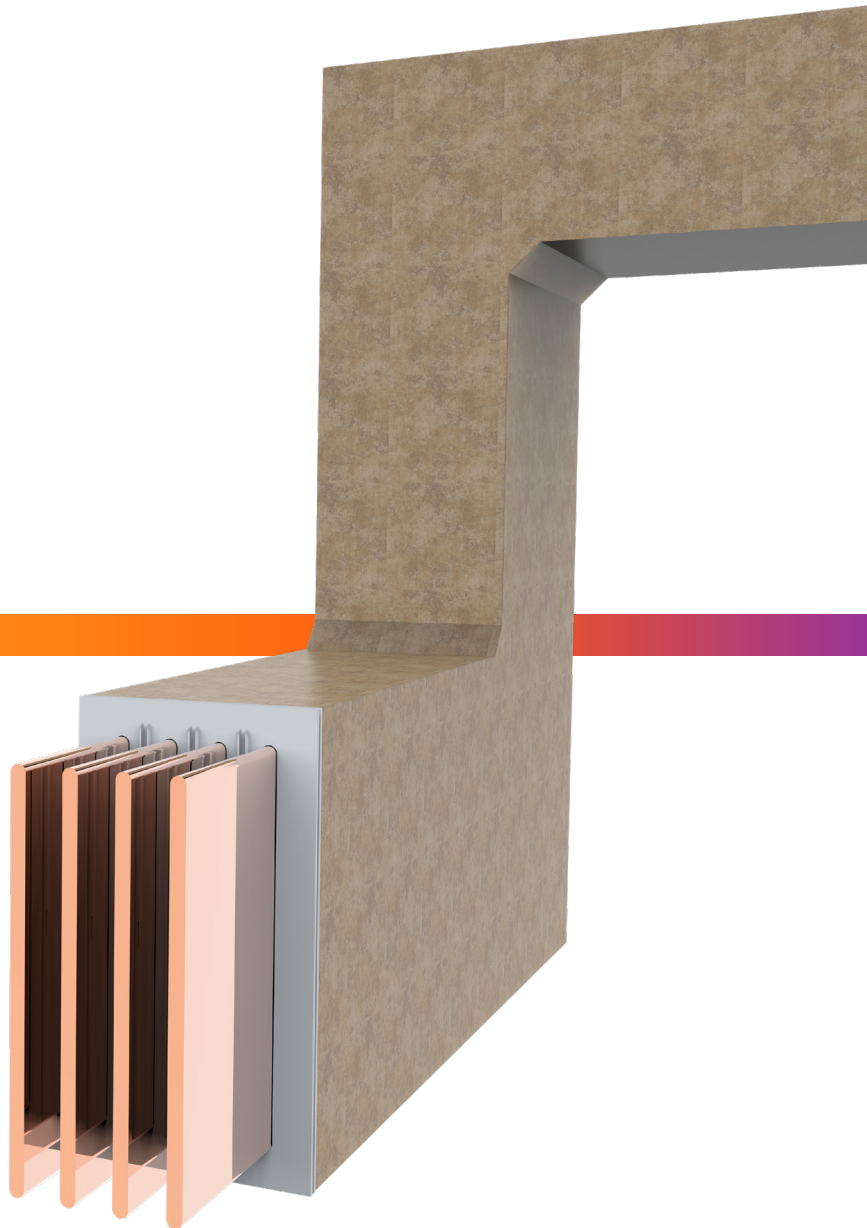




Vertiv™ PowerBar
Cast Resin
IP68 Busbar System



Overview

The conductor is available in aluminium or copper and is totally encapsulated in a fire retardant, self-extinguishing and homogenous polymer concrete. Vertiv™ PowerBar Cast Resin has been proven to guarantee high resistance to fire, water, moisture, mechanical loads, chemicals and extreme temperatures.

Cast Resin ranges from 800A to 6300A and is available in multiple configurations including neutral, double neutral and earth.

Vertiv's PowerBar Cast Resin is a 1000 Volt, IP68 rated maintenance free busbar system for outdoor applications.

