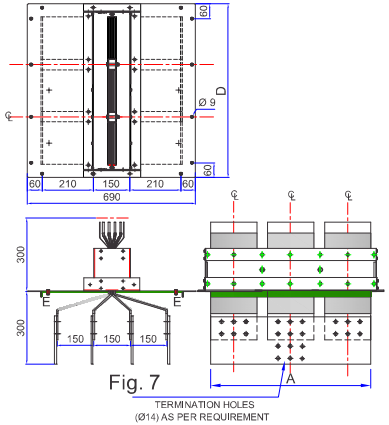


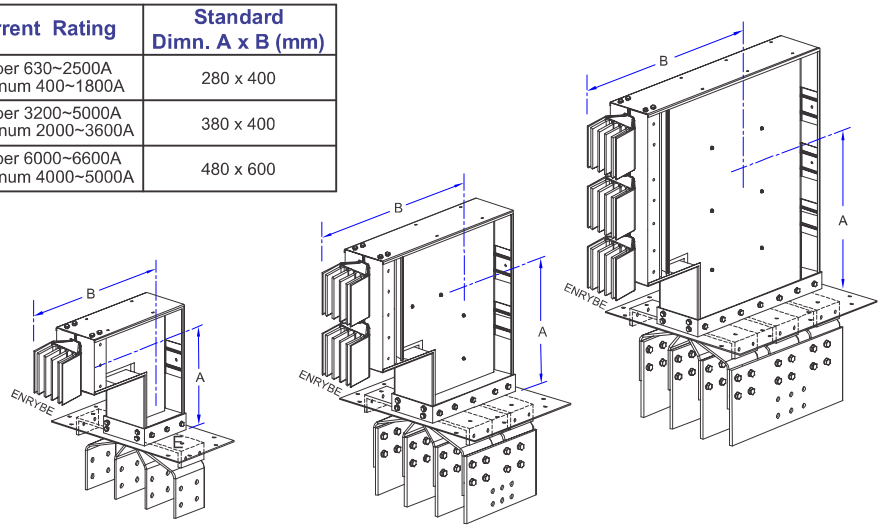
Fig. 7

Flanged End cut out & Drilling

S.No.	Copper		Aluminum		Busbar Size (No.of Busbar)	DIMENSIONS		Bus bar Hole Details	Terminal Detail
	Rating	Product Code	Rating	Product Code		D	A		
01.	630	SBC 40 N1	400	SBA 40 N1	40 x 6 (1)	146	40	fig 1	fig 5
02.	800	SBC 50 N1	500	SBA 50 N1	50 x 6 (1)	156	50	fig 1	fig 5
03.	900	SBC 60 N1	630	SBA 60 N1	60 x 6 (1)	166	60	fig 1	fig 5
04.	1000	SBC 70 N1	700	SBA 70 N1	70 x 6 (1)	176	70	fig 1	fig 5
05.	1100	SBC 80 N1	800	SBA 80 N1	80 x 6 (1)	186	80	fig 1	fig 5
06.	1250	SBC 100 N1	1000	SBA 100 N1	100 x 6 (1)	206	100	fig 2	fig 5
07.	1600	SBC 125 N1	1250	SBA 125 N1	125 x 6 (1)	231	125	fig 2	fig 5
08.	1800	SBC 150 N1	1350	SBA 150 N1	150 x 6 (1)	256	150	fig 3	fig 5
09.	2000	SBC 175 N1	1600	SBA 175 N1	175 x 6 (1)	281	175	fig 3	fig 5
10.	2250	SBC 200 N1	1800	SBA 200 N1	200 x 6 (1)	306	200	fig 4	fig 5
11.	2500	SBC 230 N1	---	---	230 x 6 (1)	336	230	fig 4	fig 5
12.	---	---	2000	SBA 100 N2	100 x 6 (2)	246	246	fig 2	fig 6
13.	3200	SBC 125 N2	2250	SBA 125 N2	125 x 6 (2)	296	296	fig 2	fig 6
14.	3600	SBC 150 N2	2500	SBA 150 N2	150 x 6 (2)	346	346	fig 3	fig 6
15.	4000	SBC 175 N2	3200	SBA 175 N2	175 x 6 (2)	396	396	fig 3	fig 6
16.	4500	SBC 200 N2	3600	SBA 200 N2	200 x 6 (2)	446	446	fig 4	fig 6
17.	5000	SBC 230 N2	---	---	230 x 6 (2)	506	506	fig 4	fig 6
18.	---	---	4000	SBA 150 N3	150 x 6 (3)	542	542	fig 3	fig 7
19.	6000	SBC 175 N3	4500	SBA 175 N3	175 x 6 (3)	617	617	fig 3	fig 7
20.	6600	SBC 200 N3	5000	SBA 200 N3	200 x 6 (3)	692	692	fig 4	fig 7

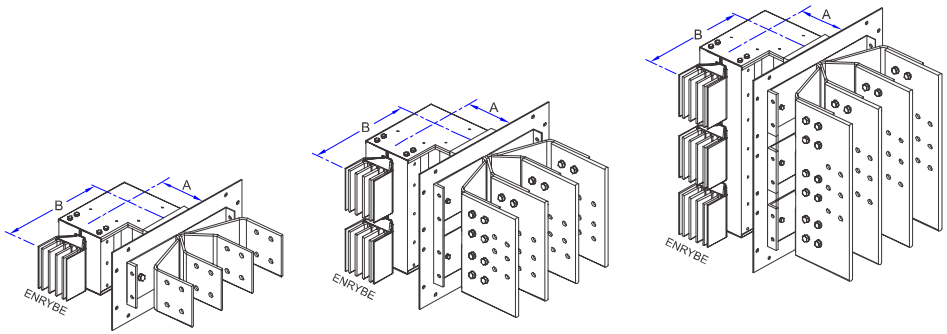
Flanged End with Flat Elbow

Current Rating	Standard Dimn. A x B (mm)
Copper 630~2500A Aluminum 400~1800A	280 x 400
Copper 3200~5000A Aluminum 2000~3600A	380 x 400
Copper 6000~6600A Aluminum 4000~5000A	480 x 600



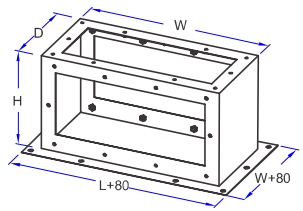
Flanged End with Edge Elbow

Current Rating	Standard Dimn. A x B (mm)
Copper 630~6600A Aluminum 400~5000A	180 x 300



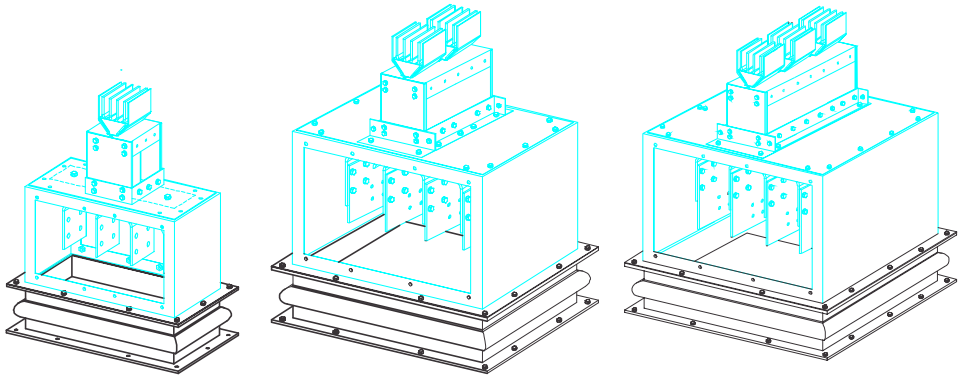
Flanged End Box

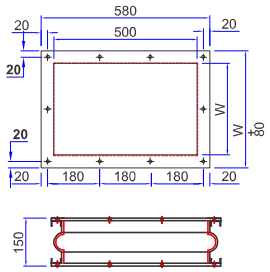
S.NO	Current Rating	STANDARD DIMENSIONS		
		W	D	H
01.	Copper 630~1600A Aluminum 400~1250A	500	250	250
02.	Copper 1800~2500A Aluminum 1350~1800A	500	350	250
03.	Copper 3200~5000A Aluminum 2000~3600A	700	620	350
04.	Copper 6000~6600A Aluminum 4000~5000A	700	800	350

