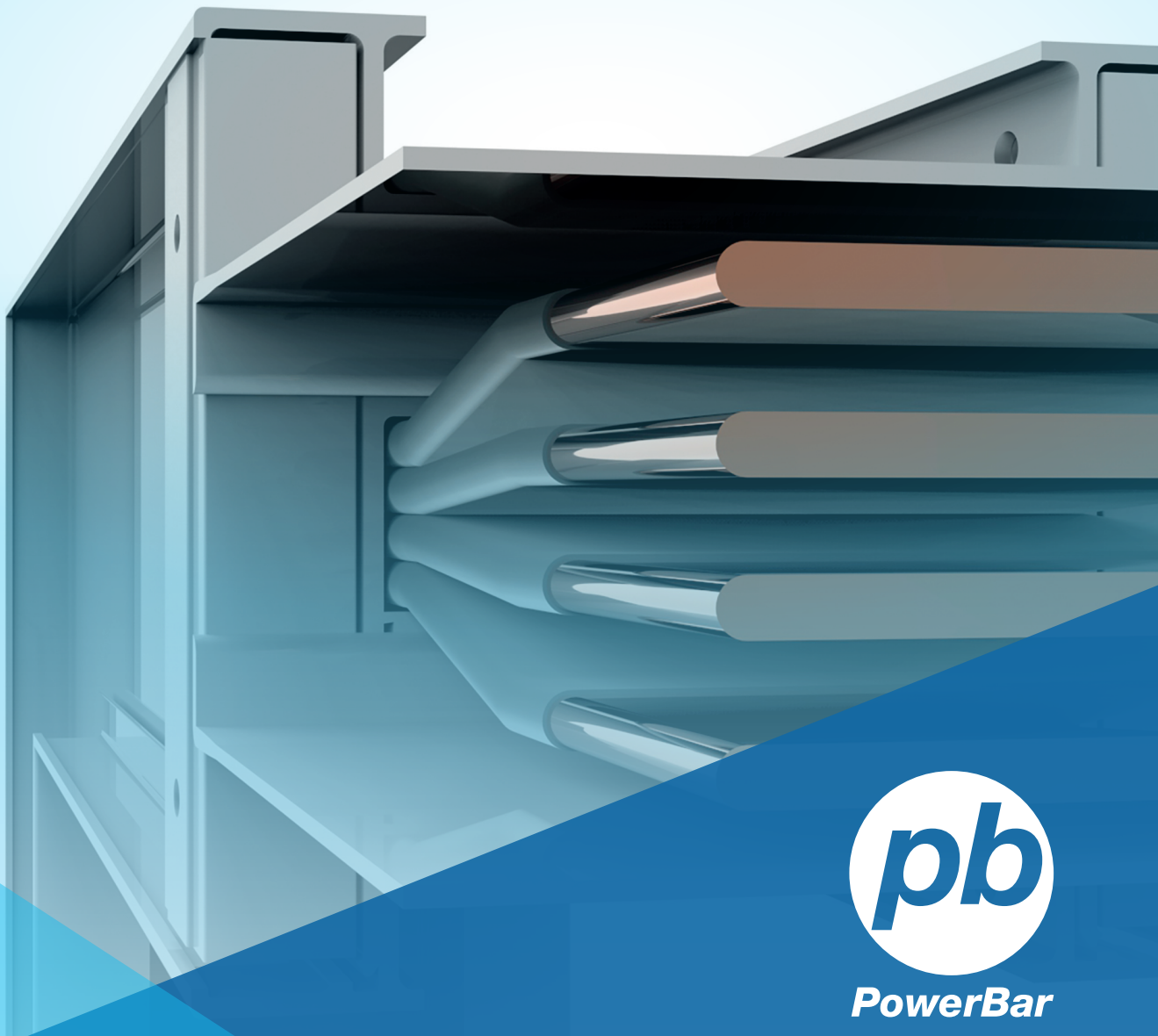




E+I ENGINEERING GROUP

# HIGH POWERBAR

COPPER



**PowerBar**

**E+I Engineering's High Powerbar (HPB) is a 1000 Volt totally encased, non-ventilated, low impedance busbar. The range is available from 630A - 6600A with multiple bar configurations to suit project requirements.**

The busbar is housed in an aluminium casing which acts as an earth. Ingress protection ratings are available from IP55 - IP67.

**Features:**

- Copper conductor, with tin or silver coated finish
- Joint pack construction with double headed shear nuts for quick installation
- Up to 5 tap off points per 3m length
- All tap offs have mechanical/electrical interlocks with an 'earth first, break last' safety feature
- Pressed out tags for tap off connections

# STANDARDS

## Standards

The HPB 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.

## Type Tests

- 10.2.2 Resistance to Corrosion
- 10.2.3.2 Resistance to Abnormal Heat and Fire Due to Internal Electric Effects
- 10.2.4 Resistance to Ultraviolet (UV) Radiation
- 10.2.5 Lifting
- 10.2.6 Mechanical Impact Test
- 10.2.7 Marking
- 10.2.101 Ability to Withstand Heavy Mechanical Loads
- 10.2.102 Thermal Cycling Test
- 10.3 Degree of Protection of Enclosures
- 10.4 Clearances and

- Creepage Distances
- 10.5.2 Effective Continuity Between the Exposed Conductive Parts of the BTS and Protective Circuit
- 10.5.3 Effectiveness of the Assembly for External Faults
- 10.9.2 Power Frequency Withstand Voltage
- 10.9.3 Impulse Withstand Voltage
- 10.10 Temperature Rise Limits (Indoor Horizontal & Vertical Installation Type Tested)
- 10.11 Short Circuit Withstand Strength
- 10.13 Mechanical Operation
- 10.101 Resistance to Flame Propagation
- 10.102 Fire Resistance in Building Penetration as per ISO-834

## ASTA Certificates

E+I Engineering have completed extensive testing at ASTA and KEMA accredited laboratories to ensure the products supplied meet the international requirements.

## ASTA Diamond Licence No. 1191

The ASTA Diamond Mark is a symbol of electrical safety. It provides evidence for customers and authorities that Intertek has independently tested and certified the product's compliance to applicable safety standards.

## UL Classified

E+I Engineering completed extensive testing at UL accredited laboratories to ensure the products supplied meet UL requirements.

## Seismic Compliance

The HPB Product range (630A - 6600A) has a qualification level - high (Zone-4&5) in accordance to IEEE standard 693-2005.60068-2-3 (Damp Heat Cyclic).

All certificates available on request



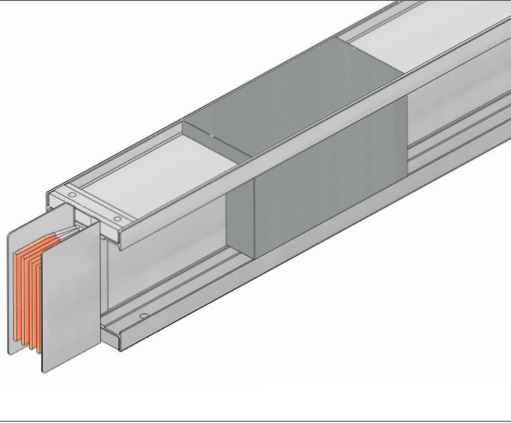
Health and Safety  
ISO 45001:2018  
No. 0087570

Quality Management  
ISO 9001:2015  
No.18346

Environmental Management  
ISO 14001:2015  
No. 18347

# TECHNICAL FEATURES

- High Powerbar is constructed from high density 99.99% conductivity copper
- The conductors are insulated with a Class B or Class F epoxy insulation applied uniformly using an electrostatic coating process. The epoxy coating is non-hygroscopic and chemical resistant with outstanding heat transfer characteristics
- The low impedance sandwich design:
  - Improves heat dissipation
  - Improves short circuit rating
  - Reduces voltage drop/ impedance
  - Removes potential pathways for flame, smoke and gas
- E+I Engineering’s patented process of pressed out tabs to connect tap off units protects the integrity of the conductor
- HPB is constructed with an all-aluminium housing. Aluminium is an extremely light metal and is cheaper and easier to install than steel. Aluminium is much less reactive than steel so it is more durable and easier to maintain.
- Powerbar offers a 50% or 100% fully isolated earth for systems where earth isolation is required.
- A fully rated 200% neutral option is available for busbar systems with non-linear loads. The additional neutral capacity prevents overloading caused by zero sequence harmonic currents
- Powerbar offer a fully certified fire wall penetration barrier for either a four hour or two hour rating



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

**Note:** Case refers to the aluminium casing being used as an earth.



# STRAIGHT LENGTHS

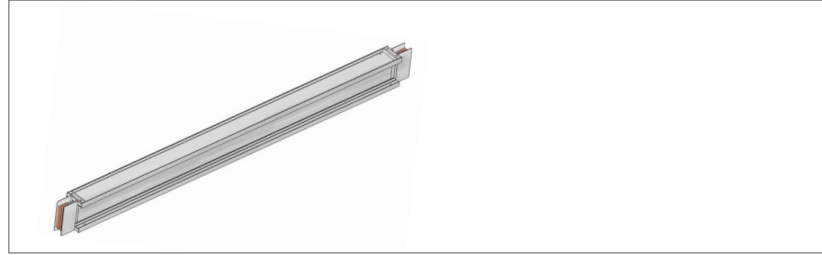
## Straight Lengths

Straight lengths can be supplied at any length from 600mm - 4000mm.