Standards

The Vertiv™ Cast Resin range is fully ASTA Tested Certified. It is manufactured in a Certified Management System environment where Quality ISO 9001, Safety ISO 45001 and Environmental ISO 14001 standards are applied to all aspects of the manufacturing and installation processes. It is manufactured in accordance with IEC61439-1 and IEC61439-6.

ASTA Certificates

Vertiv completed extensive testing at ASTA accredited laboratories to ensure the product we supply meets the international requirements.

Seismic Compliance

The product has a Qualification Level – High in accordance to IEEE Standard 693-2005.

Type Tests

Verification of:

- 10.2 Strength of Materials and Parts
- 10.3 Degree of Protection of Enclosures
- 10.4 Clearance and Creepage Distances
- 10.5 Protection Against Electric Shock and Integrity of Protective Circuits
- 10.9 Dielectric Properties
- 10.10 Temperature Rise Limits
- 10.11 Short-circuit Withstand Strength

Ingress Protection

The product has been tested at IP68 in accordance with IEC 60529.

Impact Resistance Test

The product has been rated at IK10 in accordance with IEC 62262.

Fire Resistance

This product meets the ISO834 standard for fire barrier penetration seals.

Note: For life safety applications where circuit integrity is required refer to our BS8602 catalogue.

Damp Heat

The product is in accordance with IEC60068-2-78 (Damp Heat Steady State) and IEC 60068-2-3 (Damp Heat Cyclic).

Applicable standard and test that has been passed for Silicon Rubber Bellows

SN	Required Test Properties	Applicable Standard
1	Temperature Index	ASTM D 2863
2	Zero Halogen Test	IEC 60754-2
3	Flammability Test	UL 94 V0
4	Smoke Density	ASTM D 2843 or IEC 61034/1/2
5	Toxicity Test	NES 713

Explosive Atmosphere (ATEX)

The product has the following ATEX markings in accordance with IEC60079-0:2009 and IEC60079-18:2009:

Ex m II C T5 Gb

*Produced in EU

Ex II 2G Ex eb IIC T4 Gb

Ex II 2G Ex mb IIC T115 C Gb

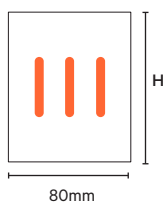
*Produced in UAE

All certificates available on request

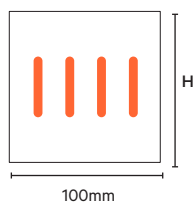


Busbar Dimensions

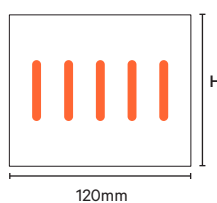
Busbar Widths



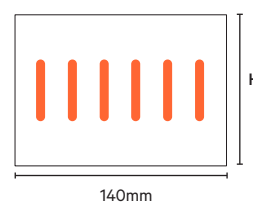
3 Pole System



4 Pole System



5 Pole System



6 Pole System

Configuration	Phases	Neutral	Earth
TP	100%	0%	0%
TP/N	100%	100%	0%
TP/E	100%	0%	100% or 50%
TP/NE	100%	100%	100% or 50%
TP/DN	100%	200%	0%

Note: If no earth bar is specified, earthing is to be provided by installation contractor.

Busbar Heights

Copper Rating (A)	Construction Type	Busbar Height (H) (mm)
800	SS	100
1000	SS	130
1250	SS	105
1400	SS	120
1600	SS	145
2000	SS	175
2500	SS	210
3200	DS	310
4000	DS	360
5000	DS	460
6300	DS	560

Aluminium Rating (A)	Construction Type	Busbar Height (H) (mm)
1000	SS	110
1250	SS	130
1400	SS	150
1600	SS	180
2000	SS	230
2500	SS	300
3200	DS	380
4000	DS	540
5000	DS	620

Key: SS - Single Stack DS - Double Stack

Chemical Resistance

Key:

- 1 Cast Resin is resistant to chemical.
- 2 Chemical evaporated quickly from Cast Resin.
- 3 Cast Resin is affected by chemical.

