



ABB BUSBAR P MAX H

IEC COPPER EDITION



INTRODUCTION

PMAX H is a patented range of busbar trunking that is utilised within building and industrial applications to deliver power to electrical loads. It is an alternative to traditional cabling and provides numerous advantages to the Installer and Client including savings on space, time and cost. There are also electrical savings due to reduced losses, reduced voltage drop and flexibility to reposition load centres using tap-off points.

The PMAX range of products is built with patented processes that make it the most reliable product of its type, providing peace of mind for your installation. This, together with unrivalled product support, means that the PMAX range of products will provide the optimum solution to your distribution requirements.

From concept to commissioning we provide complete in-house engineering.

- Site surveys
- 3D - CAD Drawings
- Project Management
- Thermal Imaging

Our highly skilled team are experts at providing the client with exactly what they require and are experienced in producing bespoke parts to meet the client's unique demand.

The ABB PMAX (H) IEC Copper range is a 1000 Volt, totally encased, non-ventilated, low impedance sandwich construction, with epoxy resin coated copper conductors. The range is available from 1100A to 6600A available with multiple bar configurations to suit project requirements, including Neutral, Double Neutral, Earth and Half Earth.

The bar is housed in an Aluminium casing which also acts as an Integral Earth and is available with a choice of ingress Protection Ratings from IP55 to IP67. The busbar is painted in grey (RAL 7035). Other colours can be accommodated on request.

FEATURES

- Copper conductor's mill, tin or silver coated-finish.
- Joint Pack construction with double headed shear nuts, for quick installation.
- Up to five tap off points per three metre length.
- All tap offs have mechanical/electrical interlocks with an "earth first, break last" safety feature.
- Pressed out tags for tap off connections – this is a patented process.

STANDARDS

Standards

The PMAX range is fully ASTA Tested Certified and is CE approved. It is manufactured in a certified management system environment where Quality BS EN ISO 9001:2008, Safety OHSAS 18001:2007 and Environmental ISO 140001 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 Verification of **Strength of materials and parts**
- 10.3 Verification of **Degree of protection of enclosures**
- 10.4 Verification of **Clearance and Creepage distances**
- 10.5 Verification of **Protection against electric shock and integrity of protective circuits.**
- 10.9 Verification of **Dielectric properties**
- 10.10 Verification of **Temperature rise limits**
- 10.11 Verification of **Short-circuit withstand strength**

ASTA Certificates

ABB completed extensive testing at ASTA and KEMA accredited laboratories to ensure the product we supply, meets the international requirements.

UL Classified

ABB completed extensive testing at UL accredited laboratories to ensure the product we supply, meets UL requirements.

Seismic Compliance

The product has a qualification level - high 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

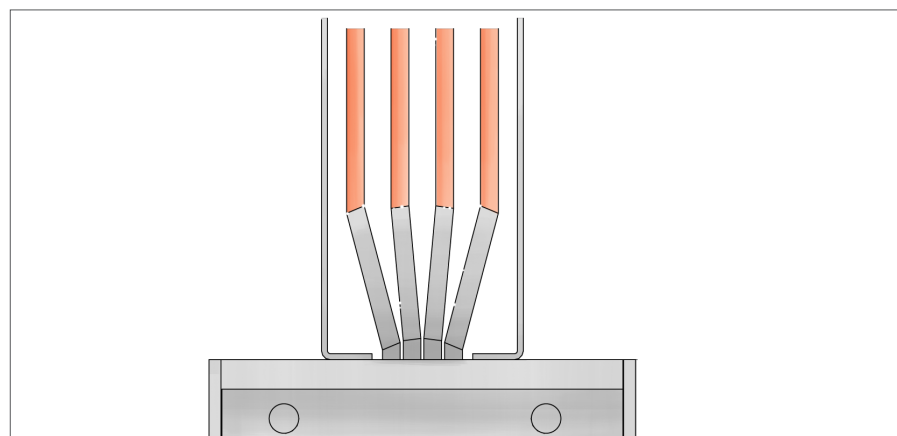
TECHNICAL FEATURES

Conductor/Insulation System

PMAX H is constructed from high density 99.99% conductivity copper. The conductors are insulated with a Class B or Class F epoxy insulation applied uniformly by our automated electrostatic coating process. The epoxy coating is non-hygroscopic, chemical resistant, and has outstanding heat transfer characteristics making it ideal for sandwich construction applications. Epoxy has excellent dielectric strength, is flame retardant and is impact resistant. The Copper is also available with the option of tin or silver plating.

The Low Impedance Sandwich Design:

- Improves heat dissipation.
- Improves short circuit rating.
- Reduces voltage drop/ impedance compared to cable.
- Removes potential pathways for the propagation of flame, smoke and gas through the busbar system.



Epoxy Coated Copper Conductors

The distribution busbar lengths have tabs pressed into the conductor to allow tap off units to be connected. This patented method for creating the tabs does not require any welding process, meaning the integrity of the conductor is not compromised.

Housing Details

The PMAX H range is constructed with an all-aluminium housing. Aluminium offers numerous advantages when compared to our competitors steel housings.

- Aluminium is a very light metal with a specific weight of 2.72 g/cm³, about a third that of steel (7.85g/cm³). This reduces transportation costs and makes the product much easier to install.
- Aluminium is non-magnetic and has a significant reduction in reactance when compared to steel.
- Unlike steel which rusts, Aluminium naturally generates a protective oxide coating which makes it highly corrosion resistant. This means the product is more durable and requires less maintenance.
- Aluminium is an excellent heat and electricity conductor and in relation to its weight is almost twice as good a conductor as copper. This means that the housing can be used as an earth along the length of the busbar.

Isolated Earth Bar (50% or 100% Copper)

ABB offer a 50% or 100% fully isolated earth for systems where earth isolation is required such as systems with heavy microprocessor, based loads, or large computer based installations. The continuity is maintained through the joint pack.

Double Neutral (200% Option)

ABB offer a fully rated 200% neutral option for busbar systems with non-linear loads. The additional neutral capacity prevents overloading caused by zero sequence harmonic currents.

TECHNICAL FEATURES

Phase Configurations

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 been utilised as a 100% housing ground.

Fire Barrier System

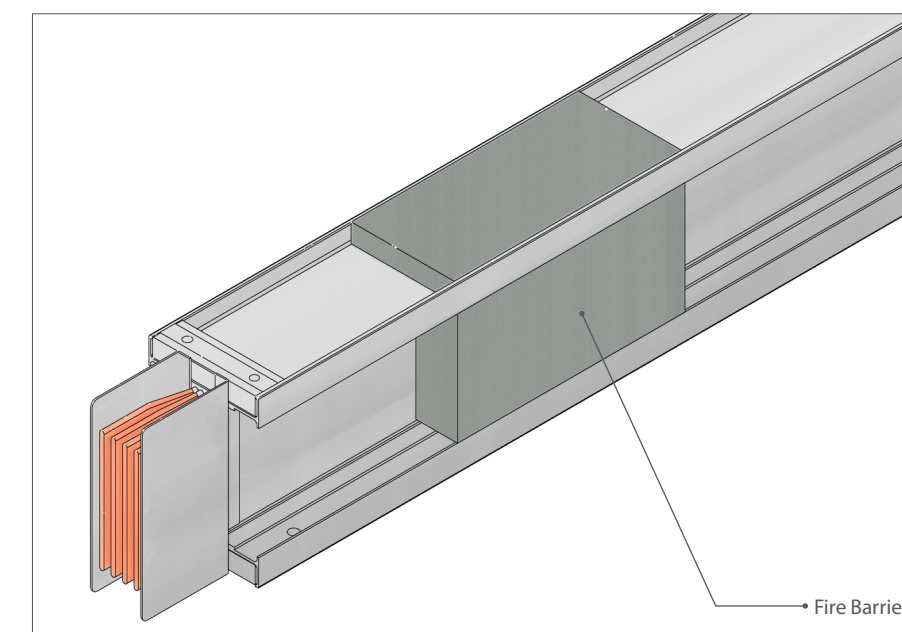
ABB offer a fully certified fire wall penetration barrier. This fire barrier can be supplied with either a four hour or two hour rating.

Key considerations for utilizing fire barriers:

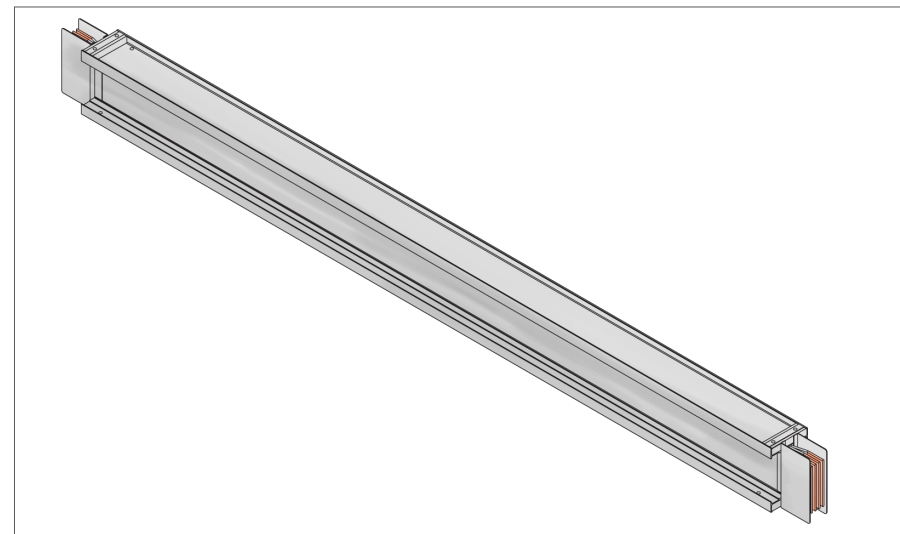
1. Life safety
2. Prevention of the passage of smoke or flames from one enclosed space to another.

If a fire barrier is not used then the busbar will simply melt when under fire load leaving a void in the wall allowing the passage of flames and smoke from one area to another.

PMAX Fire Barrier



STRAIGHT LENGTHS



Feeder length

Straight Length

Feeder lengths account for the bulk of a busbar run. Distribution lengths are like feeder lengths but with tap off slots.

