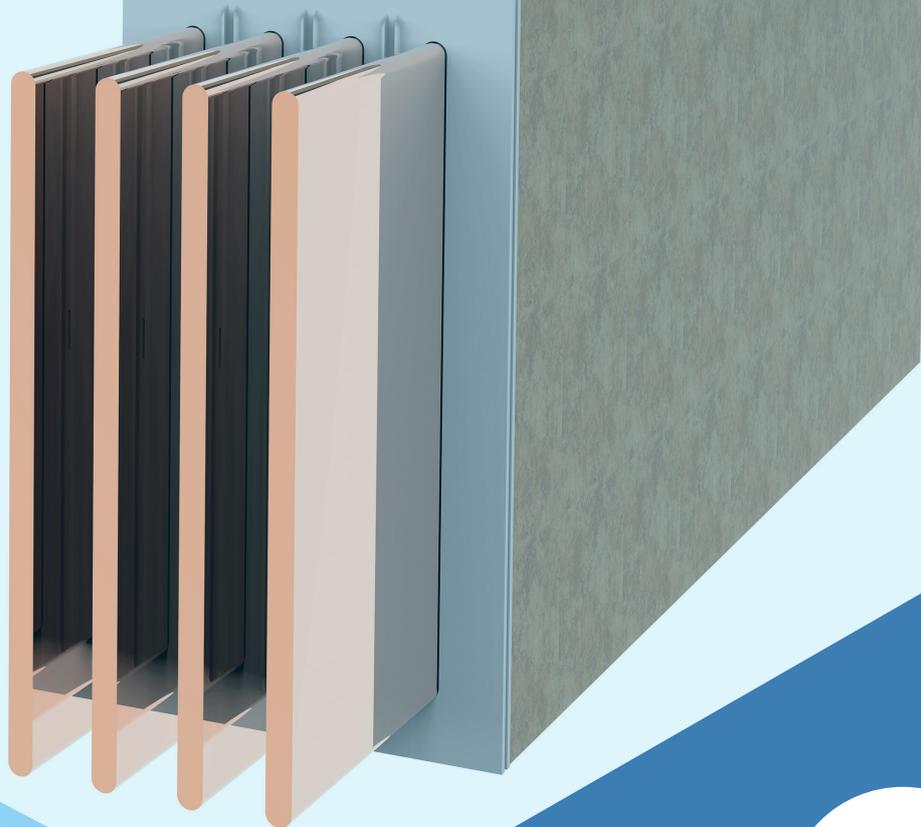




E+I ENGINEERING GROUP

CAST RESIN POWERBAR

IP68 BUSBAR SYSTEM



PowerBar

CAST RESIN POWERBAR

IP68 BUSBAR SYSTEM

E+I Engineering's Cast Resin Powerbar (CRB) is a 1000 Volt, IP68 rated maintenance free busbar system for use in outdoor, hazardous or life safety applications.

The conductor is available in aluminium or copper and is totally encapsulated in a fire retardant, self-extinguishing and homogenous polymer concrete. CRB has been proven to guarantee high resistance to fire, water, moisture, mechanical loads, chemicals and extreme temperatures (-40°C to 60°C).

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

STANDARDS

Standards

The Cast Resin Bar range is fully ASTA Tested Certified. It is manufactured in a Certified Management System environment where Quality ISO 9001, Safety ISO 45001:2018 18001 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

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

ASTA Certificates

E+I Engineering completed extensive testing at ASTA accredited laboratories to ensure the product we supply meets the international requirements.

Ingress Protection

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

All certificates available on request



Impact Resistance Test

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

Seismic Compliance

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

Fire Resistance

The product has been rated at F 180 in accordance with IEC 60331-1 and meets ISO 834 standards.

Damp Heat

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

Explosive Atmosphere (ATEX)

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

Ex II 2G Ex eb IIC T4 Gb

Ex II 2G Ex mb IIC T115 C Gb

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

Fire- Rated Wall Flange

H-120 Fire rating for the busduct wall flanges penetration as per DNV's SOLAS Chapter 11-2 Regulation 9. A-60 Fire rating for the busduct wall flanges penetration as per DNV's SOLAS Chapter 11-2 Regulation 9.

CE Marking

Low Voltage directive 2014/35/EU-CE Mark Certification.

Fire Integrity

BS 8602: 2013 Fire Integrity of Cast Resin Busbar Trunking Systems for the safety critical power distribution.

Standards and Tests for Silicone Rubber Bellows: (Rubber bellow passed the following standards)

Temperature Index, Zero Halogen, Flammability, Smoke Density, Toxicity Test, ASTM D 2863, IEC 60454-2, UL 60754-2, ASTM D 2843 or IEC 61034/1/2, NES 713

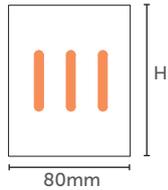
Health and Safety
ISO 45001:2018
No.0087570

Quality Management
ISO 9001:2015
No.18346

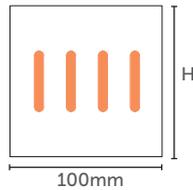
Environmental Management
ISO 14001:2015
No.18347

BUSBAR DIMENSIONS

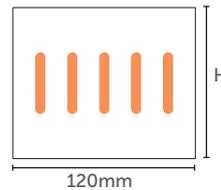
Busbar Widths



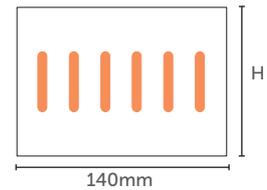
3 Pole System



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	DS	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 Length

Feeder lengths can be supplied at any length between a minimum of 500mm and a maximum of 4000mm.