Chemicals	Directly After Contact	After 24 hours	More Than 48 hours
Boric Acid	1	1	1
Hydrochloric Acid 10%	1	3	3
Sulfuric Acid 10%	1	1	1
Citric Acid	1	3	3
Lactic Acid 5%	1	3	3
Formic Acid 10%	3	3	3
Nitric Acid 10%	1	3	3
Acetic Acid 10%	3	3	3
Ethanol	1	1	1
Acetone	1	2	2
Calcium Chloride	1	1	1
Fuel (Diesel)	1	1	1
Ester	1	3	3
Ether	1	2	2
Formalin 37%	3	3	3
Glycerol	1	3	3
Ammonia 10%	1	1	1
Ammonia 30%	1	3	3
Sodium Hydroxide 10%	1	1	1
Sodium Hydroxide 50%	1	3	3
Lubricant	1	1	1
Engine Oil	1	1	1
Pentane	1	1	1
Toluene	1	3	3
Chlorinated Hydrocarbons	3	3	3
Javel Water	1	1	1

Straight Lengths



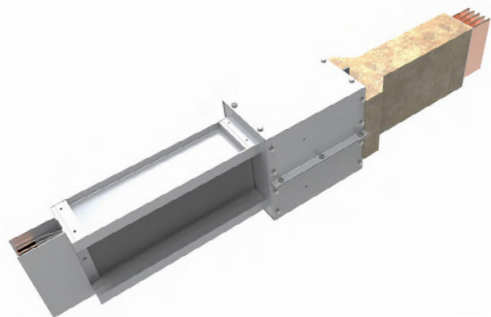
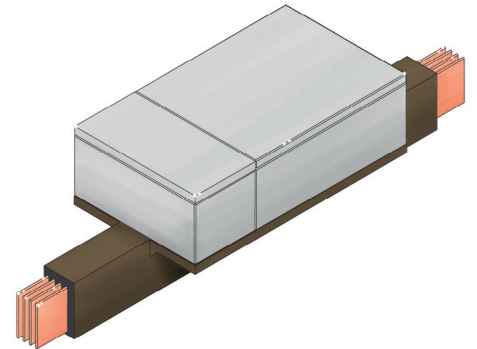
Feeder Length

Feeder lengths can be supplied at any length from 700mm - 4000mm.

Distribution Length

Tap off units are plugged into the busbar run along distribution lengths. There are two types of tap off units available:

- **Option A:** Glass reinforced polyester enclosure for standard IP68
- **Option B:** Stainless steel housing for IP68; flame retardant and resistant to extreme environmental conditions



Transition Kit

IP68 - IP55 transition kit is used to connect Cast Resin Powerbar directly to Vertiv's High Powerbar range.

Elbows

Flatwise and Edgewise Elbows

Flatwise and edgewise elbows are used to make 90° changes in the direction of the busbar system.

SS Length

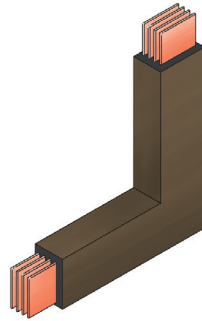
300mm - 1000mm

DS Length

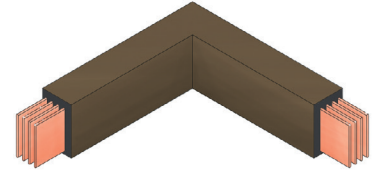
300mm - 1000mm

Total maximum length

2000mm



Flatwise Elbow



Edgewise Elbow

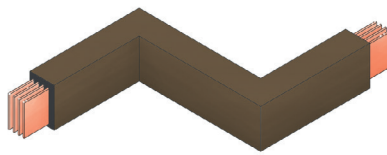
Offset Sections

An offset is used to avoid obstacles such as pipes or steel columns and to conform to the structure of the building.

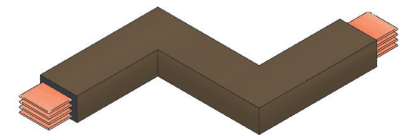
Length per leg

350mm - 500mm

Max offset - 600mm



Edgewise Offset



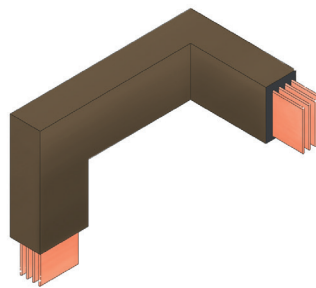
Flatwise Offset

Combination Elbows

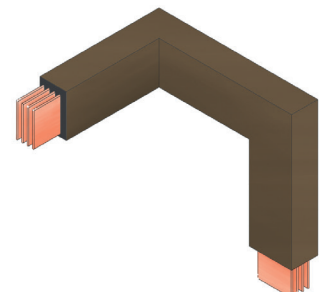
Combination elbows are used to conform to the building structure and to utilise a small amount of space to change direction.

