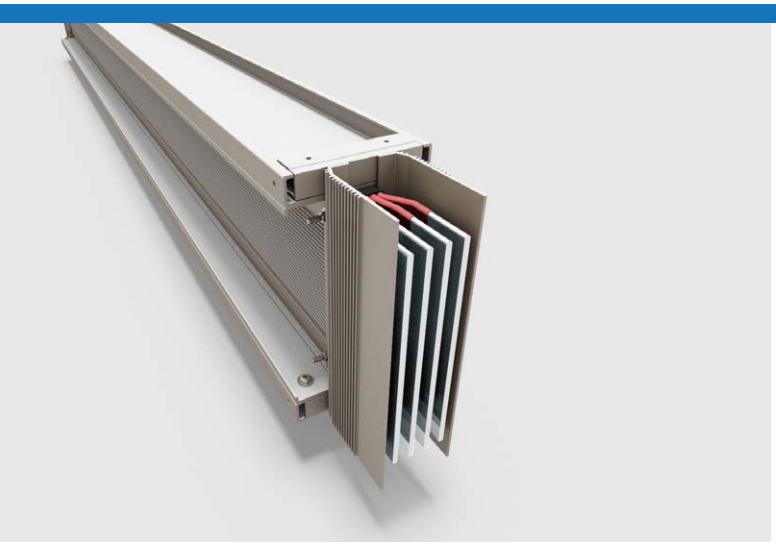
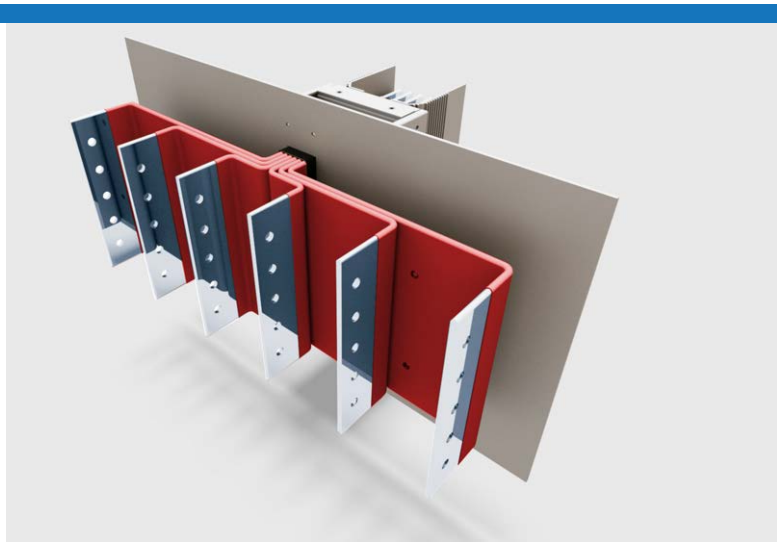
IBAR

BUSBAR TRUNKING SYSTEM

HX Range Catalogue





ANORD MARDIX

Busbar Trunking Systems

The IBAR range of power distribution busbar trunking system products has been developed to meet the growing demands of the critical power industry. Each system employs innovative designs which improve performance and reduce costs. From small scale to multi million pound projects - IBAR is the ideal choice.

We have invested in the best available technologies to ensure our finished product is of the highest quality. Our highly skilled engineering teams and applications engineers can tailor a solution to meet even the most demanding of requirements.

IBAR employs more than 50 years of leading-edge experience incorporating all the quality, reliability and innovation for which Anord Mardix is renowned.

IBAR HX is a range of high power busbar trunking systems. HX utilises a sandwich arrangement of individually insulated Copper (HXC) busbars (using a specialist epoxy resin coating) which are contained within a unique two piece, IP55 rated, Aluminium trunking/housing.

All IBAR product is manufactured within the UK to the latest British Standards (BS EN 61439-6).

Feeder Busbar

There are many applications which require the ability to move large amounts of power. The most common of which is the feeding of power between transformers and low voltage switchboards and then further sub-distribution.

IBAR's HX range provides a high-power feeder busbar solution with busbar ratings ranging from 800A up to 6300A.

Each rating type can be supplied with between 3 and 6 conductive bars arranged in a sandwich type construction and insulated with a specialist epoxy resin coating.

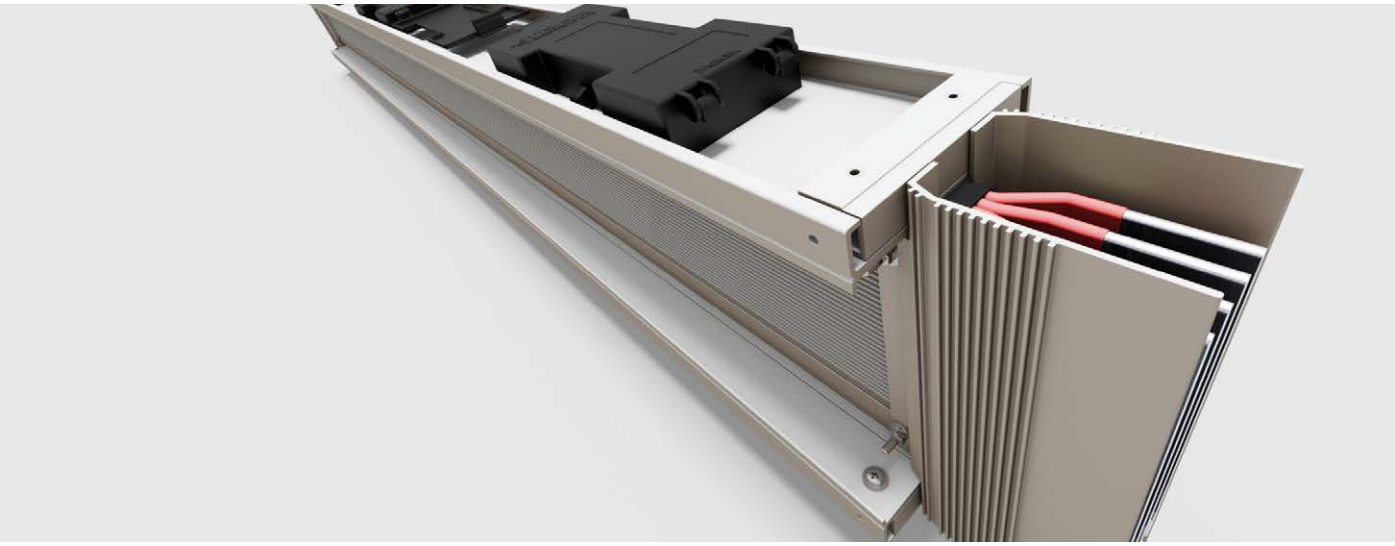
Configurations are available for 3-phase, 3-phase and neutral protected earth (for loads susceptible to harmonic distortion/leakage currents) and optional double rated neutral.

Distribution Busbar

Busbar trunking systems are favoured greatly over traditional fixed position cable installations due to the flexibility of the available tap-off locations.