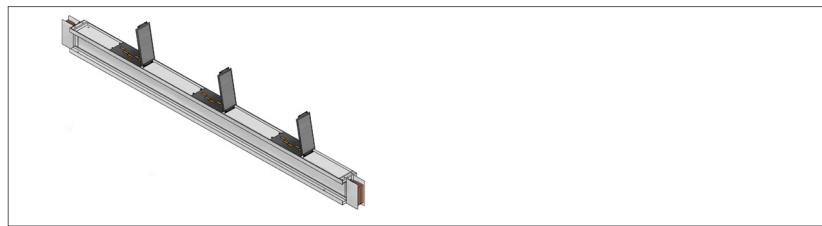
The tap off slot outlet and cover are made from a durable, high strength, Class B, 130°C or Class F, 155°C insulation material.

The tap off slot cover prevents access to the contacts behind the cover and protects it from the entry of dirt, dust or moisture.

Tap off units are IP55 as standard.



Feeder lengths account for the bulk of a busbar run



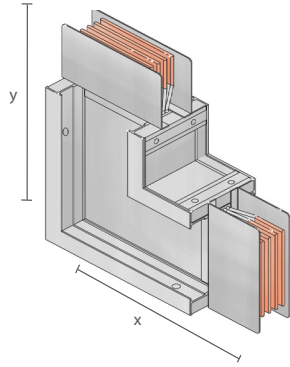
Distribution lengths allow tap off units to be plugged into the busbar run

## The different types of build arrangement depending on rating of the required busbar

Busbar Rating (Amps)	Construction Type	Busbar Size (mm)	
		Height	Width
630A	Single	85mm	148mm
800A	Single	95mm	148mm
1000A	Single	105mm	148mm
1250A	Single	120mm	148mm
1400A	Single	130mm	148mm
1500A	Single	135mm	148mm
1600A	Single	150mm	148mm
1750A	Single	170mm	148mm
2000A	Single	185mm	148mm
2000A	Double	243mm	148mm
2250A	Single	200mm	148mm
2500A	Single	210mm	148mm
2500A	Double	273mm	148mm
3000A	Single	260mm	148mm
3200A	Single	290mm	148mm
3200A	Double	323mm	148mm
3500A	Double	343mm	148mm
3750A	Double	363mm	148mm
4000A	Double	393mm	148mm
4500A	Double	423mm	148mm
4850A	Double	443mm	148mm
5000A	Double	463mm	148mm
5500A	Double	493mm	148mm
6600A	Double	603mm	148mm

**Note:** The maximum and minimum sizes recommended are not the limits of what can be produced, but a guideline to help you choose the correct product. Dimensions are taken from the centre of the joint.

# ELBOWS



Flatwise Elbows

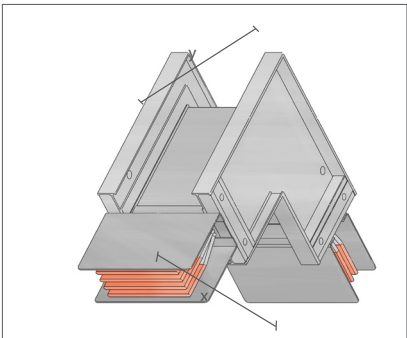
### Flatwise and Edgewise Elbows

Flatwise and edgewise elbows are used to make 90° changes in the direction of the busbar system. E+I Engineering can also manufacture specially angled elbows for both flatwise and edgewise products.

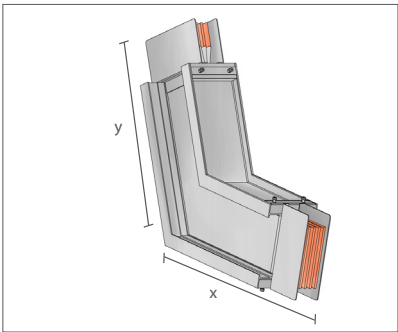
### Flatwise Elbow (Up or Down)

Ratings (Amps)	Minimum Leg Size		Standard Leg Size		Maximum Leg Size	
	X	Y	X	Y	X	Y
630A	226mm	226mm	350mm	350mm	750mm	750mm
800A	231mm	231mm	350mm	350mm	750mm	750mm
1000A	236mm	236mm	350mm	350mm	750mm	750mm
1250A	244mm	244mm	350mm	350mm	750mm	750mm
1400A	249mm	249mm	350mm	350mm	750mm	750mm
1500A	251mm	251mm	350mm	350mm	750mm	750mm
1600A	259mm	259mm	350mm	350mm	750mm	750mm
1750A	269mm	269mm	350mm	350mm	750mm	750mm
2000A	276mm	276mm	350mm	350mm	750mm	750mm
2000A	305mm	305mm	500mm	500mm	750mm	750mm
2250A	284mm	284mm	350mm	350mm	750mm	750mm
2500A	289mm	289mm	350mm	350mm	750mm	750mm
2500A	320mm	320mm	500mm	500mm	750mm	750mm
3000A	314mm	314mm	350mm	350mm	750mm	750mm
3200A	329mm	329mm	350mm	350mm	750mm	750mm
3200A	345mm	345mm	500mm	500mm	750mm	750mm
3500A	355mm	355mm	500mm	500mm	750mm	750mm
3750A	365mm	365mm	500mm	500mm	750mm	750mm
4000A	380mm	380mm	500mm	500mm	750mm	750mm
4500A	395mm	395mm	500mm	500mm	750mm	750mm
4850A	405mm	405mm	500mm	500mm	750mm	750mm
5000A	415mm	415mm	500mm	500mm	750mm	750mm
5500A	430mm	430mm	500mm	500mm	750mm	750mm
6600A	485mm	485mm	500mm	500mm	750mm	750mm

# ELBOWS



Edgewise Elbows

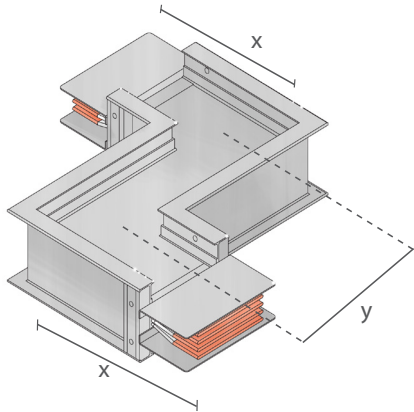


Custom Elbows

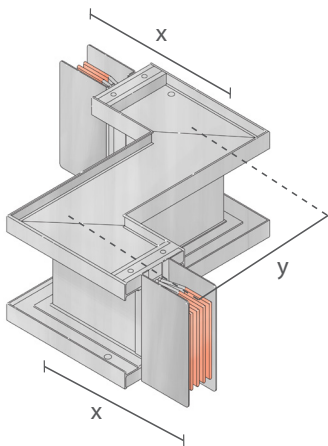
## Edgewise Elbow (Left or Right)

Ratings (Amps)	Minimum Leg Size		Standard Leg Size		Maximum Leg Size	
	X	Y	X	Y	X	Y
630A	257mm	257mm	350mm	350mm	600mm	600mm
800A	257mm	257mm	350mm	350mm	600mm	600mm
1000A	257mm	257mm	350mm	350mm	600mm	600mm
1250A	257mm	257mm	350mm	350mm	600mm	600mm
1400A	257mm	257mm	350mm	350mm	600mm	600mm
1500A	257mm	257mm	350mm	350mm	600mm	600mm
1600A	257mm	257mm	350mm	350mm	600mm	600mm
1750A	257mm	257mm	350mm	350mm	600mm	600mm
2000A	257mm	257mm	350mm	350mm	600mm	600mm
2000A	257mm	257mm	350mm	350mm	600mm	600mm
2250A	257mm	257mm	350mm	350mm	600mm	600mm
2500A	257mm	257mm	350mm	350mm	600mm	600mm
2500A	257mm	257mm	350mm	350mm	600mm	600mm
3000A	257mm	257mm	350mm	350mm	600mm	600mm
3200A	257mm	257mm	350mm	350mm	600mm	600mm
3200A	257mm	257mm	350mm	350mm	600mm	600mm
3500A	257mm	257mm	350mm	350mm	600mm	600mm
3750A	257mm	257mm	350mm	350mm	600mm	600mm
4000A	257mm	257mm	350mm	350mm	600mm	600mm
4500A	257mm	257mm	350mm	350mm	600mm	600mm
4850A	257mm	257mm	350mm	350mm	600mm	600mm
5000A	257mm	257mm	350mm	350mm	600mm	600mm
5500A	257mm	257mm	350mm	350mm	600mm	600mm
6600A	257mm	257mm	350mm	350mm	600mm	600mm