Length per leg

350mm - 500mm



Edgewise Flatwise Offset

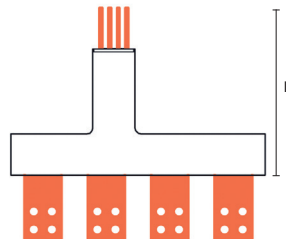


Flatwise Edgewise Offset

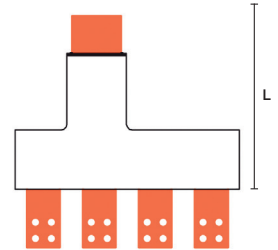
Flanges

Flange Connections

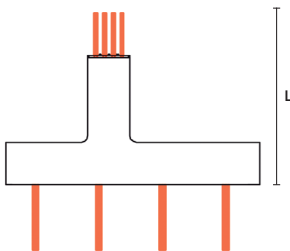
Flange connections provide a direct connection to low voltage switchgear, transformer enclosures and other electrical equipment.



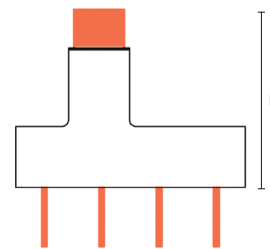
Panel Flange T2
L - 500mm - 1000mm



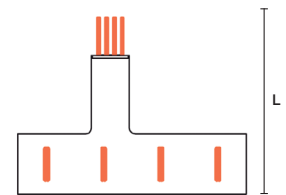
Panel Flange T3
L - 500mm - 1000mm



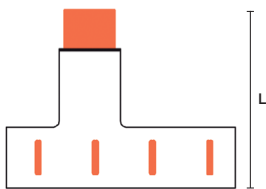
Panel Flange T4
L - 500mm - 1000mm



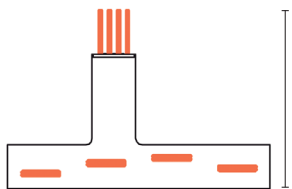
Panel Flange T5
L - 500mm - 1000mm



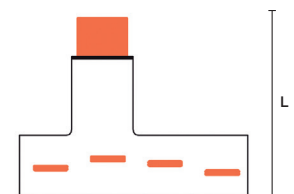
Panel Flange T6
L - 500mm - 1000mm



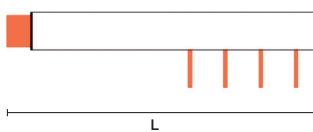
Panel Flange T7
L - 500mm - 1000mm



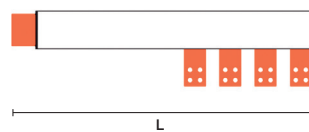
Panel Flange T8
L - 300mm - 1000mm



Panel Flange T9
L - 300mm - 1000mm



Panel Flange T10
L - 500mm - 1000mm



Panel Flange T11
L - 500mm - 1000mm



Panel Flange T12
L - 300mm - 1000mm

Specials

Flatwise Tee

Flatwise tees are used to split one busbar run into two runs going in different directions. This reduces the amount of space needed when supplying two different parts of a building.

