



E+I ENGINEERING GROUP

# HIGH POWERBAR

COPPER UL857



PowerBar



**E+I Engineering's High Powerbar (HPB) UL857 range is a 600 Volt totally encased, non-ventilated, low impedance busduct. The range is available from 800A - 5000A with multiple bar configurations to suit project requirements.**

The busduct is housed in an aluminum casing which acts as a ground. Ingress protection ratings of IP55, IP65 and IP67 are available.

**Features:**

- Epoxy resin coated copper conductors with tin or silver coated finish
- Joint pack construction with double headed shear bolts for quick installation
- Up to 5 busplug points per 12ft length
- All busplugs have mechanical/ electrical interlocks with a 'ground first, break last' safety feature
- Pressed out tags for busplug connections

# STANDARDS

## Standards

The HPB range is UL857 listed and manufactured in a certified management system environment where Quality ISO 9001, Safety OHSAS 18001 and Environmental ISO 14001 standards are applied to all aspects of the manufacturing and installation processes. We meet the requirements of NEMA, CSA, IEEE, ANSI, IEC & CE.

## UL Listed

|                    |                                                                                       |
|--------------------|---------------------------------------------------------------------------------------|
| 8.2.1              | Verification of Temperature Rise Limits                                               |
| 8.2.2              | Verification of Dielectric Voltage Withstand Test                                     |
| 8.2.2.2            | Clamped Joint Test                                                                    |
| 8.2.2.3            | Reduced Insulation Thickness Test                                                     |
| 8.2.3              | Verification of Short Circuit Withstand                                               |
| 8.2.3.1.1.2        | Dielectric Test Withstand Tests                                                       |
| 8.2.6              | Verification of Insulation Resistance and Dielectric Withstand After Exposure to Rain |
| 8.2.7.1            | Verification of Bending Resistance                                                    |
| 8.2.7.2            | Verification of Impact Strength                                                       |
| 8.2.7.3            | Verification of Crushing Resistance                                                   |
| 8.2.7.4            | Verification of Resistance to Bus Bar Pull Out                                        |
| 8.2.8              | Verification of Overload and Endurance of Non-Switching Plug-in Devices               |
| 8.2.9              | Verification of Resistance to Aging                                                   |
| 8.2.10             | Verification of Metallic Coating Thickness                                            |
| 8.2.11             | Verification of Insulation Base and Support Strength                                  |
| 8.2.12             | Gasket Tests                                                                          |
| Ref to ANSI /UL 50 | Type Rating Tests (Ingress Protection Tests) for the 2 series                         |

## Seismic Compliance

The product range is certified for Seismic withstand capability and has a qualification level - high (Zone-5) in accordance to IEEE standard 693-2005.

All certificates available on request



OHSAS 18001:2007  
OHS 533652

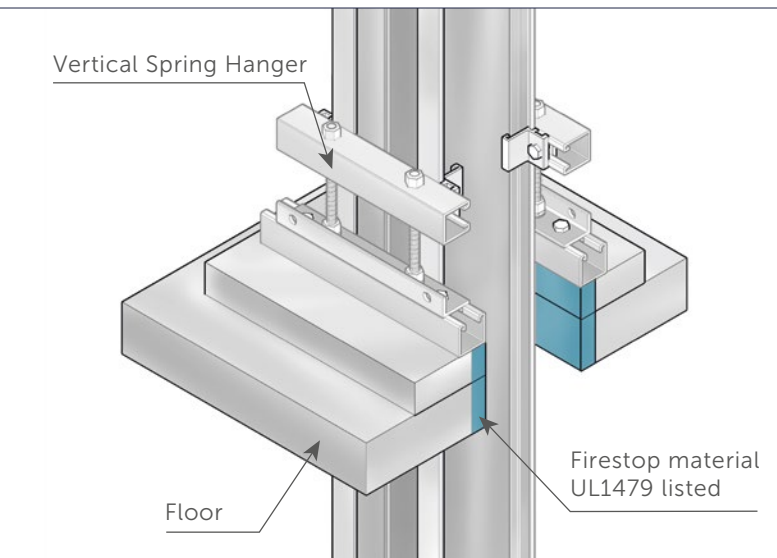


ISO 9001:2008  
FM 12680



ISO 14001:2004  
No: EMS 566536

# TECHNICAL FEATURES



**UL Fire Stop System**

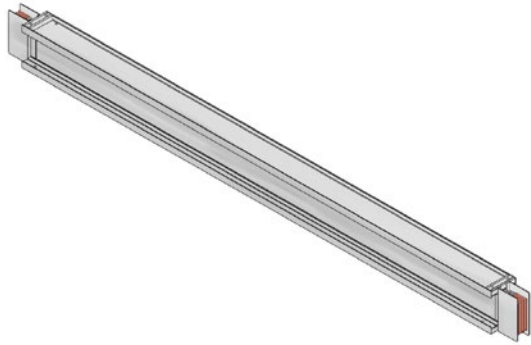
- High Powerbar is constructed from high density 99.99% conductivity copper
- The conductors are insulated with a Class B epoxy insulation applied uniformly using an electrostatic coating process. The epoxy coating is non-hygroscopic and chemical resistant with outstanding heat transfer characteristics
- 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 busplugs protects the integrity of the conductor
- HPB is constructed with an all-aluminum housing. Aluminum is an extremely light metal and is cheaper and easier to install than steel. Aluminum is much less reactive than steel so it is more durable and easier to maintain.
- E+I Engineering offer a 50% or 100% fully isolated ground for systems where ground isolation is required.
- A fully rated 200% neutral option is available for busduct systems with non-linear loads. The additional neutral capacity prevents overloading caused by zero sequence harmonic currents
- HPB UL857 can be used in 'Through-Penetration Fire Stop Systems' as listed in the UL Fire Resistance Directory

# TECHNICAL FEATURES

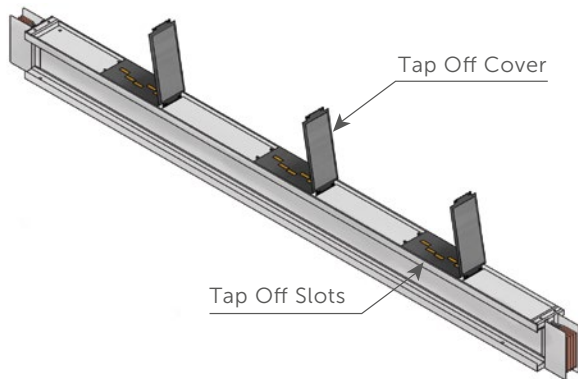
| Configuration | Phases | Neutral | Ground      |
|---------------|--------|---------|-------------|
| TP            | 100%   | 0%      | Case        |
| TP/N          | 100%   | 100%    | Case        |
| TP/E          | 100%   | 0%      | 100% or 50% |
| TP/NE         | 100%   | 100%    | 100% or 50%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

**Note:** Case refers to the aluminum casing being used as an integral ground. 100% or 50% ground bar can either be supplied as an isolated ground (ISO) or uninsulated internal ground (INT).