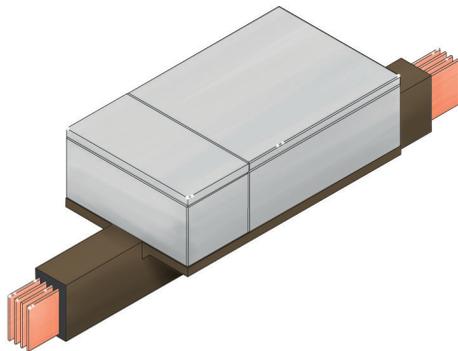
Feeder lengths account for the bulk of a busbar run

SS Length

Min = 500mm - Max = 4000mm

DS Length

Min = 500mm - Max 4000mm



Distribution Length

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.

Minimum Busbar lengths (mm)

1500mm up to 2 tap off points

Maximum Busbar lengths (mm)

4000mm up to 6 tap off points

Key Features of tap-off box:

- High impact to strength
- Resistance to adverse climate condition
- Resistance to UV Radiation
- Flame retardant
- Frame sizes
- 250A plug-in frame (MCCB trip unit 32A-250A)
- 630A plug-in frame (MCCB Trip unit 315A-630A)
- 800A plug-in frame (MCCB Trip unit 800A)
- 1600A plug-in frame (ACB Trip unit 1000A - 1600A)
- IP68
- Side or bottom IP68 cable entry

Key Features of plug-in type MCCB (Internal):

- Unambiguous remote signalling of the circuit breaker positions, On/Off/Tripped, wired with auxiliary contacts.
- Option to lock plug-in device with padlocks to prevent insertion of the circuit breaker.
- Visible conductive disconnection of the main circuit
- Easy to exchange the circuit breaker in case of failure, simply plug-in / plug-out the MCCB

ELBOWS

Flatwise and Edgewise Elbows

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

SS Length

Min = 300mm - Max = 1000mm

DS Length

Min = 300mm - Max 1000mm

Total maximum length

2000mm

Offset Sections (Flat and Edge)

An offset is used to avoid obstacles such as pipes or steel columns and to conform to the structure of the building. It is basically two elbows fabricated into one single piece.

Length per leg

Min = 350mm- Max = 500mm

Max offset - 600mm

Combination Elbows

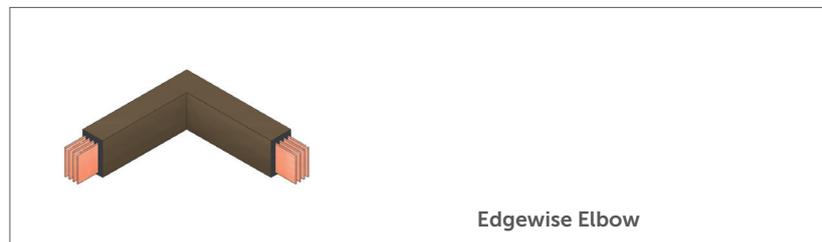
Combination elbows are used to conform to the building structure and to utilise a small amount of space to change direction.