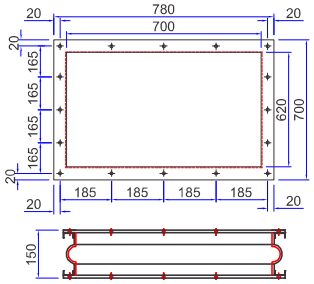


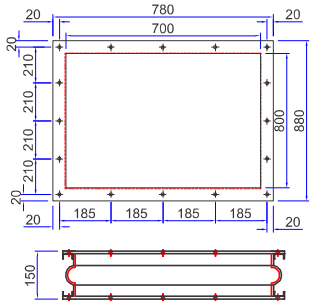
Flange Bellow

- Flange Bellow need to be fixed between Flanged End Box and Genset termination box to avoid impact of vibrations of Genset being transferred to bustrunking.









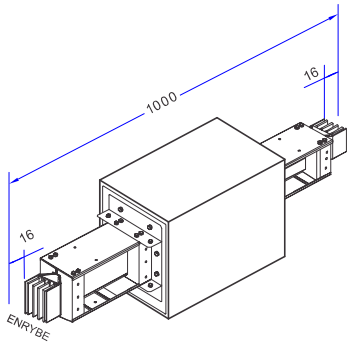
S. No	Current Rating	Standard Dimensions	Code
01.	Copper 630~1600A Aluminum 400~1250A	250	SFBE-1
02.	Copper 1800~2500A Aluminum 1350~1800A	350	SFBE-2

S. No	Current Rating	Code
01.	Copper 3200~5000A Aluminum 2000~3600A	SFBE-3

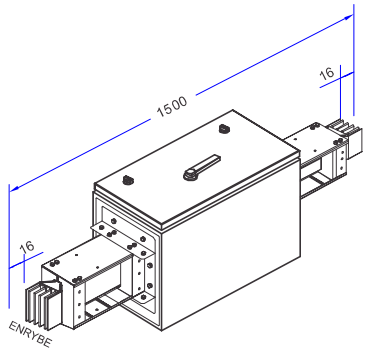
S. No	Current Rating	Code
01.	Copper 6000~6600A Aluminum 4000~5000A	SFBE-4

Reducer

- These are required to connect two dissimilar rating of bustrunking. Reducer may be designed with switching or isolating device.



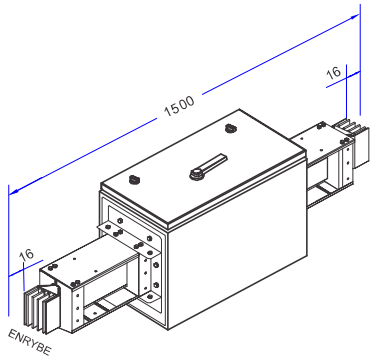
Reducer (Direct)



Reducer (Switchgear)

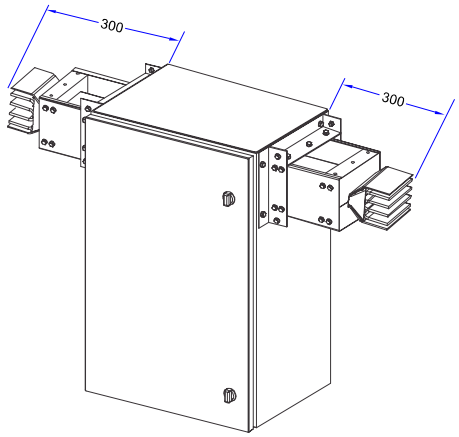
Sectional Isolator

- These are required to isolate the bustrunking run in between, for various reasons. Section Isolator Unit can be fitted with load Break Switches / SFU's / MCCB's.

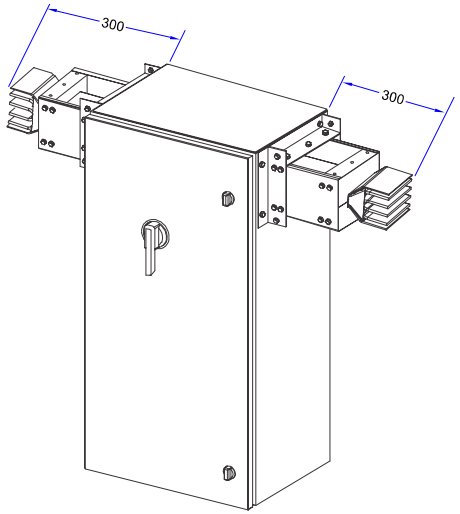


Center Feed Unit

- To charge bustrunking through cables from middle of bustrunking.
- Center feed Unit is available with sufficient space for direct connection through lugs and bolts. MCCB,SFU, Isolators, fuse holders etc. can be fitted in Center Feed Unit as per requirement.
- Undrilled cable gland plate is provided at bottom for multiple cable entry.



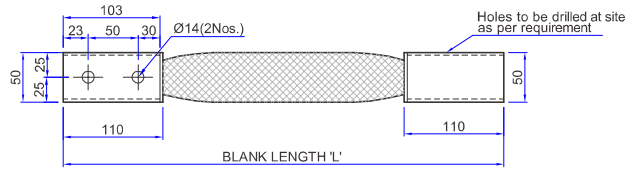
Center Feed Unit (Direct)



Center Feed Unit (Switchgear)

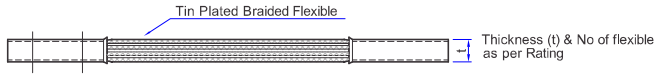
Copper Flexible

- Copper Flexible need to be used to connect flanged end busbar with busbars (Terminals) of Panel / Transformer / Generators.



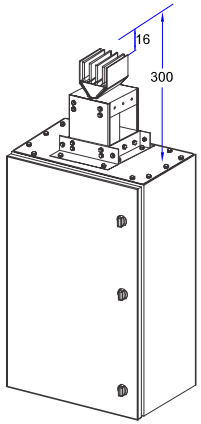
Bustrunking side

Switchgear side (Panel/D.G/TFR.)

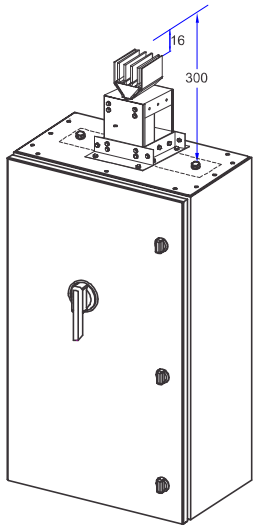


End Feed

- To charge bustrunking through cables from one end of bustrunking.
- End feed is available with sufficient space for direct connection through lugs and bolts. MCCB,SFU, Isolators, fuse holders etc. can be fitted in End Feed as per requirement.
- 300 mm length of bustrunking is integrally fitted (measured with bustrunking) along with End Feed as standard practice so that joint between End Feed and bustrunking is exactly same as joint of two normal bustrunking lengths.
- Undrilled cable gland plate is provided at bottom for multiple cable entry.