## STRAIGHT LENGTHS



Feeder lengths account for the bulk of a busbar run



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

### Straight Lengths

Straight lengths can be supplied at any length between 2ft - 12ft.

The busplug slot outlet and cover are made from a durable, high strength, Class B, 130°C insulation material.

The busplug slot cover prevents access to the contacts behind the cover and protects it from the entry of dirt, dust or moisture. Busplugs are IP55 as standard but higher levels up to IP67.

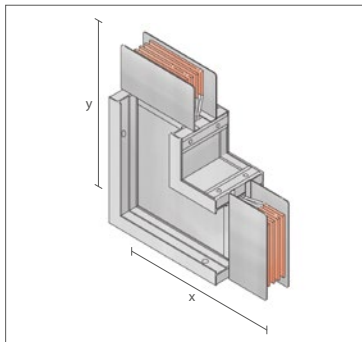
| Busduct Rating<br>(Amps) | Construction<br>Type | Busduct Size |       |        |       |
|--------------------------|----------------------|--------------|-------|--------|-------|
|                          |                      | Width        |       | Height |       |
|                          |                      | in           | mm    | in     | mm    |
| 800A                     | Single               | 3.74"        | 95mm  | 5.83"  | 148mm |
| 1000A                    | Single               | 4.33"        | 110mm | 5.83"  | 148mm |
| 1200A                    | Single               | 4.72"        | 120mm | 5.83"  | 148mm |
| 1350A                    | Single               | 5.32"        | 135mm | 5.83"  | 148mm |
| 1600A                    | Single               | 6.30"        | 160mm | 5.83"  | 148mm |
| 2000A                    | Single               | 7.87"        | 200mm | 5.83"  | 148mm |
| 2500A                    | Single               | 9.84"        | 250mm | 5.83"  | 148mm |
| 3000A                    | Double               | 13.58"       | 345mm | 5.83"  | 148mm |
| 4000A                    | Triple               | 19.69"       | 500mm | 5.83"  | 148mm |
| 5000A                    | Triple               | 23.82"       | 605mm | 5.83"  | 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 center of the joint.

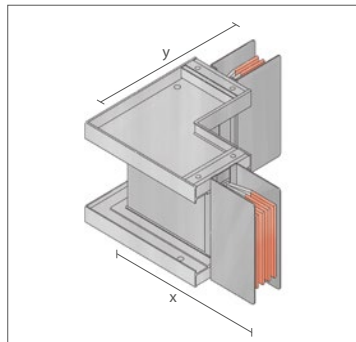
# ELBOWS

## Flatwise and Edgewise Elbows

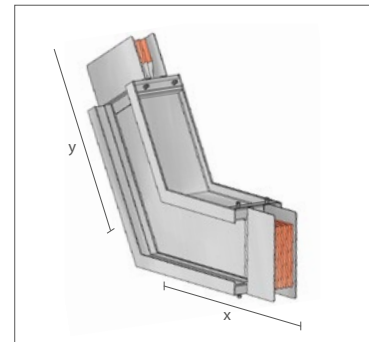
Flatwise and edgewise elbows are used to make 90° changes in the direction of the busduct system. E+I Engineering can also manufacture specially angled elbows for both flatwise and edgewise products.



**Flatwise Elbows**



**Edgewise Elbows**



**Custom Elbows**

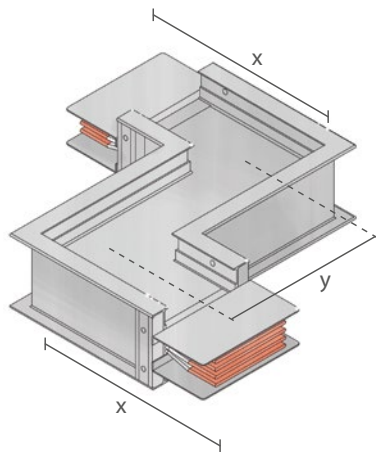
## Flatwise Elbow (Up or Down)

| Ratings<br>(Amps) | Minimum Leg Size |       |         |       | Standard Leg Size |       |     |       | Maximum Leg Size |       |     |       |
|-------------------|------------------|-------|---------|-------|-------------------|-------|-----|-------|------------------|-------|-----|-------|
|                   | X                |       | Y       |       | X                 |       | Y   |       | X                |       | Y   |       |
|                   | in               | mm    | in      | mm    | in                | mm    | in  | mm    | in               | mm    | in  | mm    |
| 800A              | 9.06"            | 230mm | 9.06"   | 230mm | 14"               | 355mm | 14" | 355mm | 30"              | 762mm | 30" | 762mm |
| 1000A             | 9.37"            | 238mm | 9.37"   | 238mm | 14"               | 355mm | 14" | 355mm | 30"              | 762mm | 30" | 762mm |
| 1200A             | 9.57"            | 243mm | 9.57"   | 243mm | 14"               | 355mm | 14" | 355mm | 30"              | 762mm | 30" | 762mm |
| 1350A             | 9.84"            | 250mm | 9.84"   | 250mm | 14"               | 355mm | 14" | 355mm | 30"              | 762mm | 30" | 762mm |
| 1600A             | 10.35"           | 263mm | 10.35"  | 263mm | 14"               | 355mm | 14" | 355mm | 30"              | 762mm | 30" | 762mm |
| 2000A             | 11.14"           | 283mm | 11.14"  | 283mm | 14"               | 355mm | 14" | 355mm | 30"              | 762mm | 30" | 762mm |
| 2500A             | 12.13 "          | 308mm | 12.13 " | 308mm | 14"               | 355mm | 14" | 355mm | 30"              | 762mm | 30" | 762mm |
| 3000A             | 13.98"           | 355mm | 13.98"  | 355mm | 20"               | 508mm | 20" | 508mm | 30"              | 762mm | 30" | 762mm |
| 4000A             | 17.05"           | 433mm | 17.05"  | 433mm | 20"               | 508mm | 20" | 508mm | 30"              | 762mm | 30" | 762mm |
| 5000A             | 19.13"           | 486mm | 19.13"  | 486mm | 20"               | 508mm | 20" | 508mm | 30"              | 762mm | 30" | 762mm |