SS length per leg

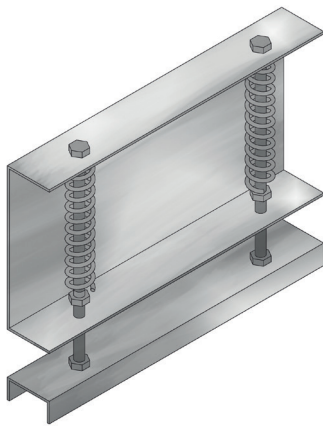
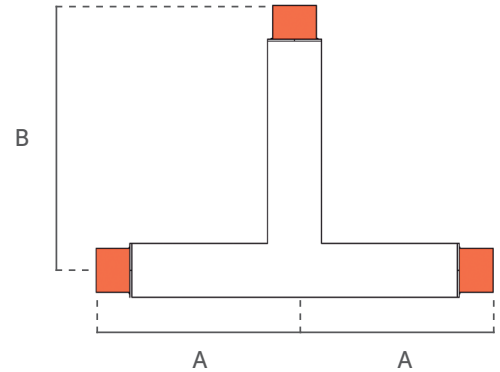
A 300mm - 1500mm

B 300mm - 1000mm

DS length per leg

A 500mm - 1500mm

B 500mm - 1500mm

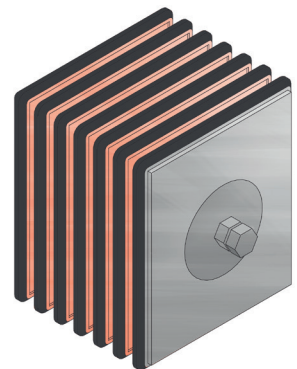


Spring Hanger

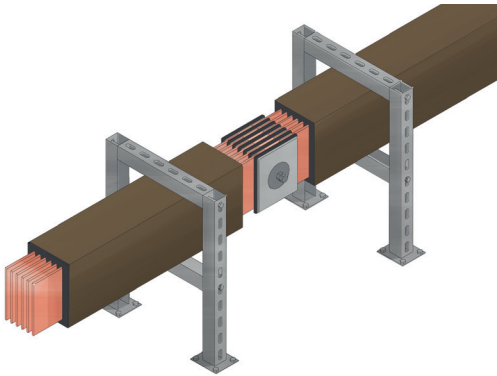
Spring hangers are used to support vertical busbar runs on each floor. They compensate for building movement and thermal expansion.

Joint Pack

The Powerbar joint pack is a compression joint design which utilises a specially designed Belleville washer to distribute the pressure evenly over the joint pack.

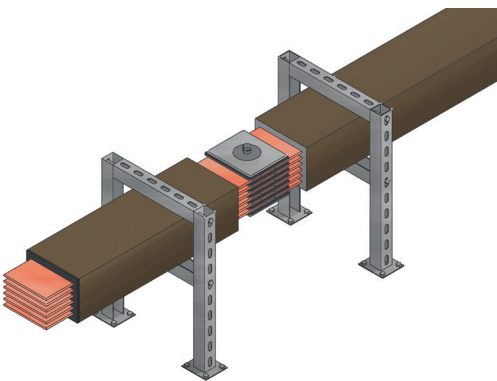


Installation



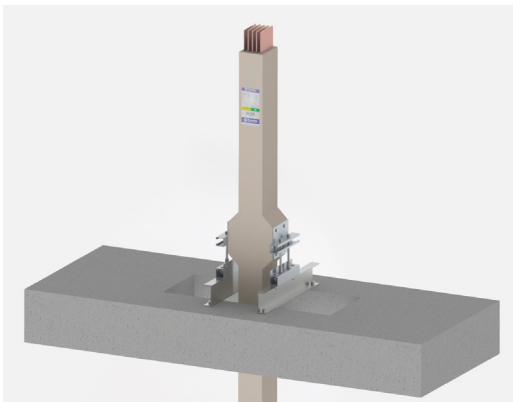
Edge Installation

Edge installation is the preferred method of installation for a smaller rated busbar system. It is also the main method used to install distribution busbar in building risers as tap off units can be connected easily.



Flat Installation

Flat installation is the preferred method of installation for a higher rated, multistack busbar system. When installed on its flat all busbar rating has a height of 140mm.