# OFFSETS



**Flatwise Offset**



**Edgewise Offset**

### Offset Sections

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

### Flatwise Offset (Up or Down)

Ratings (Amps)	Minimum Leg Size		Maximum Leg Size	
	X	Y	X	Y
630A	226mm	50mm	650mm	453mm
800A	231mm	50mm	650mm	463mm
1000A	236mm	50mm	650mm	473mm
1250A	244mm	50mm	650mm	488mm
1400A	249mm	50mm	650mm	498mm
1500A	251mm	50mm	650mm	503mm
1600A	259mm	50mm	650mm	518mm
1750A	269mm	50mm	650mm	538mm
2000A	276mm	50mm	650mm	553mm
2000A	305mm	50mm	650mm	611mm
2250A	284mm	50mm	650mm	568mm
2500A	289mm	50mm	650mm	578mm
2500A	320mm	50mm	650mm	641mm
3000A	314mm	50mm	650mm	628mm
3200A	329mm	50mm	650mm	658mm
3200A	345mm	50mm	650mm	691mm
3500A	355mm	50mm	650mm	711mm
3750A	365mm	50mm	650mm	731mm
4000A	380mm	50mm	650mm	761mm
4500A	395mm	50mm	650mm	791mm
4850A	405mm	50mm	650mm	811mm
5000A	415mm	50mm	650mm	831mm
5500A	430mm	50mm	650mm	861mm
6600A	485mm	50mm	650mm	971mm

### Edgewise Offset (Left or Right)

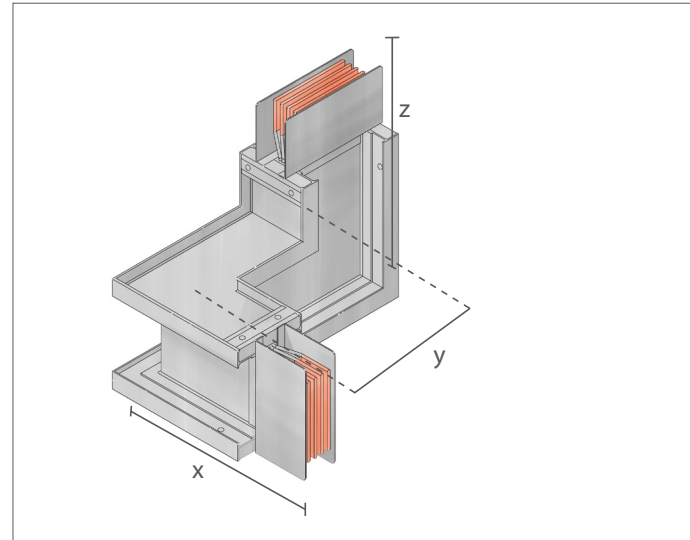
Ratings (Amps)	Minimum Leg Size		Maximum Leg Size	
	X	Y	X	Y
630A, 800A, 1000A, 1250A, 1400A, 1500A, 1600A, 1750A, 2000A, 2000A, 2250A, 2500A, 2500A, 3000A, 3200A, 3200A, 3500A, 3750A, 4000A, 4500A, 4850A, 5000A, 5500A, 6600A	257mm	80mm	600mm	513mm

# COMBINATIONS

## Combination Elbows

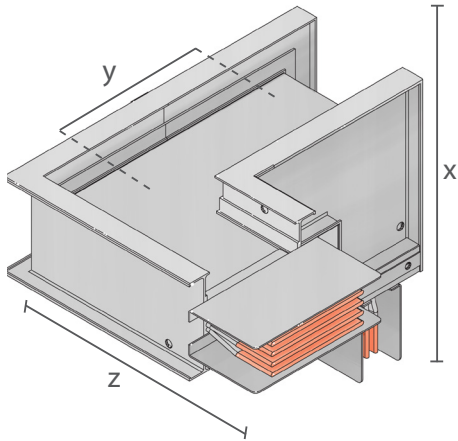
Combination elbows are used to conform to the building's structure and to change the direction of the busbar within a confined space.

Ratings (Amps)	Minimum Leg Size		
	X (Edgewise side)	Y	Z (Flatwise side)
630A	257mm	168mm	226mm
800A	257mm	173mm	231mm
1000A	257mm	178mm	236mm
1250A	257mm	186mm	244mm
1400A	257mm	191mm	249mm
1500A	257mm	193mm	251mm
1600A	257mm	201mm	259mm
1750A	257mm	211mm	269mm
2000A	257mm	218mm	276mm
2000A	257mm	247mm	305mm
2250A	257mm	226mm	284mm
2500A	257mm	231mm	289mm
2500A	257mm	262mm	320mm
3000A	257mm	256mm	314mm
3200A	257mm	271mm	329mm
3200A	257mm	287mm	345mm
3500A	257mm	297mm	355mm
3750A	257mm	307mm	365mm
4000A	257mm	322mm	380mm
4500A	257mm	337mm	395mm
4850A	257mm	347mm	405mm
5000A	257mm	357mm	415mm
5500A	257mm	372mm	430mm
6600A	257mm	427mm	485mm



Edge Right Flatwise Up

# COMBINATIONS



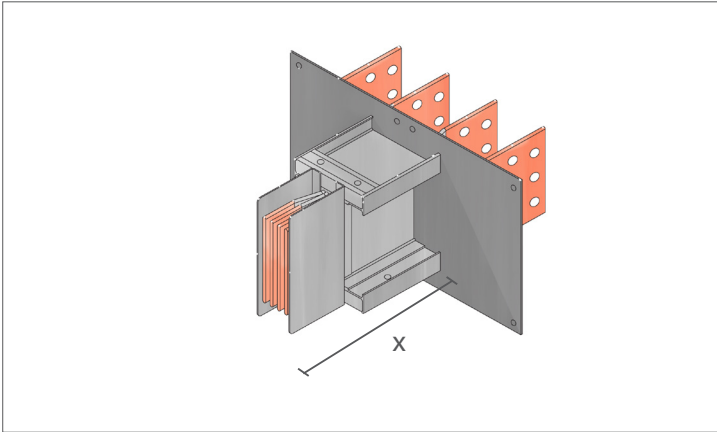
Flatwise Up Edgewise Right

Rating (Amps)	Maximum Leg size		
	X (Edgewise Side)	Y	Z (Flatwise side)
630A	600mm	482mm	750mm
800A	600mm	487mm	750mm
1000A	600mm	492mm	750mm
1250A	600mm	500mm	750mm
1400A	600mm	505mm	750mm
1500A	600mm	507mm	750mm
1600A	600mm	515mm	750mm
1750A	600mm	525mm	750mm
2000A	600mm	532mm	750mm
2000A	600mm	561mm	750mm
2250A	600mm	540mm	750mm
2500A	600mm	545mm	750mm
2500A	600mm	576mm	750mm
3000A	600mm	570mm	750mm
3200A	600mm	585mm	750mm
3200A	600mm	601mm	750mm
3500A	600mm	611mm	750mm
3750A	600mm	621mm	750mm
4000A	600mm	636mm	750mm
4500A	600mm	651mm	750mm
4850A	600mm	661mm	750mm
5000A	600mm	671mm	750mm
5500A	600mm	686mm	750mm
6600A	600mm	741mm	750mm

# FLANGES

## Flange Connections

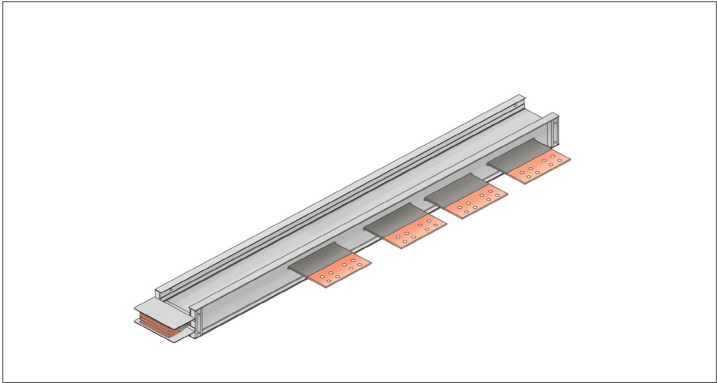
Flange connections provide a direct connection to low voltage switchgear, transformer enclosures and other electrical equipment. Standard flanges can be offset to the left or right of the section as required.