Length per leg

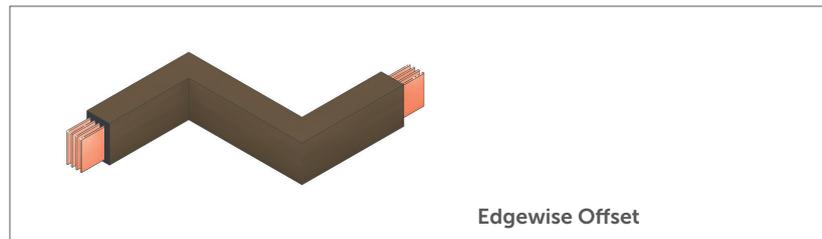
Min = 350mm -Max = 500mm



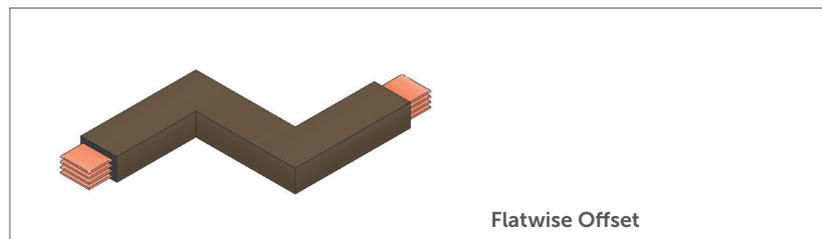
Flatwise Elbow



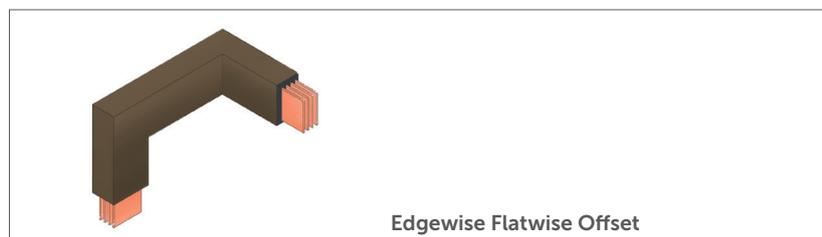
Edgewise Elbow



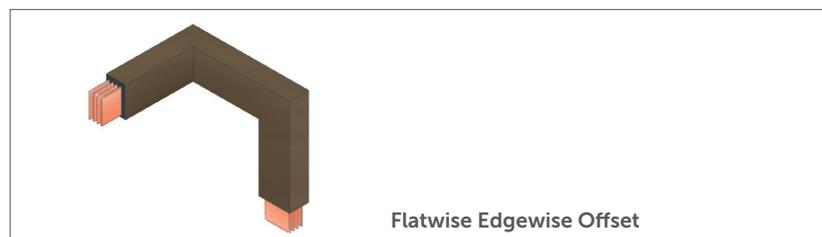
Edgewise Offset



Flatwise Offset



Edgewise Flatwise Offset

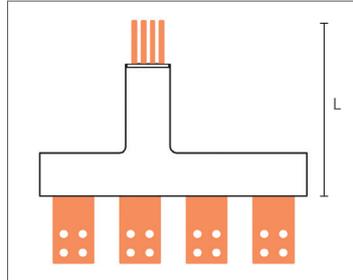


Flatwise Edgewise Offset

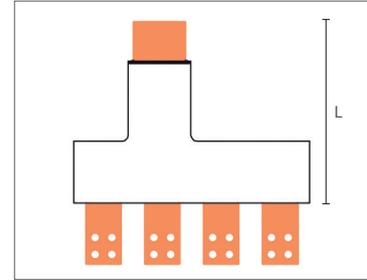
FLANGES

Flange Connections

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

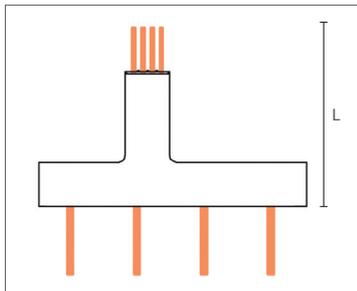


Panel Flange T2
L - 550mm - 1000mm



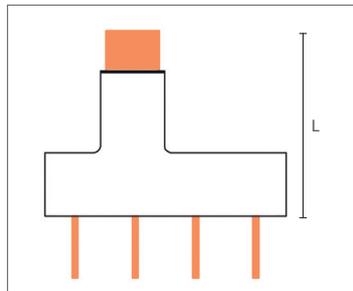
Panel Flange T3 - L

Pole Configuration	Min	Max
TP	540mm	1000mm
TPN/TPE	540mm	1000mm
TPNE/TPNHE	600mm	1000mm
TPDNE	600mm	1000mm

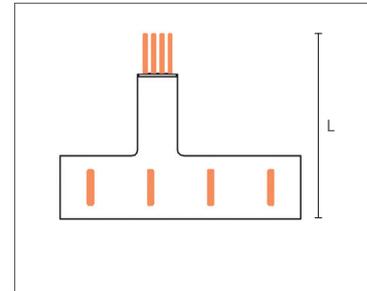


Panel Flange T4 - L

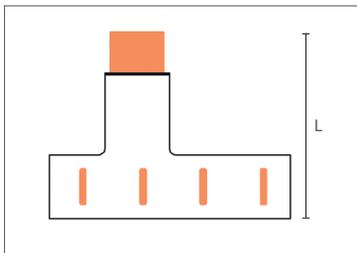
Pole Configuration	Min	Max
TP	580mm	1000mm
TPN/TPE	580mm	1000mm
TPNE/TPNHE	625mm	1000mm
TPDNE	625mm	1000mm



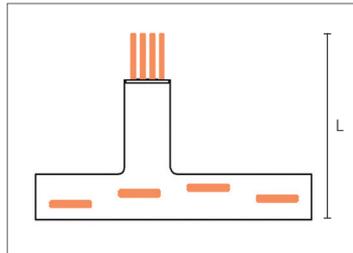
Panel Flange T5
L - Min= 600mm - Max =1000mm



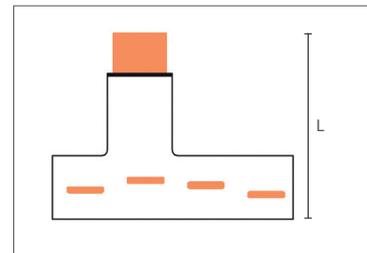
Panel Flange T6
L - 500mm - 1000mm



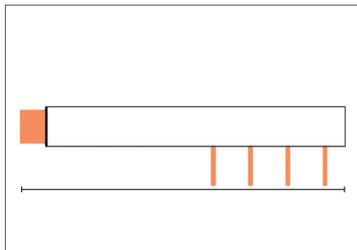
Panel Flange T7
L - Min 500mm - Max 1000mm



Panel Flange T8
L - Min = 690mm - Max 960mm

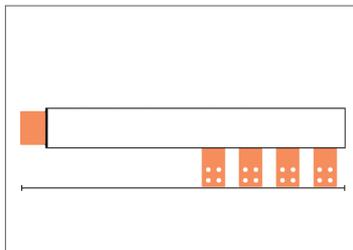


Panel Flange T9
L - Min=550-Max =1420



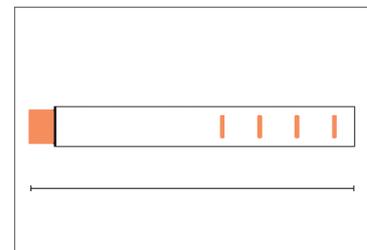
Panel Flange T10 - L

Pole Configuration	Min	Max
TP	570mm	1520mm
TPN/TPE	670mm	1670mm
TPNE/TPNHE	770mm	1820mm
TPDNE	870mm	1970mm



Panel Flange T11 - L

Pole Configuration	Min	Max
TP	980mm	2150mm
TPN/TPE	1210mm	2750mm
TPNE/TPNHE	1440mm	3350mm
TPDNE	1670mm	3950mm



Panel Flange T12- L

Pole Configuration	Min	Max
TP	675mm	2550mm
TPN/TPE	725mm	2660mm
TPNE/TPNHE	825mm	2650mm
TPDNE	925mm	2700mm

SPECIALS

Flatwise Tee

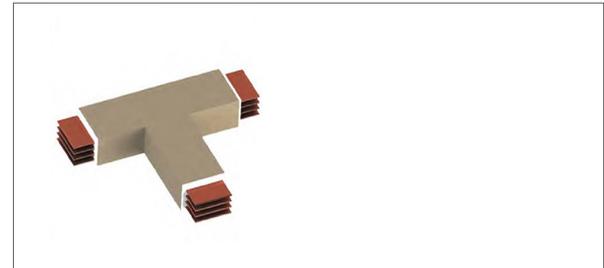
Flatwise tees are used to split one busbar run into two runs going in different directions. This reduces the amount of space needed when supplying two different parts of a building.

