COPPER BUSBARS ~ DIMENSIONS AND WEIGHTS

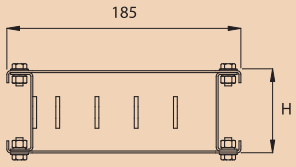

Figure A

COMPACT TYPE
(CROSS SECTION VIEW)

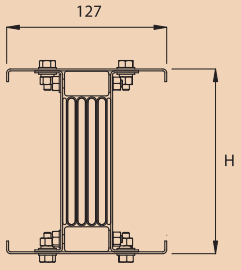

Figure B

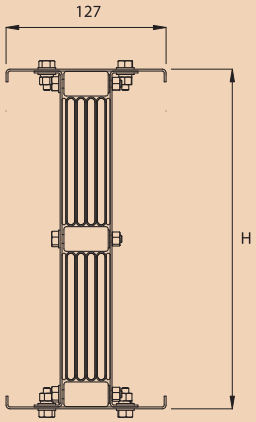

Figure C

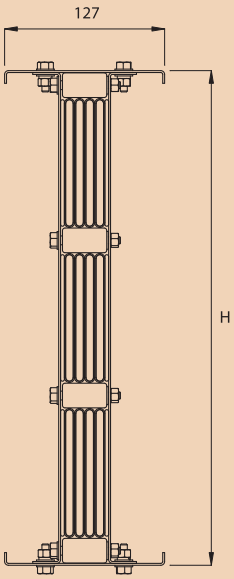

Figure D

SANDWICHED TYPE
(CROSS SECTION VIEW)

DIMENSIONS AND WEIGHTS OF FEEDER AND PLUG-IN FEEDER IN METAL HOUSING

AMPERE RATING	TYPE	BUSBAR SIZE/ PHASE (mm)	DIMENSION 'H' (mm)	APPROXIMATE WEIGHT (kg/m)					
				3W	3W + 1/2G	4W	4W + 1/2G	5W	5W + 1/2G
100	'FIGURE A' COMPACT TYPE	3 X 15	55	11	11	11	12	12	12
160		3 X 20	60	11	12	12	12	13	13
200		3 X 25	65	12	12	13	13	14	14
300		3 X 30	70	13	13	14	14	15	15
400		6 X 25	65	15	15	16	17	18	19
500		6 X 30	70	16	17	18	19	20	20
630		6 X 40	80	18	19	20	22	23	24
800		6 X 50	90	20	22	23	25	26	28
630	'FIGURE B' SANDWICHED TYPE	6 X 40	85	20	21	22	24	25	26
800		6 X 50	95	22	24	25	27	29	30
950		6 X 60	105	25	26	29	30	32	34
1000		6 X 65	110	26	28	30	32	34	36
1250		6 X 90	135	32	35	38	40	44	46
1600		6 X 110	155	37	40	44	47	51	54
1800		6 X 125	170	40	44	48	52	57	60
2000		6 X 140	185	44	48	53	57	62	66
2250		6 X 175	220	52	58	64	69	75	80
2500		6 X 200	245	58	64	71	77	84	90
3000	'FIGURE C' SANDWICHED TYPE	2 X 6 X 110	285	66	72	80	87	94	101
3200		2 X 6 X 120	305	71	78	86	94	102	109
3500		2 X 6 X 140	345	80	89	98	107	117	125
4000		2 X 6 X 150	365	85	94	105	114	124	133
4500		2 X 6 X 175	415	97	108	120	130	143	153
5000		2 X 6 X 200	465	109	121	135	147	161	173
6300	'FIGURE D' SANDWICHED TYPE	3 X 6 X 175	610	142	158	176	192	210	226