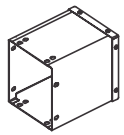
End Feed (Direct)



End Feed (Switchgear)

End Cover

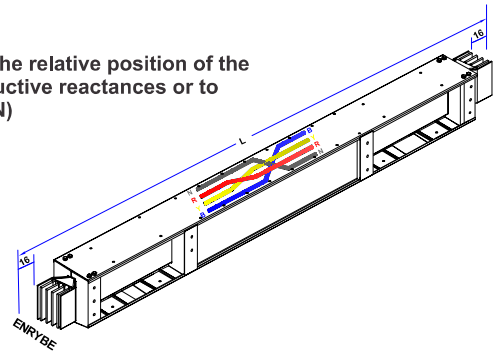
- It is used to terminate and to protect the end of plug-in bustrunking (Rising mains run.)
- It can be remove easily for extension of bustrunking .



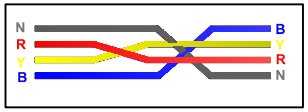
Phase Transposition Unit

Phase transposition unit are used to change the relative position of the phase conductors in order to balance the inductive reactances or to transpose the phases (such as NRYB to BYRN)

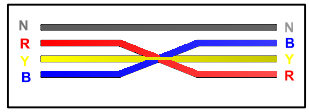
Standard Dimension (L) :- 1500mm



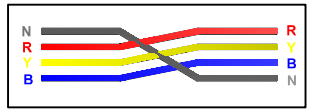
PHASE TRANSPOSITION UNIT (TYPE-3)



PHASE TRANSPOSITION UNIT (TYPE-2)



PHASE TRANSPOSITION UNIT (TYPE-1)

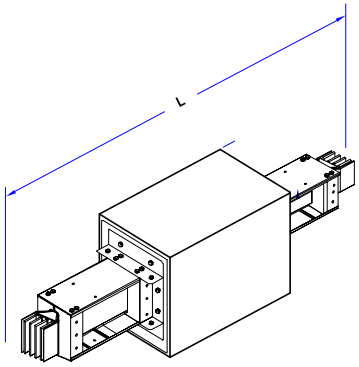


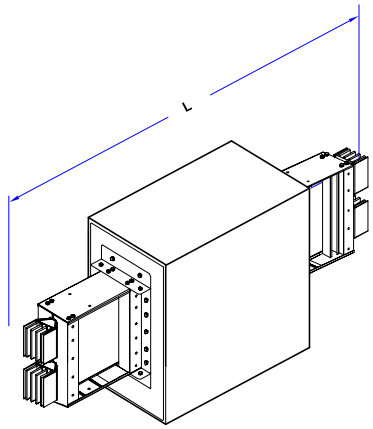
Expansion joint unit

It is required to permit certain movement in the axial direction of the bus trunking due thermal expansion, this unit also indented to allow for building movements due to thermal expansion and contraction of the building.

It is recommended to use after every 50 mtr of straight run. Expansion joint unit shall allow +/- 40 mm expansion.

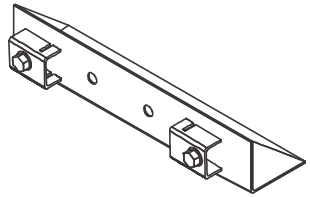
Standard Dimension (L) :- 1500mm





Vertical Support

- Vertical support is used to control Horizontal movement of sandwich rising main .



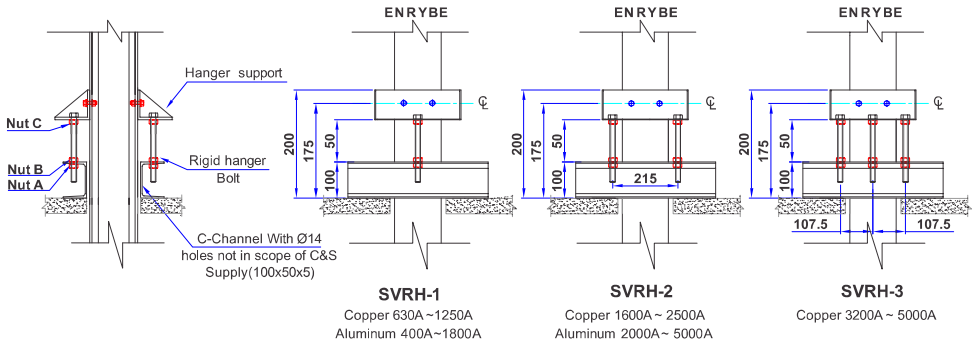
SVST-1

Vertical Rigid Hanger

One set of Rigid hanger per rising main must be installed at the start of the rising mains (i.e. At the lowest floor) to prevent expansion of bustrunking in downward direction.These can be fitted on 100x50X5 (or equivalent) channels mounted on floor / wall as shown below (not in scope of C&S supply)

Recommendation for using hangers per floor:-

- Up to 3.5 M: 01 rigid hanger.
- 3.5M >4.5 M: 01 rigid hanger + 01 Vertical support. (for ensuring vertical alignment of rising mains.)
- 4.5 m > 6.0 M: 02 rigid hanger



Installation Sequence

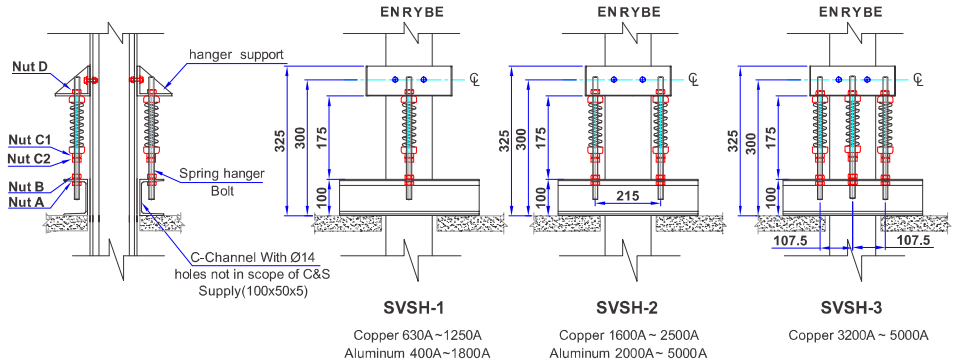
- Remove Nut A from Rigid Hanger on both sides.
- Mount " Hanger Support" through 2Nos. Ø 13 predrilled holes provided on desired rising main section.
- Insert "Rigid hanger bolts" into C-channel (already fixed at the floor level with desired holes)
- Adjust Nut B on to the C-channel (on both sides parallely) ensuring center line (℄)of rigid hanger support positioned as 175 mm from floor level (or as indicated in drawing)
- Tighten & lock nut A.
- Ensure nut “C” remains fully tightened during entire process.

Vertical Spring Hanger

One set of Spring hanger per rising main per floor (excluding lowest floor) need to be installed to sustain the bustrunking load and to allow vertical expansion of bustrunking in upward direction only.These can be fitted on 100x50X5 (or equivalent) channels mounted on floors / walls as shown below (not in scope of C&S supply)

Recommendation for using hangers per floor:-

- Up to 3.5 M: 01 Vertical spring hanger .
- 3.5M >4.5 M: 01 Vertical spring hanger + 01 Vertical support. ((for ensuring vertical alignment of rising mains.)
- 4.5 M > 6.0 M: 02 Vertical spring hanger.