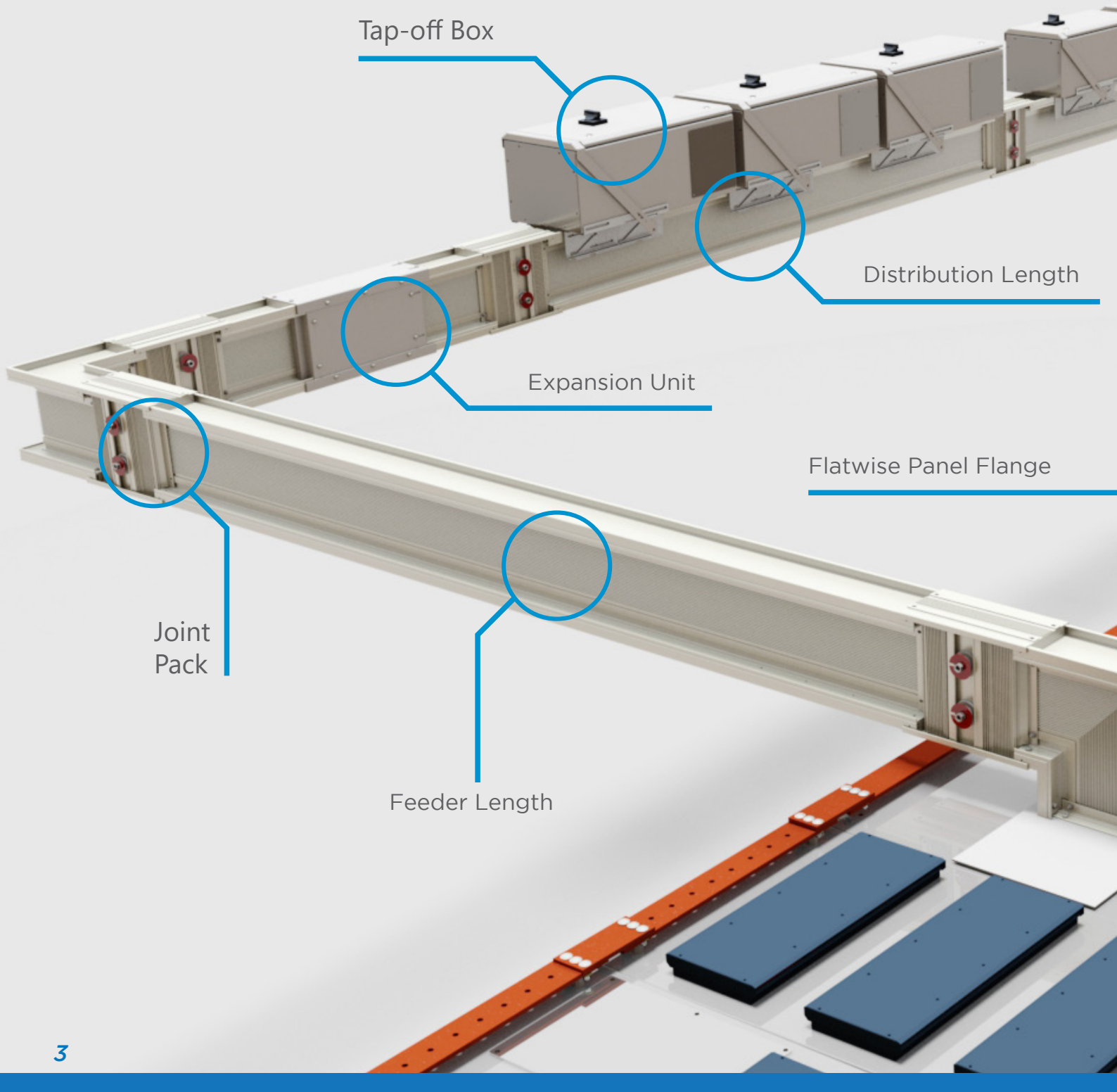
The standard straight 3m lengths can be fitted with up to five specially engineered tap-off points at standard or custom locations. Each tap-off location features high-integrity weld-bonded connection tabs.

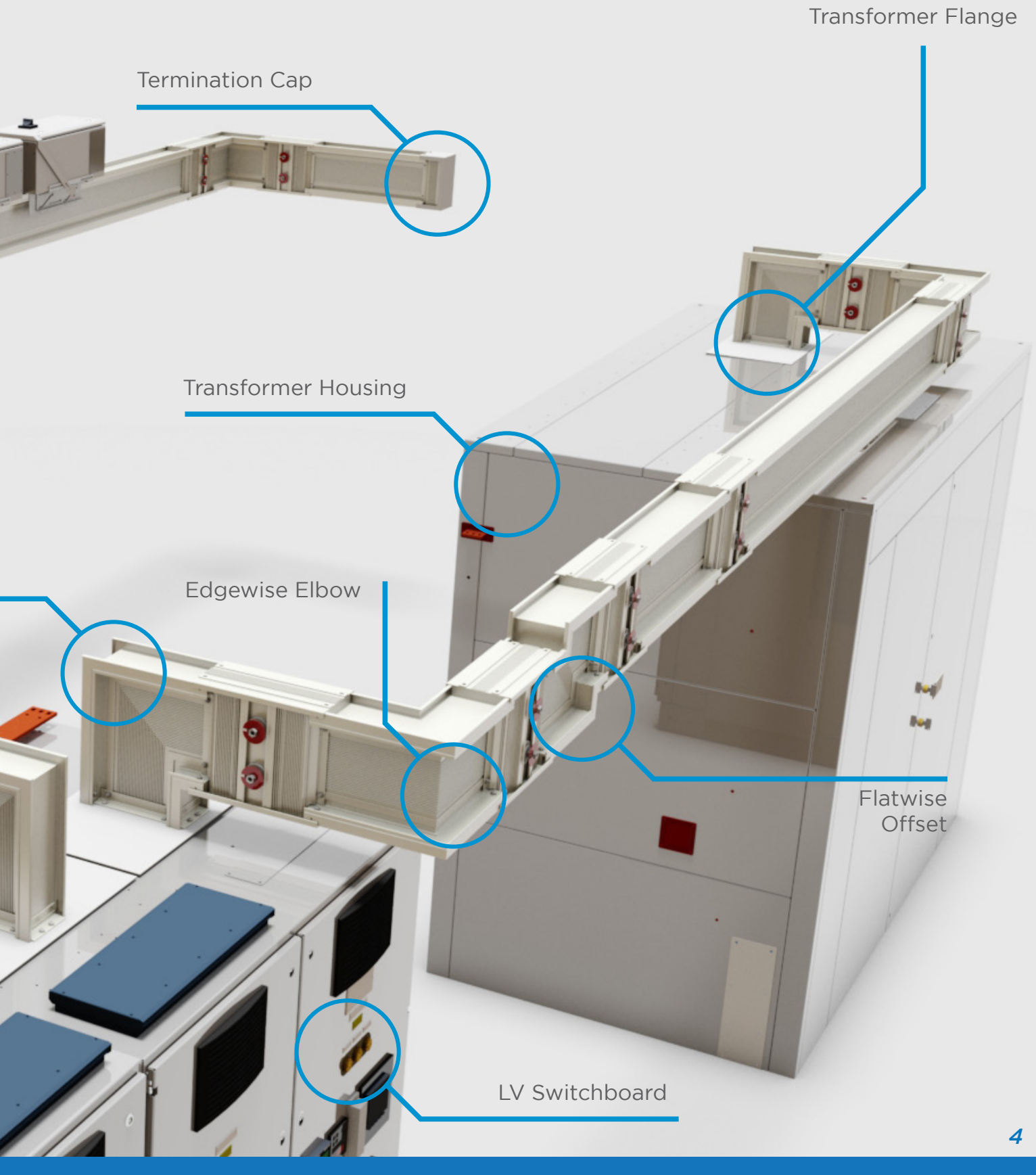
This high-quality, high-conductivity connection means that on copper conductor systems only a single tap-off location is required for tap-offs of up to 630A.