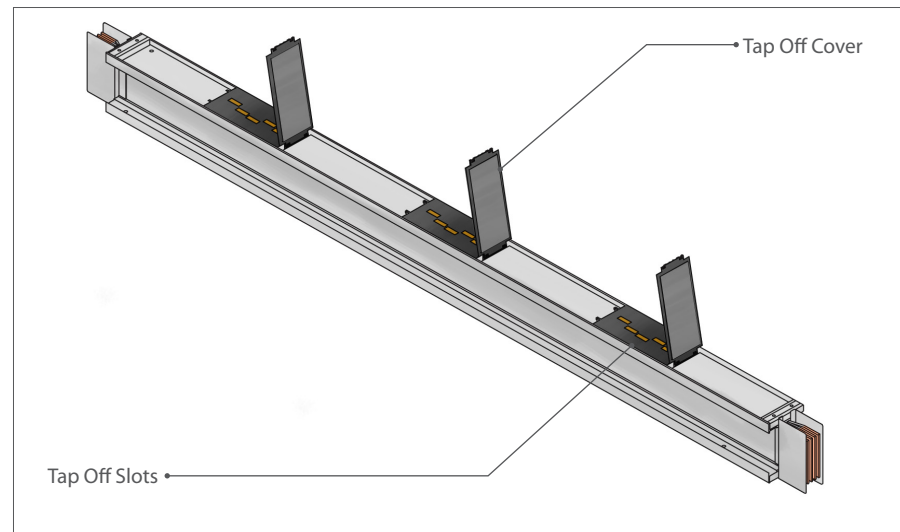
Tap off slots allow tap off units to be plugged into the busbar run. The tap off slot outlet and cover are made from a durable, high strength, Class B, 130°C insulation material.

The tap off slot cover is designed to prevent access to the contacts behind the cover and prevent the entry of dirt, dust or moisture. With a standard tap off unit or cover fitted the Ingress Protection (IP) level is at IP54 but higher levels, up to IP67, can be achieved upon request.

More information on the tap off units available from ABB can be found in our Tap Off Brochure.

Straight length can be supplied at any length between a minimum of 600mm and a maximum of 3000mm.

The table below illustrates the different types of build arrangement used depending on the rating of busbar required for the application.

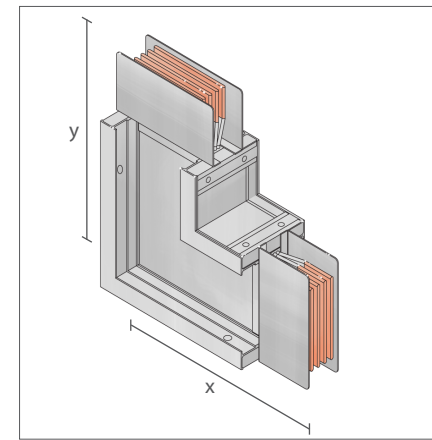


Distribution length

Busbar Rating (Amps)	Construction Type	Busbar Size (mm)	
		Height	Width
1100A	Single	130mm	145mm
1250A	Single	130mm	145mm
1400A	Single	130mm	145mm
1600A	Single	150mm	145mm
2000A	Single	185mm	145mm
2500A	Single	220mm	145mm
3200A	Single	290mm	145mm
4000A	Double	393mm	145mm
5000A	Double	463mm	145mm
6600A	Double	603mm	145mm

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

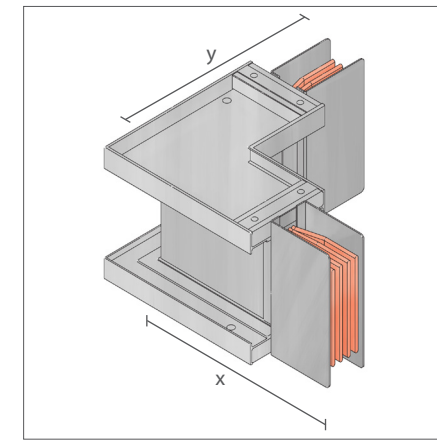
ELBOWS



Flatwise Elbows

Flatwise elbows are typically used to make 90° changes in the direction of the busbar system. There are two main kinds, flatwise up and flatwise down.

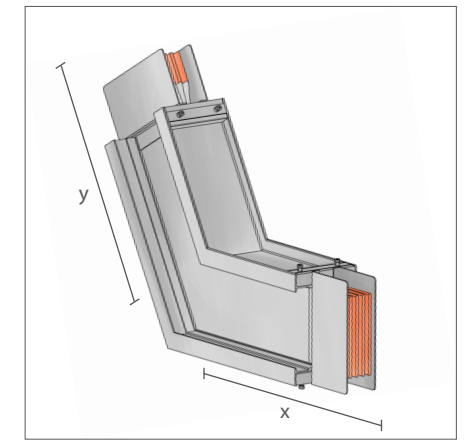
These can be used to turn the busbar route up or down if it is running on its edge, or to turn the busbar left and right if it is running on its flat.



Edgewise Elbows

Edgewise elbows are typically used to make 90° changes in the direction of the busbar system.

There are two main kinds, edgewise right and edgewise left. These can be used to turn the busbar route up or down if it is running on its flat, or to turn the busbar left and right if it is running on its edge.



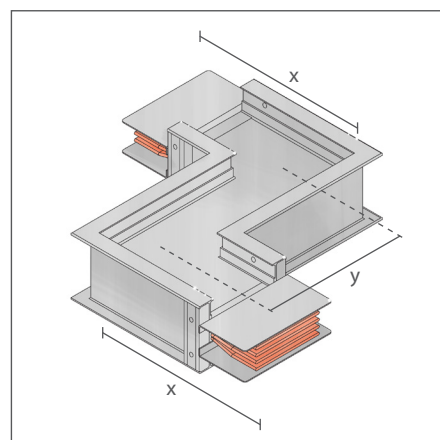
Custom Elbows

While elbows are typically 90° ABB can manufacture special angle elbows if necessary for both flatwise and edgewise products.

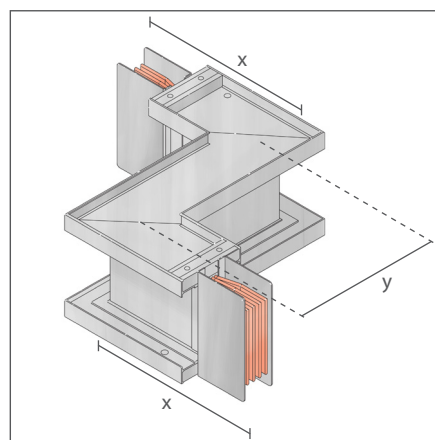
Flatwise Elbow (Up or Down)	Ratings (Amps)	Minimum Leg Size		Standard Leg Size		Maximum Leg Size	
		X	Y	X	Y	X	Y
	1100A	248mm	247mm	350mm	350mm	750mm	750mm
1250A	248mm	247mm	350mm	350mm	750mm	750mm	
1400A	248mm	247mm	350mm	350mm	750mm	750mm	
1600A	258mm	257mm	350mm	350mm	750mm	750mm	
2000A	275mm	274mm	350mm	350mm	750mm	750mm	
2500A	293mm	292mm	350mm	350mm	750mm	750mm	
3200A	328mm	327mm	350mm	350mm	750mm	750mm	
4000A	379mm	378mm	500mm	500mm	750mm	750mm	
5000A	414mm	423mm	500mm	500mm	750mm	750mm	
6600A	484mm	483mm	500mm	500mm	750mm	750mm	

Edgewise Elbow (Left or Right)	Ratings (Amps)	Minimum Leg Size		Standard Leg Size		Maximum Leg Size	
		X	Y	X	Y	X	Y
	1100A	255mm	255mm	350mm	350mm	600mm	600mm
1250A	255mm	255mm	350mm	350mm	600mm	600mm	
1400A	255mm	255mm	350mm	350mm	600mm	600mm	
1600A	255mm	255mm	350mm	350mm	600mm	600mm	
2000A	255mm	255mm	350mm	350mm	600mm	600mm	
2500A	255mm	255mm	350mm	350mm	600mm	600mm	
3200A	255mm	255mm	350mm	350mm	600mm	600mm	
4000A	255mm	255mm	350mm	350mm	600mm	600mm	
5000A	255mm	255mm	350mm	350mm	600mm	600mm	
6600A	255mm	255mm	350mm	350mm	600mm	600mm	

OFFSETS



Flatwise Offset



Edgewise Offset

Offset Sections

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.

There are four types of offset section; flatwise offset up and down, and edgewise offset left and right.

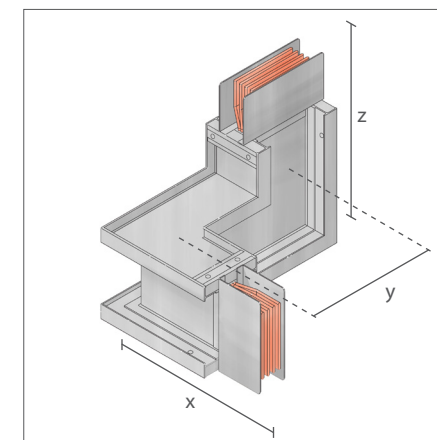
Flatwise Offset (Up or Down)	Ratings (Amps)	Minimum Leg Size		Maximum Leg Size	
		X	Y	X	Y
	1100A	248mm	50mm	650mm	496mm
1250A	248mm	50mm	650mm	496mm	
1400A	248mm	50mm	650mm	496mm	
1600A	258mm	50mm	650mm	516mm	
2000A	275mm	50mm	650mm	550mm	
2500A	293mm	50mm	650mm	586mm	
3200A	328mm	50mm	650mm	656mm	
4000A	379mm	50mm	650mm	758mm	
5000A	414mm	50mm	650mm	828mm	
6600A	484mm	50mm	650mm	968mm	

Edgewise Offset (Left or Right)	Ratings (Amps)	Minimum Leg Size		Maximum Leg Size	
		X	Y	X	Y
	1100A	255mm	80mm	510mm	600mm
1250A	255mm	80mm	510mm	600mm	
1400A	255mm	80mm	510mm	600mm	
1600A	255mm	80mm	510mm	600mm	
2000A	255mm	80mm	510mm	600mm	
2500A	255mm	80mm	510mm	600mm	
3200A	255mm	80mm	510mm	600mm	
4000A	255mm	80mm	510mm	600mm	
5000A	255mm	80mm	510mm	600mm	
6600A	255mm	80mm	510mm	600mm	