Panel Flange

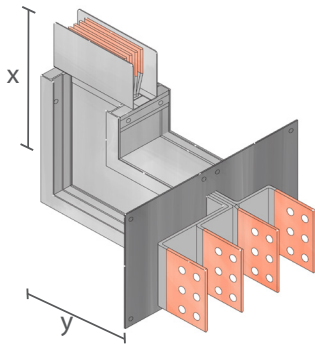
## Panel Flange

Ratings (Amps)	Minimum Leg Size	
	X	Y
630A, 800A, 1000A, 1250A, 1400A, 1500A, 1600A, 1750A, 2000A, 2000A, 2250A, 2500A, 2500A, 3000A, 3200A, 3200A, 3500A, 3750A, 4000A, 4500A, 4850A, 5000A, 5500A, 6600A	220mm	840mm



Parallel Flange

# FLANGES



**Flatwise Elbow Flange**

### Combination Flange

A combination flange is used when the minimum leg lengths for either the standard elbow or the standard flange cannot be met.

### Flange/Elbows (Flatwise)

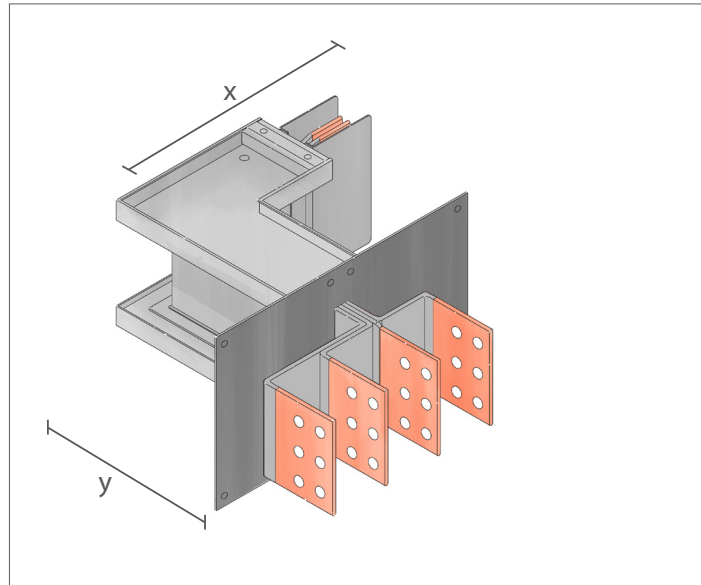
Ratings (Amps)	Minimum Leg Size		Maximum Leg Size	
	X	Y	X	Y
630A	226mm	94mm	750mm	466mm
800A	231mm	99mm	750mm	471mm
1000A	236mm	104mm	750mm	476mm
1250A	244mm	112mm	750mm	484mm
1400A	249mm	117mm	750mm	489mm
1500A	251mm	119mm	750mm	491mm
1600A	259mm	127mm	750mm	499mm
1750A	269mm	137mm	750mm	509mm
2000A	276mm	144mm	750mm	516mm
2000A	305mm	173mm	750mm	545mm
2250A	284mm	152mm	750mm	524mm
2500A	289mm	157mm	750mm	529mm
2500A	320mm	188mm	750mm	560mm
3000A	314mm	182mm	750mm	554mm
3200A	329mm	197mm	750mm	569mm
3200A	345mm	213mm	750mm	585mm
3500A	355mm	223mm	750mm	595mm
3750A	365mm	233mm	750mm	605mm
4000A	380mm	248mm	750mm	620mm
4500A	395mm	263mm	750mm	635mm
4850A	405mm	273mm	750mm	645mm
5000A	415mm	283mm	750mm	655mm
5500A	430mm	298mm	750mm	670mm
6600A	485mm	353mm	750mm	725mm



# FLANGES

## Flange/Elbows (Edgewise)

Ratings (Amps)	Minimum Leg Size		Maximum Leg Size	
	X	Y	X	Y
630A, 800A, 1000A, 1250A, 1400A, 1500A, 1600A, 1750A, 2000A, 2000A, 2250A, 2500A, 2500A, 3000A, 3200A, 3200A, 3500A, 3750A, 4000A, 4500A, 4850A, 5000A, 5500A, 6600A	257mm	124mm	600mm	495mm

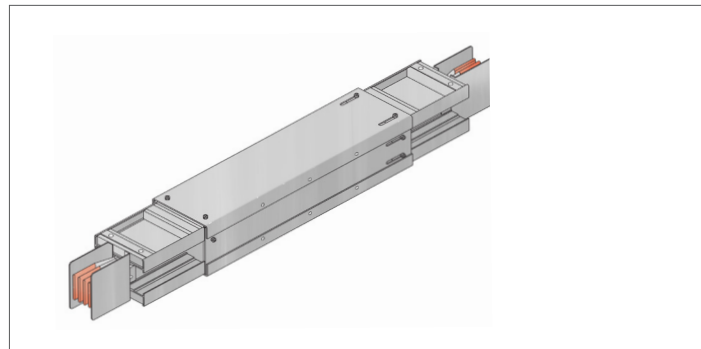


**Edgewise Elbow Flange**

## Expansion Units

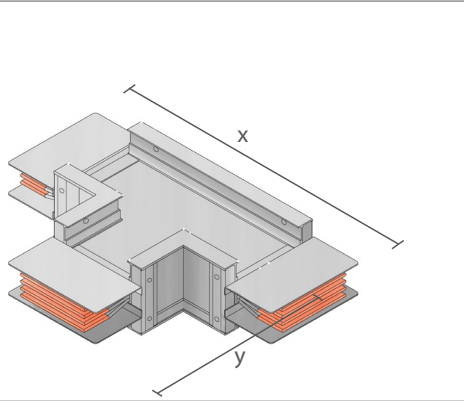
Expansion units are used to accommodate the expansion and contraction of a busbar system as well as allow for building movement. They allow for a 40mm movement along the length of the busbar.

Expansion units are recommended when a straight busbar run exceeds 60m.



**Expansion Unit**

# SPECIALS



Flatwise Tee

### Flatwise Tee

Flatwise tee's are used to split one busbar run into two runs going in different directions.

### Flatwise Tee

Ratings (Amps)	Minimum Leg Size		Standard Leg Size		Maximum Leg Size	
	X	Y	X	Y	X	Y
630A	453mm	226mm	700mm	350mm	1500mm	650mm
800A	463mm	231mm	700mm	350mm	1500mm	650mm
1000A	473mm	236mm	700mm	350mm	1500mm	650mm
1250A	488mm	244mm	700mm	350mm	1500mm	650mm
1400A	498mm	249mm	700mm	350mm	1500mm	650mm
1500A	503mm	251mm	700mm	350mm	1500mm	650mm
1600A	518mm	259mm	700mm	350mm	1500mm	650mm
1750A	538mm	269mm	700mm	350mm	1500mm	650mm
2000A	553mm	276mm	700mm	350mm	1500mm	650mm
2000A	611mm	305mm	1000mm	500mm	1500mm	650mm
2250A	568mm	284mm	700mm	350mm	1500mm	650mm
2500A	578mm	289mm	700mm	350mm	1500mm	650mm
2500A	641mm	320mm	1000mm	500mm	1500mm	650mm
3000A	628mm	314mm	700mm	350mm	1500mm	650mm
3200A	658mm	329mm	700mm	350mm	1500mm	650mm
3200A	691mm	345mm	1000mm	500mm	1500mm	650mm
3500A	711mm	355mm	1000mm	500mm	1500mm	650mm
3750A	731mm	365mm	1000mm	500mm	1500mm	650mm
4000A	761mm	380mm	1000mm	500mm	1500mm	650mm
4500A	791mm	395mm	1000mm	500mm	1500mm	650mm
4850A	811mm	405mm	1000mm	500mm	1500mm	650mm
5000A	831mm	415mm	1000mm	500mm	1500mm	650mm
5500A	861mm	430mm	1000mm	500mm	1500mm	650mm
6600A	971mm	485mm	1000mm	500mm	1500mm	650mm

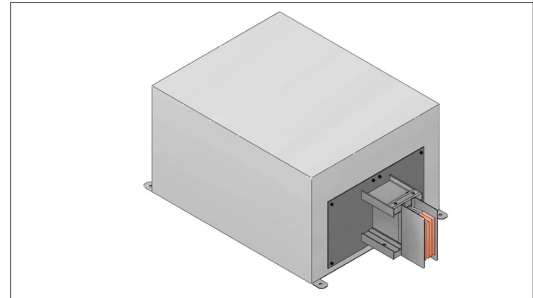
# FEED UNITS & CAPS

## Cable Feed Units

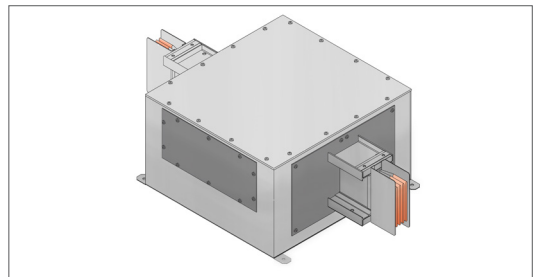
End feed units are used on the ends of busbar risers which are cable fed. Centre feed units are used in the middle of busbar risers which are cable fed.