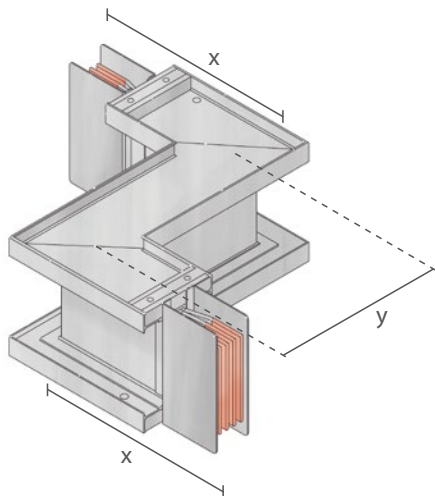
## Edgewise Elbow (Left or Right)

| Ratings<br>(Amps)                                                         | Minimum Leg Size |       |     |       | Standard Leg Size |       |     |       | Maximum Leg Size |       |     |       |
|---------------------------------------------------------------------------|------------------|-------|-----|-------|-------------------|-------|-----|-------|------------------|-------|-----|-------|
|                                                                           | X                |       | Y   |       | X                 |       | Y   |       | X                |       | Y   |       |
|                                                                           | in               | mm    | in  | mm    | in                | mm    | in  | mm    | in               | mm    | in  | mm    |
| 800A, 1000A, 1200A, 1350A,<br>1600A, 2000A, 2500A, 3000A,<br>4000A, 5000A | 10"              | 254mm | 10" | 254mm | 14"               | 355mm | 14" | 355mm | 24"              | 610mm | 24" | 610mm |

## 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<br>(Amps) | Minimum Leg Size |       |    |      | Maximum Leg Size |       |        |       |
|-------------------|------------------|-------|----|------|------------------|-------|--------|-------|
|                   | X                |       | Y  |      | X                |       | Y      |       |
|                   | in               | mm    | in | mm   | in               | mm    | in     | mm    |
| 800A              | 9.06"            | 230mm | 2" | 51mm | 26"              | 660mm | 18.11" | 460mm |
| 1000A             | 9.37"            | 238mm | 2" | 51mm | 26"              | 660mm | 18.74" | 476mm |
| 1200A             | 9.57"            | 243mm | 2" | 51mm | 26"              | 660mm | 19.13" | 486mm |
| 1350A             | 9.84"            | 250mm | 2" | 51mm | 26"              | 660mm | 19.69" | 500mm |
| 1600A             | 10.35"           | 263mm | 2" | 51mm | 26"              | 660mm | 20.71" | 526mm |
| 2000A             | 11.14"           | 283mm | 2" | 51mm | 26"              | 660mm | 22.28" | 566mm |
| 2500A             | 12.13"           | 308mm | 2" | 51mm | 26"              | 660mm | 24.25" | 616mm |
| 3000A             | 13.98"           | 355mm | 2" | 51mm | 26"              | 660mm | 27.95" | 710mm |
| 4000A             | 17.05"           | 433mm | 2" | 51mm | 26"              | 660mm | 34.10" | 866mm |
| 5000A             | 19.13"           | 486mm | 2" | 51mm | 26"              | 660mm | 38.26" | 972mm |

### Edgewise Offset (Left or Right)

| Ratings (Amps)                                                      | Minimum Leg Size |       |    |      | Maximum Leg Size |       |     |       |
|---------------------------------------------------------------------|------------------|-------|----|------|------------------|-------|-----|-------|
|                                                                     | X                |       | Y  |      | X                |       | Y   |       |
|                                                                     | in               | mm    | in | mm   | in               | mm    | in  | mm    |
| 800A, 1000A, 1200A, 1350A, 1600A, 2000A, 2500A, 3000A, 4000A, 5000A | 10"              | 254mm | 3" | 76mm | 20"              | 508mm | 24" | 610mm |

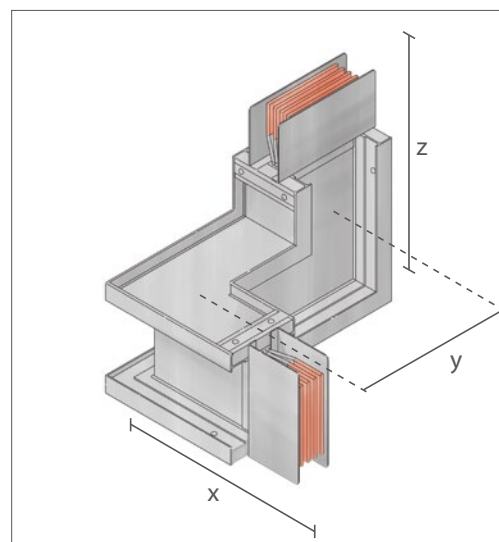
# COMBINATIONS

## Combination Elbows

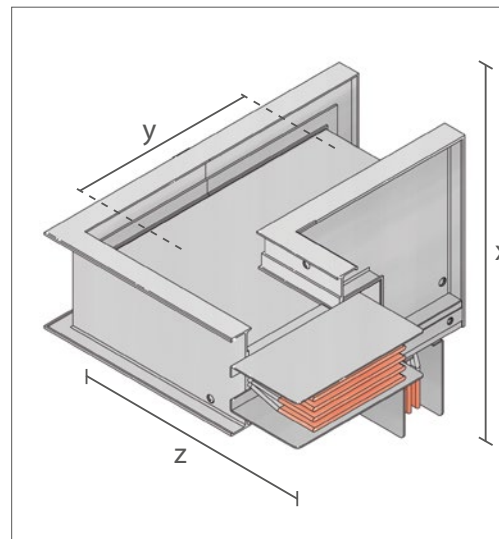
Combination elbows are used to conform to the building's structure and to change the direction of the busduct within a confined space.

| Ratings<br>(Amps) | Minimum Leg Size  |       |        |       |                   |       |
|-------------------|-------------------|-------|--------|-------|-------------------|-------|
|                   | X (Edgewise side) |       | Y      |       | Z (Flatwise side) |       |
|                   | in                | mm    | in     | mm    | in                | mm    |
| 800A              | 10"               | 254mm | 6.77"  | 172mm | 9.06              | 230mm |
| 1000A             | 10"               | 254mm | 7.05"  | 179mm | 9.37"             | 238mm |
| 1200A             | 10"               | 254mm | 7.24"  | 184mm | 9.57"             | 243mm |
| 1350A             | 10"               | 254mm | 7.56"  | 192mm | 9.84"             | 250mm |
| 1600A             | 10"               | 254mm | 8.03"  | 204mm | 10.35"            | 263mm |
| 2000A             | 10"               | 254mm | 8.82"  | 224mm | 11.24"            | 283mm |
| 2500A             | 10"               | 254mm | 9.80"  | 249mm | 12.13"            | 308mm |
| 3000A             | 10"               | 254mm | 11.36" | 297mm | 13.98"            | 355mm |
| 4000A             | 10"               | 254mm | 14.69" | 373mm | 17.05"            | 433mm |
| 5000A             | 10"               | 254mm | 16.73" | 425mm | 19.13"            | 486mm |