Installation Sequence

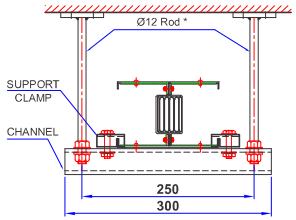
- Remove nut A from spring hanger on both sides.
- Mount " Hanger support" through 2 Nos. Ø13 predrilled holes provided on desired Rising main section
- Insert "Spring hanger bolts" into C-channel (already fixed at the floor level with desired holes)
- Adjust nut B on to the C-Channel ensuring center line (℄) of Hanger Support positioned at 300 mm from floor level (or as indicated in drawing)
- If two section are required at any floor, then (join) upper section with lower section (fitted with spring hanger) so that entire weight of rising main for that floor falls on spring hanger.
- open & bring down nut C1 & C2 slowly (on both sides parallely) until a gap of 1~2mm is created between nut D and spring hanger support
- Lock nut C1 & C2 at this position
- Loosen Nut D for allowing thermal expansion of rising main.

C&S In India

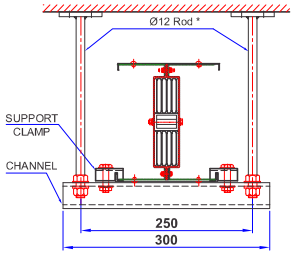
Martet Leader In Busways. More Than 1000 Installation

Edgewise Horizontal Support

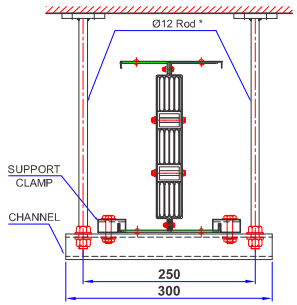
- These support need to be provided on horizontal feeder run at an interval of 1.5 M (or as per site requirement)



Copper 630A ~ 2500A
Aluminum 400 ~ 1800A
(SEHS-1)



Copper 3200A ~ 5000A
Aluminum 2000 ~ 3600A
(SEHS-1)



Copper 6000A ~ 6600A
Aluminum 4000 ~ 5000A
(SEHS-1)

* Not in scope of C&S Supply

Flatwise Horizontal Support

- These support need to be provided on horizontal feeder run at an interval of 1.5 M (or as per site requirement)

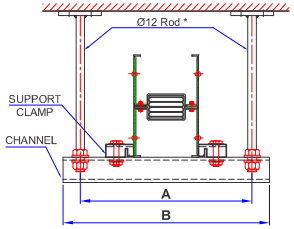


Fig.-1

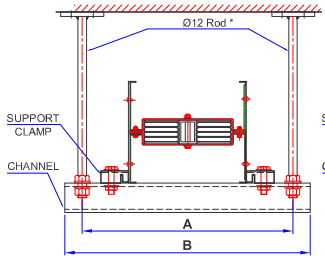


Fig.-2

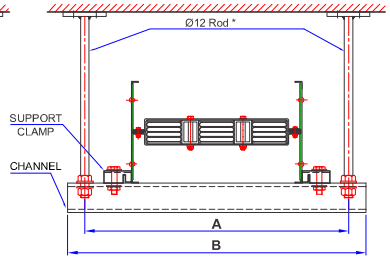


Fig.-3

Current Rating	Standard Dimensions		Code	Detail
	A	B		
Copper 630~1250A Aluminum 400~1000A	250	300	SFHS-1	Fig.-1
Copper 1600~2500A Aluminum 1250~1800A	400	450	SFHS-2	Fig.-1
Copper 3200~5000A Aluminum 2000~3600A	650	700	SFHS-3	Fig.-2
Copper 6000~6600A Aluminum 4000~5000A	850	900	SFHS-4	Fig.-3

* Not in scope of C&S Supply

Plug - in - Box

- Plug in box enclosure is made from G.I with side hinged door.
- Plug in contacts are made out of silver plated copper with spring steel backup pressure clips for ensuring uniform pressure and low contact resistance .
- For cables entry, provision of gland plates are provided on both sides and bottom of Plug in Box.
- Earth contact of Plug-in boxes makes first & breaks last.
- Plug in box are suitable for MCCB/SFU's with rotary handle and door interlocking.
- Plug in boxes are available with Interlocking with bustrunking to ensure "plug-in" and "Plug-Out" possible only in "Off" Condition.
- Silver Plated contacts are properly shrouded / isolated.
- Plug in box up to 400 A are compatible to all ratings of Bustrunking with 400 A Plug-in-points
- Plug in box from 500A to 800 A are compatible to all ratings of Bustrunking with 800 A plug in points.
- Plug in boxes can only be fitted on to the Bustrunking with corrected polarity i.e. ENRYBE.

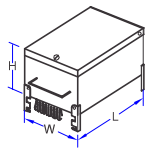


Fig.-1

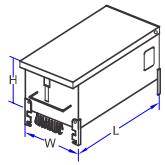


Fig.-2

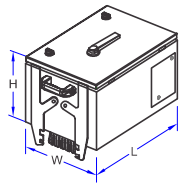


Fig.-3

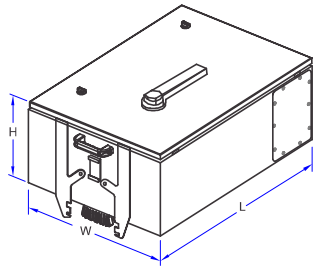


Fig.-4

Product Code	PIB X-S - 4B	PIB X-S - 5B	* PIB X-A - 4B	* PIB X-A - 5B	PIB X-N - 4B	PIB X-N - 5B	PIB X-B - 4B	PIB X-B - 5B	PIB X-C - 4B	PIB X-C - 5B	PIB X-D - 4B	PIB X-D - 5B	PIB X-E - 4B	PIB X-E - 5B
Figuer	Figure 1		Figure 2		Figure 3		Figure 4		Figure 4		Figure 4		Figure 4	
With MCB/FUSES	32~63A	32~63A	32~125A		NA		NA		NA		NA		NA	
With SOCKET-1No.	32A	32A	63A		NA		NA		NA		NA		NA	
WithMCB+SOCKET 1No	NA	NA	32~63A		NA		NA		NA		NA		NA	
With MCCB	NA	NA	32~125A		NA		160~200A		250~400A		500~630A		800A	
With MCCB+R/H	NA	NA	NA		32~125A		160~200A		250~400A		500~630A		800A	
With SFU	NA	NA	NA		32~125A		160~200A		315~400A		500~630A		800A	
FINAL BOX SIZE (L x W x H)	240x180 x100	240x204 x100	380x180 x124	380x204 x124	430x300x170		430X300X250		600X400X250		800x400X250		1000x400X250	
Recommended Cable Size (Aluminum)	25 Sqmm	25 Sqmm	70 Sqmm	70 Sqmm	70 Sqmm	70 Sqmm	150 Sqmm	150 Sqmm	2X150 Sqmm	2X150 Sqmm	2X300 Sqmm	2X300 Sqmm	2X400 Sqmm	2X400 Sqmm

* Available with Isolator.