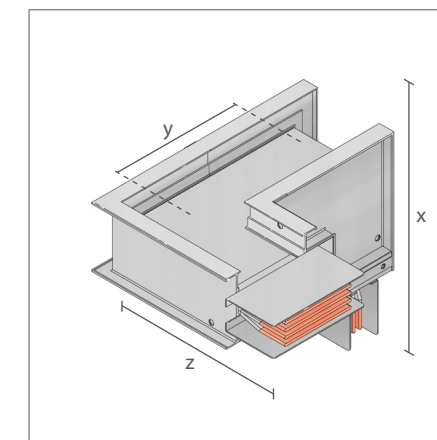
COMBINATIONS

Combination Possibilities

- Edgewise Right/Flatwise Up
- Edgewise Right/Flatwise Down
- Edgewise Left/Flatwise Up
- Edgewise Left/Flatwise Down
- Flatwise UP/Edgewise Left
- Flatwise Up/Edgewise Right
- Flatwise Down/Edgewise Left
- Flatwise Down/Edgewise Right



Edge Right Flatwise Up



Flatwise Up Edgewise Right

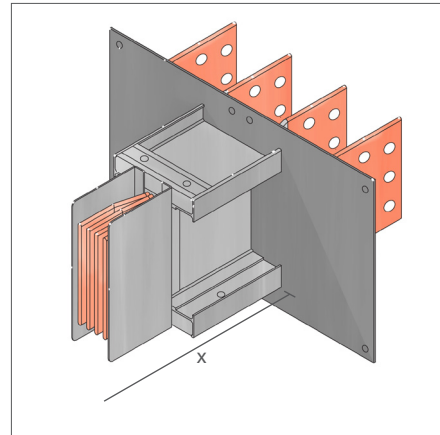
Combination Elbows

Combination elbows are used to conform to the buildings structure and to utilise a small amount of space to change direction by combining both Flatwise and Edgewise elbows.

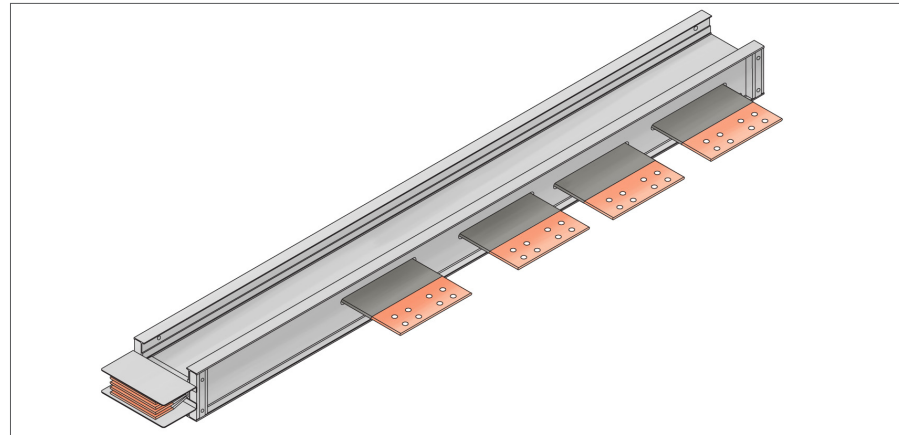
Combination Elbows	Ratings (Amps)	Minimum Leg Size		
		X (Edgewise side)	Y	Z (Flatwise side)
	1100A	255mm	188mm	248mm
1250A	255mm	188mm	248mm	
1400A	255mm	188mm	248mm	
1600A	255mm	198mm	258mm	
2000A	255mm	215mm	275mm	
2500A	255mm	233mm	293mm	
3200A	255mm	268mm	328mm	
4000A	255mm	319mm	379mm	
5000A	255mm	354mm	414mm	
6600A	255mm	424mm	484mm	

Combination Elbows	Ratings (Amps)	Maximum Leg Size		
		X (Edgewise side)	Y	Z (Flatwise side)
	1100A	600mm	502mm	750mm
1250A	600mm	502mm	750mm	
1400A	600mm	502mm	750mm	
1600A	600mm	513mm	750mm	
2000A	600mm	529mm	750mm	
2500A	600mm	548mm	750mm	
3200A	600mm	583mm	750mm	
4000A	600mm	634mm	750mm	
5000A	600mm	669mm	750mm	
6600A	600mm	738mm	750mm	

FLANGES



Panel Flange



Parallel Flange

Flange Connections

Flange connections provide a direct connection to low Voltage Switchgear, transformer enclosures, and other electrical equipment. Cut out details, dimensions and drilling plans are provided with the customer drawings and it is the responsibility of the switchgear manufacturer to provide the opening, drill fixing holes, connecting hardware and busbar risers in their equipment.

Switchgear can be provided through our partners E&I Engineering. For more information use the contact details on the back cover of this brochure.

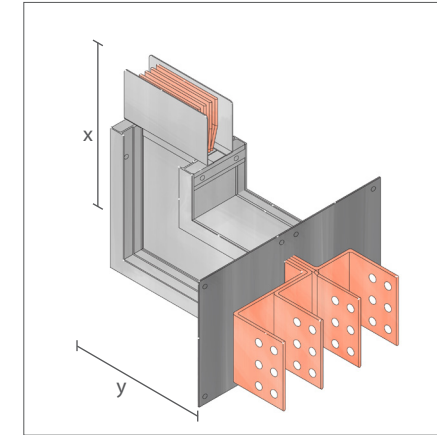
For proper coordination between the busbar system and the other equipment, detailed drawings, including switchgear phase rotation, must accompany the order. Standard flanges can be offset to the left or right of the section as required.

	Ratings (Amps)	Minimum	Maximum
		X	X
Panel Flange	1100A	220mm	840mm
	1250A	220mm	840mm
	1400A	220mm	840mm
	1600A	220mm	840mm
	2000A	220mm	840mm
	2500A	220mm	840mm
	3200A	220mm	840mm
	4000A	220mm	840mm
	5000A	220mm	840mm
	6600A	220mm	840mm

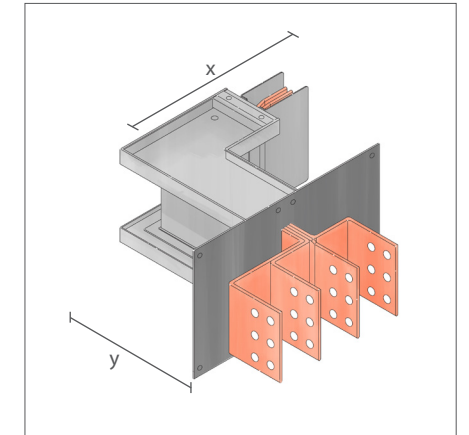
COMBINATION FLANGES

Combination Possibilities

- Panel Flange/Edgewise Left
- Panel Flange/Edgewise Right
- Panel Flange/Edgewise Up
- Panel Flange/Edgewise Down
- Edgewise Left/Panel Flange
- Edgewise Right/Panel Flange
- Flatwise Up/Panel Flange
- Flatwise Down/Panel Flange



Flatwise Elbow Flange



Edgewise Elbow Flange

Combination Flanges

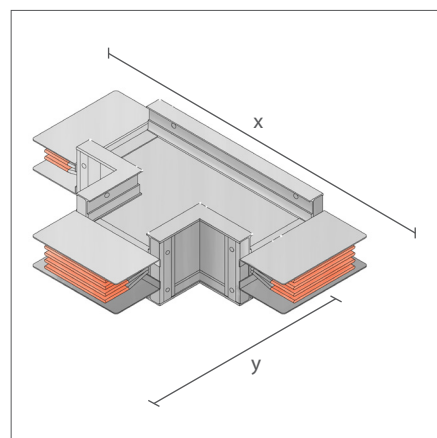
A Flange combination elbow is a combination of a standard elbow and a standard flange. Flange combination elbows are typically used when the minimum leg lengths for either the standard elbow or the standard flange cannot be maintained.

A typical example would be when the busbar must lie close to the top of the switchboard, when avoiding other services or when there is reduced head height above the switchgear.

Flange/Elbows(Flatwise)	Ratings (Amps)	Minimum Leg Size		Maximum Leg Size	
		X	Y	X	Y
	1100A	248mm	115mm	750mm	488mm
1250A	248mm	115mm	750mm	488mm	
1400A	248mm	115mm	750mm	488mm	
1600A	258mm	125mm	750mm	498mm	
2000A	275mm	143mm	750mm	515mm	
2500A	293mm	160mm	750mm	533mm	
3200A	328mm	195mm	750mm	568mm	
4000A	379mm	247mm	750mm	619mm	
5000A	414mm	282mm	750mm	654mm	
6600A	484mm	352mm	750mm	724mm	

Flange/Elbows(Edgewise)	Ratings (Amps)	Minimum Leg Size		Maximum Leg Size	
		X	Y	X	Y
	1100A	255mm	123mm	600mm	495mm
1250A	255mm	123mm	600mm	495mm	
1400A	255mm	123mm	600mm	495mm	
1600A	255mm	123mm	600mm	495mm	
2000A	255mm	123mm	600mm	495mm	
2500A	255mm	123mm	600mm	495mm	
3200A	255mm	123mm	600mm	495mm	
4000A	255mm	123mm	600mm	495mm	
5000A	255mm	123mm	600mm	495mm	
6600A	255mm	123mm	600mm	495mm	

SPECIALS

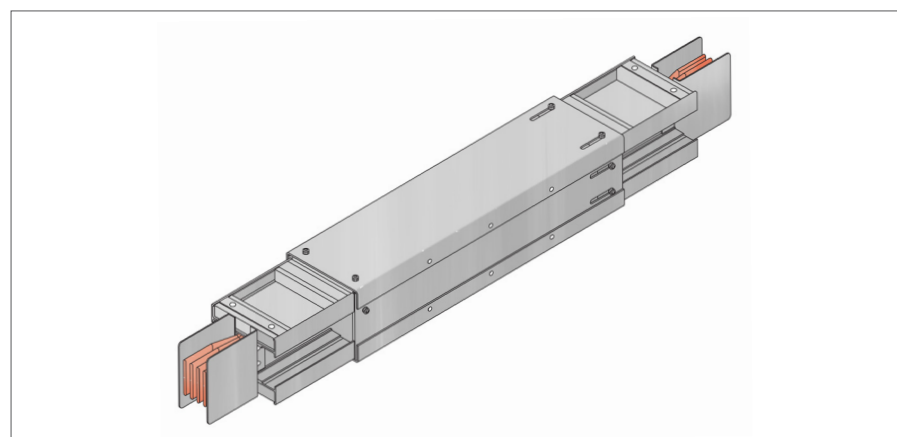


Flatwise Tee's

Flatwise tee's are used to split one busbar run into two runs going in different directions. This can be very useful in utilizing a small amount of space and supplying two different parts of a building with power.