| Ratings<br>(Amps) | Maximum Leg Size  |       |        |       |                   |       |
|-------------------|-------------------|-------|--------|-------|-------------------|-------|
|                   | X (Edgewise side) |       | Y      |       | Z (Flatwise side) |       |
|                   | in                | mm    | in     | mm    | in                | mm    |
| 800A              | 24"               | 610mm | 19.06" | 484mm | 30"               | 762mm |
| 1000A             | 24"               | 610mm | 19.37" | 492mm | 30"               | 762mm |
| 1200A             | 24"               | 610mm | 19.57" | 497mm | 30"               | 762mm |
| 1350A             | 24"               | 610mm | 19.84" | 504mm | 30"               | 762mm |
| 1600A             | 24"               | 610mm | 20.35" | 517mm | 30"               | 762mm |
| 2000A             | 24"               | 610mm | 21.14" | 537mm | 30"               | 762mm |
| 2500A             | 24"               | 610mm | 22.13" | 562mm | 30"               | 762mm |
| 3000A             | 24"               | 610mm | 23.98" | 609mm | 30"               | 762mm |
| 4000A             | 24"               | 610mm | 27.05" | 687mm | 30"               | 762mm |
| 5000A             | 24"               | 610mm | 29.13" | 740mm | 30"               | 762mm |

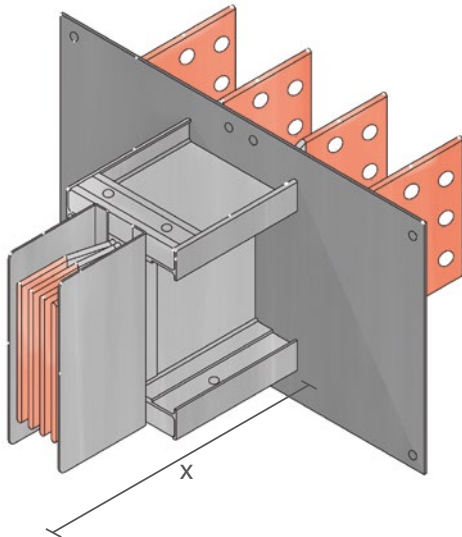


Edge Right Flatwise Up

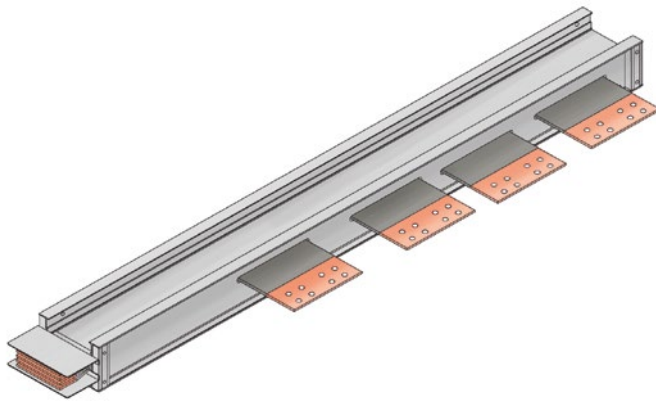


Flatwise Up Edgewise Right

## FLANGES



Panel Flange



Parallel Flange

### 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

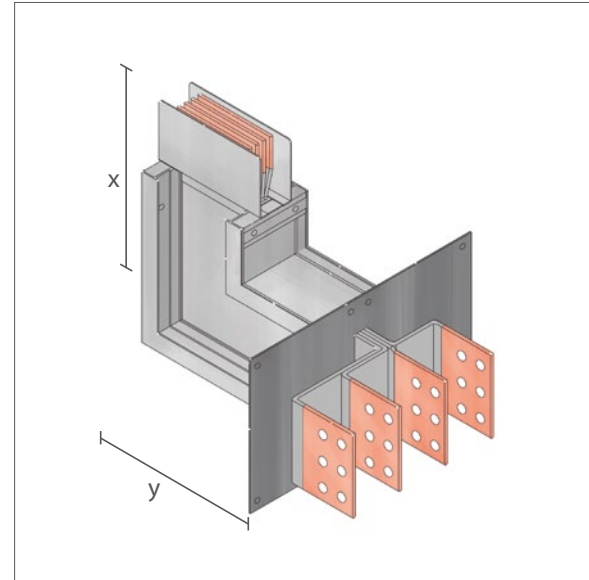
| Ratings (Amps)                                                      | Width |       | Height |       |
|---------------------------------------------------------------------|-------|-------|--------|-------|
|                                                                     | in    | mm    | in     | mm    |
| 800A, 1000A, 1200A, 1350A, 1600A, 2000A, 2500A, 3000A, 4000A, 5000A | 9"    | 229mm | 33"    | 838mm |

## Combination Flange

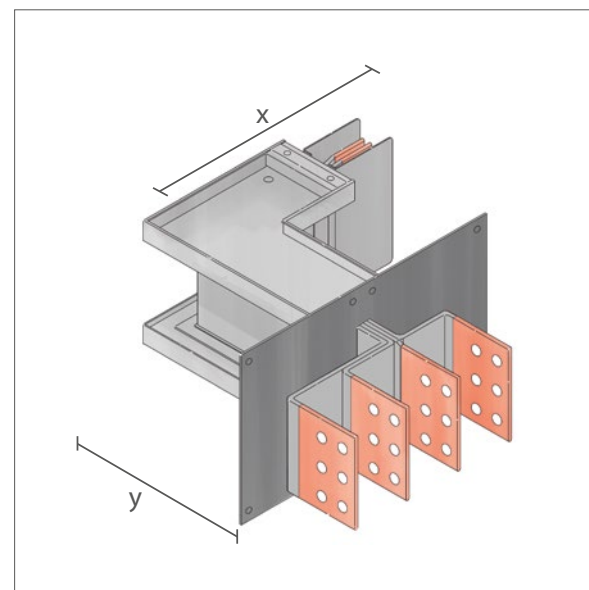
A combination flange is used when the minimum leg lengths for either the standard elbow or the standard flange cannot be met.