PIB with subcode 4B is applicable for-

- 3 Phase+50% Internal Earth
- 3 Phase+100% Neutral +50% Internal Earth

PIB with subcode 4B is applicable for-

- 3 Phase+200% Neutral +50% Internal Earth
- 3 Phase+100% Neutral+100% Isolated Earth+50% Internal Earth

Export

S No.	Project	Conductor	Rating
1	Dafna Residential tower,Doha	CU	2500A,1600A, 800A,400A
2	West Bay 44 tower,Doha	CU	2500A,1600A, 800A,400A
3	SHK Falak twin tower,Doha	CU	2500A,1600A, 800A,400A
4	B +G +3 (Jamai Ahmed Ismail Ahmed),Doha	CU	400A
5	SHK thani Bin Abdul Aziz, Doha	CU	400A
6	G + 11 Residential building,Doha	CU	400A, 800A
7	B+G+5, Navigation Building,Doha	CU	400A
8	B3+B2+B1+G+M+15 Residential Bld, Doha	CU	400A
9	AJJAJ building ,Doha	CU	400A
10	Mellineium tower,Doha	CU	400A, 800A
11	B +G +3, Doha - Qatar	CU	400A
12	B+G+7 Islamic Park, Dubai	CU	400A
13	B+G+8 Al Ghanem, Dubai	CU	400A
14	B+G+10, Dubai	CU	630A
15	3B+G+M+7,Doha,Qatar	CU	1000A
16	Al-Mansoura Project	CU	400A
17	Kirbey building system, Kuwait	CU	1600A
18	Al Nazar Tower, Kuwait	CU	1600A, 1000A, 800A
19	Al Mazaya tower, Kuwait	CU	1600A, 2000A
20	Holiaday INN, Kuwait	CU	3000A,2000A,1600A
21	Gravity Tower	CU	800A
22	Najat School, Kuwait	CU	1600A,2500A
23	Centre Research & Studies	CU	1500A, 800A
24	Holiaday INN, Kuwait	CU	2000A
25	Salmiya Hotel, Kuwait	CU	2500A,2000A,1500A
26	Phoneix Hotel, Tanzania	CU	400A
27	Land Mark Plaza, Kenya	CU	400A
28	Blue sheild Insurace Co HQ, Kenya	CU	400A
29	Infinity Info-Electric Co Ltd, Taiwan	CU	4000A,1600A,1250A
30	JSC SOEMI, Russia	AL	630A,400A,250A
31	Qatar, Doha Technical Services	CU	630 A
32	Power Lux ME FZC ,Saif Zone Sharjah UAE	CU	3600 A
33	Orient Star international Doha Qatar	CU	1000 A

S No.	Project	Conductor	Rating
34	AL Nazzar Tower, Jordan	CU	1350A
35	Port Saeed, Dubai	CU	1250A
36	Port Saeed, Dubai	CU	2500A,1600A, 1250A
37	2B+G+12, Doha	CU	2500A
38	P.S Bank, Philipines	CU	2500A,600A
39	E-Services Manila	AL	4000A,3000A
40	Victoria Tower, Philipines	AL	3200A,1200A,600A
41	San Lazaro BPO, Philipines	CU	3600A
42	Glorietta 5, Philipines	CU	1200A,1600A
43	ICON Residences, Philipines	AL	1200A,1600A
44	HKM Hotel, Philipines	AL	2000A
45	SEIBU Tower, Philipines	AL	2000A
46	2B+G+14, Dubai	CU	1600A,2000A,2500A
47	Liugong, Dhar, Taiwan	AL	250A
48	Specialised Power system, Kenya	CU	250A
49	Orient Star International, Doha, Qatar	CU	400A
50	PET, Moscow Russia	AL	1350 A,1000 A,800 A,50A
51	MH Poly- Electromechs,inc	AL	4000 A
52	Infinity Info- Electric Co Ltd Taiwan	AL	1600 A
53	MH Poly- Electromechs,inc Philipines	AL	1800 A,3200 A
54	MH Poly- Electromechs,inc Philipines	AL	1600 A, 1250 A
55	Mun Hean Singapore PTE Ltd.	CU	3200 A,800 A
56	Mun Hean Singapore PTE Ltd.	AL	2250 A
57	Speciallised Power systems Ltd.	CU	1600 A
58	Speciallised Power systems Ltd.	CU	1600 A
59	Rove Group P.O.Box33647 Dubai, U. A.E.	CU	4000 A
60	MH Poly- electromechs. Inc	AL	2500 A
61	Volonter Russia	AL	2500 A
62	MH Poly-electromechs.Inc ,Quezon City, Philippines	AL	1000 A,1600 A
63	ELTA Russia	CU	630 A
64	MH Poly-electromechs. ,Quezon City, Philippines	AL	2250 A,1800 A
65	Qatar, Doha Technical Services	CU	630 A
66	Qatar, Doha Technical Services	CU	630 A

S No.	Project	Conductor	Rating
67	MH Poly- Electromechs,inc Philipines	AL	1000 A
68	PROM ELEKTRO AVTOMATIKA MOSCOW RUSSIA	AL	1600 A
69	MH Poly- Electromechs,inc Philipines	AL	3200 A,2500 A,2000 A
70	MH Poly- Electromechs,inc Philipines	AL	4000 A
71	Qatar, Doha Technical Services	CU	630 A
72	Power Lux Me FZC	CU	2250 A, 80 A
73	Power Lux Me FZC	CU	2000 A, 11250 A
74	Power Lux ME FZC ,Saif Zone Sharjah UAE	CU	2500 A
75	Qatar, Doha Technical Services	CU	1000 A
76	Qatar, Doha Technical Services	CU	630 A

Installation Picture - Distribution

Installation Picture - Feeder

Dafna Tower 3&4, Doha

Westbay 44 Tower, Doha

Shek. Falak Twin Tower, Doha

Residential Complex At Al Qusais,dubai

Citymax Hotel At Al Barsha,dubai

Sobha Sapphire At Business Bay,dubai

Commecial & Residential Building At Al Nahda

Moscow Project

Holiday Inn Kuwait

Residential Building At Silicon Oasis,dubai

Victorias Tower Project Philippines

Al Mazaya Tower Kuwait

Residential Building At Al Qusaias,dubai

Al Nazar Tower Kuwait

Avenue 77 Moscow

Sobha Sapphire at Business Bay, Dubai

Residential Complex at Al Qusais, Dubai

Commecial & Residential Building at Al Nahda

Citymax Hotel at Al Barsha, Dubai

Residential Building at Silicon Oasis, Dubai

Glorieta 5 Project Philippinesi

Hkm Tower

Eastwood Tower Project Philippines

Installation References

Phoneix Hotel Tower Tanzania

Landmark Plaza Kenya

Seibu Tower Project

PS Bank Project Philippines

ASTA

CERTIFICATE OF DEGREE OF PROTECTION

Certificate No.....

Laboratory Ref. No: LSWGWO0066500/03

APPARATUS: 1250A, 1000V/1000V (U_e/U_i), 50 Hz, Sandwich Insulated Copper busbar Trunking system with one joint which comprises of three phase, 100% neutral & 50% internal earth round edge busbars in G.I. Sheet enclosure.

DESIGNATION: SBC 100N1

MANUFACTURER: **C&S Electric Ltd.**, (Bustrunking Division), Plot No. 1A, Sector-8C, Integrated Industrial Estate, Ranipur, Haridwar (Uttarakhand), India

TESTED BY: **Electrical Research & Development Association**
ERDA Road, Makarpura Industrial Estate, Vadodara-390 010, Gujarat, INDIA

DATES OF TESTS: 4th & 5th December 2008

The apparatus, constructed in accordance with the description, drawings and photographs incorporated in this certificate has been subjected to the series of proving tests in accordance with

IEC 60439-2 {Ed 3.1}: 2005 -10 & BS EN 60439-2:2000 incorporating Amendment 1: 2006, Clauses 8.2.7

The results are shown in the record of Proving Tests and the oscillograms attached hereto. The values obtained and the general performance is considered to comply with the above standard(s) and to justify the ratings assigned by the manufacturer as stated below.

Ratings assigned by the manufacturer and proved by the tests

Degree of protection of (Clause 8.2.7): **IP 67**

The record of Proving Tests applies only to the apparatus tested. The responsibility for conformity of any apparatus having the same designations with that tested rests with the Manufacturer.