They are a combination of a feeder length and a flatwise elbow.

Flatwise Tee	Ratings (Amps)	Minimum Leg Size		Standard Leg Size		Maximum Leg Size	
		X	Y	X	Y	X	Y
	1100A	496mm	248mm	700mm	350mm	1500mm	650mm
1250A	496mm	248mm	700mm	350mm	1500mm	650mm	
1400A	496mm	248mm	700mm	350mm	1500mm	650mm	
1600A	516mm	258mm	700mm	350mm	1500mm	650mm	
2000A	550mm	275mm	700mm	350mm	1500mm	650mm	
2500A	586mm	293mm	700mm	350mm	1500mm	650mm	
3200A	656mm	328mm	700mm	350mm	1500mm	650mm	
4000A	758mm	379mm	1000mm	500mm	1500mm	650mm	
5000A	828mm	414mm	1000mm	500mm	1500mm	650mm	
6600A	968mm	484mm	1000mm	500mm	1500mm	650mm	



Expansion Unit

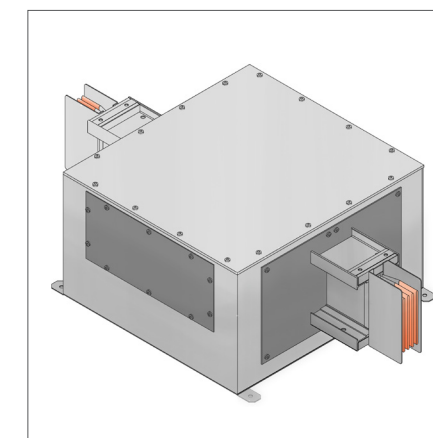
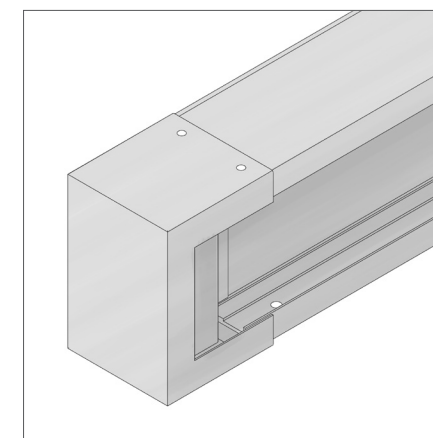
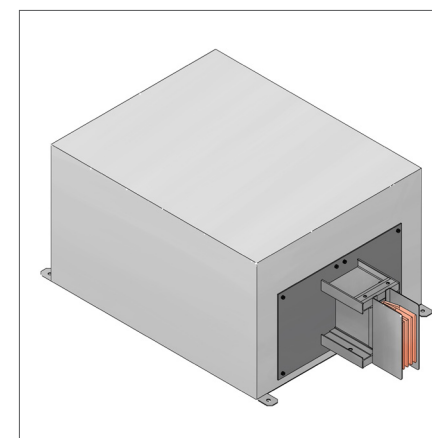
Expansion Units

Expansion units are a fitting used to accommodate the expansion and contraction of a busbar system and for building movement. Expansion units are typically installed in the centre of long busbar runs, and might also be used at the beginning of riser runs to minimize the stress on the lower section of the busbar run. Another common use would be where a busbar crosses an expansion joint of a building.

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

Expansion units allow for a 40mm movement along the length of the busbar.

END & CENTRE FEED UNITS



End Feed Units

Cable end feed units are used on the ends of busbar risers which are cable fed. They can be on the top of the busbar, feeding down through the building, or they can be located at the bottom of the busbar riser, feeding up through the building.

The size of the cable end feed unit depends on a number of factors:

- Rating of busbar
- Size of cable
- Number of cables
- Is a protective device or an isolator required

End Caps

End caps are used to safely cap off the end of a busbar run. The end cap units are factory fitted but they can be easily removed on site to allow for the extension of a busbar system. If the busbar run is bottom fed the end cap would be located at the top end of the busbar. If the system is top fed then the end cap would be located at the bottom. In the case of a centre fed system, an end cap must be used at both end of the system, one at the top and one at the bottom.

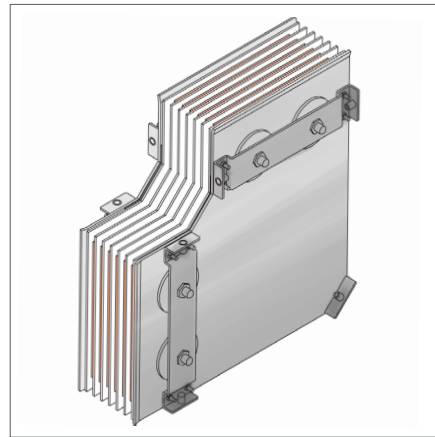
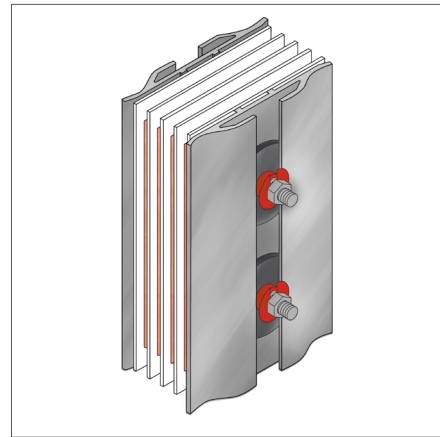
Centre Feed Units

Centre feed units are used on the centre of busbar risers which are cable fed.

The size of a centre feed unit depends on a number of factors:

- Rating of busbar
- Size of cable
- Number of cables
- Is a protective device or an isolator required

JOINT PACKS



Joint Packs

The ABB joint pack is a compression joint design which utilizes a specially designed Belleville washer to distribute the 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 tees.

The earth is maintained through the joint both by the joint pack cover and by the earth side plate. The joint pack is supplied in specific sizes depending on the rating of busbar required.

During installation, when the joint is torqued properly, the first head of the nut will break off and the red indicator disk will fall away.

If any red disks are still present after installation, the joints have not been properly secured.

Flatwise Elbow Joint Packs

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

These can be used to turn the busbar route up or down if it is running on its edge, or to turn the busbar left and right if it is running on its flat.

FITTINGS

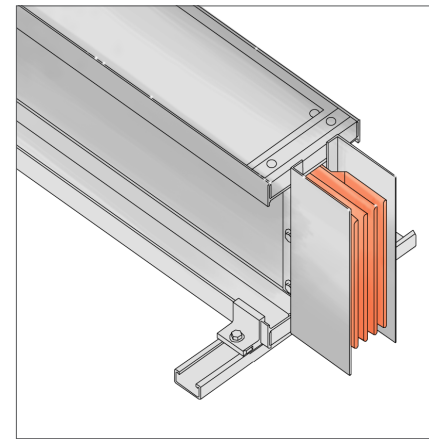
Fittings

Busbar can either be installed to run on its "Flat" or on its "Edge." The decision of how to run the busbar is governed by a number of factors:

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

The modular design of the ABB Busbar System allows it to easily be installed in either position.

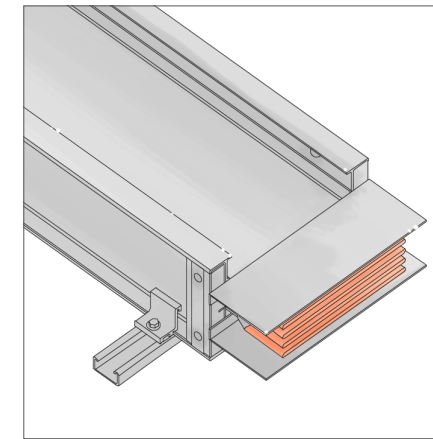
Note: The bar can be installed both on its edge and on its flat. This will not affect the bars performance



Edge Installation Detail

Edge Installation

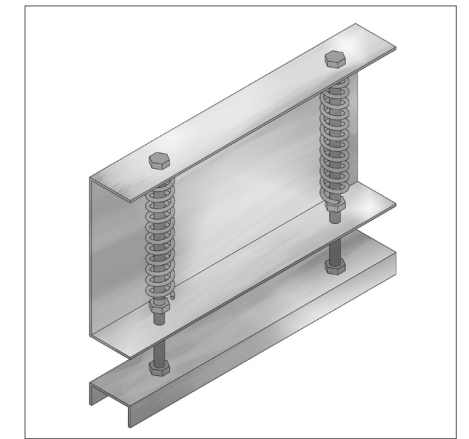
This is the preferred method of installation for the smaller rated busbar systems. It is also the main method used to install distribution busbar in building risers as it ensures tap off units can be connected easily.



Flat Installation Detail

Flat Installation

This is the preferred method of installation for the higher rated, multistack, busbar systems. When coordinated through the building on its flat any busbar rating only has a "height" of 145mm.



Spring Hanger

Spring Hanger

Spring hangers are used to support vertical busbar runs. They are used to support the weight of the busbar system on each floor and they also compensate for minimal building movement and thermal expansion.

The maximum distance between spring hangers may not exceed 5m.

The standard spring bracket is designed to suit our single stack busbar system, for multi-stack arrangements please contact our engineering team for details.