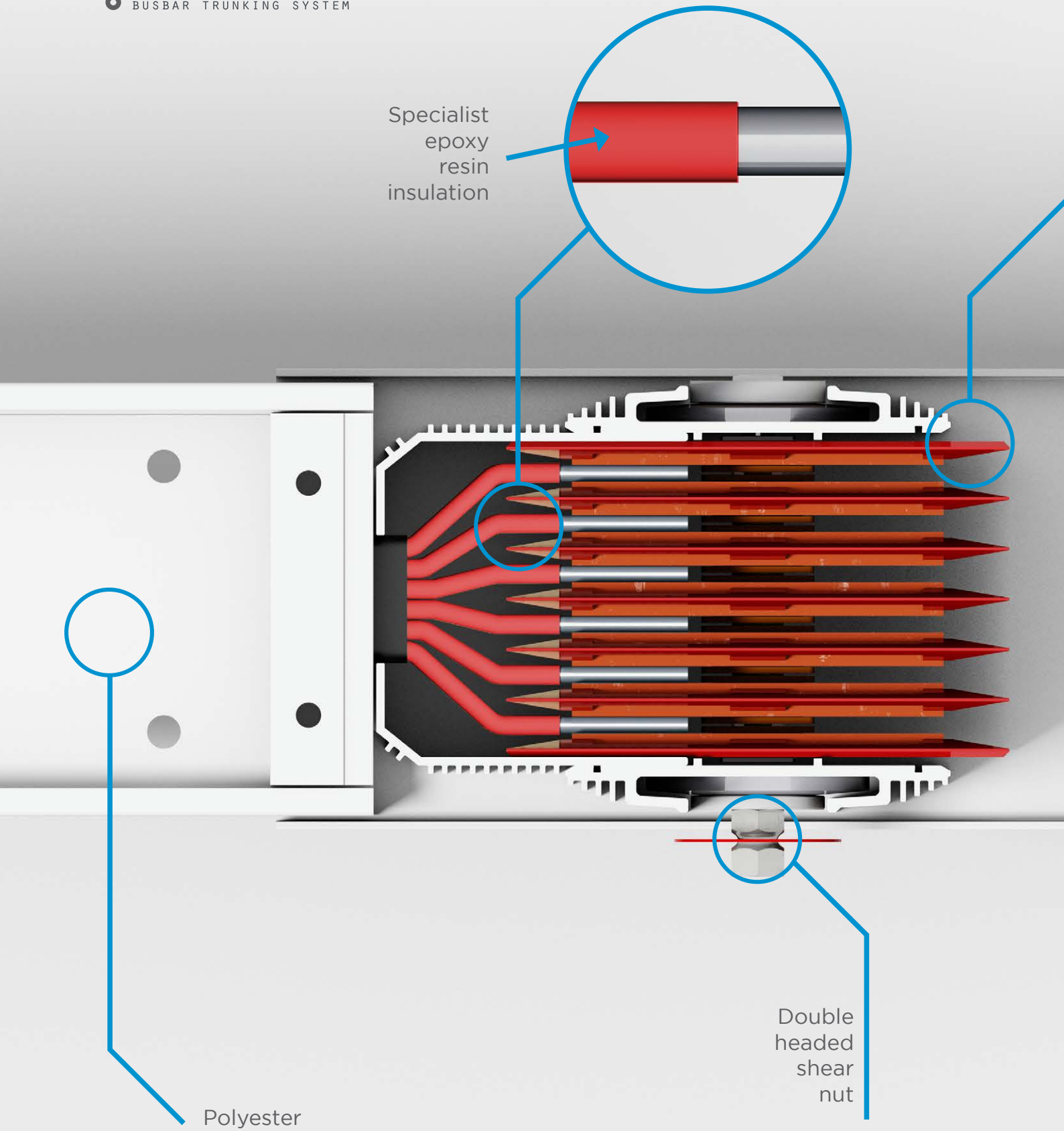
High integrity weld-bonded connections are at the heart of IBAR's distribution busbar trunking system

IBAR
BUSBAR TRUNKING SYSTEM

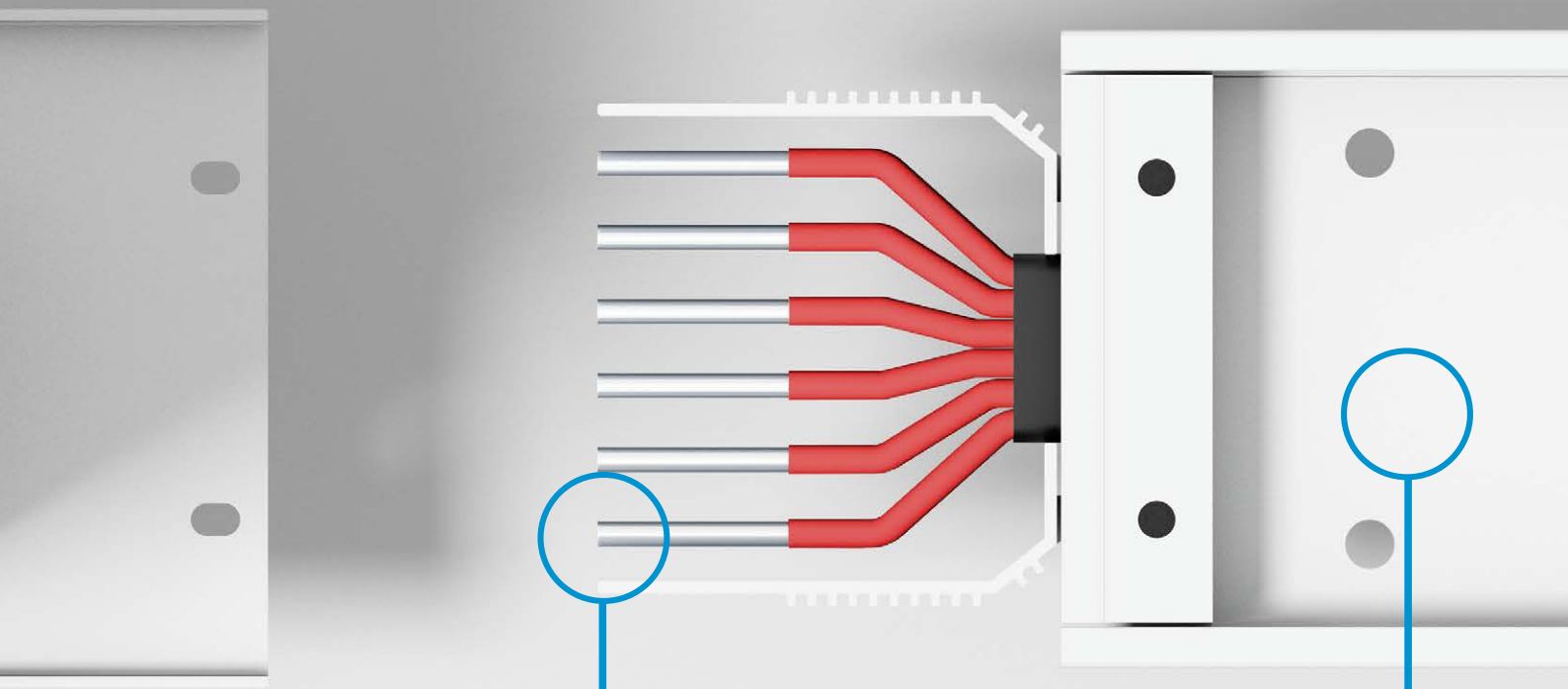



Transformer Flange
Termination Cap
Transformer Housing
Edgewise Elbow
Flatwise
Offset
LV Switchboard