COPPER BUSBARS ~ IMPEDANCES AND VOLTAGE DROPS

FREQUENCY 50HZ — **COPPER CONDUCTOR**

AMPERE RATING (AMP)	No. of BARS	BUSBAR SIZE (mm)	IMPEDANCE AT 95°C (micro-Ohm/m)			LINE TO LINE VOLTAGE DROP IN MILI-VOLT PER METER AT RATED CURRENT AND VARIOUS POWER FACTORS					
			R	X	Z	1.0	0.9	0.8	0.7	0.6	0.5
100	1	3 X 15	491.16	146.65	512.58	85.07	87.64	83.30	77.69	71.36	64.53
160	1	3 X 20	368.37	132.11	391.34	102.09	107.84	103.64	97.61	90.54	82.75
200	1	3 X 25	294.70	120.70	318.46	102.09	110.10	106.76	101.32	94.70	87.25
300	1	3 X 30	245.58	111.40	269.67	127.61	140.08	136.82	130.66	122.87	113.93
400	1	6 X 25	147.35	114.41	186.55	102.09	126.43	129.23	128.07	124.66	119.69
500	1	6 X 30	122.79	106.04	162.24	106.34	135.73	140.17	140.02	137.27	132.70
630	1	6 X 40	92.09	31.66	97.38	100.49	105.50	101.12	95.01	87.93	80.16
800	1	6 X 50	73.67	26.83	78.41	102.09	108.08	103.97	98.01	90.99	83.24
950	1	6 X 60	61.39	23.29	65.66	101.02	107.63	103.81	98.09	91.28	83.70
1000	1	6 X 65	56.67	21.86	60.74	98.16	104.84	101.24	95.75	89.18	81.86
1250	1	6 X 90	40.93	16.72	44.21	88.62	95.53	92.61	87.88	82.13	75.66
1600	1	6 X 110	33.49	14.08	36.33	92.80	100.54	97.66	92.83	86.90	80.20
1800	1	6 X 125	29.47	12.59	32.05	91.88	99.80	97.06	92.36	86.54	79.94
2000	1	6 X 140	26.31	11.39	28.67	91.15	99.23	96.60	91.99	86.26	79.75
2250	1	6 X 175	21.05	9.32	23.02	82.03	89.66	87.41	83.35	78.27	72.46
2500	1	6 X 200	18.42	8.24	20.18	79.75	87.34	85.22	81.32	76.41	70.80
3000	2	2 X 6 X 110	16.74	7.04	18.16	87.00	94.25	91.56	87.03	81.47	75.19
3200	2	2 X 6 X 120	15.35	6.53	16.68	85.07	92.33	89.76	85.39	79.98	73.87
3500	2	2 X 6 X 140	13.16	5.70	14.34	79.75	86.83	84.52	80.49	75.48	69.78
4000	2	2 X 6 X 150	12.28	5.36	13.40	85.07	92.74	90.32	86.05	80.73	74.67
4500	2	2 X 6 X 175	10.52	4.66	11.51	82.03	89.66	87.41	83.35	78.27	72.46
5000	2	2 X 6 X 200	9.21	4.12	10.09	79.75	87.34	85.22	81.32	76.41	70.80
6300	3	3 X 6 X 175	7.02	3.11	7.67	76.56	83.68	81.59	77.80	73.05	67.63