This Certificate comprises 6 pages, 0 diagram, 0 oscillogram, 6 photographs, 2 drawings and no other sheets as listed on page 1

Only integral reproduction of this Certificate, or reproductions of this page accompanied by any page(s) on which are stated the assigned rated characteristics of the apparatus tested, are permitted without written permission Intertek Testing and Certification Ltd, Hilton House, Corporation Street, Rugby. CV21 2DN, England.

UKAS PRODUCT CERTIFICATION 010

Rajani Menon
ASTA Observer

Certification Manager

8th April 2009 Date

KEMA

Controls & Switchgear company Ltd.
222, Okhla Industrial Estate
110 020 NEW DELHI

India

your letter -
your reference -

our reference 2036755.00-QUA/COM
04-0385 HLS/Sco
author H.L. Schendstok
direct line +31 26 3 56 20 07
telefax +31 26 3 52 58 00
e-mail Henk.Schendstok@kema.com

Arnhem, April 5, 2004

subject
Testing of busbar truncking system types CBC1000, SBC100N1, SBC175N1, SBC175N2 and SBA175N1 from the manufacturer Controls & Switchgear Company Ltd.

Dear Sirs,

We declare herewith that the busbar truncking system, types CBC1000, SBC100N1, SBC175N1, SBC175N2 and SBA175N1, from the manufacturer Controls & Switchgear Company Ltd., have been tested according to IEC 60439-2 as in the clauses mentioned on pages 2 and 3. The tests as laid down in the reports from Prof. Ir. Damstra Laboratorium dated March 15, 2004 were witnessed by KEMA.

We trust that we have informed you sufficiently, if not, please do not hesitate contact us.

Kind regards,

KEMA Quality B.V.

H.L. Schendstok

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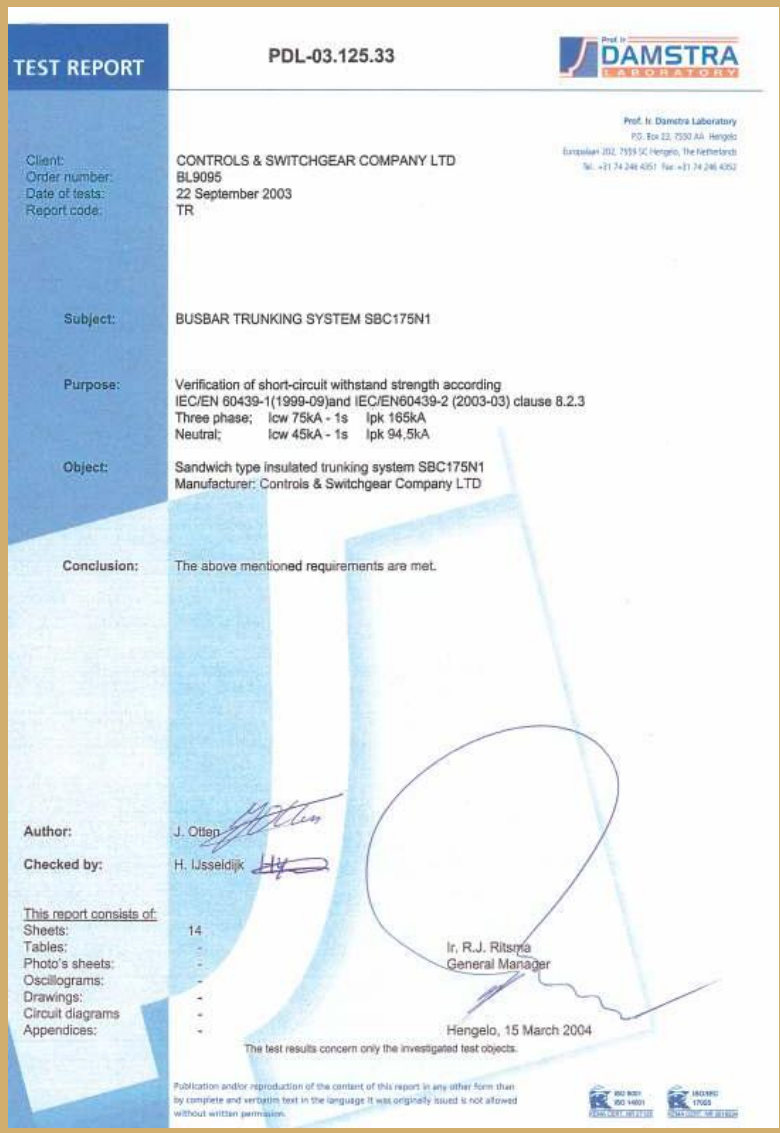
Postbank 6794687
ABN AMRO Bank Utrecht 43.10.71.748



TEST REPORT

PDL-03.125.33

DAMSTRA LABORATORY

Prof. Ir. Damstra Laboratory
P.O. Box 33, 7550 AA Hengelo
Europalaan 202, 7559 SC Hengelo, The Netherlands
Tel.: +31 74 246 4051 Fax: +31 74 246 4052

Client:	CONTROLS & SWITCHGEAR COMPANY LTD
Order number:	BL9095
Date of tests:	22 September 2003
Report code:	TR
Subject:	BUSBAR TRUNKING SYSTEM SBC175N1
Purpose:	Verification of short-circuit withstand strength according IEC/EN 60439-1(1999-09)and IEC/EN60439-2 (2003-03) clause 8.2.3 Three phase; Icw 75kA - 1s Ipk 165kA Neutral; Icw 45kA - 1s Ipk 94,5kA
Object:	Sandwich type insulated trunking system SBC175N1 Manufacturer: Controls & Switchgear Company LTD
Conclusion:	The above mentioned requirements are met.
Author:	J. Otten
Checked by:	H. IJsseldijk

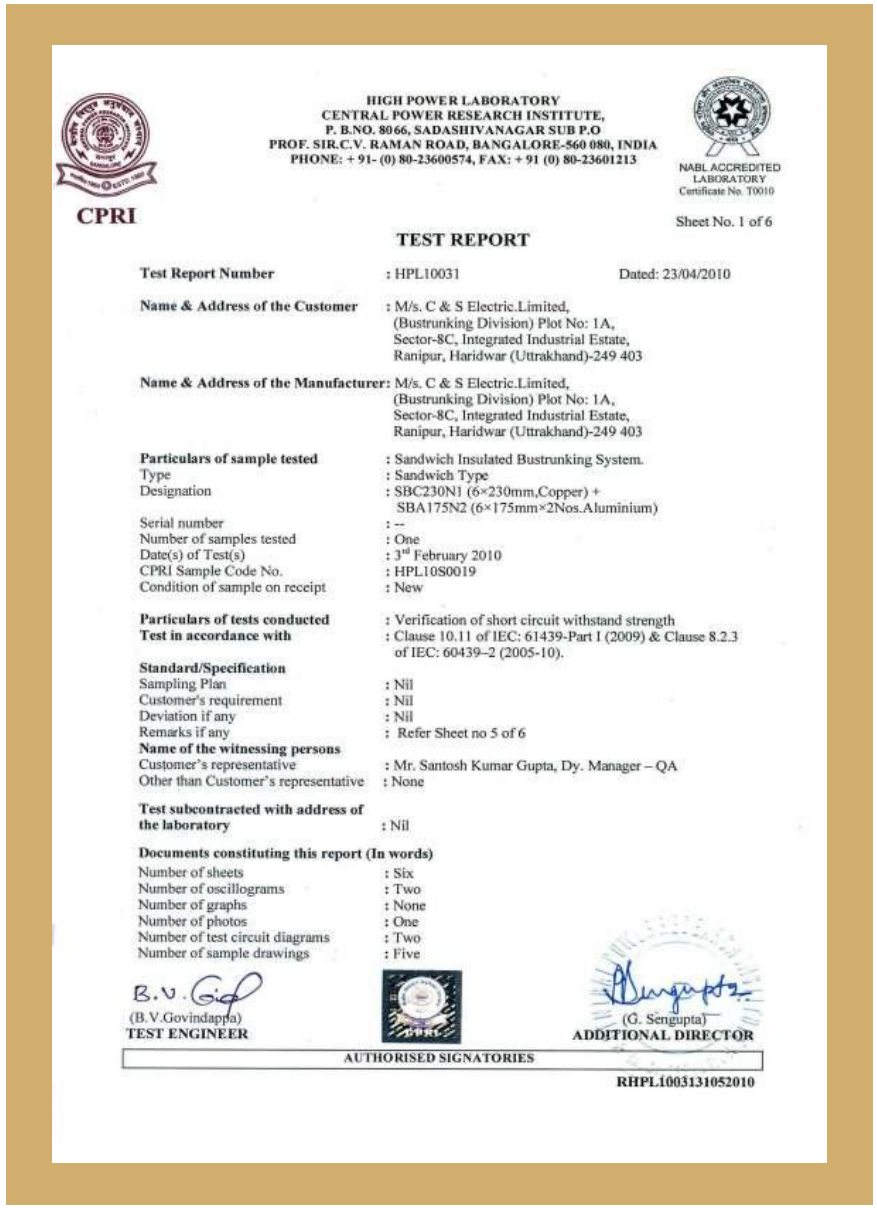
This report consists of:

Sheets:	14
Tables:	-
Photo's sheets:	-
Oscillograms:	-
Drawings:	-
Circuit diagrams	-
Appendices:	-

Ir. R.J. Ritsma
General Manager

Hengelo, 15 March 2004

The test results concern only the investigated test objects.



HIGH POWER LABORATORY
CENTRAL POWER RESEARCH INSTITUTE,
P. B.NO. 8066, SADASHIVANAGAR SUB P.O
PROF. SIR.C.V. RAMAN ROAD, BANGALORE-560 080, INDIA
PHONE: + 91- (0) 80-23600574, FAX: + 91 (0) 80-23601213

NABL ACCREDITED LABORATORY
Certificate No. T0010

CPRI

Sheet No. 1 of 6

TEST REPORT

Test Report Number : HPL10031 Dated: 23/04/2010

Name & Address of the Customer : M/s. C & S Electric.Limited,
(Bustrunking Division) Plot No: 1A,
Sector-8C, Integrated Industrial Estate,
Ranipur, Haridwar (Uttrakhand)-249 403

Name & Address of the Manufacturer: M/s. C & S Electric.Limited,
(Bustrunking Division) Plot No: 1A,
Sector-8C, Integrated Industrial Estate,
Ranipur, Haridwar (Uttrakhand)-249 403

Particulars of sample tested : Sandwich Insulated Bustrunking System.
Type : Sandwich Type
Designation : SBC230N1 (6×230mm,Copper) +
SBA175N2 (6×175mm×2Nos.Aluminium)
Serial number : --
Number of samples tested : One
Date(s) of Test(s) : 3rd February 2010
CPRI Sample Code No. : HPL10S0019
Condition of sample on receipt : New

Particulars of tests conducted : Verification of short circuit withstand strength
Test in accordance with : Clause 10.11 of IEC: 61439-Part I (2009) & Clause 8.2.3 of IEC: 60439–2 (2005-10).

Standard/Specification
Sampling Plan : Nil
Customer's requirement : Nil
Deviation if any : Nil
Remarks if any : Refer Sheet no 5 of 6
Name of the witnessing persons
Customer's representative : Mr. Santosh Kumar Gupta, Dy. Manager – QA
Other than Customer's representative : None

Test subcontracted with address of the laboratory : Nil

Documents constituting this report (In words)
Number of sheets : Six
Number of oscillograms : Two
Number of graphs : None
Number of photos : One
Number of test circuit diagrams : Two
Number of sample drawings : Five

B.V. Gip
(B.V.Govindappa)
TEST ENGINEER

(G. Sengupta)
ADDITIONAL DIRECTOR

AUTHORISED SIGNATORIES

RHPL1003131052010

ASTA

CERTIFICATE OF SELECTED TYPE TESTS

Laboratory Ref. No: 2006/STN-1/207 Certificate No. 16478

APPARATUS: 2500A, 1000V/1000V (U_e/U_i), 50 Hz, Sandwich insulated bustrunking system with flange end units, joints and straight lengths, comprises of three phase, neutral & 50% internal earth copper round edge busbars in galvanized iron (G.I.) enclosure.

DESIGNATION: SBC230N1

MANUFACTURER: Controls & Switchgear Co. Ltd., (Bustrunking Division), Plot No. 1A, Sector-8C, Integrated Industrial Estate, Ranipur, Haridwar (Uttaranchal), India

TESTED BY: Central Power Research Institute, Switchgear Testing & Development Station, Bhopal – 462 023, Madhya Pradesh, India.

DATES OF TESTS: 27th June to 4th July 2006

The apparatus, constructed in accordance with the description, drawings and photographs incorporated in this certificate has been subjected to the series of proving tests in accordance with

IEC 60439-2 (Ed 3.1): 2005 -10 and BSEN 60439-2, 2000 incorporating Amendment 1: 2006 Clauses 8.2.1, 8.2.2, 8.2.3, 8.2.4, 8.2.5, 8.2.7, 8.2.9 and 8.2.13.

The results are shown in the record of Proving Tests and the oscillograms attached hereto. The values obtained and the general performance are considered to comply with the above standard(s) and to justify the ratings assigned by the manufacturer as stated below.

For ratings assigned by the manufacturer and proved by the tests see page 1.

The record of Proving Tests applies only to the apparatus tested. The responsibility for conformity of any apparatus having the same designations with that tested rests with the Manufacturer.

This Certificate comprises **16** pages, **3** diagrams, **3** oscillograms, **20** photographs, **5** drawings and no other sheets as detailed on page 1

Only integral reproduction of this Certificate, or reproductions of this page accompanied by any page(s) on which are stated the assigned rated characteristics of the apparatus tested, are permitted without written permission from ASTA BEAB Certification Services, Hilton House, Corporation Street, Rugby. CV21 2DN, England.