IBAR
BUSBAR TRUNKING SYSTEM



Joint pack



Unique two piece
IP55 Aluminium
trunking case

HXC Range
HDHC
Copper
(99.9%)
BS EN 13601

Tap-offs (HX Range)

Tap-offs can be installed on to IBAR Distribution Busbar at any suitable tap-off location point. Tap-offs are typically used on vertical rising mains within multi-storey buildings to distribute power to each floor or area, the tap-off can be used to directly feed equipment or final circuits via a PDU or Distribution Board.

Distribution busbar and tap-offs are also common place within manufacturing or industrial environments where shop floor layouts are dynamically changed to meet the current production demands.

IBAR tap-offs incorporate a unique quick connect actuation system that automatically operates the IP4X tap-off point shutters (tap-off points are IP55 rated whilst the covers are in place).

The tap-off is simply positioned onto the busbar at a tap-off location and the levered operation clamps the unit, ensuring correct engagement every time.

Once the installation is complete the tap-off cannot be removed, or the door opened, whilst the tap-off circuit breaker is in the ON position.

IBAR's standard range of tap-offs are available with options for all major component manufacturer's protective devices such as Schneider Electric, ABB, Terasaki & Siemens.

Our range of tap-offs include a fully welded steel enclosure and feature multiple cable glanding plates and fully shrouded neutral and protected-earth bars. All tap-off doors and breaker connection shrouds feature Anord Mardix Thermagrid technology to facilitate safe thermal imaging of the circuit breaker and connections whilst live.

Metering

Metering and control options can be built into the IBAR HX range tap-off boxes to enable remote (PLC) management of motorised breakers in load-shedding activities or to provide requisite monitoring or MID approved tenant metering for landlord's billing requirements.

Breaker status' or power consumption data can be incorporated within SCADA and Power Management head end systems. Metering solutions are inclusive of all major meter manufacturers such as Schneider Electric, Janitza, Socomec, ABB and Autometers.

The IBAR HX range of distribution busbar trunking solutions can also be supplied with optional integrated Modbus and/or Ethernet comms channel.

Schneider Electric - PM5110

The PowerLogic PM5110 power meter are the new benchmark in affordable, precision metering. The ideal fit for high-end cost management applications. It provides the measurement capabilities needed to allocate energy usage, perform tenant metering and sub-billing, pin-point energy savings and optimise equipment efficiency and utilisation. It also performs a high level assessment of the power quality in an electrical network.

Schneider Electric - PM5111 MID APPROVED

The PM5111 offers Class 0.5S for active energy metering and compliance to regulations EN50470-1/3 (MID), IEC 61557-12, IEC 62053-21/22 and IEC 62053-23.

Schneider Electric - iEM3255 MID APPROVED

More than just kWh meters, the iEM3255 meter provides a full view of energy consumption with full four-quadrant measurement of active and reactive energy delivered. Additionally, extensive real-time measurements (V, I, P, PF) give users greater detail on their energy usage. Where required support of multiple tariffs gives customers the flexibility to match the billing structure of their utility.

The iEM3255 offers Class 0.5S for active energy metering and compliance to regulations EN50470-1/3 (MID), IEC 61557-12, IEC 62053-21/22 and IEC 62053-23.

Ethernet Comms Modules - Moxa Ethernet Gateway typically required one per every twenty two devices. Each ethernet gateway requires only a single ethernet cable (fibre also available) wiring back to a network switch for integration.

Typically the uplink connection to the installations meter/PMS/BMS network is made via an ethernet switch within the source switchboard or other suitable SCADA/ PMS outstation panel.