The size of cable feed required depends on a number of factors:

- rating of busbar
- size of cable
- number of cables
- use of a protective device or isolator



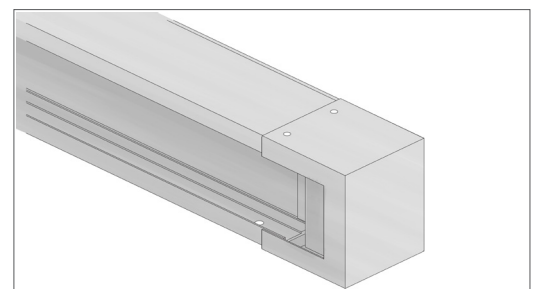
End Feed Units



Centre Feed Units

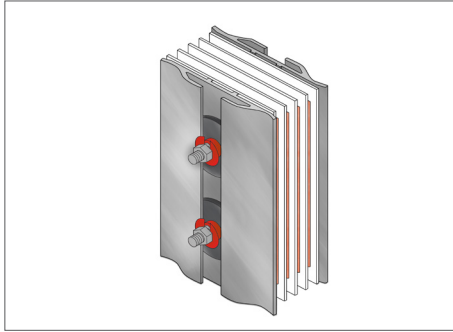
## End Caps

End caps are used to safely cap off the end of a busbar run. The end cap units are factory fitted but can be easily removed to allow for the extension of the system.



End Caps

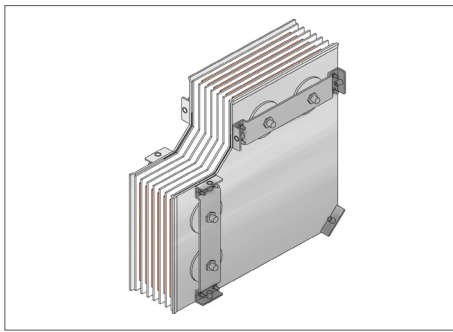
# JOINT PACKS



**Joint Packs**

## Joint Packs

The joint pack is a compression joint design utilising a specially designed Belleville washer to distribute the pressure evenly over the joint pack. The joint pack is supplied in specific sizes depending on the rating of busbar required.



**Flatwise Elbow Joint Packs**

## Flatwise Elbow Joint Packs

Flatwise elbow joint packs can be used to make 90° changes in the direction of the busbar system.

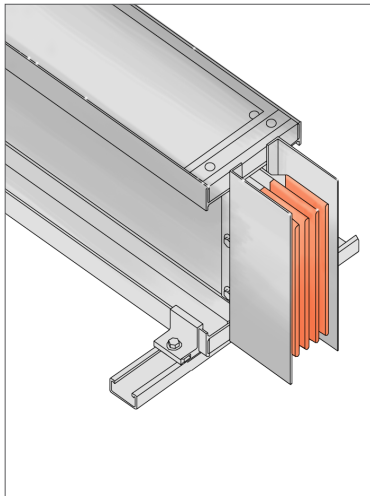
# INSTALLATION

The modular design of HPB allows it to be installed flat or on its edge. The installation is determined by:

- Busbar route
- Type of installation
- Available space
- Size of busbar

## Edge Installation

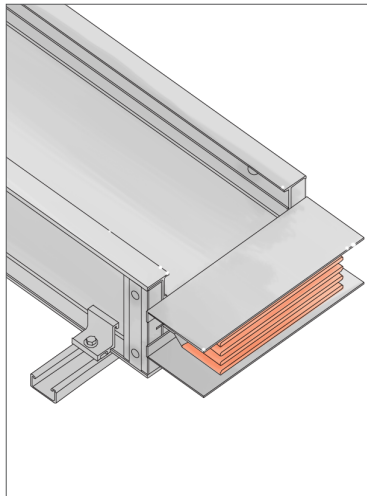
Edge installation is the preferred method of installation for a smaller rated busbar system.



Edge Installation

## Flat Installation

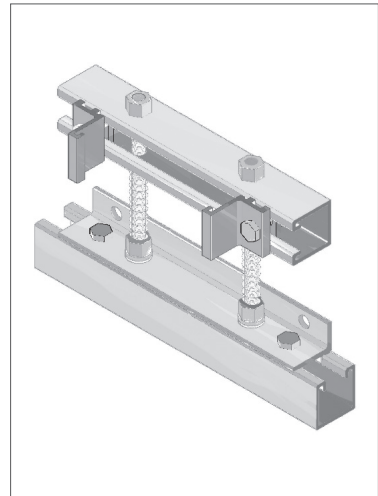
Flat installation is the preferred method of installation for a higher rated, multistack busbar system. When installed on its flat all busbar rating has a height of 148mm.