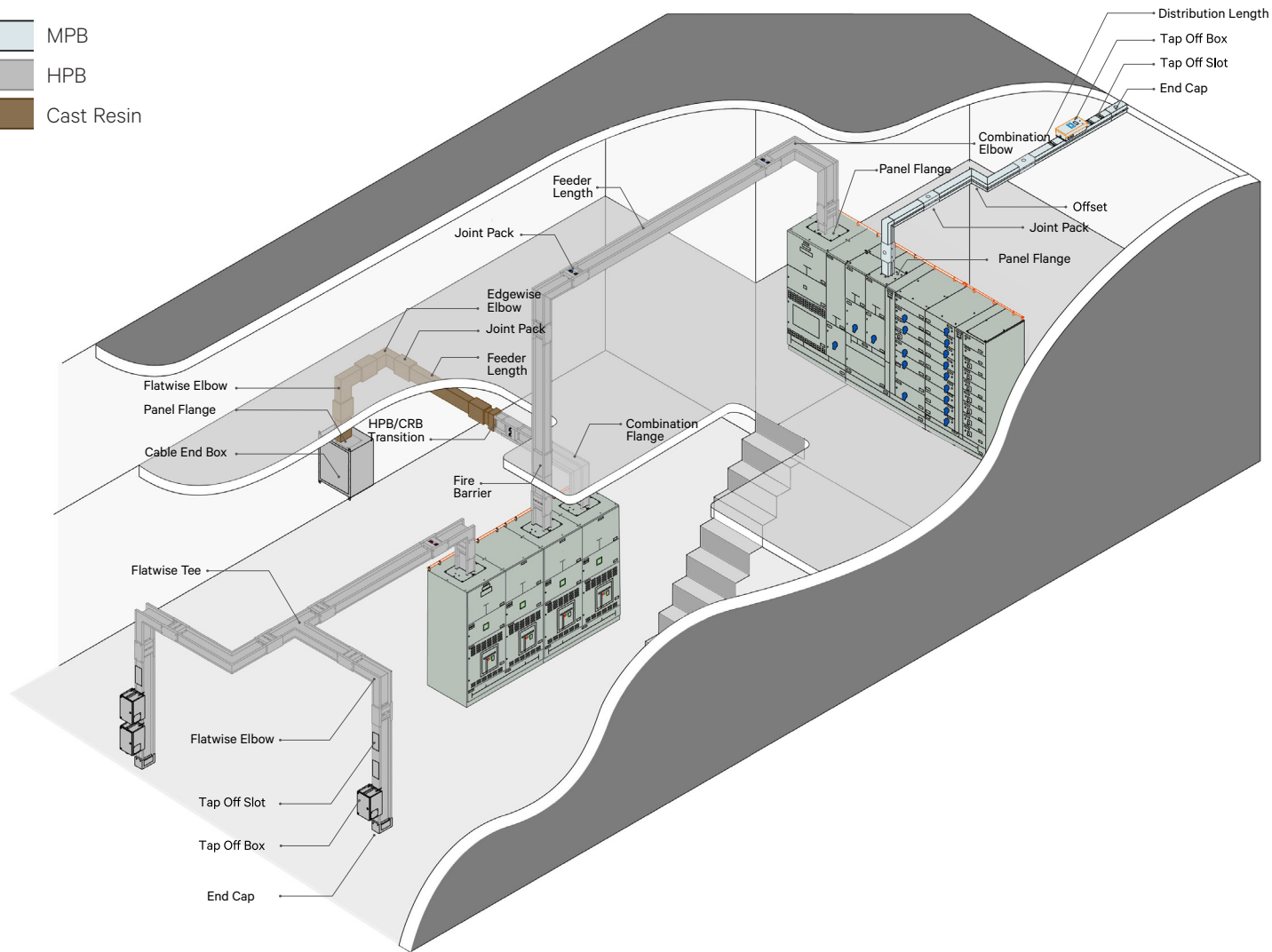
Vertical Installation

Vertical installation is the main method used to install distribution busbar in high-rise buildings. Tap off units can be connected easily and the busbar delivers to each floor.

Typical Installation

Key

	MPB
	HPB
	Cast Resin



Vertiv provides a complete power distribution solution.

The Vertiv™ Powerbar range includes the following products:

MPB - Medium Powerbar

Air insulated range covering 160 - 1250 Amps.

Cast Resin

IP68 rate polymer concrete product for use in extreme conditions covering 800 - 6300 Amps. Cast Resin can be directly connected to HPB through a special jointing system. All products are available with both copper and aluminium conductors.

HPB - High Powerbar

Sandwich construction range covering 800 - 6600 Amps.