## Flange/Elbows (Flatwise)

| Ratings<br>(Amps) | Minimum Leg Size |       |        |       | Maximum Leg Size |       |        |       |
|-------------------|------------------|-------|--------|-------|------------------|-------|--------|-------|
|                   | X                |       | Y      |       | X                |       | Y      |       |
|                   | in               | mm    | in     | mm    | in               | mm    | in     | mm    |
| 800A              | 9.06"            | 230mm | 3.85"  | 98mm  | 30"              | 762mm | 18.11" | 460mm |
| 1000A             | 9.37"            | 238mm | 4.13"  | 105mm | 30"              | 762mm | 18.74" | 476mm |
| 1200A             | 9.57"            | 243mm | 4.33"  | 110mm | 30"              | 762mm | 19.13" | 486mm |
| 1350A             | 9.84"            | 250mm | 4.65"  | 118mm | 30"              | 762mm | 19.69" | 500mm |
| 1600A             | 10.35"           | 263mm | 5.12"  | 130mm | 30"              | 762mm | 20.70" | 526mm |
| 2000A             | 11.14"           | 283mm | 5.91"  | 150mm | 30"              | 762mm | 22.28" | 566mm |
| 2500A             | 12.13"           | 308mm | 6.89"  | 175mm | 30"              | 762mm | 24.25" | 616mm |
| 3000A             | 13.98"           | 355mm | 8.78"  | 223mm | 30"              | 762mm | 27.95" | 710mm |
| 4000A             | 17.05"           | 433mm | 11.81" | 300mm | 30"              | 762mm | 34.09" | 866mm |
| 5000A             | 19.13"           | 486mm | 13.90" | 353mm | 30"              | 762mm | 38.27" | 972mm |



Flatwise Elbow Flange

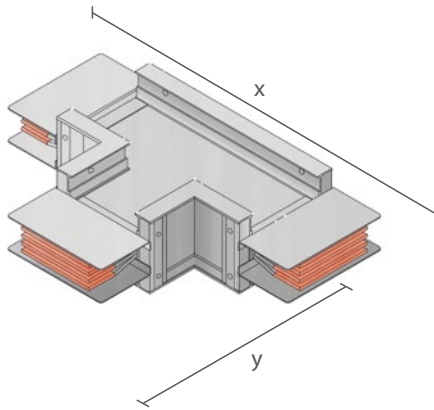


Edgewise Elbow Flange

## Flange/Elbows (Edgewise)

| Ratings (Amps)                                                      | Minimum Leg Size |       |    |       | Maximum Leg Size |       |     |       |
|---------------------------------------------------------------------|------------------|-------|----|-------|------------------|-------|-----|-------|
|                                                                     | X                |       | Y  |       | X                |       | Y   |       |
|                                                                     | in               | mm    | in | mm    | in               | mm    | in  | mm    |
| 800A, 1000A, 1200A, 1350A, 1600A, 2000A, 2500A, 3000A, 4000A, 5000A | 10"              | 254mm | 5" | 127mm | 24"              | 610mm | 20" | 508mm |

## SPECIALS



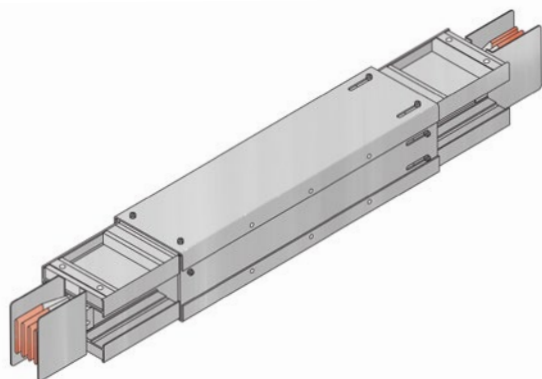
Flatwise Tee

### Flatwise Tee

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

### Flatwise Tee

| Ratings<br>(Amps) | Minimum Leg Size |       |        |       | Standard Leg Size |        |     |       | Maximum Leg Size |        |     |       |
|-------------------|------------------|-------|--------|-------|-------------------|--------|-----|-------|------------------|--------|-----|-------|
|                   | X                |       | Y      |       | X                 |        | Y   |       | X                |        | Y   |       |
|                   | in               | mm    | in     | mm    | in                | mm     | in  | mm    | in               | mm     | in  | mm    |
| 800A              | 18.11"           | 460mm | 9.06"  | 230mm | 28"               | 711mm  | 14" | 356mm | 60"              | 1524mm | 26" | 660mm |
| 1000A             | 18.39"           | 476mm | 9.37"  | 238mm | 28"               | 711mm  | 14" | 356mm | 60"              | 1524mm | 26" | 660mm |
| 1200A             | 19.13"           | 486mm | 9.57"  | 243mm | 28"               | 711mm  | 14" | 356mm | 60"              | 1524mm | 26" | 660mm |
| 1350A             | 19.69"           | 500mm | 9.84"  | 250mm | 28"               | 711mm  | 14" | 356mm | 60"              | 1524mm | 26" | 660mm |
| 1600A             | 20.71"           | 526mm | 10.35" | 263mm | 28"               | 711mm  | 14" | 356mm | 60"              | 1524mm | 26" | 660mm |
| 2000A             | 22.28"           | 566mm | 11.14" | 283mm | 28"               | 711mm  | 14" | 356mm | 60"              | 1524mm | 26" | 660mm |
| 2500A             | 24.25"           | 616mm | 12.13" | 308mm | 28"               | 711mm  | 14" | 356mm | 60"              | 1524mm | 26" | 660mm |
| 3000A             | 27.95"           | 710mm | 13.98" | 355mm | 40"               | 1016mm | 20" | 508mm | 60"              | 1524mm | 26" | 660mm |
| 4000A             | 34.09"           | 866mm | 17.05" | 433mm | 40"               | 1016mm | 20" | 508mm | 60"              | 1524mm | 26" | 660mm |
| 5000A             | 38.27"           | 972mm | 19.13" | 486mm | 40"               | 1016mm | 20" | 508mm | 60"              | 1524mm | 26" | 660mm |



Expansion Unit

### Expansion Units

Expansion units are used to accommodate the expansion and contraction of a busduct system as well as allow for building movement. They allow for a 1.57" movement along the length of the busduct.

Expansion units are recommended when a straight busduct run exceeds 196ft.