Flat Installation

## Spring Hanger

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






Spring Hanger

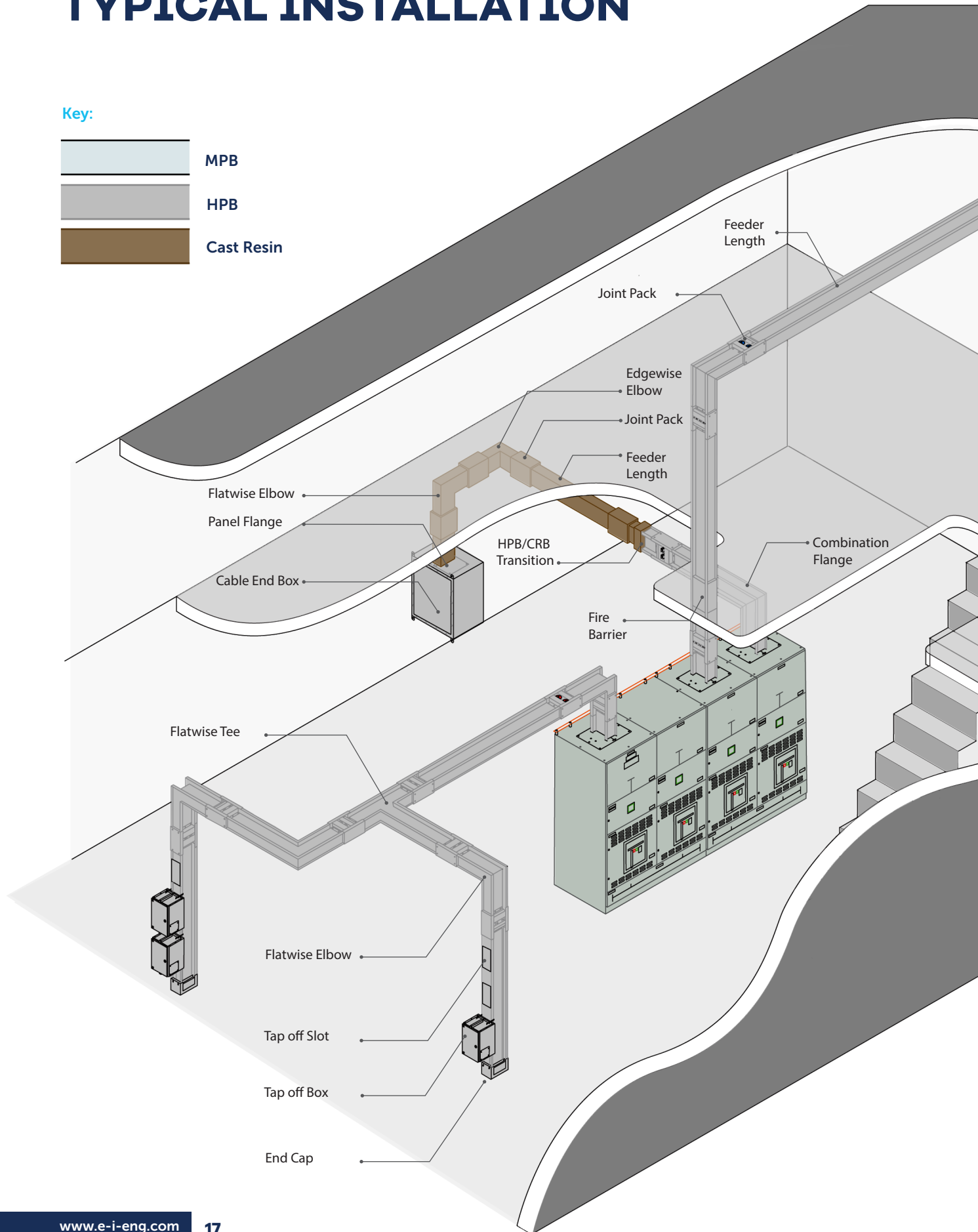
## Special Sections

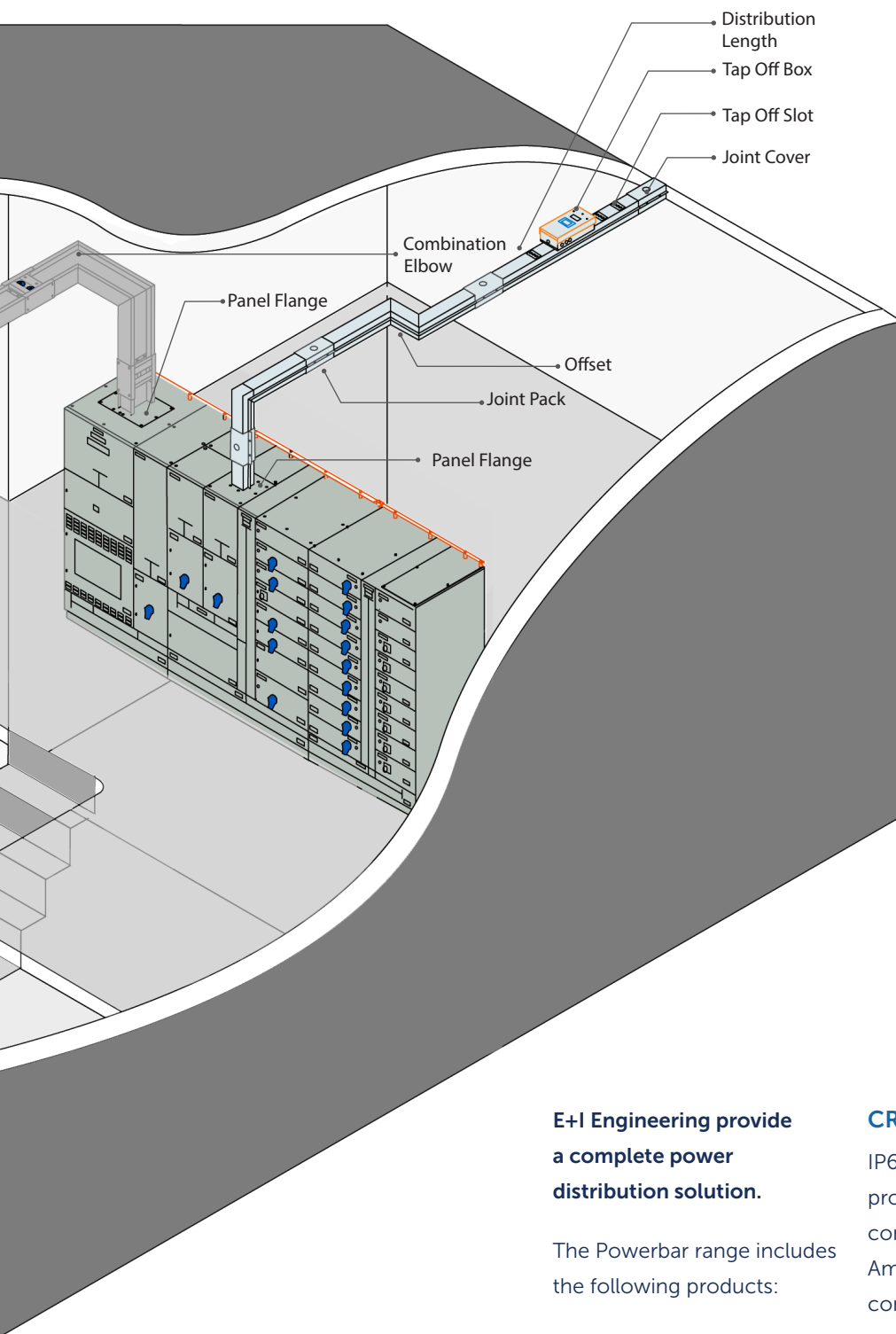
E-I Engineering manufacture a variety of more specialised units and components to meet unique system requirements. These include: edgewise tee's, flatwise cross, step up/ step down reducers, phase rotation units, in-line disconnect cubicles, in-line tap off units, custom built busbar connection units.

# TYPICAL INSTALLATION

**Key:**

-  **MPB**
-  **HPB**
-  **Cast Resin**





**E+I Engineering provide a complete power distribution solution.**

The Powerbar range includes the following products:

**MPB - Medium Powerbar**

Air insulated range covering 160 - 800 Amps

**HPB - High Powerbar**

Sandwich construction range covering 630 - 6600 Amps

**CRB - Cast Resin Powerbar**

IP68 rate polymer concrete product for use in extreme conditions covering 800 - 6300 Amps. CRPB can be directly connected to HPB through a special jointing system.

All products are available with both copper and aluminium conductors.

**HPB SE - High Powerbar Skin Effect**

Sandwich construction range covering 630 - 3200 Amps

# TECHNICAL DATA

Technical Data						
Rated Current (A)	630	800	1000	1250	1400	1500
Rated Operational Voltage (V)	1000	1000	1000	1000	1000	1000
Rated Insulation Voltage (V)	1000	1000	1000	1000	1000	1000
<b>Short Circuit</b>						
1 Second (kA rms)	20	36	50	65	70	70
Peak Value (kA)	40	76	105	143	154	154
<b>Phase Conductor</b>						
Cross Sectional Area (mm <sup>2</sup> )	150	210	270	360	420	450
<b>Neutral Conductor</b>						
Cross Sectional Area (mm <sup>2</sup> )	150	210	270	360	420	450
<b>Isolated Earth Conductor</b>						
100% Earth Cross Sectional Area (mm <sup>2</sup> )	150*	210	270	360	420	450
50% Earth Cross Sectional Area (mm <sup>2</sup> )	75*	105	135	180	210	225
<b>Housing Earth Path</b>						
Cross Sectional Area (mm <sup>2</sup> )	1007*	1049	1091	1154	1196	1217
<b>Overall Dimensions</b>						
Height x Width of 4 Bar System (mm)	85 x 148	95 x 148	105 x 148	120 x 148	130 x 148	135 x 148
<b>Weight</b>						
Weight of 4 Bar System (kg/m)	11.1	12.0	14.4	17.7	19.8	20.9
<b>Resistance</b>						
Resistance (mΩ/m) at 20°C	0.116	0.094	0.072	0.056	0.048	0.044
<b>Reactance</b>						
Reactance (mΩ/m) at 50 Hz	0.065	0.043	0.035	0.029	0.028	0.026
Reactance (mΩ/m) at 60 Hz	0.078	0.051	0.042	0.035	0.034	0.032
<b>Impedance</b>						
Impedance (mΩ/m) at 50 Hz at 20°C	0.133	0.103	0.079	0.063	0.056	0.051
Impedance (mΩ/m) at 60 Hz at 20°C	0.140	0.107	0.083	0.066	0.059	0.054
<b>Voltage Drop at Full Load 50Hz</b>						
Power Factor = 0.7 (V/m) at 80°C	0.163	0.162	0.157	0.157	0.157	0.156
Power Factor = 0.8 (V/m) at 80°C	0.171	0.172	0.167	0.166	0.165	0.163
Power Factor = 0.9 (V/m) at 80°C	0.176	0.179	0.173	0.171	0.169	0.167
Power Factor = 1.0 (V/m) at 80°C	0.161	0.171	0.164	0.160	0.155	0.152
<b>Voltage Drop at Full Load 60Hz</b>						
Power Factor = 0.7 (V/m) at 80°C	0.174	0.170	0.166	0.166	0.167	0.165
Power Factor = 0.8 (V/m) at 80°C	0.180	0.179	0.174	0.173	0.173	0.171
Power Factor = 0.9 (V/m) at 80°C	0.182	0.184	0.179	0.177	0.175	0.173
Power Factor = 1.0 (V/m) at 80°C	0.161	0.171	0.164	0.160	0.155	0.152