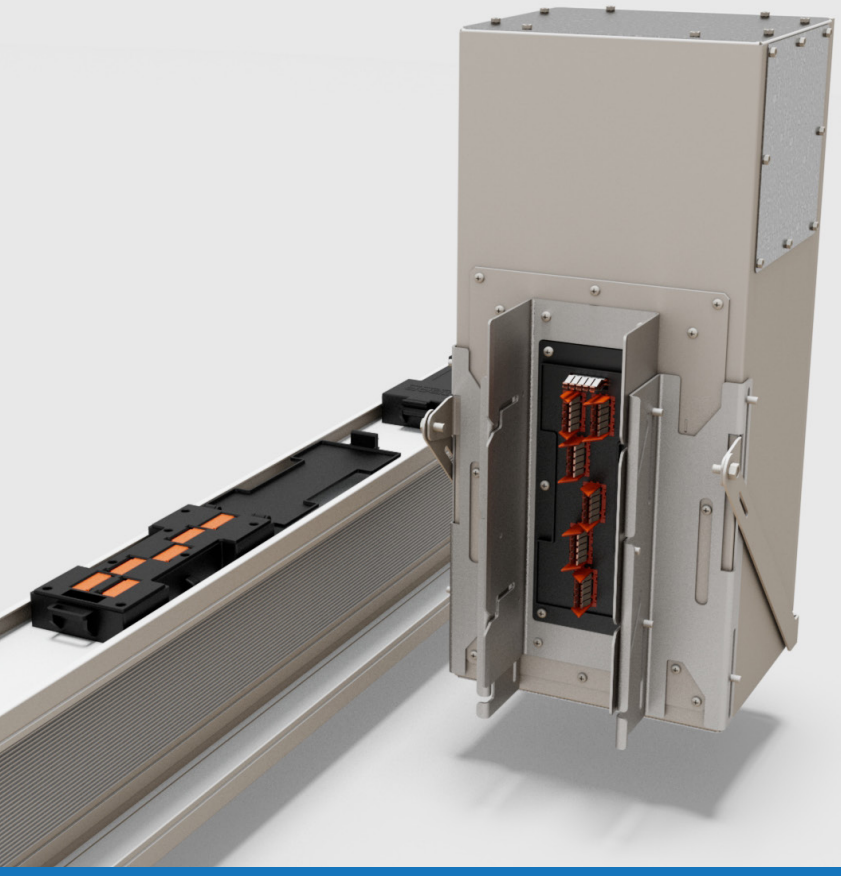
Tap-off Installation

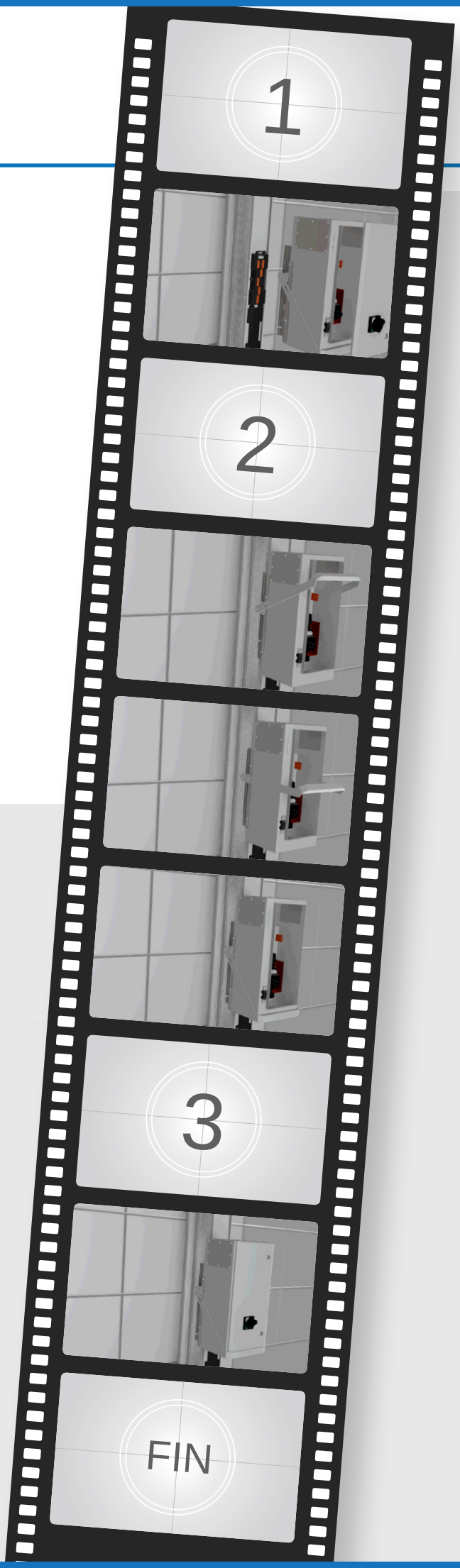
IBAR HX range tap-off boxes have been designed to be easily installed and utilise a unique actuation system.

First, the tap-off location cover on the busbar is opened (removing any security fixings), the tap-off circuit breaker is then turned to the off position and the tap-off box outer door is removed (un-coupling any in-door meters/ controls). This allows the actuating handle to be raised, the busbar tap-off location pins can then enter the locating mechanism on the tap-off box.

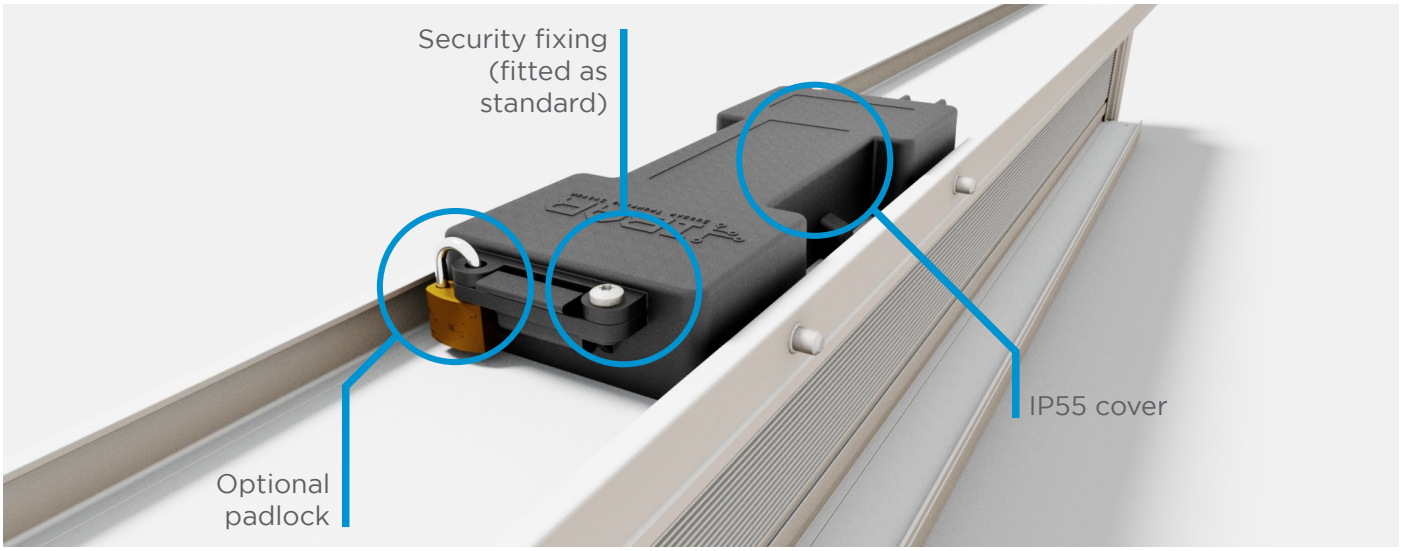
Secondly, once correctly located, the actuating handle is lowered which draws the tap-off assembly in toward the tap-off location point. The tap-off box shutter actuators then open the safety sprung shutters on the busbar tap-off location, allowing the sprung clamps to access the busbar tabs. The case earth connection is made first, followed by the integral conductors.

Any cabling can then be terminated via the integral glanding plates (or via optional built-in plug sockets), then following succesful testing and commissioning procedures the door can be replaced and the circuit breaker closed.

