{A}   AMPERE - VS - BUSBAR SELECTION CHART

(Ref : Power Mat Busbar Supporter)

Note
- Calculation is on the based on : Ac current capacity for Aluminum bar is 1 A/mm^2 , & for Copper is 1.7 A /mm^2
- Assumed that the bars are mounted in still but Unconfined open air.
- Current Rating for E91 E bars are about 3 % Lower .
- Based on bars mounted with the long side vertical and a gap between bars equal to the bar thickness.

Size of Bus bar (mm x mm)	Sectional Area (mm^2)	Approx. Rating (Amp) for Copper Busbar	Approx. Rating (Amp) for Aluminum Busbar		
			1 BAR	2 BAR	3 BAR
25 x 6	150	450	364	640	900
40 x 6	240	660	545	935	1310
50 x 6	300	792	660	1130	1580
60 x 6	360	915	782	1350	1870
80 x 6	480	1162	995	1700	2310
100 x 6	600	1395	1215	2090	2770
125 x 6	750	1671	1467	2501	3289
150 x 6	900	1915	1726	2929	3833
50 x 10	500	1060	870	1500	2060
80 x 10	800	1525	1250	2215	2940
100 x 10	1000	1800	1565	2650	3465
125 x 10	1250	2150	1873	3161	4155
150 x 10	1500	2456	2185	3718	4880
200 x 10	2000	3140	2795	4750	6160
80 x 12	960	1332	1344	2222	2807
100 x 12	1200	1665	1618	2530	3125
125 x 12	1500	1980	1934	2920	3627
150 x 12	1800	2235	2251	3255	4092
200 x 12	2400	2820	2846	4139	4929
250 x 12	3000	3375	3385	4650	5580

Total Area of Cross Section (mm 2)	MULTIPLYING FACTORS FOR AC COPPER BARS		
	2 BARS	3 BARS	4 BARS
500	1.78	2.45	3.13
1000	1.72	2.36	3.00
1500	1.65	2.24	2.84
2000	1.60	2.16	2.70
2500	1.55	2.10	2.60
3000	1.52	2.02	2.52
3500	1.48	1.98	2.48
4000	1.44	1.96	2.45

FINAL CAPACITY OF BUSBAR

Final Capacity of Busbar = (Actual capacity of Busbar) x (Deration due to Temperature)
x (Deration due to Proximity) x (Deration due to Enclosure)

➢ **TEMPERATURE FACTOR :**

Normally Busbar System given are at 35 Deg .while in practice the temperature is about 50 Deg.
So this variation leads to certain Deration in the carrying capacity of Busbar .

Deration factor = (T2 / T1) $^{0.588}$

Where :
T1= Temperature at the site of Installation (i.e 50 Deg)
T2 =Ambient Temp. of the Busbar Manufacture (i.e 35 deg)

➢ **PROXIMITY FACTOR :**

Some Deration in the current carrying capacity happens due to gap between two phases .The following table should be taken in to account the proximity effect.

Distance Between Phases	Deration Factor.
3 x W	0.82
4 x W	0.89
5 x W	0.95
6 x W	0.99
> 6 x W	1.00

➢ **ENCLOSURE FACTOR :**

The size of Enclosure also create some deration in the carrying current capacity. To derive the enclosure Factor use following table.

Enclosure	(Total Cross section Area of Busbar / Cross Section Area of Enclosure)x100%	Deration Factor
Outdoor	< 1%	0.95
	5%	0.90
	10%	0.85
Indoor where the Enclosure itself is in a well ventilated room	< 1%	0.85
	5%	0.75
	10%	0.65
Indoor where the Enclosure itself is in a poorly ventilated room & Room Temp. is high.	< 1%	0.65
	5%	0.60
	10%	0.50

{B}   BUSBARS CLEARANCE

(Ref : Based on BS 159 : 1957 , Copy : Power Mat Busbar Supporter)

Rated Voltage up to and including (KV)	Minimum clearance to earth in Air In mm		Minimum clearance between phases in Air, In mm	
	OPEN :	ENCLOSED :	OPEN :	ENCLOSED :
0 .415,	19,	16	26	19
0 .6	26	19	32	19
3.3	51	51	51	51
6.6	64	64	89	89
11.0	77	77	127	127
15.0	102	102	165	165
22.0	140	140	242	242
33.0	223	223	356	356