# TECHNICAL DATA

Technical Data						
Rated Current (A)	1600	1750	2000	2000	2250	2500
Rated Operational Voltage (V)	1000	1000	1000	1000	1000	1000
Rated Insulation Voltage (V)	1000	1000	1000	1000	1000	1000
<b>Short Circuit</b>						
1 Second (kA rms)	70	100	100	85	85	85
Peak Value (kA)	154	220	220	187	187	187
<b>Phase Conductor</b>						
Cross Sectional Area (mm <sup>2</sup> )	540	660	750	600	840	900
<b>Neutral Conductor</b>						
Cross Sectional Area (mm <sup>2</sup> )	540	660	750	600	840	900
<b>Isolated Earth Conductor</b>						
100% Earth Cross Sectional Area (mm <sup>2</sup> )	540	660	750	600	840	900
50% Earth Cross Sectional Area (mm <sup>2</sup> )	270	330	375	300	420	450
<b>Housing Earth Path</b>						
Cross Sectional Area (mm <sup>2</sup> )	1280	1364	1427	1271	1490	1532
<b>Overall Dimensions</b>						
Height x Width of 4 Bar System (mm)	150 x 148	170 x 148	185 x 148	243 x 148	200 x 148	210 x 148
<b>Weight</b>						
Weight of 4 Bar System (kg/m)	24.2	28.7	31.9	31.5	35.2	37.3
<b>Resistance</b>						
Resistance (mΩ/m) at 20°C	0.038	0.030	0.026	0.032	0.024	0.022
<b>Reactance</b>						
Reactance (mΩ/m) at 50 Hz	0.023	0.021	0.019	0.018	0.017	0.016
Reactance (mΩ/m) at 60 Hz	0.028	0.025	0.023	0.022	0.020	0.019
<b>Impedance</b>						
Impedance (mΩ/m) at 50 Hz at 20°C	0.044	0.036	0.032	0.037	0.029	0.027
Impedance (mΩ/m) at 60 Hz at 20°C	0.046	0.039	0.035	0.039	0.031	0.029
<b>Voltage Drop at Full Load 50Hz</b>						
Power Factor = 0.7 (V/m) at 80°C	0.139	0.125	0.128	0.147	0.131	0.137
Power Factor = 0.8 (V/m) at 80°C	0.146	0.130	0.132	0.155	0.135	0.141
Power Factor = 0.9 (V/m) at 80°C	0.149	0.131	0.132	0.159	0.136	0.143
Power Factor = 1.0 (V/m) at 80°C	0.135	0.116	0.115	0.147	0.120	0.126
<b>Voltage Drop at Full Load 60Hz</b>						
Power Factor = 0.7 (V/m) at 80°C	0.148	0.134	0.137	0.156	0.140	0.146
Power Factor = 0.8 (V/m) at 80°C	0.153	0.137	0.140	0.162	0.143	0.150
Power Factor = 0.9 (V/m) at 80°C	0.154	0.137	0.138	0.165	0.142	0.149
Power Factor = 1.0 (V/m) at 80°C	0.135	0.116	0.115	0.147	0.120	0.126

# TECHNICAL DATA

Technical Data						
Rated Current (A)	2500	3000	3200	3200	3500	3750
Rated Operational Voltage (V)	1000	1000	1000	1000	1000	1000
Rated Insulation Voltage (V)	1000	1000	1000	1000	1000	1000
<b>Short Circuit</b>						
1 Second (kA rms)	100	100	100	120	120	120
Peak Value (kA)	220	220	220	264	264	264
<b>Phase Conductor</b>						
Cross Sectional Area (mm <sup>2</sup> )	780	1200	1380	1080	1200	1320
<b>Neutral Conductor</b>						
Cross Sectional Area (mm <sup>2</sup> )	780	1200	1380	1080	1200	1320
<b>Isolated Earth Conductor</b>						
100% Earth Cross Sectional Area (mm <sup>2</sup> )	780	1200	1380	1080	1200	1320
50% Earth Cross Sectional Area (mm <sup>2</sup> )	390	600	690	540	600	660
<b>Housing Earth Path</b>						
Cross Sectional Area (mm <sup>2</sup> )	1397	1742	1868	1607	1691	1775
<b>Overall Dimensions</b>						
Height x Width of 4 Bar System (mm)	273 x 148	260 x 148	290 x 148	323 x 148	343 x 148	363 x 148
<b>Weight</b>						
Weight of 4 Bar System (kg/m)	38.0	48.2	54.6	48.7	52.7	57.9
<b>Resistance</b>						
Resistance (mΩ/m) at 20°C	0.025	0.015	0.014	0.018	0.015	0.015
<b>Reactance</b>						
Reactance (mΩ/m) at 50 Hz	0.015	0.014	0.011	0.0120	0.0110	0.010
Reactance (mΩ/m) at 60 Hz	0.018	0.017	0.013	0.0140	0.0130	0.012
<b>Impedance</b>						
Impedance (mΩ/m) at 50 Hz at 20°C	0.029	0.021	0.018	0.021	0.0190	0.018
Impedance (mΩ/m) at 60 Hz at 20°C	0.031	0.023	0.019	0.023	0.0205	0.019
<b>Voltage Drop at Full Load 50Hz</b>						
Power Factor = 0.7 (V/m) at 80°C	0.146	0.124	0.111	0.137	0.132	0.133
Power Factor = 0.8 (V/m) at 80°C	0.153	0.126	0.114	0.143	0.136	0.138
Power Factor = 0.9 (V/m) at 80°C	0.157	0.125	0.114	0.146	0.137	0.140
Power Factor = 1.0 (V/m) at 80°C	0.143	0.103	0.097	0.131	0.118	0.124
<b>Voltage Drop at Full Load 60Hz</b>						
Power Factor = 0.7 (V/m) at 80°C	0.156	0.134	0.120	0.147	0.142	0.143
Power Factor = 0.8 (V/m) at 80°C	0.161	0.135	0.121	0.151	0.145	0.146
Power Factor = 0.9 (V/m) at 80°C	0.163	0.131	0.119	0.151	0.143	0.146
Power Factor = 1.0 (V/m) at 80°C	0.143	0.103	0.097	0.131	0.118	0.124

# TECHNICAL DATA

Technical Data						
Rated Current (A)	4000	4500	4850	5000	5500	6600
Rated Operational Voltage (V)	1000	1000	1000	1000	1000	1000
Rated Insulation Voltage (V)	1000	1000	1000	1000	1000	1000
<b>Short Circuit</b>						
1 Second (kA rms)	120	120	120	120	120	100
Peak Value (kA)	264	264	264	264	264	220
<b>Phase Conductor</b>						
Cross Sectional Area (mm <sup>2</sup> )	1500	1680	1800	1920	2100	2760
<b>Neutral Conductor</b>						
Cross Sectional Area (mm <sup>2</sup> )	1500	1680	1800	1920	2100	2760
<b>Isolated Earth Conductor</b>						
100% Earth Cross Sectional Area (mm <sup>2</sup> )	1500	1680	1800	1920	2100	2760
50% Earth Cross Sectional Area (mm <sup>2</sup> )	750	840	900	960	1050	1380
<b>Housing Earth Path</b>						
Cross Sectional Area (mm <sup>2</sup> )	1901	2027	2111	2195	2321	2783
<b>Overall Dimensions</b>						
Height x Width of 4 Bar System (mm)	393 x 148	423 x 148	443 x 148	463 x 148	493 x 148	603 x 148
<b>Weight</b>						
Weight of 4 Bar System (kg/m)	63.7	70.3	74.6	79.1	86.2	109.0
<b>Resistance</b>						
Resistance (mΩ/m) at 20°C	0.012	0.011	0.011	0.010	0.008	0.006
<b>Reactance</b>						
Reactance (mΩ/m) at 50 Hz	0.011	0.010	0.009	0.008	0.007	0.004
Reactance (mΩ/m) at 60 Hz	0.013	0.012	0.011	0.010	0.008	0.005
<b>Impedance</b>						
Impedance (mΩ/m) at 50 Hz at 20°C	0.016	0.015	0.0138	0.013	0.011	0.008
Impedance (mΩ/m) at 60 Hz at 20°C	0.018	0.016	0.0150	0.014	0.012	0.008
<b>Voltage Drop at Full Load 50Hz</b>						
Power Factor = 0.7 (V/m) at 80°C	0.128	0.133	0.136	0.129	0.125	0.105
Power Factor = 0.8 (V/m) at 80°C	0.130	0.136	0.1399	0.133	0.128	0.109
Power Factor = 0.9 (V/m) at 80°C	0.129	0.135	0.140	0.135	0.127	0.111
Power Factor = 1.0 (V/m) at 80°C	0.106	0.114	0.121	0.118	0.107	0.098
<b>Voltage Drop at Full Load 60Hz</b>						
Power Factor = 0.7 (V/m) at 80°C	0.139	0.143	0.146	0.138	0.136	0.112
Power Factor = 0.8 (V/m) at 80°C	0.140	0.145	0.149	0.141	0.136	0.115
Power Factor = 0.9 (V/m) at 80°C	0.135	0.141	0.146	0.140	0.133	0.115
Power Factor = 1.0 (V/m) at 80°C	0.106	0.114	0.121	0.118	0.107	0.098