Technical Data (Copper)

Rated Current (A)	800	1000	1250	1400	1600	2000	2500	3200	4000	5000	6300
Rated Operational Voltage (V)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Rated Insulation Voltage (V)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Short Circuit											
1 Second (kA rms)	36	40	50	50	65	65	65	100	100	100	120
Peak Value (kA)	74	84	105	105	143	143	143	220	220	220	264
Phase Conductor											
Cross Sectional Area (mm ²)	240	420	450	540	690	870	1080	1500	1800	2400	3000
Neutral Conductor											
Cross Sectional Area (mm ²)	240	420	450	540	690	870	1080	1500	1800	2400	3000
Isolated Earth Conductor											
100% Earth Cross Sectional Area (mm ²)	240	420	450	540	690	870	1080	1500	1800	2400	3000
50% Earth Cross Sectional Area (mm ²)	120	210	225	270	345	435	540	750	900	1200	1500
Overall Dimensions											
Height x Width of 4 Bar System (mm)	100x100	130x100	105x100	120x100	145x100	175x100	210x100	310x100	360x100	460x100	560x100
Weight											
Weight of 4 Bar System (kg/m)	30.9	42.9	37.5	43.6	53.6	65.7	79.7	115.3	135.4	175.6	215.8
Resistance											
Resistance (mΩ/m) at 20°C	0.048	0.052	0.040	0.033	0.026	0.020	0.016	0.012	0.010	0.007	0.006
Resistance (mΩ/m) at 80°C	0.060	0.064	0.050	0.041	0.032	0.025	0.020	0.015	0.012	0.009	0.007
Reactance											
Reactance (mΩ/m) at 50 Hz	0.051	0.047	0.045	0.040	0.033	0.027	0.021	0.016	0.014	0.011	0.009
Impedance											
Impedance (mΩ/m) at 80°C	0.079	0.080	0.067	0.057	0.046	0.037	0.029	0.022	0.018	0.014	0.011
Voltage Drop at Full Load 50Hz											
Power Factor = 0.7 (V/m) at 80°C	0.155	0.136	0.145	0.138	0.127	0.128	0.126	0.120	0.127	0.122	0.125
Power Factor = 0.8 (V/m) at 80°C	0.156	0.138	0.145	0.137	0.125	0.126	0.125	0.118	0.125	0.119	0.121
Power Factor = 0.9 (V/m) at 80°C	0.153	0.136	0.139	0.131	0.119	0.120	0.119	0.112	0.117	0.110	0.113
Power Factor = 1.0 (V/m) at 80°C	0.124	0.111	0.107	0.100	0.089	0.088	0.088	0.081	0.084	0.078	0.079
Voltage Drop Full Load 60Hz											
Power Factor = 0.7 (V/m) at 80°C	0.168	0.148	0.158	0.152	0.140	0.142	0.140	0.133	0.141	0.136	0.139
Power Factor = 0.8 (V/m) at 80°C	0.168	0.148	0.157	0.149	0.136	0.138	0.136	0.129	0.137	0.131	0.134
Power Factor = 0.9 (V/m) at 80°C	0.162	0.143	0.148	0.140	0.128	0.128	0.127	0.120	0.126	0.120	0.122
Power Factor = 1.0 (V/m) at 80°C	0.125	0.112	0.108	0.100	0.089	0.088	0.088	0.081	0.084	0.079	0.079

Technical Data (Aluminium)