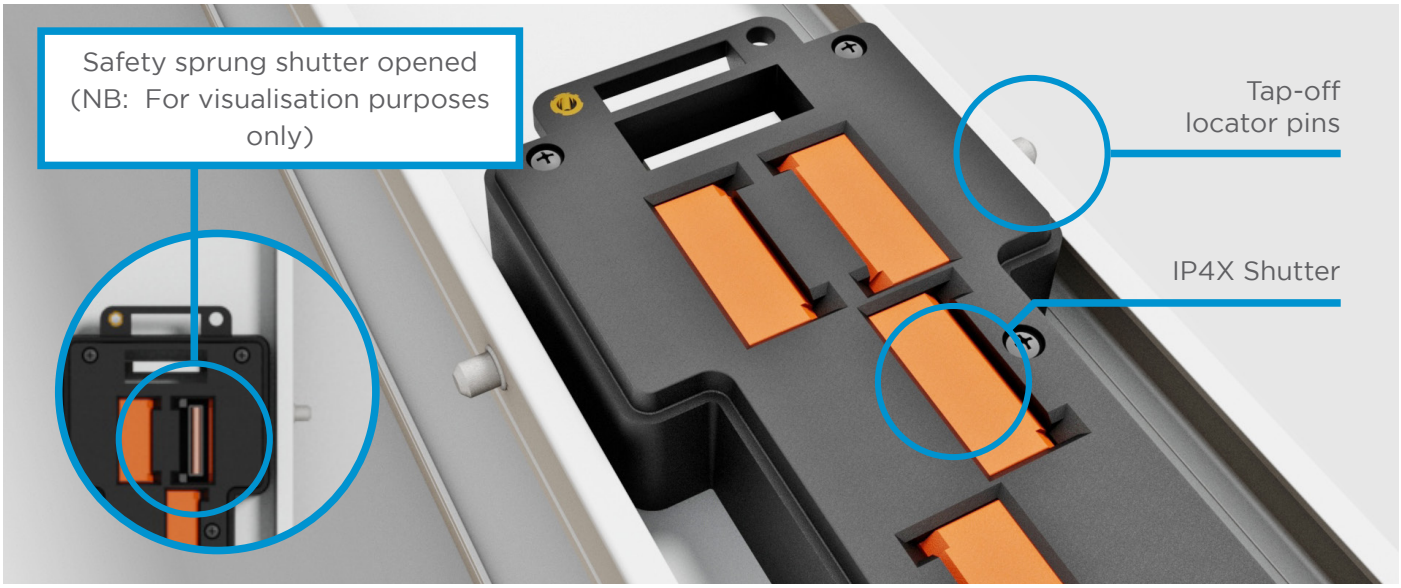




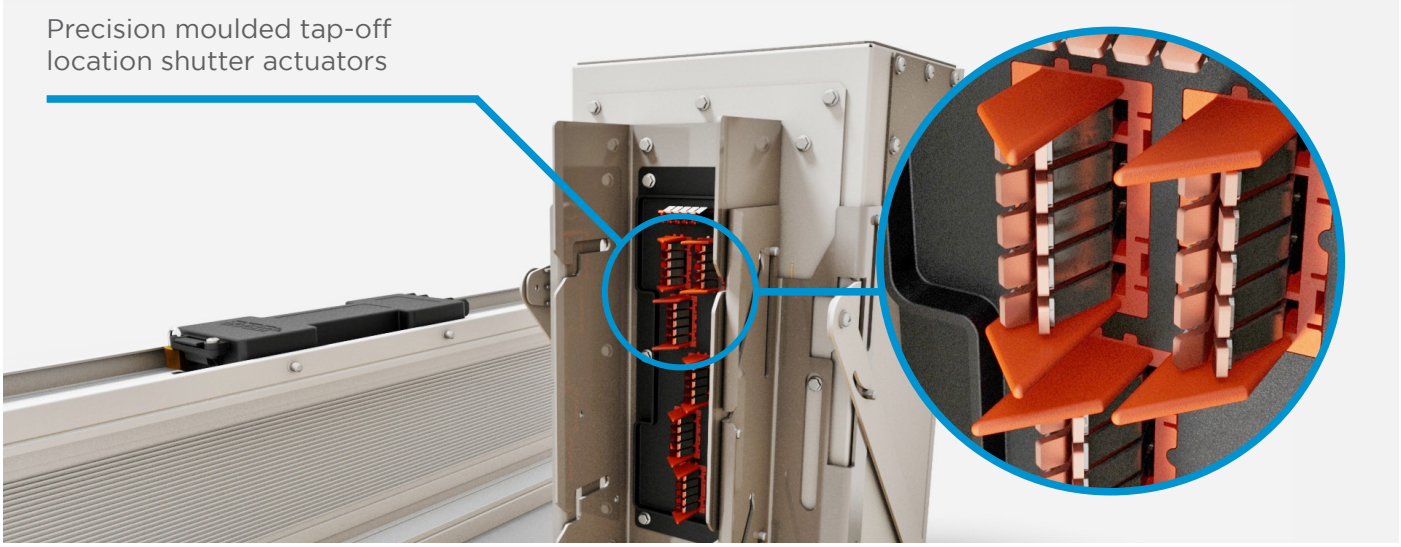
Tap-off location in fully locked off state (padlock and security bolt)



Close-up of tap-off location with IP55 cover hinged down/removed



Tap-off showing rear connections and tap-off location shutter actuating blades



Tap-offs Technical Overview

Plug-in style tap-off units are used to quickly and easily distribute power to loads or secondary distribution systems e.g. other busbar or PDU.

IBAR tap-offs incorporate a unique quick connect™ actuation system that automatically operates the IP4X tap-off point shutters (tap-off points are IP55 rated whilst the covers are in place). The tap-off is simply positioned onto the busbar at a tap-off location and the levered operation clamps the unit ensuring correct engagement every time. Once the installation is complete the tap off cannot be removed, or the door opened, whilst the tap-off circuit breaker is in the ON position.

The tap-off points are made from durable, self-extinguishing, halogen free performance polymers with padlock rings on the hinged cover to enable additional security if required. Moisture, dust and dirt are prevented ingress to IP55 whilst the covers are closed and whilst a tap-off unit is connected. The plug-in tap-offs are interchangeable between busbar systems provided the configuration is the same.

Safety and operation of MCCB style tap-offs

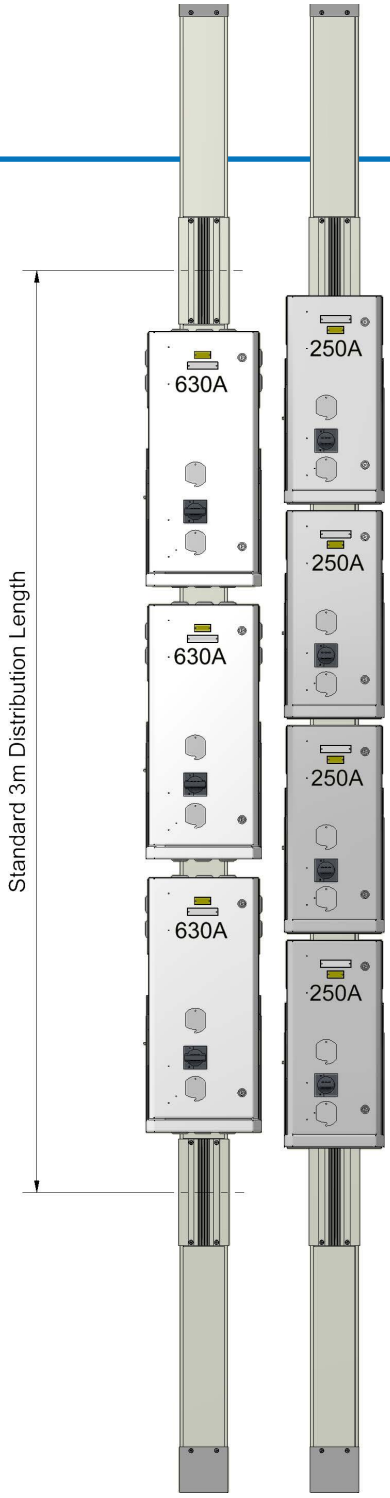
- Units cannot be plugged in or removed with the door closed
- Door cannot be opened with MCCB in ON position (MCCB type dependent)
- Units can only be fitted in the correct orientation to suit the phase rotation of the bar
- Earth make first and break last through an extended earth contact design
- No live parts accessible when door is open (IP2X)

Characteristics

- IP55 as standard with no accessories required
- Standard MCCB units are fitted with fixed, front connected devices with extended rotary handles
- Fully welded construction for maximum rigidity
- Standard glanding areas on end and sides of box directly opposite the incoming MCCB terminals
- Available with galvanised steel or aluminium gland plates (G or A)