SS length per leg

A 300mm - 1500mm
B 300mm - 1000mm

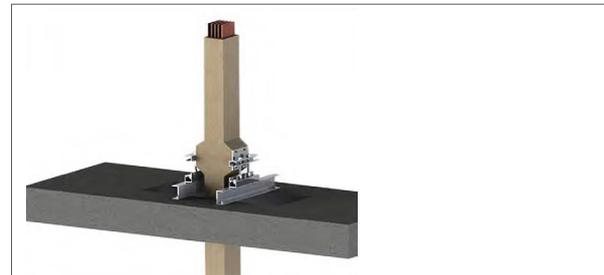
DS length per leg

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.

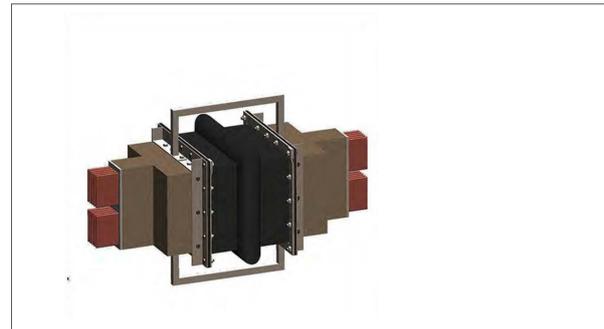


Thermal and Building Expansion Units

The busbar systems should have expansion joints as separate standard element. Busbar System that combine the function of expansion elements with the joint unit are not acceptable.

Expansion joints to be fitted at least 40m of horizontal or vertical run or in accordance to the busbar manufacturer's recommendations

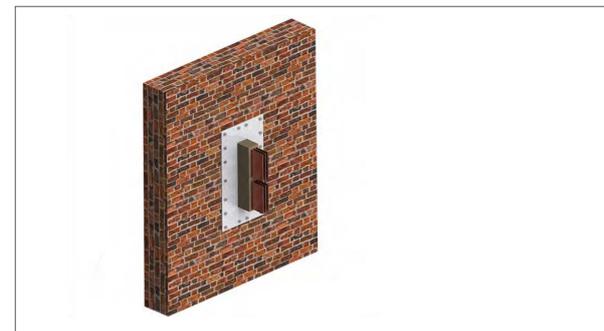
Expansion joints shall be fitted wherever busbars cross a building expansion unit.



Fire-rated wall flange

H-120 Certificate for bulkhead / Roof / Floor: The busduct penetration has been found to meet H-120 requirements as per DNV's interpretation of SOLAS chapter II-2 Regulation 9.

A-60 Certificates for bulkhead / roof / floor: The busduct penetration has been found to meet A-60 requirements as per DNV's interpretation of SOLAS chapter II-2 Regulation 9.