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# QUICK REFERENCE GUIDE

## Critical Dimensions

- The distance from the centre of a joint to the wall, ceiling or floor must be at least 190mm.
- All joints must be accessible for maintenance. Joints should not be located inside a wall, ceiling or floor.
- Busbar's should be spaced apart allowing for sufficient physical access, for ease of installation and future maintenance. We recommend 50mm as an absolute minimum for any pinch points, and a minimum of 100mm between the busbar and any wall / ceiling / other busbar runs where space permits'.
- Allow adequate space for tap off units to be installed easily and safely.
- Busbar lengths are available from 600mm - 3000mm.
- Distribution busbar lengths are available from 900mm - 3000mm.
- Edgewise elbow sections are available with leg lengths from 257mm - 600mm.
- Flatwise elbow sections are available

with a maximum leg length of 750mm. The minimum leg length varies depending on the busbar.

Ambient Temperature	De-rating Factor
60°C	0.90
65°C	0.84

## Operating Conditions

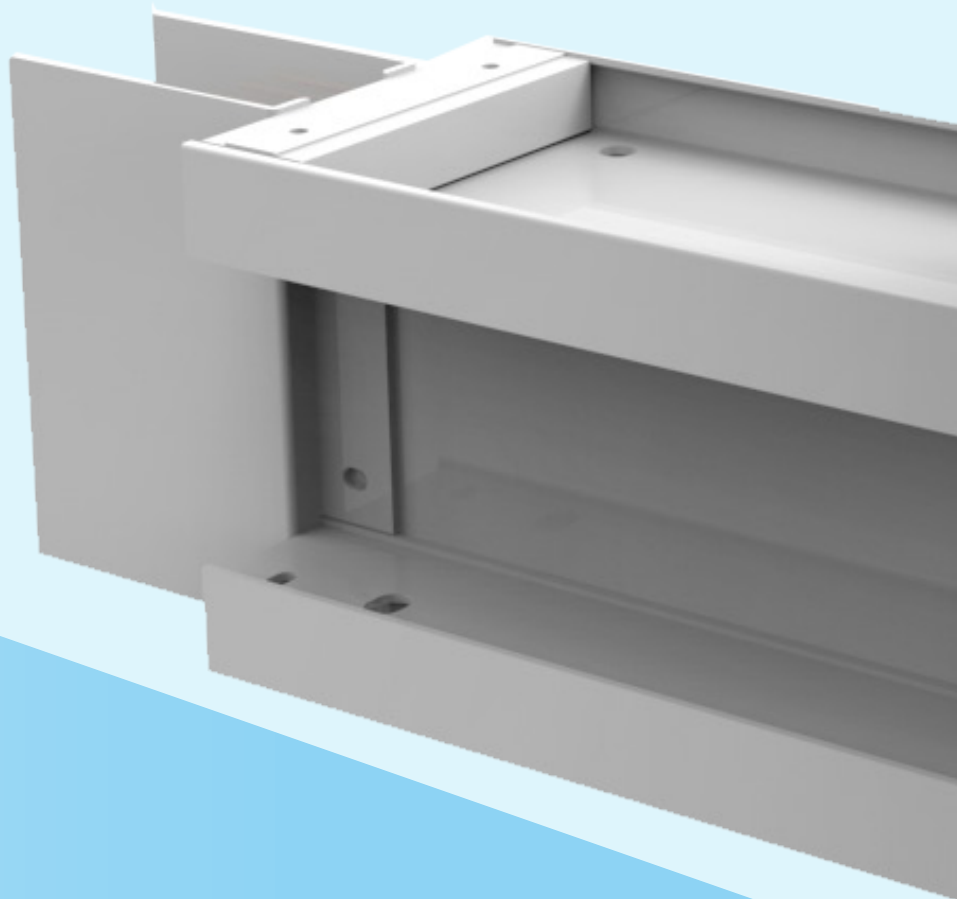
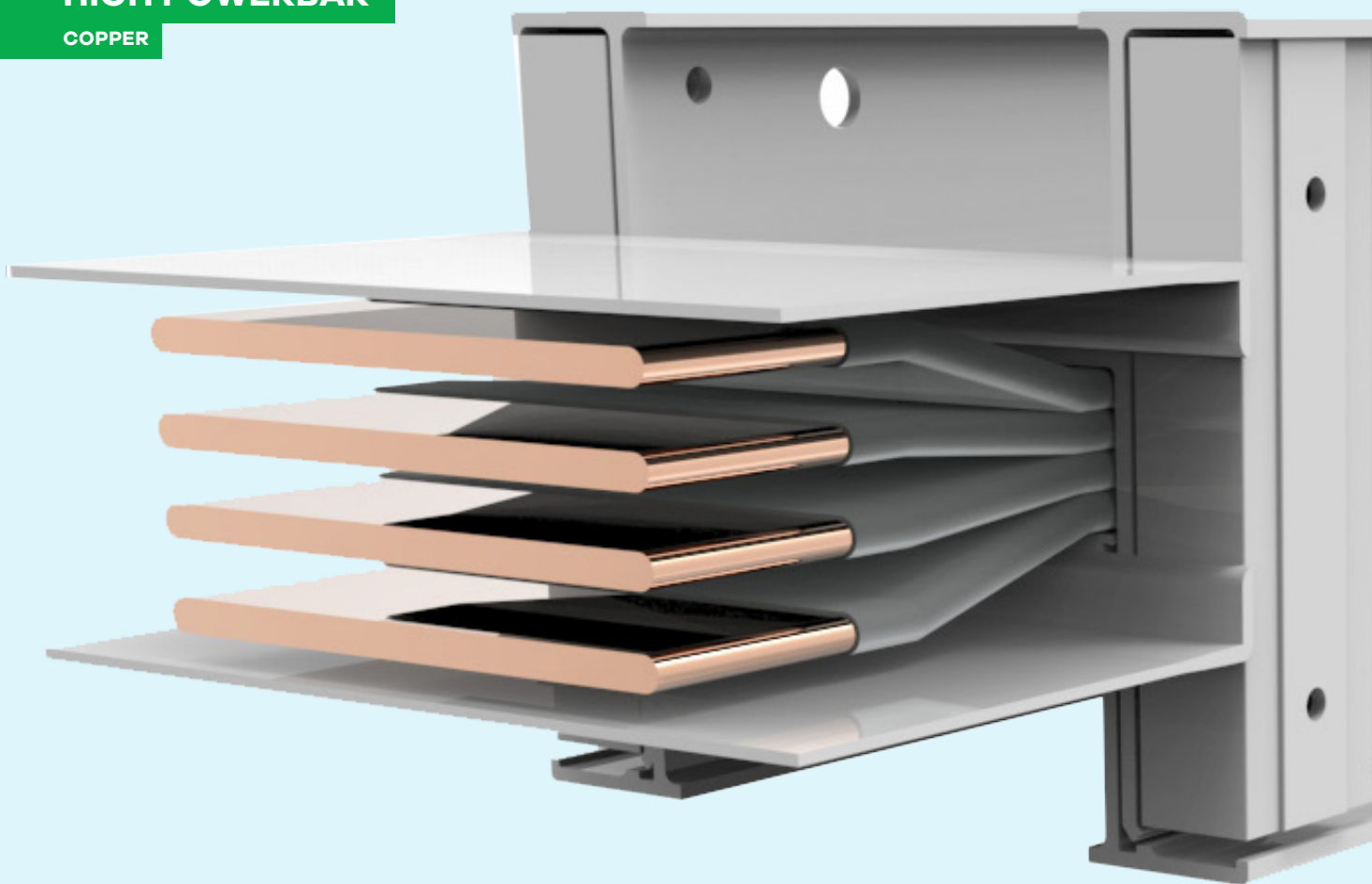
- Ambient temperature from -5°C to +55°C
- Relative humidity of 95% or below.
- This product designed for indoor use and can be installed horizontally or vertically.

## 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.

# HIGH POWERBAR

COPPER







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