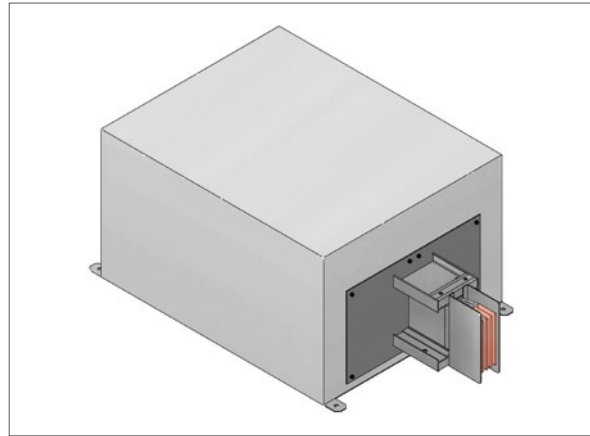
# FEED UNITS & CAPS

## Cable Feed Units

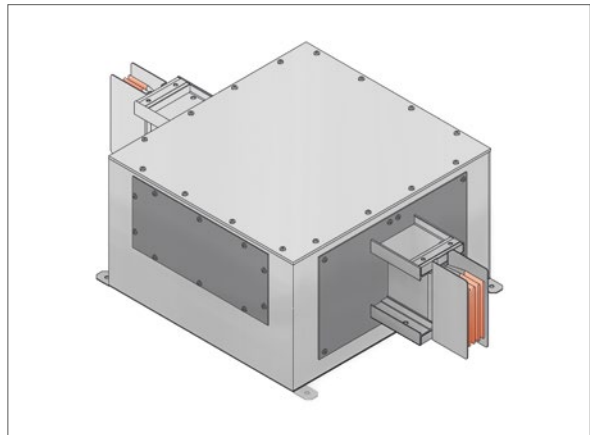
End feed units are used on the ends of busduct risers which are cable fed. Center feed units are used in the middle of busduct risers which are cable fed.

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

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



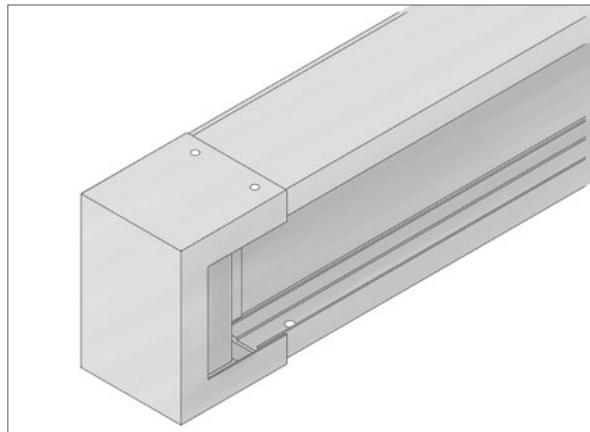
**End Feed Units**



**Center Feed Units**

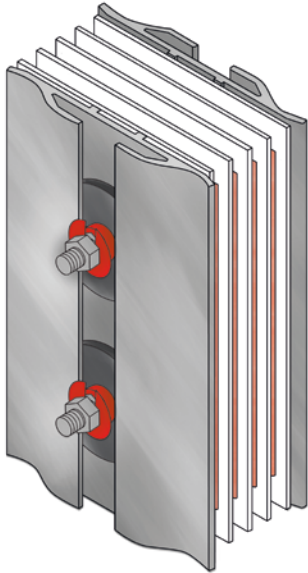
## End Caps

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



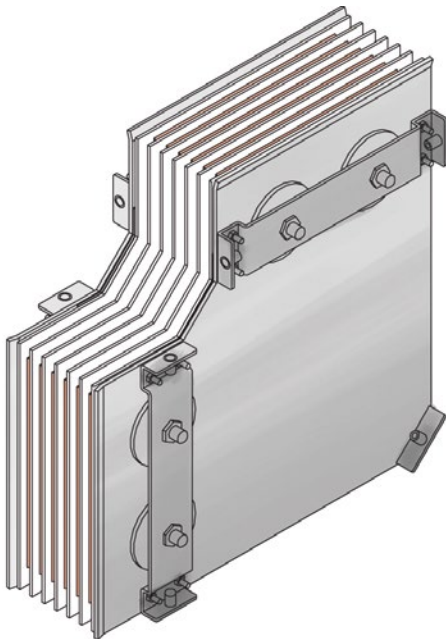
**End Caps**

# SPLICE

**Splice**

## Splice

E+I Engineering's splice is a compression joint design utilising a specially designed Belleville washer to distribute the pressure evenly over the splice. The splice is supplied in specific sizes depending on the rating of busduct required.

**Flatwise Elbow Splice**

## Flatwise elbow splices

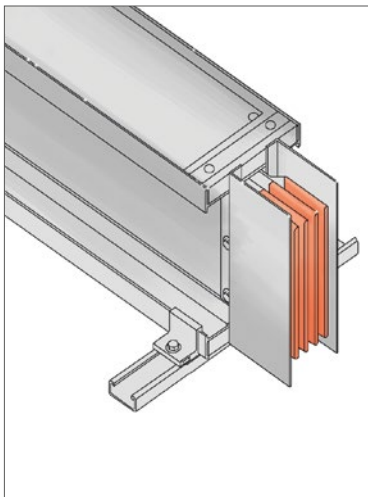
Flatwise elbow splices can be used to make 90° changes in the direction of the busduct system.

# INSTALLATION

The modular design of HPB allows it to be installed flat or on its edge.

## Edge Installation

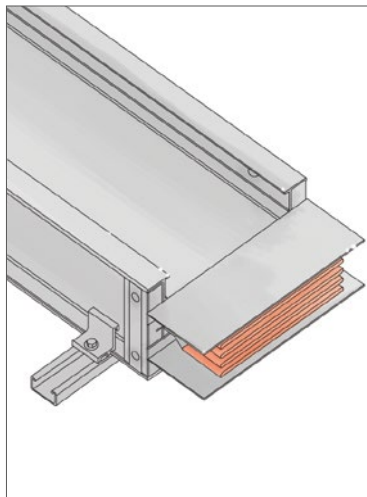
Edge installation is the preferred method of installation for a smaller rated busbar system.



Edge Installation

## Flat Installation

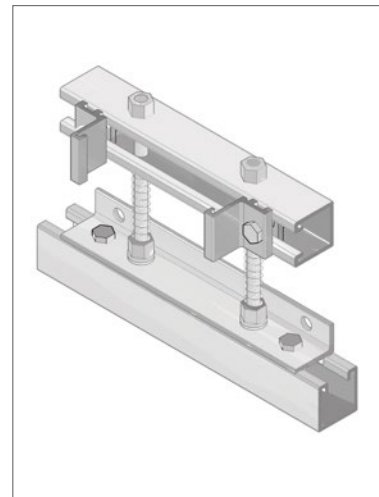
Flat installation is the preferred method of installation for a higher rated, multistack busbar system. When installed on its flat all busbar rating has a height of 145mm.



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 Pieces

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.