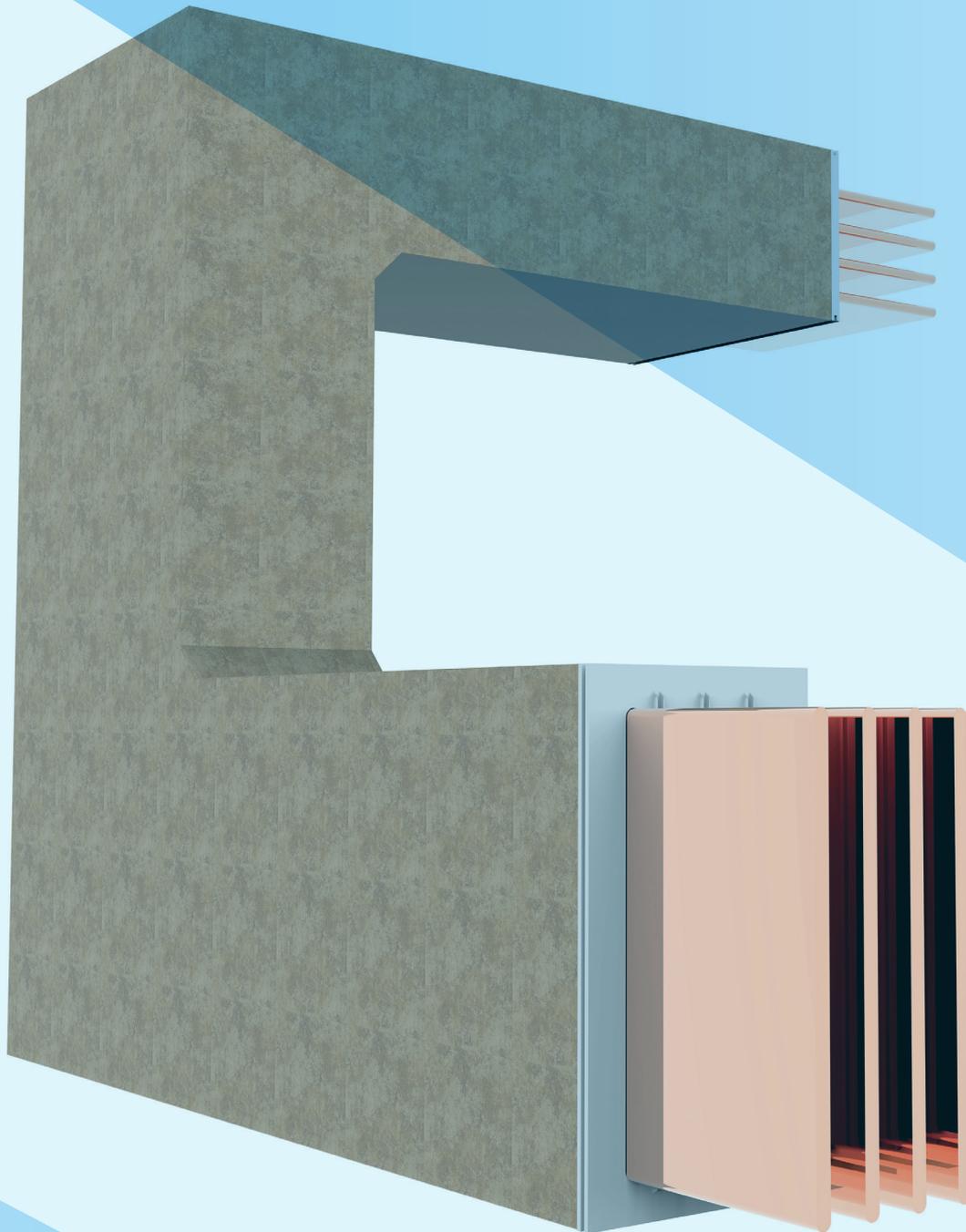


Special Sections

E+I Engineering manufacture a variety of more specialised units and components to meet unique system requirements. These include: end feed units, centre feed units, expansions units, edgewise tees, flatwise crosses, step up/ step down reducers, phase rotation units, in-line disconnect cubicles, in-line tap off units and custom built busbar connection units.

CAST RESIN POWERBAR

IP68 BUSBAR SYSTEM



INSTALLATION



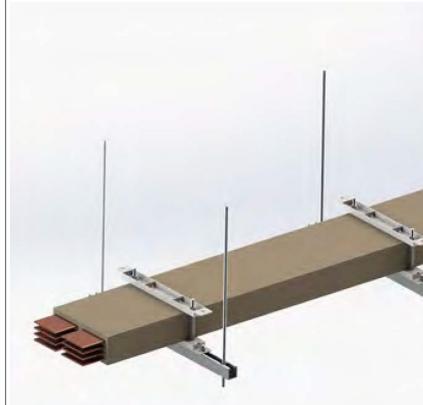
Joint Pack

Joint Pack

The power joint pack is a compressing joint design, which utilises a specially designed Belleville washer to distribute pressure evenly over the joint pack.

Joint packs are used to connect all the components in a busbar system together, from feeder lengths to flatwise tee's.

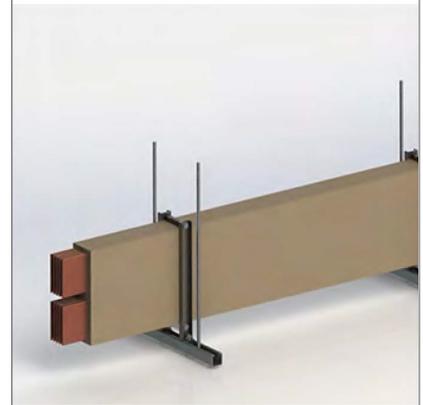
Powerbar's Cast Resin Bar products can be directly connected to our high powerbar product through a special jointing system. This feature is useful in systems where only a small section of the bar will be exposed to extreme conditions and require an IP68 rating.



Flat 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 140mm.



Edge Installation

Edge Installation

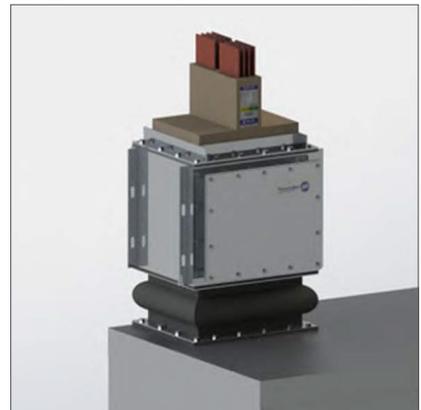
Edge installation is the preferred method of installation for a smaller rated busbar system. It is also the main method used to install distribution busbar in building risers as tap off units can be connected easily.



Busbar Termination Set-up

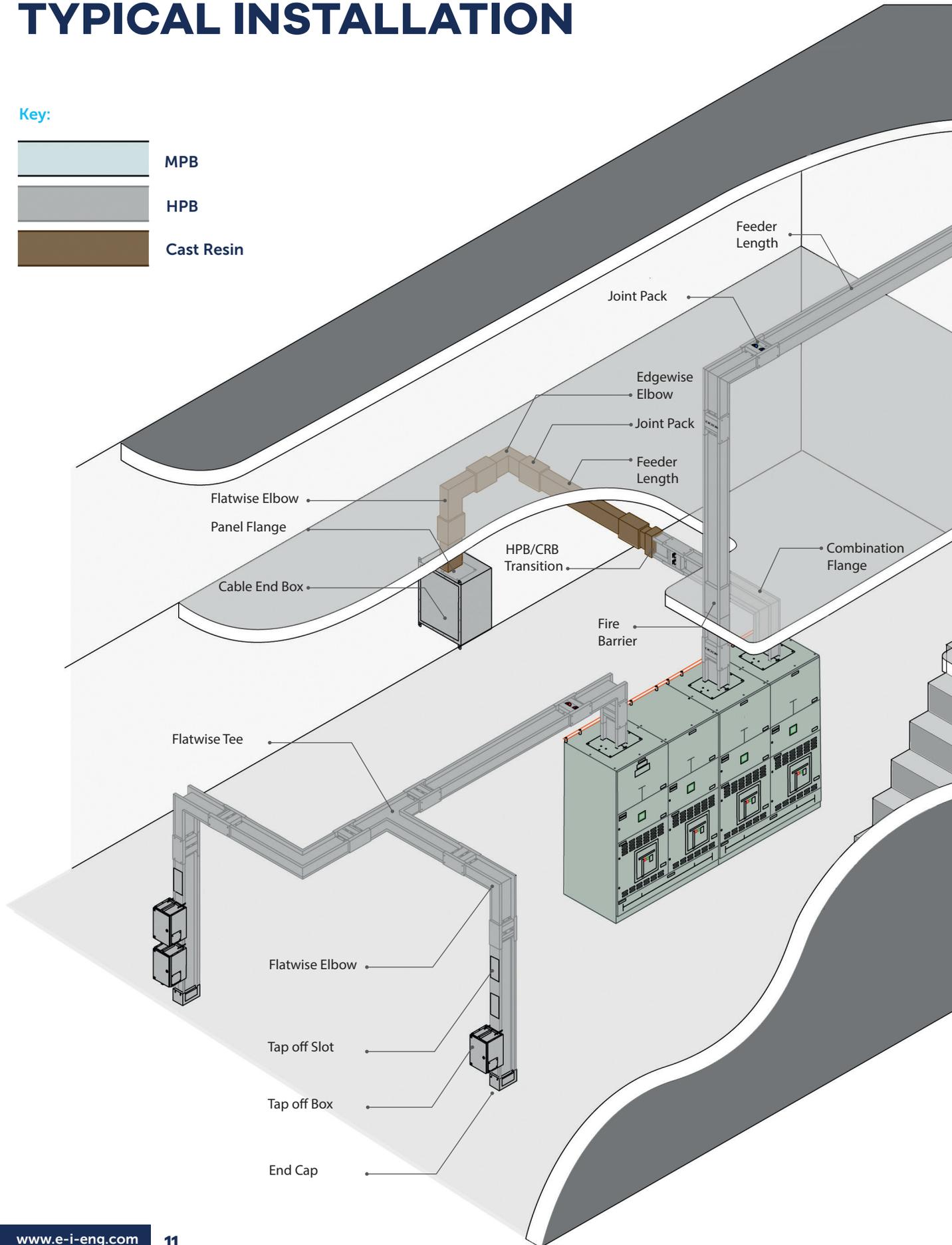
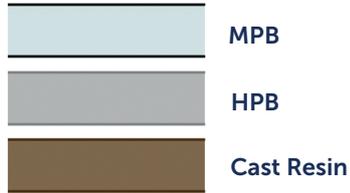
Busbar Adapter boxes, rubber bellows for busbar termination with equipment (Transformers, Switch gear) ATEX/ IECEx certified.