Special Sections

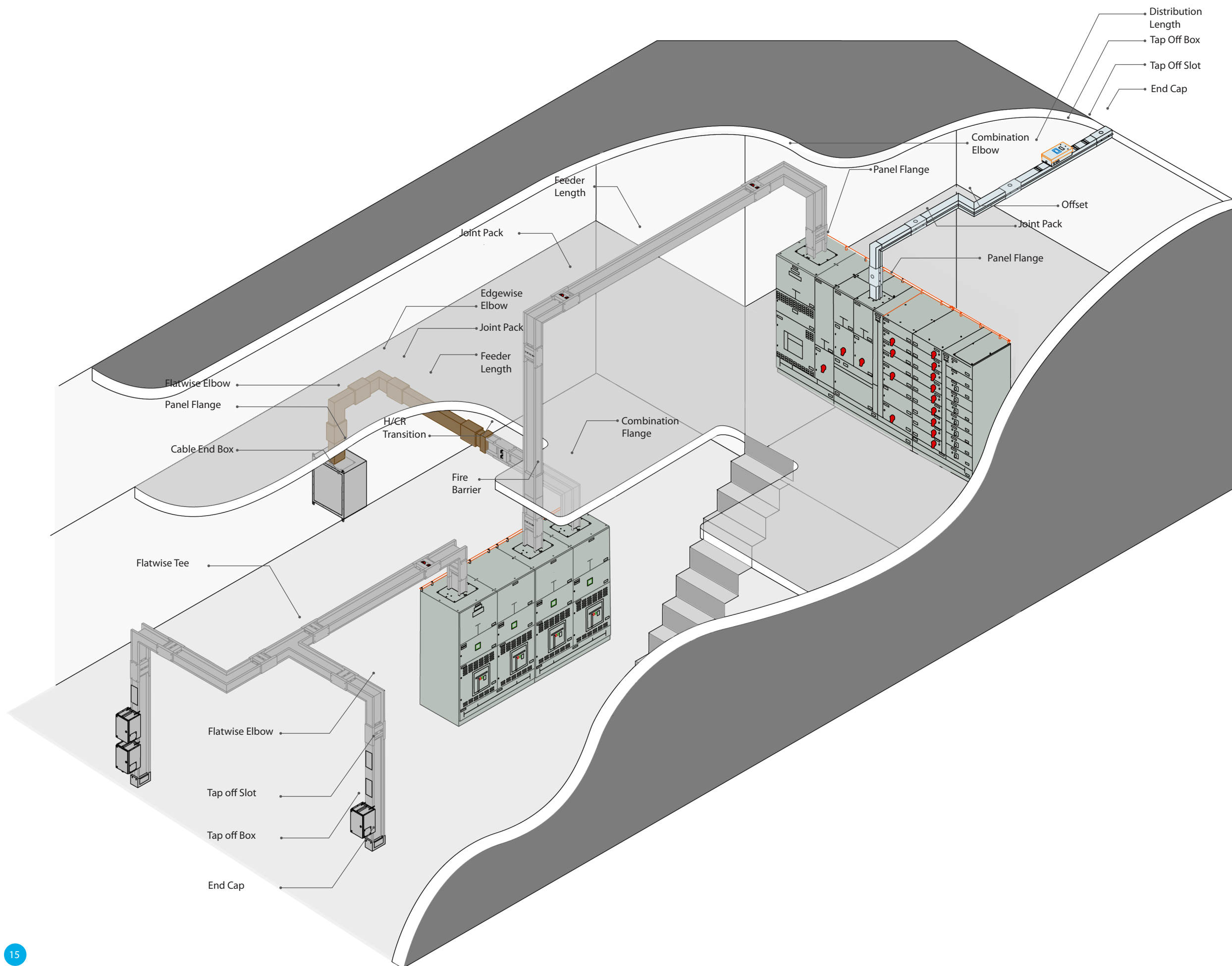
We manufacture a variety of more specialized units and components to meet unique system requirements. These range from edgewise tee's, flatwise cross, step up/step down reducers, phase rotation units, In-line disconnect cubicles, In-line tap off units, custom built busbar connection units.

ABB can produce a wide range of special sections of busbar to suit a wide variety of applications and unusual issues that may arise. Some of these special sections are detailed below.

Please contact ABB regarding any special requirements as we take pride in our ability to produce bespoke parts to meet our clients needs.

TYPICAL INSTALLATION

TYPICAL INSTALLATION



E&I Engineering provide high voltage and low voltage switchgear and ABB provides a range of busbar trunking for power distribution. Together we can provide complete power solutions for you project.

We have three ranges of PMAX:

PMAX M - Medium BUSBar. Our air insulated range available with both Copper and Aluminium conductors. This range covers 160-800 Amps

PMAX H - High BUSBar. Our sandwich construction range available with both Copper and Aluminium conductors. This range covers 800-6600 Amps.

PMAX CR - Cast Resin Bar. Our IP68 rated polymer concrete product for use in extreme conditions. This range is available with both Copper and Aluminium conductors. This range covers 800-6300 Amps.

Key.

	PMAX M
	PMAX H
	PMAX CR

TECHNICAL DATA

Rating	1100A	1250A	1400A	1600A	2000A
Rating Current(Amps)(lth)	1100	1250	1400	1600	2000
Rating Insulation Voltage	1000V	1000V	1000V	1000V	1000V
Rating Short Time Withstand Current (Icw)					
1 Second (KA)	50	50	50	65	80
Peak Value (KA)	105	105	105	143	176
Conductor C.S.A. (mm²) Copper(Phase)					
Cross Sectional Area	328mm ²	420mm ²	420mm ²	540mm ²	750mm ²
Conductor C.S.A. (mm²) Copper(Neutral)					
Cross Sectional Area	328mm ²	420mm ²	420mm ²	540mm ²	750mm ²
Conductor C.S.A. (mm²) Copper (Integral Clean Earth 100% & 50%)					
Cross Sectional Area (100% Earth)	328mm ²	420mm ²	420mm ²	540mm ²	750mm ²
Cross Sectional Area (50% Earth)	210mm ²	210mm ²	210mm ²	270mm ²	375mm ²
Protective Earth C.S.A. (mm²) Aluminium Housing					
Cross Sectional Area	1169mm ²	1169mm ²	1169mm ²	1229mm ²	1334mm ²
Height					
Height of the trunking (mm)	130mm	130mm	130mm	150mm	185mm
Weight					
Weight of the trunking (4 bar system)kg/m	17	20	20	24	32
Resistance					
Resistance (mΩ/m) at 20°C	0.052	0.042	0.042	0.033	0.023
Resistance (mΩ/m) at 80°C	0.064	0.053	0.053	0.041	0.030
Reactance					
Reactance (mΩ/m) @50Hz	0.017	0.016	0.016	0.013	0.010
Impedance					
Impedance (mΩ/m) at 80°C	0.066	0.055	0.055	0.043	0.031
Voltage Drop per metre (V/m) at Full Load 50Hz					
Voltage drop , pf = 0.7 (V/m) at 80°C	0.099	0.105	0.118	0.105	0.095
Voltage drop , pf = 0.8 (V/m) at 80°C	0.106	0.113	0.126	0.112	0.101
Voltage drop , pf = 0.9 (V/m) at 80°C	0.113	0.118	0.132	0.118	0.106
Voltage drop , pf = 1.0 (V/m) at 80°C	0.111	0.114	0.128	0.113	0.101
Voltage Drop per metre at Full Load 60Hz					
Voltage drop , pf = 0.7 (V/m) at 80°C	0.103	0.111	0.124	0.111	0.100
Voltage drop , pf = 0.8 (V/m) at 80°C	0.111	0.117	0.131	0.117	0.106
Voltage drop , pf = 0.9 (V/m) at 80°C	0.116	0.122	0.136	0.121	0.109
Voltage drop , pf = 1.0 (V/m) at 80°C	0.112	0.115	0.128	0.113	0.101

TECHNICAL DATA

Rating	2500A	3200A	4000A	5000A	6600A
Rating Current(Amps)(lth)	2500	3200	4000	5000	6600
Rating Insulation Voltage	1000V	1000V	1000V	1000V	1000V
Rating Short Time Withstand Current (Icw)					
1 Second (KA)	80	80	100	100	100
Peak Value (KA)	176	176	220	220	220
Conductor C.S.A. (mm²) Copper(Phase)					
Cross Sectional Area	960mm ²	1380mm ²	1500mm ²	1920mm ²	2760mm ²
Conductor C.S.A. (mm²) Copper(Neutral)					
Cross Sectional Area	960mm ²	1380mm ²	1500mm ²	1920mm ²	2760mm ²
Conductor C.S.A. (mm²) Copper(Integral Clean Earth 100% & 50%)					
Cross Sectional Area (100% Earth)	960mm ²	1380mm ²	1500mm ²	1920mm ²	2760mm ²
Cross Sectional Area (50% Earth)	480mm ²	690mm ²	750mm ²	960mm ²	1380mm ²
Protective Earth C.S.A. (mm²) Aluminium Housing					
Cross Sectional Area	1559mm ²	1792mm ²	2668mm ²	2878mm ²	3118mm ²
Height					
Height of the trunking (mm)	220mm	290mm	393mm	463mm	603mm
Weight					
Weight of the trunking (4 bar system)kg/m	50	58	64	80	100
Resistance					
Resistance (mΩ/m) at 20°C	0.018	0.013	0.012	0.009	0.063
Resistance (mΩ/m) at 80°C	0.226	0.016	0.014	0.011	0.078
Reactance					
Reactance (mΩ/m) @50Hz	0.008	0.006	0.005	0.004	0.029
Impedance					
Impedance (mΩ/m) at 80°C	0.024	0.017	0.015	0.012	0.083
Voltage Drop per metre (V/m) at Full Load 50Hz					
Voltage drop , pf = 0.7 (V/m) at 80°C	0.093	0.083	0.095	0.093	0.086
Voltage drop , pf = 0.8 (V/m) at 80°C	0.099	0.088	0.101	0.099	0.091
Voltage drop , pf = 0.9 (V/m) at 80°C	0.130	0.092	0.105	0.103	0.094
Voltage drop , pf = 1.0 (V/m) at 80°C	0.098	0.087	0.100	0.097	0.089
Voltage Drop per metre at Full Load 60Hz					
Voltage drop , pf = 0.7 (V/m) at 80°C	0.099	0.088	0.100	0.098	0.091
Voltage drop , pf = 0.8 (V/m) at 80°C	0.103	0.093	0.105	0.103	0.096
Voltage drop , pf = 0.9 (V/m) at 80°C	0.107	0.095	0.108	0.106	0.098
Voltage drop , pf = 1.0 (V/m) at 80°C	0.098	0.087	0.100	0.098	0.090

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 190mm.
- 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 a wall, ceiling, floor or another busbar allow a minimum of 50mm.
- From the side of the busbar to a wall, ceiling, floor or other busbar minimum - 50mm.

Tap Off Busbar Clearances:

- Ensure adequate space is given to allow the tap off unit to be operated both easily and safely.

Feeder Busbar Length:

- Minimum length - 600mm
- Maximum length - 3000mm

Distribution Busbar Length:

- Minimum length - 600mm
- Maximum length - 3000mm

Flatwise Elbow Section:

- Minimum leg length – varies depending on the busbar.
- Maximum leg length – 750mm

Edgewise Elbow Section:

- Minimum leg length – 255mm
- Maximum leg length – 600mm

Critical Details

- Busbar drawing must have all relevant dimensions.
- Centre-line dimensions are expected, please highlight any dimensions that are not centre-line dimensions.
- Walls and floors must be located, shown and dimensioned.
- The front of all switchboards must be given and the phasing for any existing boards provided.
- Transformer connections require full details.
- When using rising busbar please note the phase orientation of the distribution sections.
- Horizontal distribution busbar positioned on its 'flat' must always be oriented with the Neutral phase to the top.