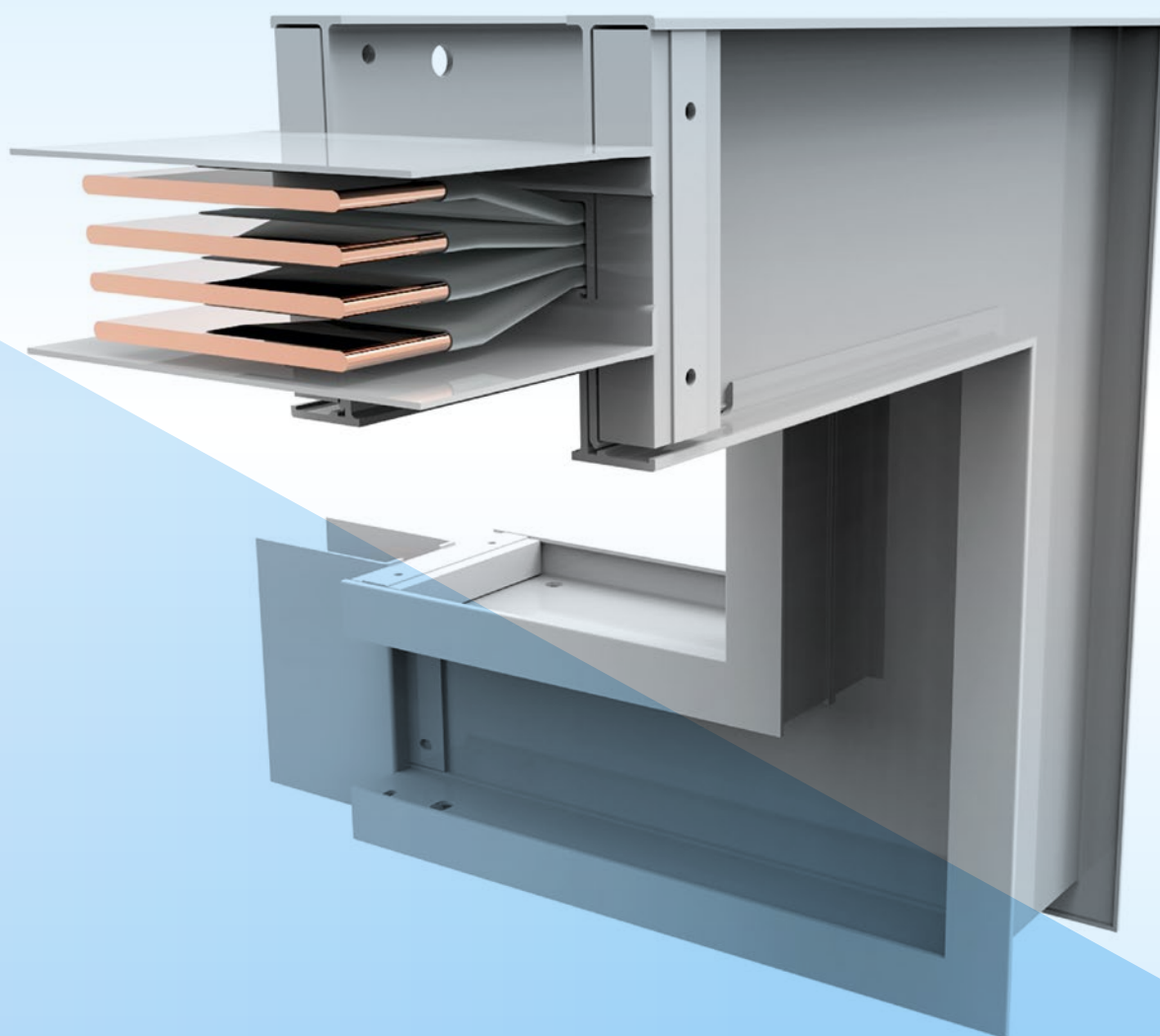
# TECHNICAL DATA

| Technical Data                                      |             |             |             |             |             |
|-----------------------------------------------------|-------------|-------------|-------------|-------------|-------------|
| Rated Current (A)                                   | 800         | 1000        | 1200        | 1350        | 1600        |
| Rated Operational Voltage (V)                       | 600         | 600         | 600         | 600         | 600         |
| Rated Insulation Voltage (V)                        | 600         | 600         | 600         | 600         | 600         |
| Short Circuit                                       |             |             |             |             |             |
| 6 Cycle RMS Symmetrical Short circuit rating (KA)   | 75          | 100         | 100         | 100         | 150         |
| Phase Conductor Cross Sectional Area                |             |             |             |             |             |
| inches <sup>2</sup>                                 | 0.31        | 0.47        | 0.56        | 0.70        | 0.93        |
| millimeters <sup>2</sup>                            | 202         | 300         | 360         | 450         | 600         |
| Neutral Conductor Cross Sectional Area              |             |             |             |             |             |
| inches <sup>2</sup>                                 | 0.31        | 0.47        | 0.56        | 0.70        | 0.93        |
| millimeters <sup>2</sup>                            | 202         | 300         | 360         | 450         | 600         |
| Isolated 100% Ground Conductor Cross Sectional Area |             |             |             |             |             |
| inches <sup>2</sup>                                 | 0.31        | 0.47        | 0.56        | 0.70        | 0.93        |
| millimeters <sup>2</sup>                            | 202         | 300         | 360         | 450         | 600         |
| 50% Ground Cross Sectional Area                     |             |             |             |             |             |
| inches <sup>2</sup>                                 | 0.16        | 0.23        | 0.28        | 0.35        | 0.46        |
| millimeters <sup>2</sup>                            | 105         | 150         | 180         | 225         | 300         |
| Housing Ground Path Cross Sectional Area            |             |             |             |             |             |
| inches <sup>2</sup>                                 | 2.68        | 2.82        | 2.92        | 3.06        | 3.30        |
| millimeters <sup>2</sup>                            | 1730        | 1820        | 1880        | 1970        | 2120        |
| Overall Dimensions                                  |             |             |             |             |             |
| Height x Width ( in )                               | 3.74 x 5.83 | 4.33 x 5.83 | 4.72 x 5.83 | 5.32 x 5.83 | 6.30 x 5.83 |
| Height x Width ( mm )                               | 95 x 148    | 110 x 148   | 120 x 148   | 135 x 148   | 160 x 148   |
| Weight                                              |             |             |             |             |             |
| Weight of 4 Bar System (lbs/ft)                     | 10.43       | 12.89       | 14.57       | 17.09       | 21.29       |
| Weight of 5 Bar System (lbs/ft)                     | 11.77       | 14.80       | 16.87       | 20.33       | 25.12       |
| Resistance                                          |             |             |             |             |             |
| Resistance (mΩ/100ft) at 68.5°F                     | 2.591       | 1.450       | 1.098       | 0.838       | 0.561       |
| Resistance (mΩ/100ft) at 176°F                      | 3.201       | 1.785       | 1.385       | 1.042       | 0.732       |
| Reactance                                           |             |             |             |             |             |
| Reactance (mΩ/100ft) at 60Hz                        | 1.189       | 0.558       | 0.497       | 0.406       | 0.293       |
| Impedance                                           |             |             |             |             |             |
| Impedance (mΩ/m) at 176°F                           | 3.354       | 1.840       | 1.437       | 1.092       | 0.756       |
| Voltage Drop Full Load 60Hz per 100ft               |             |             |             |             |             |
| Power Factor = 0.7 (V/100ft) at 176°F               | 4.299       | 2.853       | 2.752       | 2.384       | 1.998       |
| Power Factor = 0.8 (V/100ft) at 176°F               | 4.573       | 3.052       | 2.922       | 2.519       | 2.109       |
| Power Factor = 0.9 (V/100ft) at 176°F               | 4.756       | 3.203       | 3.041       | 2.606       | 2.179       |
| Power Factor = 1.0 (V/100ft) at 176°F               | 4.482       | 3.091       | 2.879       | 2.436       | 2.018       |