Options

- Cable spreader boxes for side or end entry
- Metering for landlord applications, MID (Ofgem) approved
- BMS monitoring of breaker status and/or metering
- Remote open/close of MCCB
- Fused switches
- Integral socket arrangements with fixed or whip type sockets
- Integrated distribution boards
- Choice of RAL colour finishes (Standard Light Grey RAL 7035)



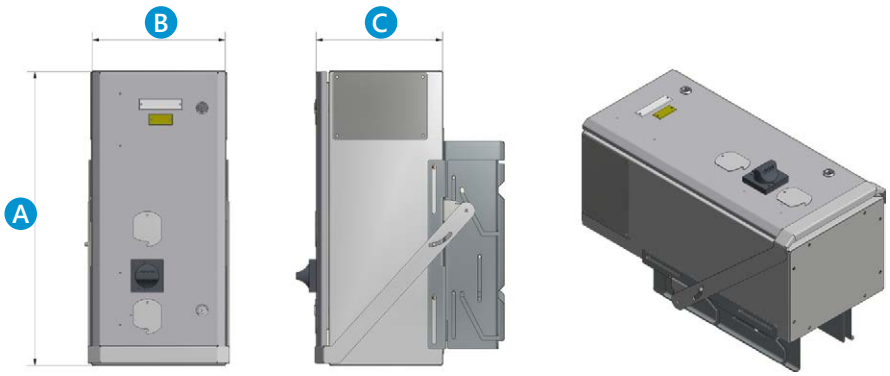
Typical Dimensions

100-250A Tap-off

A = 580mm
B = 310mm
C = 294mm
Typ. 35kg

400-630A Tap-off

A = 829mm
B = 360mm
C = 329mm
Typ. 46kg



Technical Overview HXC (Copper Conductor)

Rated Current In [A]		1000	1250	1600	2000	2500	3200	4000	5000	6300
Rated operating voltage	Ue [V]	1000								
Rated insulation voltage	Ui [V]	1000								
Frequency	f [Hz]	50/60								
Degree of protection	IP	55								
Casing material		Aluminium								
Conductor arrangement		Sandwich								
Conductor profile		Rect. Full radius corner								
Conductor material		Cu (99.9) BSEN13601								
Conductor surface treatment		Plain (Tinned optional)								
Conductor Insulation		Epoxy UL94 (V0)								

Dimensions		1000	1250	1600	2000	2500	3200	4000	5000	6300
Casing overall dimensions	W x H [mm]	155 x 115	155 x 130	155 x 150	155 x 185	155 x 220	155 x 290	155 x 400	155 x470	155 x 610
Conductor dimensions	W x D [mm]	55x6	70x6	90x6	125x6	160x6	230x6	2x125x6	2x160x6	2x230x6
Conductor CSA	CSA [mm2]	322	412	532	742	952	1372	1484	1904	2744
Weight (3 conductors)	p [kg/m]	15.03	17.13	20.62	26.6	32.72	44.88	53.38	65.63	89.94
Weight (4 conductors)	p [kg/m]	17.8	20.66	25.19	32.98	40.91	56.68	66.14	82	113.54
Weight (5 conductors)	p [kg/m]	20.67	24.24	29.49	39.43	49.19	68.62	79.05	98.57	137.42
Weight (6 conductors)	p [kg/m]	23.52	27.82	34.43	45.88	57.47	80.56	91.96	115.14	161.31

Fault Rating		1000	1250	1600	2000	2500	3200	4000	5000	6300
Rated short-time current for three-phase fault (1s)	Icw [kA] rms	50	65	65	100	100	100	120	120	120
Allowable peak current for three-phase fault	Ipk [kA]	110	143	143	220	220	220	264	264	264
Rated short-time current for single-phase fault (1s)	Icw [kA] rms	30	39	39	60	60	60	72	72	72
Allowable peak current for single-phase fault	Ipk [kA]	66	85.8	85.8	132	132	132	158.4	158.4	158.4
Rated short-time withstand current for protective fault circuit (case) (1s)	Icw [kA] rms	30	39	39	60	60	60	72	72	72
Allowable peak current for protective circuit fault (case)	Ipk [kA]	66	85.8	85.8	132	132	132	158.4	158.4	158.4

Phase Conductor Characteristics at 50Hz *		1000	1250	1600	2000	2500	3200	4000	5000	6300
Mean resistance at 20°C ambient	mΩ/m	0.0559	0.0437	0.0338	0.0243	0.0189	0.0131	0.0121	0.0095	0.0066
Mean resistance at rated current & 35°C ambient	mΩ/m	0.0770	0.0590	0.0472	0.0335	0.0257	0.0179	0.0166	0.0128	0.0089
Mean reactance at rated current	mΩ/m	0.0335	0.0233	0.0212	0.0154	0.0166	0.0134	0.0094	0.0083	0.0067
Mean impedance at rated current & 35°C ambient	mΩ/m	0.0840	0.0634	0.0517	0.0368	0.0306	0.0223	0.0191	0.0153	0.0112

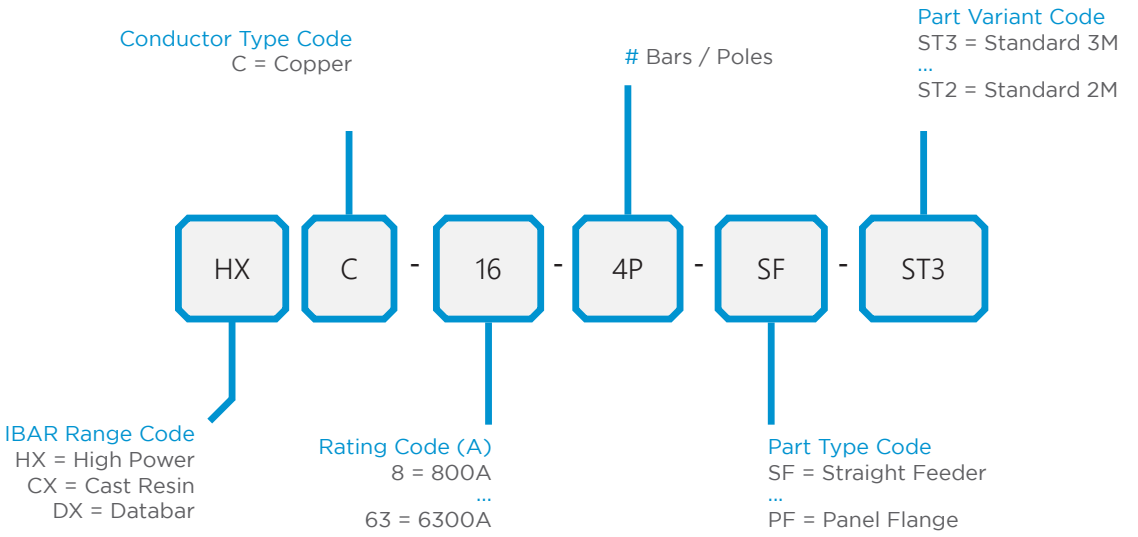
Line to Line Volt Drop *		1000	1250	1600	2000	2500	3200	4000	5000	6300
Load Power Factor - 1.0	mV/A/m	0.0667	0.0511	0.0408	0.0290	0.0223	0.0155	0.0144	0.0111	0.0077
Load Power Factor - 0.9	mV/A/m	0.0727	0.0548	0.0448	0.0319	0.0263	0.0190	0.0165	0.0131	0.0095
Load Power Factor - 0.8	mV/A/m	0.0708	0.0530	0.0437	0.0312	0.0264	0.0193	0.0164	0.0132	0.0097
Load Power Factor - 0.7	mV/A/m	0.0674	0.0502	0.0417	0.0298	0.0258	0.0191	0.0159	0.0129	0.0096

* Line to Line Volt Drop in Millivolts/Amp/Metre at 50Hz and 35°C Ambient Temperature with the load spread over the busbar trunking system run. For load concentrated at one end double the figures in the table. Figures stated in accordance with BS EN 60439-2.