FREQUENCY 60HZ — **COPPER CONDUCTOR**

AMPERE RATING (AMP)	No. of BARS	BUSBAR SIZE (mm)	IMPEDANCE AT 95°C (micro-Ohm/m)			LINE TO LINE VOLTAGE DROP IN MILI-VOLT PER METER AT RATED CURRENT AND VARIOUS POWER FACTORS					
			R	X	Z	1.0	0.9	0.8	0.7	0.6	0.5
100	1	3 X 15	491.16	175.97	521.73	85.07	89.85	86.34	81.32	75.43	68.93
160	1	3 X 20	368.37	158.53	401.03	102.09	111.03	108.03	102.83	96.40	89.09
200	1	3 X 25	294.70	144.84	328.37	102.09	113.75	111.77	107.29	101.39	94.50
300	1	3 X 30	245.58	133.68	279.61	127.61	145.12	143.76	138.93	132.13	123.96
400	1	6 X 25	147.35	137.29	201.40	102.09	133.34	138.74	139.39	137.35	133.42
500	1	6 X 30	122.79	127.24	176.83	106.34	143.74	151.19	153.13	151.96	148.60
630	1	6 X 40	92.09	37.99	99.62	100.49	108.51	105.26	99.94	93.45	86.14
800	1	6 X 50	73.67	32.19	80.40	102.09	111.32	108.43	103.32	96.94	89.68
950	1	6 X 60	61.39	27.95	67.46	101.02	110.97	108.41	103.56	97.41	90.34
1000	1	6 X 65	56.67	26.23	62.45	98.16	108.14	105.78	101.15	95.24	88.42
1250	1	6 X 90	40.93	20.06	45.58	88.62	98.69	96.96	93.05	87.92	81.93
1600	1	6 X 110	33.49	16.90	37.51	92.80	103.94	102.34	98.41	93.15	86.96
1800	1	6 X 125	29.47	15.11	33.12	91.88	103.23	101.77	97.96	92.82	86.75
2000	1	6 X 140	26.31	13.67	29.65	91.15	102.68	101.33	97.62	92.57	86.59
2250	1	6 X 175	21.05	11.18	23.83	82.03	92.82	91.77	88.54	84.08	78.75
2500	1	6 X 200	18.42	9.89	20.91	79.75	90.45	89.51	86.42	82.13	76.98
3000	2	2 X 6 X 110	16.74	8.45	18.76	87.00	97.44	95.95	92.26	87.33	81.52
3200	2	2 X 6 X 120	15.35	7.83	17.23	85.07	95.49	94.10	90.55	85.77	80.13
3500	2	2 X 6 X 140	13.16	6.84	14.83	79.75	89.84	88.67	85.42	81.00	75.76
4000	2	2 X 6 X 150	12.28	6.43	13.86	85.07	95.97	94.77	91.35	86.66	81.09
4500	2	2 X 6 X 175	10.52	5.59	11.92	82.03	92.82	91.77	88.54	84.08	78.75
5000	2	2 X 6 X 200	9.21	4.95	10.45	79.75	90.45	89.51	86.42	82.13	76.98
6300	3	3 X 6 X 175	7.02	3.73	7.94	76.56	86.63	85.65	82.64	78.47	73.50

ALUMINIUM BUSBARS ~ DIMENSIONS AND WEIGHTS

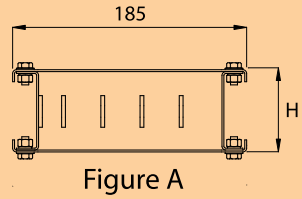

Figure A

COMPACT TYPE
(CROSS SECTION VIEW)

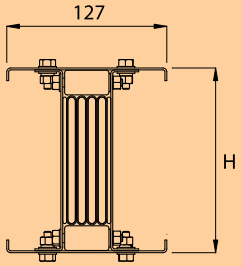

Figure B

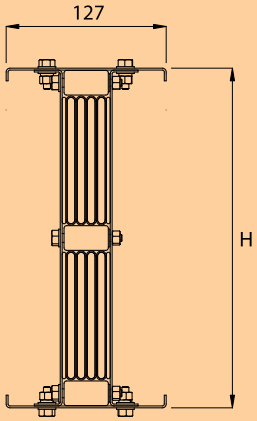

Figure C

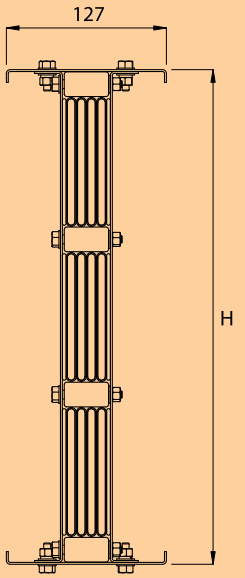

Figure D

SANDWICHED TYPE
(CROSS SECTION VIEW)