| Technical Data                                      |             |             |              |              |              |
|-----------------------------------------------------|-------------|-------------|--------------|--------------|--------------|
| Rated Current (A)                                   | 2000        | 2500        | 3000         | 4000         | 5000         |
| Rated Operational Voltage (V)                       | 600         | 600         | 600          | 600          | 600          |
| Rated Insulation Voltage (V)                        | 600         | 600         | 600          | 600          | 600          |
| Short Circuit                                       |             |             |              |              |              |
| 6 Cycle RMS Symmetrical Short circuit rating (KA)   | 150         | 150         | 200          | 200          | 200          |
| Phase Conductor Cross Sectional Area                |             |             |              |              |              |
| inches <sup>2</sup>                                 | 1.30        | 1.77        | 1.86         | 2.51         | 3.49         |
| millimeters <sup>2</sup>                            | 840         | 1140        | 1200         | 1620         | 2250         |
| Neutral Conductor Cross Sectional Area              |             |             |              |              |              |
| inches <sup>2</sup>                                 | 1.30        | 1.77        | 1.86         | 2.51         | 3.49         |
| millimeters <sup>2</sup>                            | 840         | 1140        | 1200         | 1620         | 2250         |
| Isolated 100% Ground Conductor Cross Sectional Area |             |             |              |              |              |
| inches <sup>2</sup>                                 | 1.30        | 1.77        | 1.86         | 2.51         | 3.49         |
| millimeters <sup>2</sup>                            | 840         | 1140        | 1200         | 1620         | 2250         |
| 50% Ground Cross Sectional Area                     |             |             |              |              |              |
| inches <sup>2</sup>                                 | 0.65        | 0.88        | 0.93         | 1.25         | 1.74         |
| millimeters <sup>2</sup>                            | 420         | 570         | 600          | 810          | 1125         |
| Housing Ground Path Cross Sectional Area            |             |             |              |              |              |
| inches <sup>2</sup>                                 | 3.66        | 4.14        | 6.60         | 9.60         | 10.56        |
| millimeters <sup>2</sup>                            | 2360        | 2660        | 4238         | 6179         | 6809         |
| Overall Dimensions                                  |             |             |              |              |              |
| Height x Width ( in )                               | 7.87 x 5.83 | 9.84 x 5.83 | 13.58 x 5.83 | 19.69 x 5.83 | 23.82 x 5.83 |
| Height x Width ( mm )                               | 200 x 148   | 250 x 148   | 345 x 148    | 500 x 148    | 605 x 148    |
| Weight                                              |             |             |              |              |              |
| Weight of 4 Bar System (lbs/ft)                     | 28.01       | 36.42       | 43.17        | 58.37        | 59.95        |
| Weight of 5 Bar System (lbs/ft)                     | 33.37       | 43.69       | 50.97        | 68.59        | 70.17        |
| Resistance                                          |             |             |              |              |              |
| Resistance (mΩ/100ft) at 68°F                       | 0.480       | 0.327       | 0.293        | 0.232        | 0.149        |
| Resistance (mΩ/100ft) at 176°F                      | 0.587       | 0.403       | 0.341        | 0.283        | 0.199        |
| Reactance                                           |             |             |              |              |              |
| Reactance (mΩ/100ft) at 60Hz                        | 0.267       | 0.176       | 0.146        | 0.129        | 0.075        |
| Impedance                                           |             |             |              |              |              |
| Impedance (mΩ/m) at 176°F                           | 0.640       | 0.428       | 0.366        | 0.309        | 0.199        |
| Voltage Drop Full Load 60Hz                         |             |             |              |              |              |
| Power Factor = 0.7 (V/100ft) at 176°F               | 2.083       | 1.766       | 1.785        | 2.008        | 1.666        |
| Power Factor = 0.8 (V/100ft) at 176°F               | 2.181       | 1.854       | 1.876        | 2.103        | 1.765        |
| Power Factor = 0.9 (V/100ft) at 176°F               | 2.233       | 1.903       | 1.928        | 2.153        | 1.831        |
| Power Factor = 1.0 (V/100ft) at 176°F               | 2.033       | 1.745       | 1.774        | 1.960        | 1.722        |

## HIGH POWERBAR

COPPER UL857



# QUICK REFERENCE GUIDE

## Critical Dimensions

- The distance from the centre of a joint to the wall, ceiling or floor must be at least 7 inches.
- All joints must be accessible for maintenance. Joints should not be located inside a wall, ceiling or floor.
- There must be a minimum distance of 2 inches between the busduct and any wall/ ceiling/ other busduct.
- Allow adequate space for busplugs to be installed easily and safely.
- Busduct lengths are available from 2ft - 12ft.
- Distribution busduct lengths are available from 2ft - 12ft.
- Edgewise elbow sections are available with leg lengths from 10in - 2ft.
- Flatwise elbow sections are available with a maximum leg length of 2.5ft. The minimum leg length varies depending on the busduct.

## Operating Conditions

- Ambient temperature from -22°F to +131°F
- High Powerbar may be operated continuously at its assigned ratings provided the ambient temperature does not exceed 131°F. For higher ambient temperatures, the ratings should be reduced by applying the appropriate multiplier as shown in the table below:

| Ambient Temperature (°F) | Multiplier |
|--------------------------|------------|
| 131                      | 1.00       |
| 140                      | 0.95       |
| 149                      | 0.90       |
| 158                      | 0.85       |
| 167                      | 0.80       |
| 176                      | 0.74       |
| 185                      | 0.68       |

- Relative humidity of 95% or below.
- This product designed for indoor use and can be installed horizontally or vertically.

## Critical Details

- Busduct 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 busduct must be installed with the neutral phase to the top. Please indicate the phase orientation for vertically installed busduct.



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