Service Conditions:

- Ambient Temp : -15°C to +50°C
- Relative Humidity: 95% or below

CONTACT US

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TAP OFF UNITS

INTRODUCTION

PMAX is a patented range of Busbar trunking that is utilised within building and industrial applications to deliver power to Electrical Loads. It is an alternative to traditional cabling and provides numerous advantages to the Installer and Client including savings on space, time and cost. There are also electricity savings due to reduced losses, reduced voltage drop and flexibility to reposition load centres, using tap-off points.

The PMAX range of products is built with patented processes that make it the most reliable product of its type, providing peace of mind for your installation. This, together with unrivalled product support, means that the PMAX range of products will provide the optimum solution to your distribution requirements.

From concept to commissioning we provide complete in-house engineering.

- Site surveys
- 3D - CAD Drawings
- Project Management
- Thermal Imaging

Because of our highly skilled team, we are experts at providing the client exactly what they require and are well experienced in producing bespoke parts to meet the client's unique demand.

STANDARDS

Standards

The PMAX range is fully ASTA Tested Certified and is CE approved. It is manufactured in a **certified management system** environment where Quality BS EN ISO 9001:2008, Safety OHSAS 18001:2007 and Environmental ISO 140001 standards are applied to all aspects of the manufacturing and installation processes. It is manufactured in accordance with IEC60439-1 and IEC60439-2.

Type Tests

- 8.2.1 Verification of **Temperature Rise Limits.**
- 8.2.2 Verification of the **Dielectric Properties**
- 8.2.3 Verification of the **Short Circuit Withstand Strength**
- 8.2.4 Verification of the **Effectiveness of the Protective Circuit.**
- 8.2.5 Verification of **Clearance and Creepage Distances.**
- 8.2.6 Verification of **Mechanical Operation.**
- 8.2.7 Verification of the **Degree of Protection.**
- 8.2.9 Verification of the **Electrical Characteristics.**
- 8.2.10 Verification of **Structural Strength.**
- 8.2.12 Verification of **Crushing Resistance.**
- 8.2.13 Verification of **Resistance to Abnormal Heat.**
- 8.2.14 Verification of **Resistance to Flame Propagation.**
- 8.2.15 Verification of the **Fire Barrier in Building Penetration.**

ASTA Certificates

ABB competed extensive testing at ASTA and KEMA accredited laboratories to ensure the product we supply meets the international requirements.

UL Classified

ABB completed extensive testing at UL accredited laboratories to ensure the product we supply meets UL requirements.

All certificates available on request



OHSAS 18001:2007
OHS 533652



ISO 9001:2008
FM 12680



ISO 14001:2004
No: EMS 566536

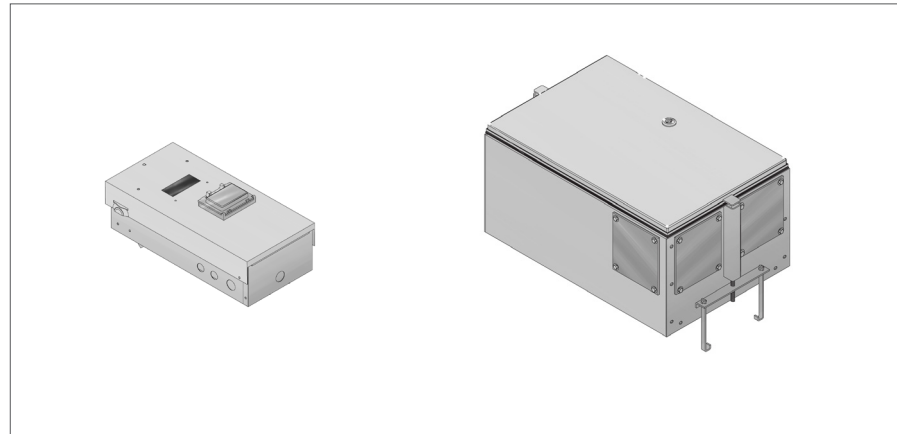
PRODUCT OVERVIEW

Tap Off Units

ABB offers a range of tap off units to fit both our PMAx H and PMAx M range for multiple applications. There are over 100 units in our standard range. ABB can also manufacture special tap off units to suit any Power Distribution, metering or control requirements.

Safety

All ABB tap off units are designed with the safety of the installer and user as the key criteria. The tap off unit has an extended Earth Contact Bracket which ensures the earth ground is always the first point to connect with the busbar system during installation. The tap off units have an interlock which prevents the tap off door from being opened while the tap off unit is in the ON position. The tap off unit is secured to the busbar housing using high tensile strength, lockable hardware, with an extended shutter actuator and mechanical clamping mechanism. This ensures the units are properly sealed during installation and cannot be fitted incorrectly.



Cable Entry

The standard tap off unit usually has bottom and side removable gland plates for cable access, but other variations are available as necessary, including cable spreader boxes. For any special requirements please contact the ABB engineering department.

Special Tap Off Units

ABB can also manufacture special tap off units based on your specific needs and requirements.

These features include:

- Metering options for landlord electrical tariff purposes
- BMS monitoring of breaker status
- BMS monitoring of metering systems
- Automatic remote open/close features
- Load shedding features
- Integral sockets
- Integral distribution boards

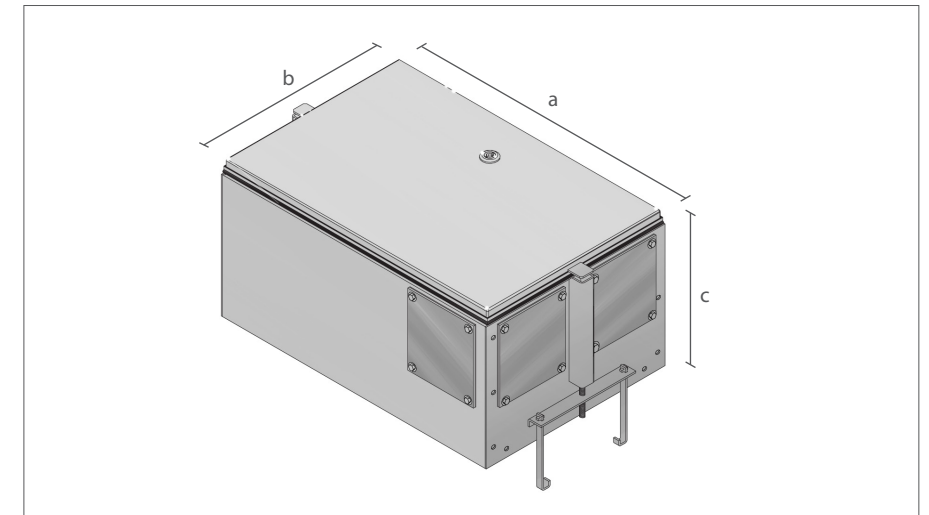
PMAx-H TAP OF UNITS

PMAx-H-V1

- Current Rating ≤315A
- Voltage 690V
- Tap Off Slots 1
- Approx. Weight 23kg

Size:

- a 503mm
- b 340mm
- c 250mm

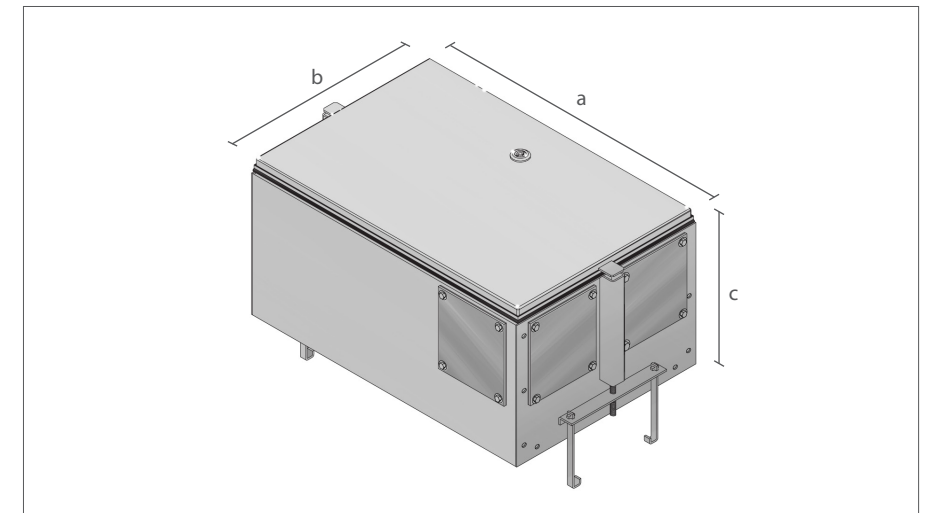


PMAx-H-V2

- Current Rating ≤100A
- Voltage 690V
- Tap Off Slots 1
- Approx. Weight 23kg

Size:

- a 403mm
- b 256mm
- c 250mm

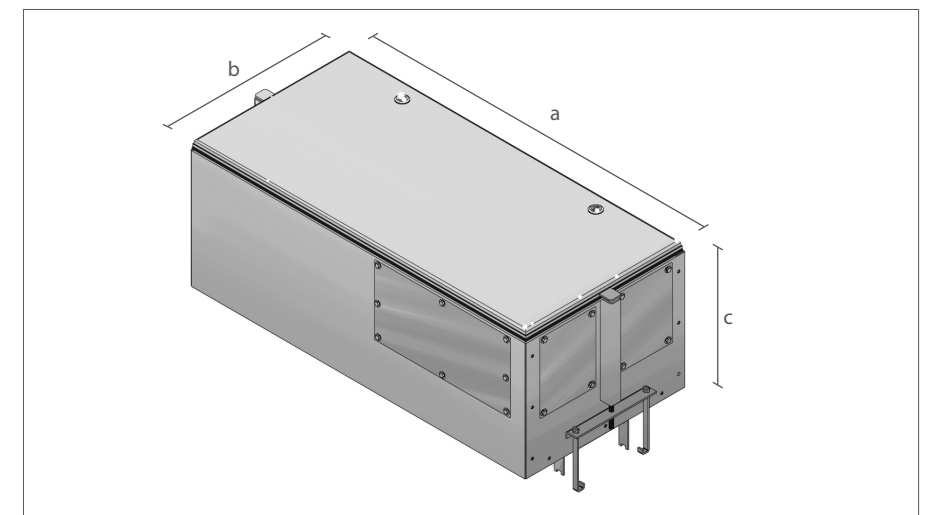


PMAx-H-V1DC400

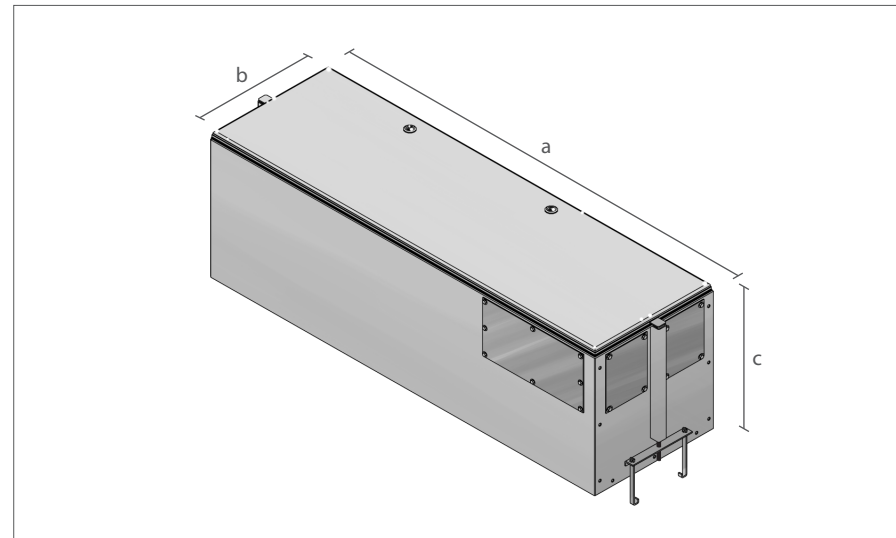
- Current Rating ≤400A
- Voltage 690V
- Tap Off Slots 2
- Approx. Weight 52kg

Size:

- a 756mm
- b 360mm
- c 383mm



PMAX-H TAP OF UNITS



PMAX-H-V1DC630

- Current Rating ≤630A
- Voltage 690V
- Tap Off Slots 2
- Approx. Weight 60kg

Size:

- a** 967mm
- b** 360mm
- c** 383mm

Note:

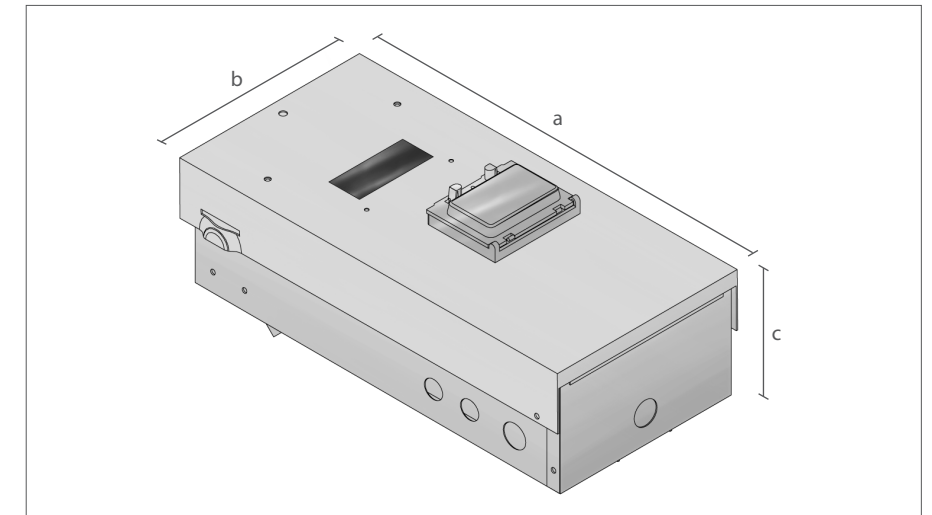
- The list above is based on a typical solution based on standards MCCBs and switchfuses, other factors need to be considered when deciding on what type of box to use, such as location of box, cable size, additional accessories etc.
- The PMAX-H Tap Off Unit range is a "plug-in" type up to 630A. The plug-in tap off Unit is interchangeable between busbar's provided the configuration is the same.

Above 630A the tap off Units range changes to "in line," these units are fixed in position.

PMAX H Tap Off Units

Current Rating	MCCB with Thermal Magnetic Trip	Motorised MCCB with Thermal Magnetic Trip	MCCB with Electronic Trip	Motorised MCCB with Electronic Trip	Switchfuse
32A	●	●	●	●	●
40A	●	●	●	●	●
63A	●	●	●	●	●
80A	●	●	●	●	●
100A	●	●	●	●	●
125A	●	●	●	●	●
160A	●	●	●	●	●
200A	●	●	●	●	●
250A	●	●	●	●	●
315A			●	●	●
400A			●	●	●
630A			●		
800A			●		
1000A			●		
1250A			●		
1600A			●		

PMAX-M TAP OF UNITS

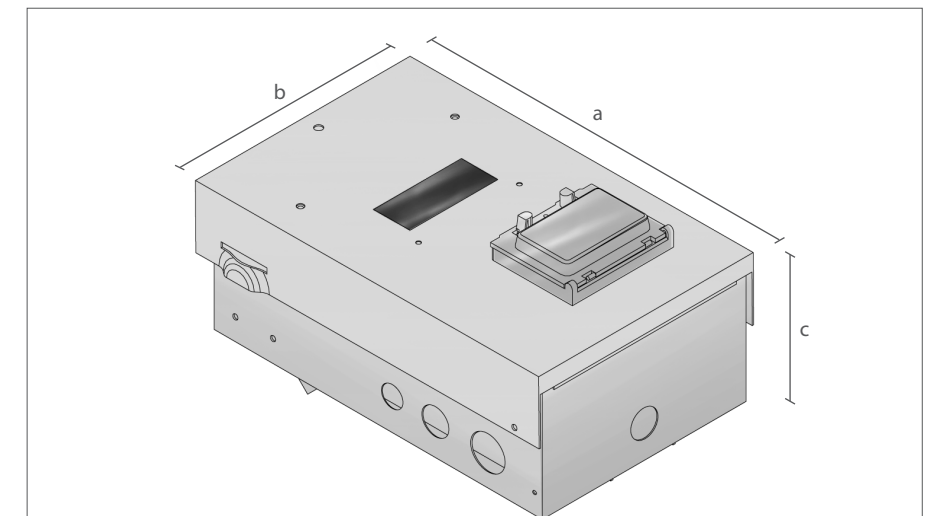


PMAX-M-ETOB-T1

- Current Rating ≤100A
- Voltage 600V
- Tap Off Slots 1
- Approx. Weight 5kg

Size:

- a** 420mm
- b** 199mm
- c** 116mm



PMAX-M-ETOB-T2

- Current Rating ≤100A
- Voltage 600V
- Tap Off Slots 1
- Approx. Weight 5kg

Size:

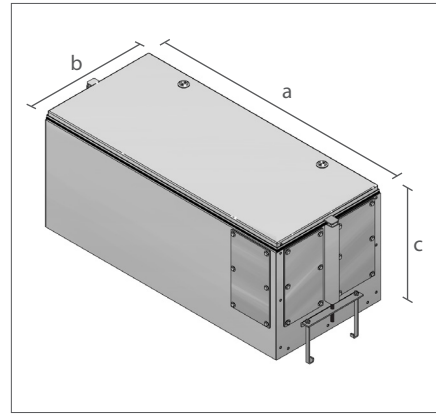
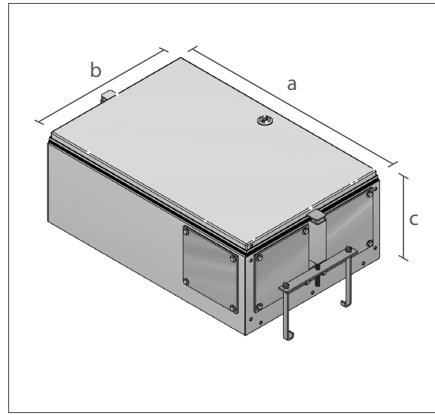
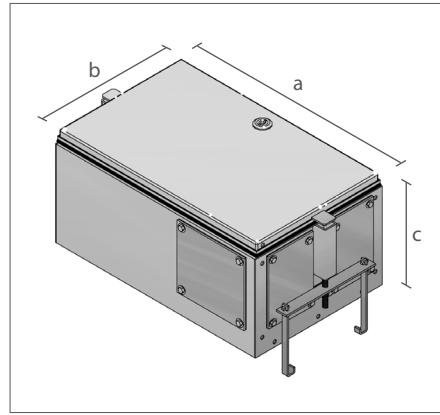
- a** 320mm
- b** 199mm
- c** 116mm

Euro Tap Offs

Current Rating	Single Pole MCB	Euro Tap Off Unit with Three Pole MCB	3 x Single Pole MCB with 3 x Single Phase Socket	Three Pole MCB with Three Phase Socket	Single Pole Fuse Switch	Three Pole Fuse Switch	3 x Single Pole Fuse Switch with 3 x Single Phase Socket	Three Pole Fuse Switch with Three Phase Socket	MCCB with Thermal Magnetic Trip
10A	●	●			●	●			
16A	●	●	●	●	●	●	●	●	
32A	●	●	●	●	●	●	●	●	●
40A									●
63A									●
80A									●
100A									●

PMAX-M TAP OF UNITS

TYPICAL LAYOUT



PMAX M-V1
 • Current Rating ≤350A
 • Voltage 600V
 • Tap Off Slots 1
 • Approx. Weight 20kg

Size:
a 503mm
b 340mm
c 173mm

PMAX M-V2
 • Current Rating ≤200A
 • Voltage 600V
 • Tap Off Slots 1
 • Approx. Weight 10kg

Size:
a 403mm
b 340mm
c 173mm

PMAX M-V1-DC
 • Current Rating ≤400A
 • Voltage 600V
 • Tap Off Slots 2
 • Approx. Weight 52kg