DIMENSIONS AND WEIGHTS OF FEEDER AND PLUG-IN FEEDER IN METAL HOUSING

AMPERE RATING	TYPE	BUSBAR SIZE/ PHASE (mm)	DIMENSION 'H' (mm)	APPROXIMATE WEIGHT (kg/m)					
				3W	3W + 1/2G	4W	4W + 1/2G	5W	5W + 1/2G
200	'FIGURE A' COMPACT TYPE	6 X 31	71	12	13	13	13	14	14
400		6 X 63	103	15	16	17	17	18	19
630		6 X 76	116	16	17	18	19	20	20
400	'FIGURE B' SANDWICHED TYPE	6 X 63	109	18	18	19	20	21	21
630		6 X 76	122	19	20	21	22	23	23
800		6 X 100	145	22	23	24	25	26	27
1000		6 X 127	172	25	26	28	29	31	32
1250		6 X 152	198	28	29	31	33	35	36
1600		6 X 203	249	34	36	38	40	43	45
1800		6 X 250	295	39	41	45	47	50	53
2000	'FIGURE C' SANDWICHED TYPE	2 X 6 X 152	370	48	49	55	56	61	63
2500		2 X 6 X 203	472	59	61	68	71	77	80
3000		2 X 6 X 230	525	66	68	76	78	86	88
3200		2 X 6 X 250	565	70	73	81	84	92	95
3500	'FIGURE D' SANDWICHED TYPE	3 X 6 X 203	695	85	87	99	101	112	114
4000		3 X 6 X 230	775	94	97	110	112	125	128
4500		3 X 6 X 250	835	101	104	118	121	134	137
5000		3 X 6 X 250	835	101	104	118	121	134	137

ALUMINIUM BUSBARS ~ IMPEDANCES AND VOLTAGE DROPS

FREQUENCY 50HZ

ALUMINIUM CONDUCTOR

AMPERE RATING (AMP)	No. of BARS	BUSBAR SIZE (mm)	IMPEDANCE AT 95°C (micro-Ohm/m)			LINE TO LINE VOLTAGE DROP IN MILI-VOLT PER METER AT RATED CURRENT AND VARIOUS POWER FACTORS					
			R	X	Z	1.0	0.9	0.8	0.7	0.6	0.5
200	1	6 X 31	180.15	102.85	207.45	62.41	71.70	71.30	69.13	65.95	62.06
400	1	6 X 63	90.08	21.97	92.72	62.41	62.80	59.06	54.55	49.62	44.38
630	1	6 X 76	79.44	19.21	81.73	86.69	87.15	81.93	75.65	68.78	61.50
800	1	6 X 100	60.53	15.29	62.44	83.88	84.73	79.81	73.84	67.27	60.28
1000	1	6 X 127	45.04	12.27	46.68	78.01	79.47	75.16	69.78	63.80	57.40
1250	1	6 X 152	37.53	10.43	38.95	81.26	82.98	78.56	73.01	66.82	60.19
1600	1	6 X 203	29.79	8.13	30.88	82.56	84.12	79.56	73.87	67.55	60.78
1800	1	6 X 250	24.21	6.70	25.12	75.49	77.05	72.93	67.76	62.01	55.84
2000	2	2 X 6 X 152	18.77	5.22	19.48	65.01	66.38	62.85	58.41	53.46	48.15
2500	2	2 X 6 X 203	14.90	4.06	15.44	64.50	65.72	62.15	57.71	52.77	47.48
3000	2	2 X 6 X 230	13.16	3.62	13.65	68.38	69.75	66.00	61.31	56.08	50.49
3200	2	2 X 6 X 250	12.11	3.35	12.56	67.10	68.49	64.82	60.23	55.12	49.63
3500	3	3 X 6 X 203	9.93	2.71	10.29	60.20	61.34	58.01	53.86	49.25	44.32
4000	3	3 X 6 X 230	8.77	2.41	9.10	60.78	62.00	58.66	54.49	49.85	44.88
4500	3	3 X 6 X 250	8.07	2.23	8.37	62.91	64.21	60.77	56.47	51.67	46.53
5000	3	3 X 6 X 250	8.07	2.23	8.37	69.90	71.34	67.53	62.74	57.41	51.70