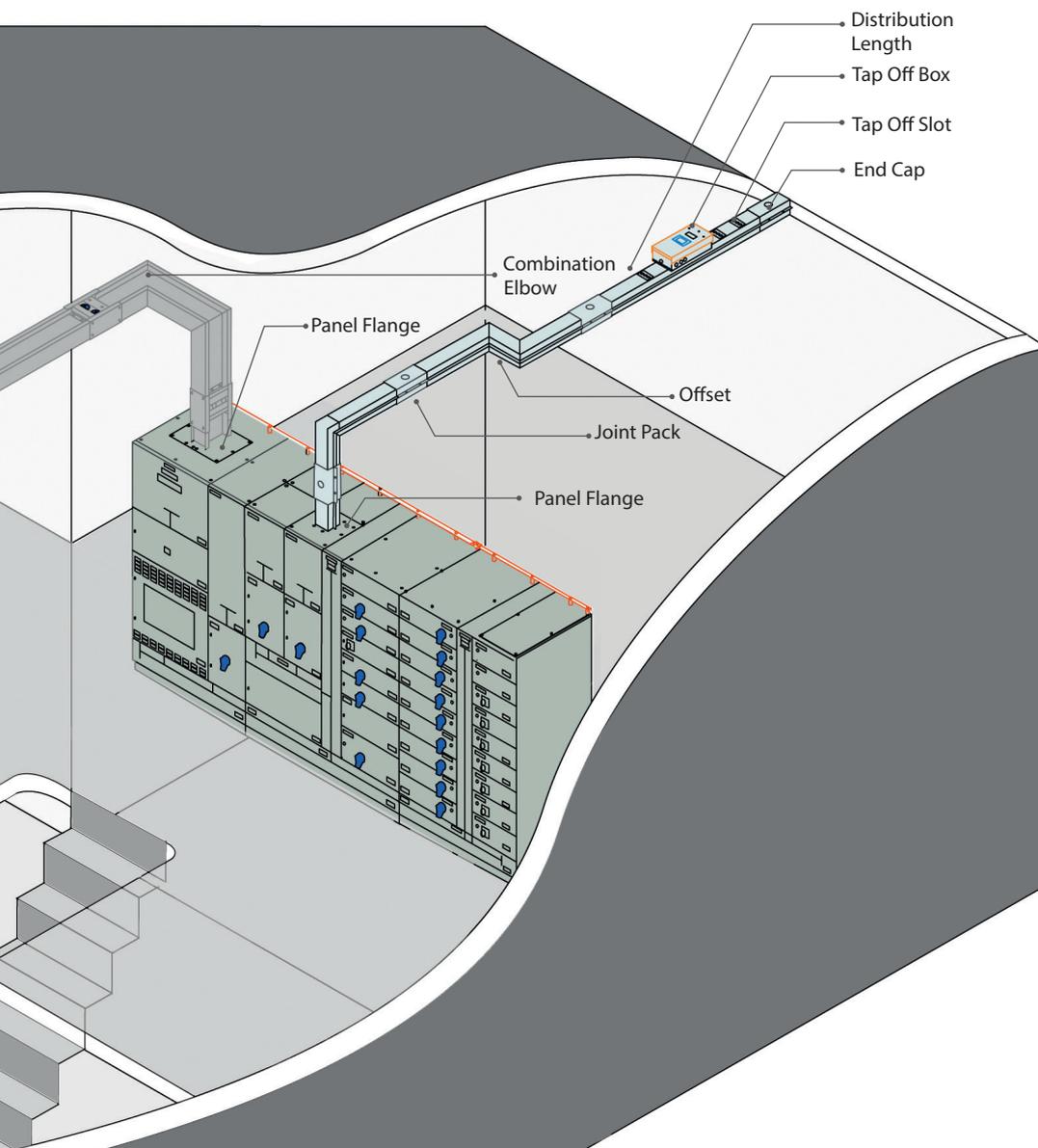
Ex II 2 G Ex eb IIC T4 Gb
Ex II 2 G Ex mb IIC T115 C Gb



TYPICAL INSTALLATION

Key:





E+I Engineering provide a complete power distribution solution.