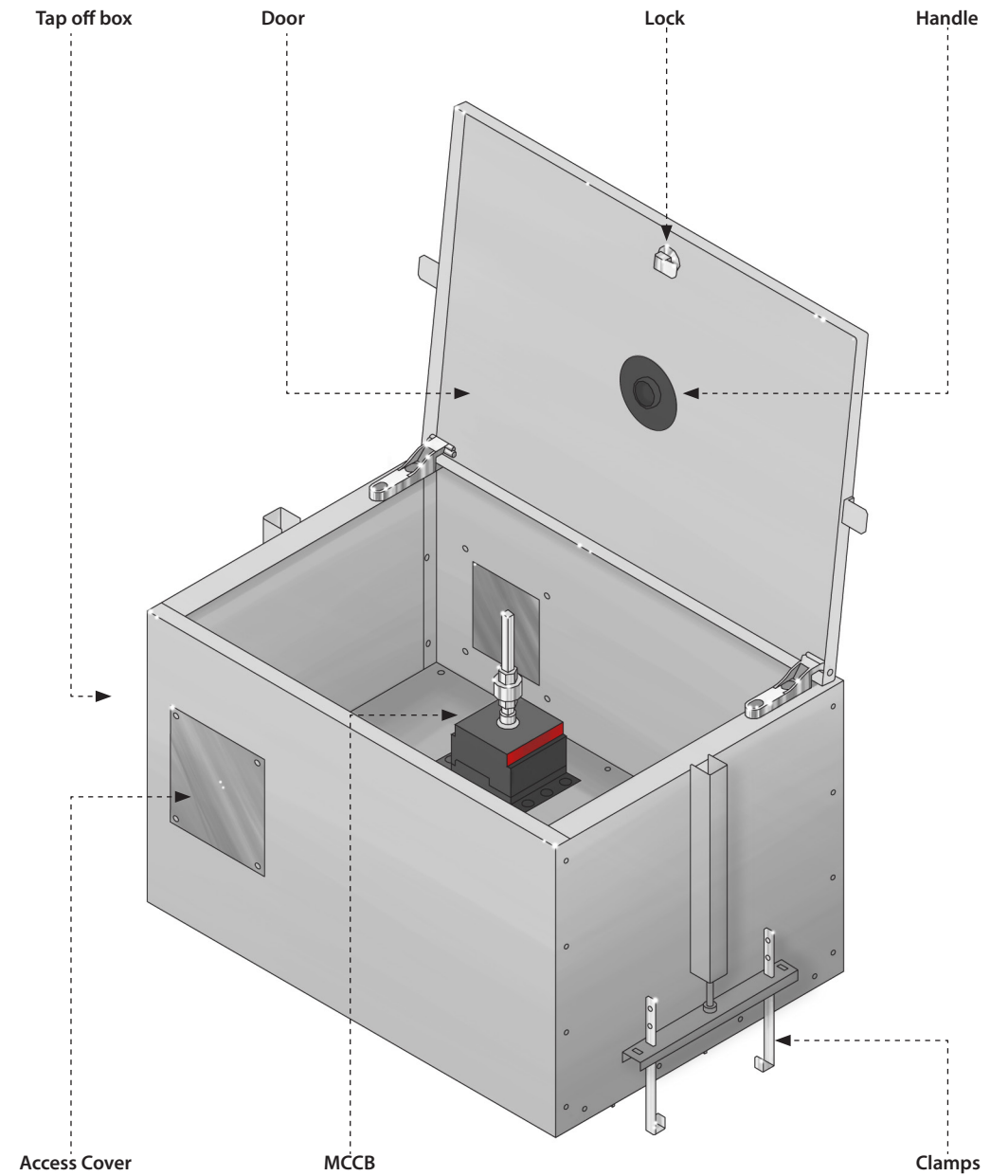
Size:
a 756mm
b 340mm
c 327mm

Note:

- The list above is based on a typical solution based on standards MCCBs and switchfuses, other factors need to be considered when deciding on what type of Unit to use, such as location of Unit, cable size, additional accessories etc.
- The PMAX M Tap Off Unit range is a "plug-in" type up to 400A. The plug-in tap off Unit is interchangeable between busbars provided the configuration is the same. Above 400A the tap off Units range changes to "in-line," these units are fixed in position.

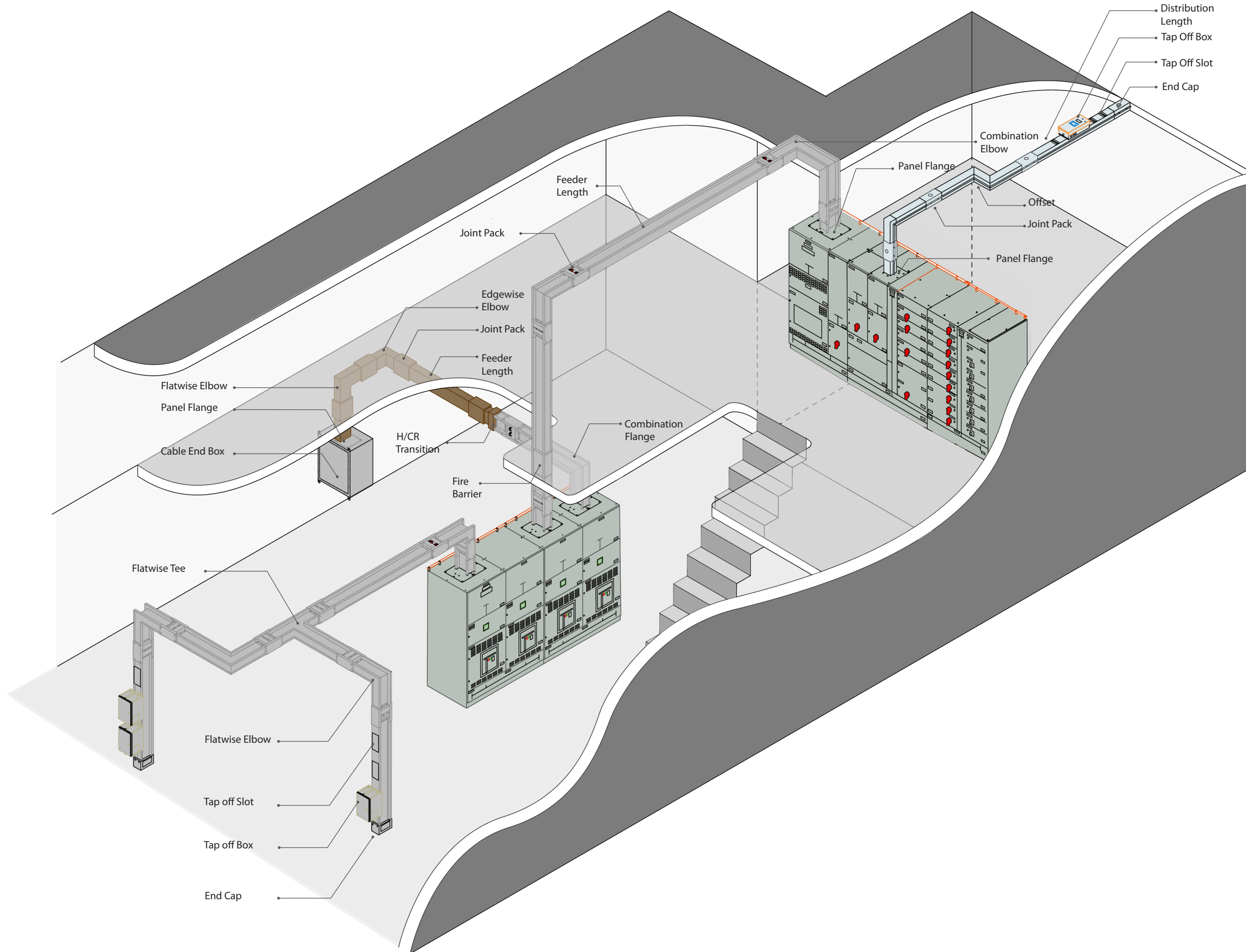
MPB Tap Offs

Current Rating	MCCB with Thermal Magnetic Trip	Motorised MCCB with Thermal Magnetic Trip	MCCB with Electronic Trip	Motorised MCCB with Electronic Trip	Switchfuse
32A	●	●	●	●	●
40A	●	●	●	●	●
63A	●	●	●	●	●
80A	●	●	●	●	●
100A	●	●	●	●	●
125A	●	●	●	●	●
160A	●	●	●	●	●
200A	●	●	●	●	●
250A	●	●	●	●	●
315A			●	●	●
400A			●	●	●



TYPICAL INSTALLATION

TYPICAL INSTALLATION



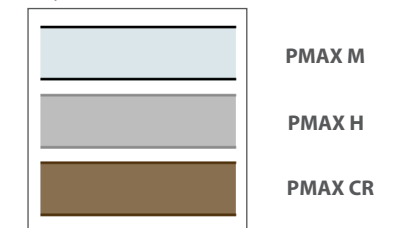
We have three ranges of BUSBar:

PMAX H - High BUSbar. Our sandwich construction range available with both Copper and Aluminium conductors. This range covers 800-6600 Amps.

PMAX M - Medium BUSBar. Our air insulated range available with both Copper and Aluminium conductors. This range covers 160-800 Amps

PMAX CR - Cast Resin Bar. Our IP68 rated polymer concrete product for use in extreme conditions. This range is available from 800-6300A and comes with both Copper and Aluminium conductors.

Key.



QUICK REFERENCE GUIDE

Critical Dimensions

Busbar passing through a wall, ceiling or floor:

- Centre-line of a joint to the wall, ceiling or floor minimum - 190mm.
- Joints cannot be positioned inside a wall, ceiling or floor – joints must be accessible for maintenance.

Feeder Busbar Clearances:

- From the top of the busbar to a wall, ceiling, floor or another busbar minimum - 50mm.
- From the side of the busbar to a wall, ceiling, floor or other busbar minimum - 50mm.

Distribution Busbar Clearances:

- Clearance must be given to provide for access and operation of the Tap Off Unit.
- Otherwise, clearances for the feeder busbar apply.

Feeder Busbar Length:

- Minimum length - 600mm
- Maximum length - 4000mm

Distribution Busbar Length:

- Minimum length - 600mm
- Maximum length - 4000mm

Flatwise Elbow Section:

- Minimum leg length – varies depending on the busbar.
- Maximum leg length – 750mm

Edgewise Elbow Section

- Minimum leg length – 255mm
- Maximum leg length – 600mm

Critical Details

- Busbar drawing must have all relevant dimensions.
- Centre-line dimensions are expected (please note any dimensions that are not centre-line dimensions).
- Walls and floor must be located and shown (wall/floor thickness must be given).
- The front of all switchboards must be given and provide the phasing for any existing boards.
- Transformer connections require full details.
- When using rising busbar please note the phase orientation of the distribution sections.
- Horizontal distribution busbar run on its "Flat" should always be oriented with the Neutral phase to the top face.

CONTACT US

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