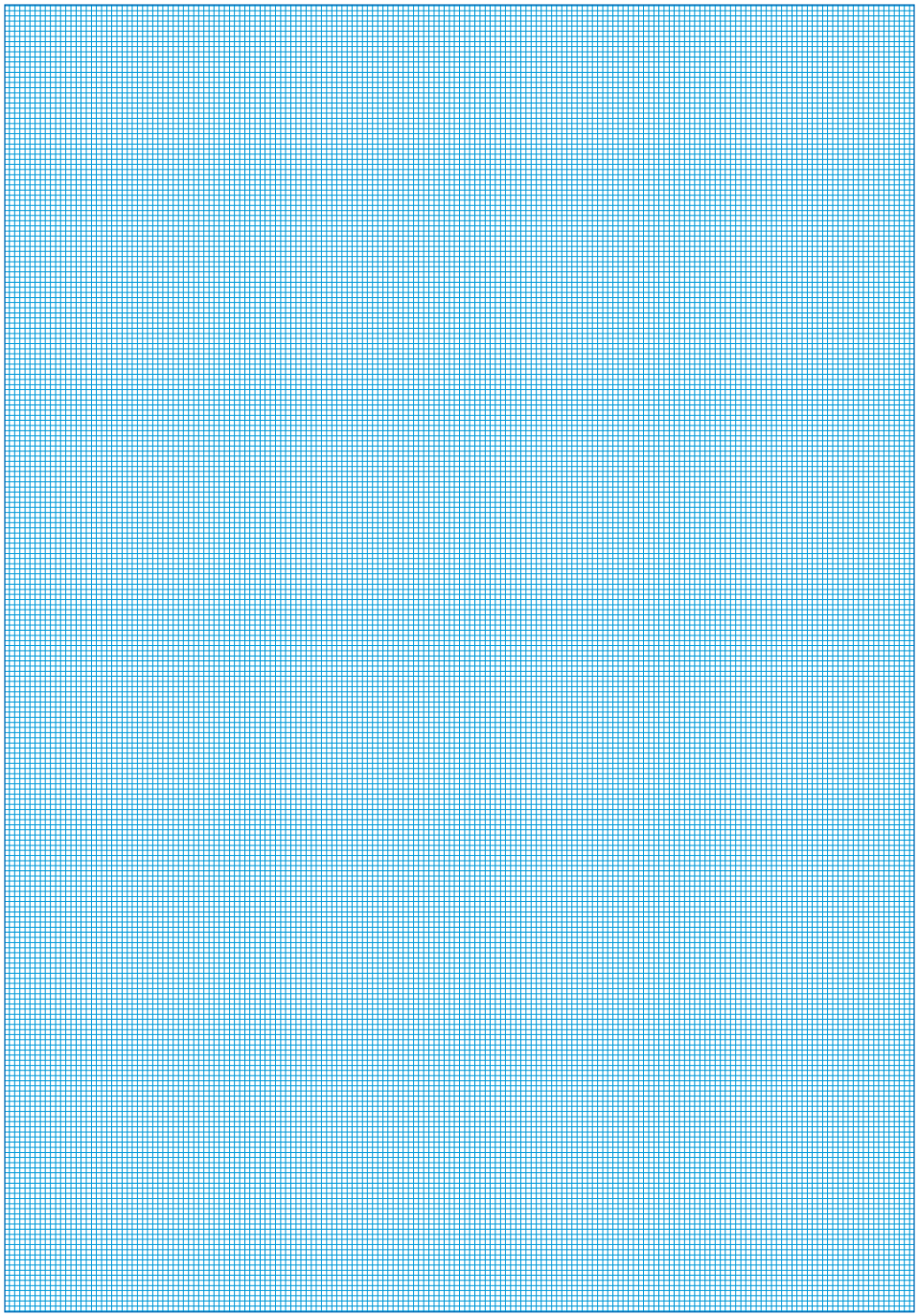
UKAS PRODUCT CERTIFICATION 010

Rajani Menon
ASTA Observer

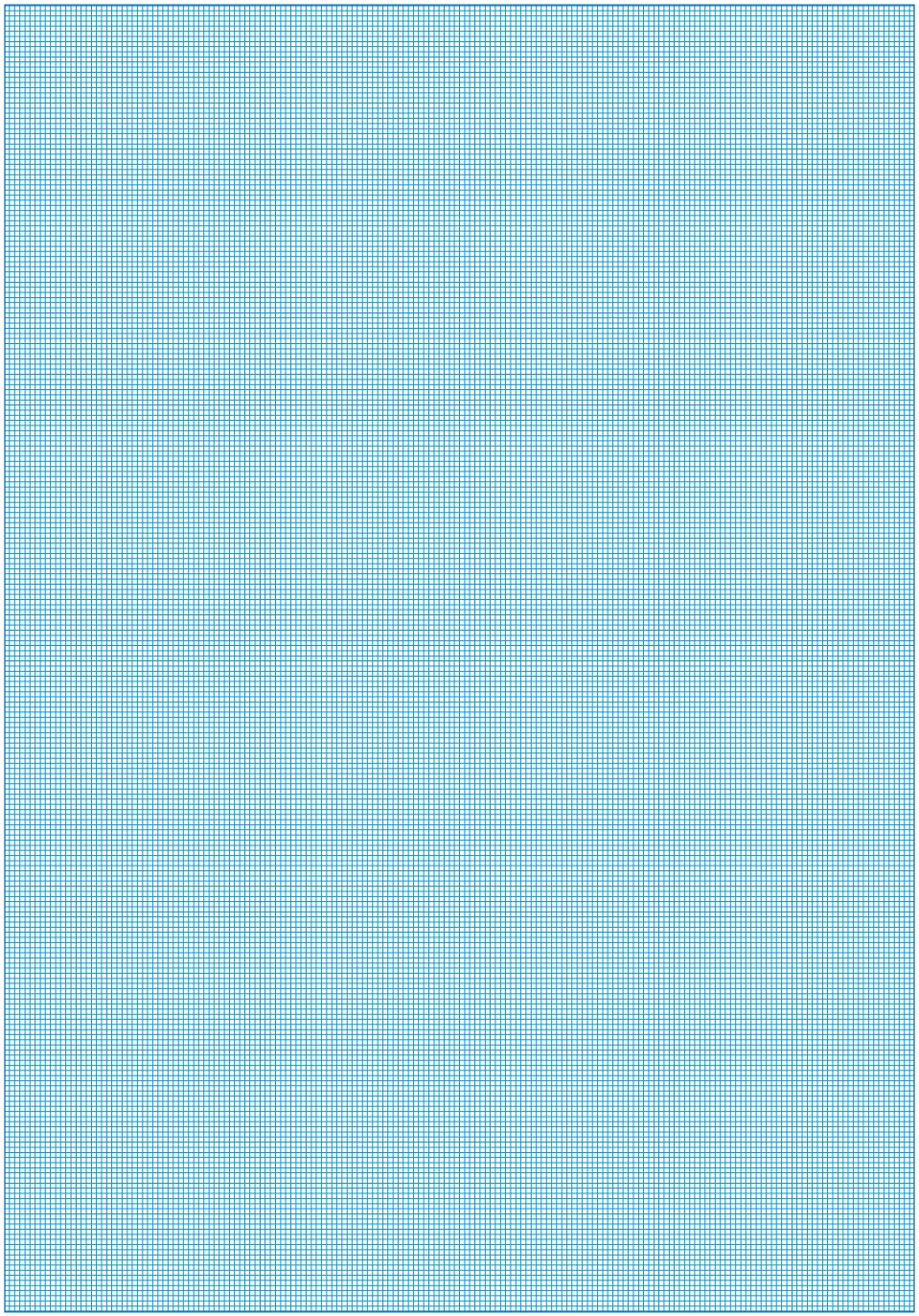
DIRECTOR

8th December 2006 Date

Notes



Notes



Other Busbar System From C&S

Isolated Phase Busducts

(11- 36KV up to 28,000 Amps)

Segregated / Non-Segregated
Phase Busduct
(415 - 33KV up to 5000 Amps.)

Air Insulated
Busbar Trunking System
(125~2000 Amps.)

Lighting Trunking
(25 - 40A)

C&S Electric Ltd.
Corporate Office :
222, Okhla Industrial Estate, New Delhi - 110 020
Tel. : +91-11-30887520-29, 30887513(D)
Fax: +91-11-2684 8241, 2684 7342
email : rajesh.bhardwaj@cselectric.co.in
Website: www.cselectric.co.in

C&S
electric

C&S Electric Ltd.
Works : Plot No. 1A, Sector 8C, Integrated Industrial Estate (SIDCUL)
Ranipur, Hardwar, Uttarakhand - 249403 Tel.: 01334-239212, 01334-239217
Website: www.cselectric.co.in

REV. 0/1/11