The Powerbar range includes the following products:

MPB - Medium Powerbar

Air insulated range covering 160 - 1250 Amps

HPB - High Powerbar

Sandwich construction range covering 800 - 6600 Amps

CRB - Cast Resin Powerbar

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

All products are available with both copper and aluminium conductors.

TECHNICAL DATA (COPPER)

Technical Data - Copper					
Rated Current (A)	800	1000	1250	1400	1600
Rated Operational Voltage (V)	1000	1000	1000	1000	1000
Rated Insulation Voltage (V)	1000	1000	1000	1000	1000
Short Circuit					
1 Second (kA rms)	36	40	50	50	65
Peak Value (kA)	756	84	105	105	143
Phase Conductor					
Cross Sectional Area (mm ²)	240	420	450	540	690
Neutral Conductor					
Cross Sectional Area (mm ²)	240	420	450	540	690
Isolated Earth Conductor					
100% Earth Cross Sectional Area (mm ²)	240	420	450	540	690
50% Earth Cross Sectional Area (mm ²)	120	210	225	270	345
Overall Dimensions					
Height x Width of 4 Bar System (mm)	100 x 100	130 x 100	105 x 100	120 x 100	145 x 100
Weight					
Weight of 4 Bar System (kg/m)	30.9	42.9	37.5	43.6	53.6
Resistance					
Resistance (mΩ/m) at 20°C	0.048	0.052	0.040	0.033	0.026
Resistance (mΩ/m) at 80°C	0.060	0.064	0.050	0.041	0.032
Reactance					
Reactance (mΩ/m) at 50Hz	0.051	0.047	0.045	0.040	0.033
Reactance (mΩ/m) at 60Hz	0.061	0.056	0.054	0.048	0.040
Impedance					
Impedance (mΩ/m) at 80°C	0.079	0.080	0.067	0.057	0.046
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
Power Factor = 0.8 (V/m) at 80°C	0.156	0.138	0.145	0.137	0.125
Power Factor = 0.9 (V/m) at 80°C	0.153	0.136	0.139	0.131	0.119
Power Factor = 1.0 (V/m) at 80°C	0.124	0.111	0.107	0.100	0.089
Voltage Drop Full Load 60Hz					
Power Factor = 0.7 (V/m) at 80°C	0.168	0.148	0.158	0.152	0.140
Power Factor = 0.8 (V/m) at 80°C	0.168	0.148	0.157	0.149	0.136
Power Factor = 0.9 (V/m) at 80°C	0.162	0.143	0.148	0.140	0.128
Power Factor = 1.0 (V/m) at 80°C	0.125	0.112	0.108	0.100	0.089

Technical Data - Copper						
Rated Current (A)	2000	2500	3200	4000	5000	6300
Rated Operational Voltage (V)	1000	1000	1000	1000	1000	1000
Rated Insulation Voltage (V)	1000	1000	1000	1000	1000	1000
Short Circuit						
1 Second (kA rms)	65	80	100	100	100	120
Peak Value (kA)	143	176	220	220	220	264
Phase Conductor						
Cross Sectional Area (mm ²)	870	1080	1500	1800	2400	3000
Neutral Conductor						
Cross Sectional Area (mm ²)	870	1080	1500	1800	2400	3000
Isolated Earth Conductor						
100% Earth Cross Sectional Area (mm ²)	870	1080	1500	1800	2400	3000
50% Earth Cross Sectional Area (mm ²)	435	540	750	900	1200	1500
Overall Dimensions						
Height x Width of 4 Bar System (mm)	175 x 100	210 x 100	310 x 100	360 x 100	460 x 100	560 x 100
Weight						
Weight of 4 Bar System (kg/m)	65.7	79.7	115.3	135.4	175.6	215.8
Resistance						
Resistance (mΩ/m) at 20°C	0.020	0.016	0.012	0.010	0.007	0.006
Resistance (mΩ/m) at 80°C	0.025	0.020	0.015	0.012	0.009	0.007
Reactance						
Reactance (mΩ/m) at 50Hz	0.027	0.021	0.016	0.014	0.011	0.009
Reactance (mΩ/m) at 60Hz	0.032	0.025	0.019	0.017	0.013	0.011
Impedance						
Impedance (mΩ/m) at 80°C	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	0.128	0.126	0.120	0.127	0.122	0.125
Power Factor = 0.8 (V/m) at 80°C	0.126	0.125	0.118	0.125	0.119	0.121
Power Factor = 0.9 (V/m) at 80°C	0.120	0.119	0.112	0.117	0.110	0.113
Power Factor = 1.0 (V/m) at 80°C	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	0.142	0.140	0.133	0.141	0.136	0.139
Power Factor = 0.8 (V/m) at 80°C	0.138	0.136	0.129	0.137	0.131	0.134
Power Factor = 0.9 (V/m) at 80°C	0.128	0.127	0.120	0.126	0.120	0.122
Power Factor = 1.0 (V/m) at 80°C	0.088	0.088	0.081	0.084	0.079	0.079

TECHNICAL DATA (ALUMINIUM)