FREQUENCY 60HZ

ALUMINIUM CONDUCTOR

AMPERE RATING (AMP)	No. of BARS	BUSBAR SIZE (mm)	IMPEDANCE AT 95°C (micro-Ohm/m)			LINE TO LINE VOLTAGE DROP IN MILI-VOLT PER METER AT RATED CURRENT AND VARIOUS POWER FACTORS					
			R	X	Z	1.0	0.9	0.8	0.7	0.6	0.5
200	1	6 X 31	180.15	123.42	218.38	62.41	74.80	75.58	74.22	71.65	68.23
400	1	6 X 63	90.08	26.36	93.85	62.41	64.13	60.88	56.73	52.06	47.02
630	1	6 X 76	79.44	23.05	82.72	86.69	88.98	84.44	78.64	72.13	65.13
800	1	6 X 100	60.53	18.35	63.25	83.88	86.57	82.36	76.87	70.66	63.95
1000	1	6 X 127	45.04	14.72	47.38	78.01	81.23	77.70	72.81	67.20	61.09
1250	1	6 X 152	37.53	12.52	39.56	81.26	84.95	81.27	76.02	70.44	64.10
1600	1	6 X 203	29.79	9.75	31.35	82.56	86.08	82.26	77.09	71.15	64.68
1800	1	6 X 250	24.21	8.04	25.51	75.49	78.87	75.43	70.75	65.35	59.46
2000	2	2 X 6 X 152	18.77	6.26	19.78	65.01	67.96	65.01	60.99	56.35	51.28
2500	2	2 X 6 X 203	14.90	4.88	15.67	64.50	67.25	64.27	60.22	55.59	50.53
3000	2	2 X 6 X 230	13.16	4.35	13.86	68.38	71.36	68.25	63.99	59.09	53.75
3200	2	2 X 6 X 250	12.11	4.02	12.76	67.10	70.11	67.05	62.89	58.09	52.85
3500	3	3 X 6 X 203	9.93	3.25	10.45	60.20	62.77	59.98	56.21	51.88	47.16
4000	3	3 X 6 X 230	8.77	2.90	9.24	60.78	63.45	60.67	56.88	52.53	47.78
4500	3	3 X 6 X 250	8.07	2.68	8.50	62.91	65.72	62.86	58.96	54.46	49.55
5000	3	3 X 6 X 250	8.07	2.68	8.50	69.90	73.03	69.85	65.51	60.51	55.05

Notes:

1. The values computed above are based on ambient temperature of 40°C and max temperature of 95°C.
2. The line-to-line voltage drop of the busbar trunking system can be calculated using the formula:

$$\Delta V = k \times \sqrt{3} \times (R_0 \cos \phi + X_0 \sin \phi) \times I_0 \quad (V/m)$$

where I_0 = rated current, $\cos \phi$ = load power factor, $\sin \phi = \sqrt{1 - \cos^2 \phi}$, k = load distribution factor, (k = 1 for concentrated load, k = 0.5 for distributed load)

3. The AC resistance, R at load current I can be calculated using the formula:

$$R = R_0 \times \frac{1 + \alpha (55 \times (I / I_0)^2 + 20)}{1 + 75\alpha} \quad (\Omega/m)$$

where R_0 = AC resistance at I_0, α = temperature co-efficient of conductor at 20°C (Copper ~ 3.94×10^{-3}, Aluminium ~ 4.00×10^{-3})

4. To determine line-to-neutral voltage drop, multiply line-to-line voltage drop by **0.577**.