Rated Current (A)	1000	1250	1400	1600	2000	2500	3200	4000	5000
Rated Operational Voltage (V)	1000	1000	1000	1000	1000	1000	1000	1000	1000
Rated Insulation Voltage (V)	1000	1000	1000	1000	1000	1000	1000	1000	1000
Short Circuit									
1 Second (kA rms)	25	36	36	50	65	80	80	100	100
Peak Value (kA)	52.5	75.6	75.6	105	143	176	176	220	220
Phase Conductor									
Cross Sectional Area (mm ²)	480	600	720	900	1200	1440	1920	2880	3360
Neutral Conductor									
Cross Sectional Area (mm ²)	480	600	720	900	1200	1440	1920	2880	3360
Isolated Earth Conductor									
100% Earth Cross Sectional Area (mm ²)	480	600	720	900	1200	1440	1920	2880	3360
50% Earth Cross Sectional Area (mm ²)	240	300	360	450	600	720	960	1440	1680
Overall Dimensions									
Height x Width of 4 Bar System (mm)	110x100	130x100	150x100	180x100	230x100	300x100	380x100	540x100	620x100
Weight									
Weight of 4 Bar System (kg/m)	27.6	32.6	37.7	45.2	57.8	75.3	95.5	135.8	156.0
Resistance									
Resistance (mΩ/m) at 20°C	0.066	0.053	0.025	0.020	0.015	0.013	0.01	0.006	0.005
Resistance (mΩ/m) at 80°C	0.082	0.065	0.054	0.043	0.032	0.027	0.021	0.014	0.012
Reactance									
Reactance (mΩ/m) at 50 Hz	0.044	0.037	0.032	0.026	0.021	0.017	0.013	0.009	0.008
Impedance									
Impedance (mΩ/m) at 80°C	0.093	0.075	0.063	0.051	0.030	0.032	0.025	0.017	0.014
Voltage Drop at Full Load 50Hz									
Power Factor = 0.7 (V/m) at 80°C	0.153	0.156	0.148	0.136	0.130	0.135	0.132	0.113	0.121
Power Factor = 0.8 (V/m) at 80°C	0.158	0.161	0.152	0.140	0.134	0.138	0.136	0.115	0.123
Power Factor = 0.9 (V/m) at 80°C	0.162	0.162	0.152	0.140	0.133	0.138	0.135	0.113	0.122
Power Factor = 1.0 (V/m) at 80°C	0.141	0.141	0.132	0.120	0.112	0.117	0.113	0.095	0.101
Voltage Drop Full Load 60Hz									
Power Factor = 0.7 (V/m) at 80°C	0.164	0.167	0.159	0.147	0.141	0.145	0.143	0.122	0.131
Power Factor = 0.8 (V/m) at 80°C	0.168	0.171	0.161	0.149	0.143	0.147	0.145	0.122	0.132
Power Factor = 0.9 (V/m) at 80°C	0.167	0.169	0.159	0.147	0.140	0.144	0.141	0.119	0.128
Power Factor = 1.0 (V/m) at 80°C	0.142	0.142	0.132	0.121	0.113	0.118	0.114	0.095	0.101

BIM Library

Vertiv is committed to supporting our clients by providing direct access to our comprehensive BIM library.

Architects, contractors, engineering consultants and others are able to directly place specific items into a 3D BIM environment to produce accurate and efficient plans, containment drawings and bills of quantities to form a fully integrated overall project.

Vertiv provides high quality digitized data, available in a range of formats. Our intelligent BIM libraries are maintained and updated to reflect any changes in the products.

Log on to access the library

bim.vertiv.com

Quick Reference Guide

Critical Dimensions

- The distance from the centre of a joint to the wall, ceiling or floor must be at least 190mm.
- There must be a minimum distance of 200mm between the busbar and any wall/ceiling/ other busbar.
- Allow adequate space for tap off units to be installed easily and safely.
- Busbar lengths are available from 500mm - 4000mm.
- Distribution busbar lengths are available from 500mm - 4000mm.
- Edgewise elbow sections are available with leg lengths from 300mm - 1000mm. The total maximum length is 2000mm.
- Flatwise elbow sections are available with a maximum leg length of 1000mm. The minimum leg length is 300mm for a single stack busbar and 500mm for a double stack busbar. The total maximum length is 2000mm.

Operating Conditions

- Ambient temperature from -40°C to +40°C. Up to 55°C available on request.
- Relative humidity of 100% or below.
- This product designed for both indoor and outdoor use.

Critical Details

- Busbar drawings must include all relevant dimensions. Centre-line dimensions are expected. Please highlight any dimensions that are not centre-line.
- Walls and floors must be indicated and the relevant dimensions provided.
- The phasing and location of all switchboards must be provided.
- Full details are required for any transformer connections.
- Horizontal busbar must be installed with the neutral phase to the top. Please indicate the phase orientation for vertically installed busbar.