Technical Data - Aluminium					
Rated Current (A)	1000	1250	1400	1600	2000
Rated Operational Voltage (V)	1000	1000	1000	1000	1000
Rated Insulation Voltage (V)	1000	1000	1000	1000	1000
Short Circuit					
1 Second (kA rms)	25	36	36	50	50
Peak Value (kA)	52.5	75.6	75.6	105	105
Phase Conductor					
Cross Sectional Area (mm ²)	480	600	720	900	1200
Neutral Conductor					
Cross Sectional Area (mm ²)	480	600	720	900	1200
Isolated Earth Conductor					
100% Earth Cross Sectional Area (mm ²)	480	600	720	900	1200
50% Earth Cross Sectional Area (mm ²)	240	300	360	450	600
Overall Dimensions					
Height x Width of 4 Bar System (mm)	110 x 100	130 x 100	150 x 100	180 x 100	230 x 100
Weight					
Weight of 4 Bar System (kg/m)	27.6	32.6	37.7	45.2	57.8
Resistance					
Resistance (mΩ/m) at 20°C	0.066	0.053	0.025	0.020	0.015
Resistance (mΩ/m) at 80°C	0.082	0.065	0.054	0.043	0.032
Reactance					
Reactance (mΩ/m) at 50Hz	0.044	0.037	0.032	0.026	0.021
Impedance					
Impedance (mΩ/m) at 80°C	0.093	0.075	0.063	0.051	0.030
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
Power Factor = 0.8 (V/m) at 80°C	0.158	0.161	0.152	0.140	0.134
Power Factor = 0.9 (V/m) at 80°C	0.162	0.162	0.152	0.140	0.133
Power Factor = 1.0 (V/m) at 80°C	0.141	0.141	0.132	0.120	0.112
Voltage Drop Full Load 60Hz					
Power Factor = 0.7 (V/m) at 80°C	0.164	0.167	0.159	0.147	0.141
Power Factor = 0.8 (V/m) at 80°C	0.168	0.171	0.161	0.149	0.143
Power Factor = 0.9 (V/m) at 80°C	0.167	0.169	0.159	0.147	0.140
Power Factor = 1.0 (V/m) at 80°C	0.142	0.142	0.132	0.121	0.113

Technical Data - Aluminium				
Rated Current (A)	2500	3200	4000	5000
Rated Operational Voltage (V)	1000	1000	1000	1000
Rated Insulation Voltage (V)	1000	1000	1000	1000
Short Circuit				
1 Second (kA rms)	80	80	100	100
Peak Value (kA)	176	176	220	220
Phase Conductor				
Cross Sectional Area (mm ²)	1440	1920	2880	3360
Neutral Conductor				
Cross Sectional Area (mm ²)	1440	1920	2880	3360
Isolated Earth Conductor				
100% Earth Cross Sectional Area (mm ²)	1440	1920	2880	3360
50% Earth Cross Sectional Area (mm ²)	720	960	1440	1680
Overall Dimensions				
Height x Width of 4 Bar System (mm)	300 x 100	380 x 100	540 x 100	620 x 100
Weight				
Weight of 4 Bar System (kg/m)	75.3	95.5	135.8	156.0
Resistance				
Resistance (mΩ/m) at 20°C	0.013	0.01	0.006	0.005
Resistance (mΩ/m) at 80°C	0.027	0.021	0.014	0.012
Reactance				
Reactance (mΩ/m) at 50Hz	0.017	0.013	0.009	0.008
Impedance				
Impedance (mΩ/m) at 80°C	0.032	0.025	0.017	0.014
Voltage Drop at Full Load 50Hz				
Power Factor = 0.7 (V/m) at 80°C	0.135	0.132	0.113	0.121
Power Factor = 0.8 (V/m) at 80°C	0.138	0.136	0.115	0.123
Power Factor = 0.9 (V/m) at 80°C	0.138	0.135	0.113	0.122
Power Factor = 1.0 (V/m) at 80°C	0.117	0.113	0.095	0.101
Voltage Drop Full Load 60Hz				
Power Factor = 0.7 (V/m) at 80°C	0.145	0.143	0.122	0.131
Power Factor = 0.8 (V/m) at 80°C	0.147	0.145	0.122	0.132
Power Factor = 0.9 (V/m) at 80°C	0.144	0.141	0.119	0.128
Power Factor = 1.0 (V/m) at 80°C	0.118	0.114	0.095	0.101

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QUICK REFERENCE GUIDE

Critical Dimensions

Busbar passing through a wall , ceiling or floor:

- From the centre-line of a joint to the wall, ceiling or floor allow a minimum of 190 cm.
- Joints cannot be positioned inside a wall, ceiling or floor - joints must be accessible for maintenance.

Busbar Clearances:

- From the top of the busbar to wall, ceiling, floor or another busbar allow a minimum of 200mm. This is allow for joint pouring.

Tap off Clearances

- Ensure adequate space is given to allow the tap of unit to be operated both easily and safely
- Busbar lengths are available from 500mm - 4000mm.

Feeder Busbar Length:

- Minimum length -500mm
- Maximum length - 4000mm

Distribution Busbar Length:

- Minimum length -500mm
- Maximum length-4000mm

Flatwise Elbow Section:

- Minimum leg length 300mm for single stack and 500mm for double stack
- Maximum length-1000mm
- Total Maximum length-1000mm

Edgewise Elbow Section:

- Minimum leg - 300mm
- Maximum length-1000mm
- Total Maximum length-2000mm

Operating Conditions

- Ambient temperature from -40°C to +60°C
- 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.



E+I ENGINEERING GROUP

E+I Engineering Ltd.

[European Manufacturing Location](#)

Ballyderowen
Burnfoot
Co. Donegal
Ireland

Tel:
(UK) +44 (0)28 71353030
(ROI) +353 (0)74 9368719

E+I Engineering USA Corp

[USA Manufacturing Location](#)

400 Supreme Industrial Drive
Anderson
South Carolina
29621

Tel: +1 864 375 1757

Powerbar Gulf LLC

[Middle East Manufacturing Location](#)

N15/N18
Al Ghail Industrial Park
Ras Al Khaimah
PO Box 13229
UAE

Tel: +971(0) 7221 6100

E+I Engineering Ltd.

[UK Central Office](#)

2/8 Victoria Avenue
London
EC2M 4NS

Tel: +44 (0)20 3206 1650

Email:
info@e-i-eng.com

WWW.E-I-ENG.COM