IBAR's real-time manufacturing traceability is the foundation of quality products and on-time delivery

Part Numbering Guide

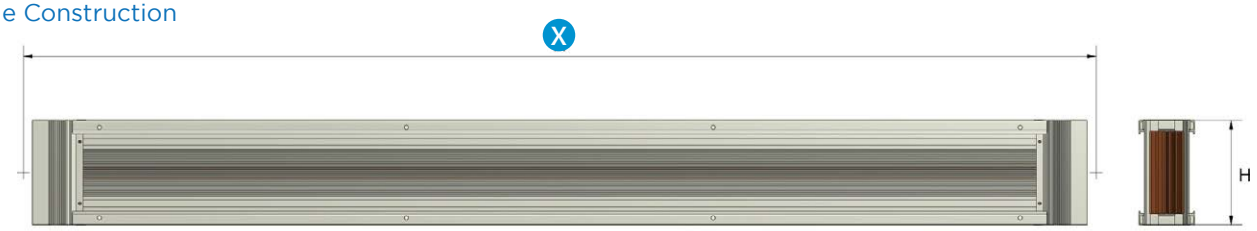
CF	Centre Feed	EX	Expansion	PR	Phase Rotation
CM	Combination	FB	Fire Barrier	SD	Straight Distibution
CX	Custom	JP	Joint Pack	SF	Straight Feeder
EC	End Cap	LE	Elbow Edgewise	TF	Tee Flatwise
EF	End Feed	LF	Elbow Flatwise	TX	Transformer Flange
		NR	Neutral Rotation	ZE	Offset Edgewise
		PF	Panel Flange	ZF	Offset Flatwise



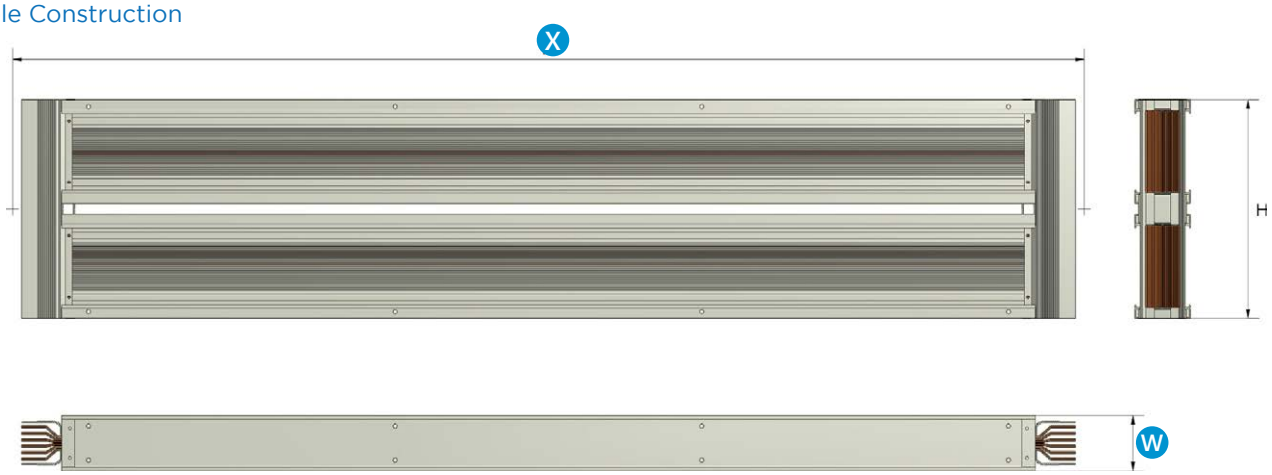
Straight

Straights are one of the most common parts of any trunking system. Custom lengths can be manufactured to suit each application requirement within the ranges below. Feeder type busbar is used for end to end transmission and distribution type incorporates tapping outlets for connection of tap off units.

Single Construction



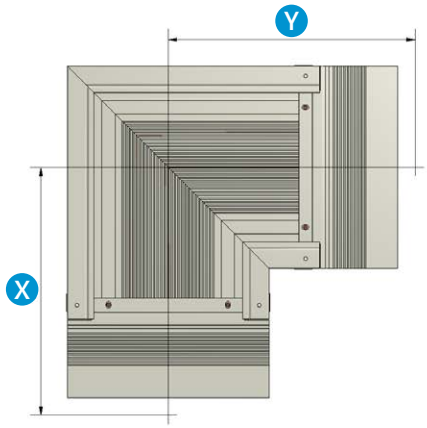
Double Construction

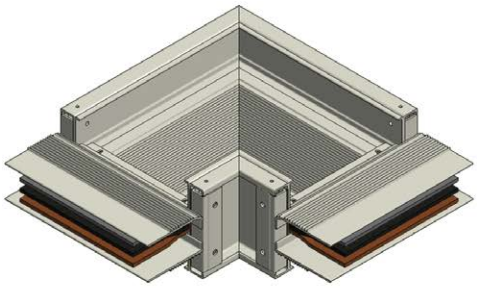


Standard lengths = 3m, 2m & 1m. Min.X = 0.5m, Max.X = 3m. W = 155mm

Flatwise Elbows

Flatwise elbows are used to make directional changes to busbar runs usually at 90° to the direction of travel. In addition to providing left and right elbows in standard 90°, it is possible to have custom angles manufactured.



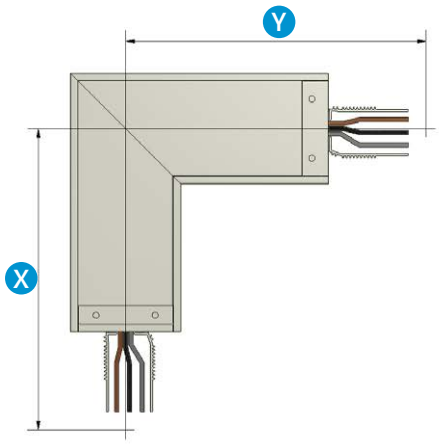


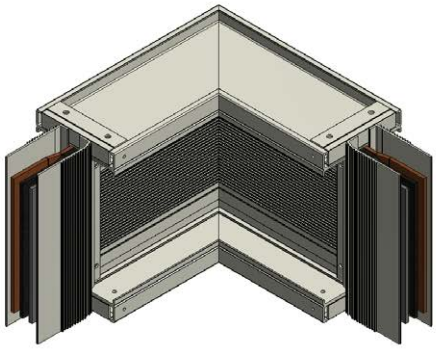
HXC (Copper) Systems

Rating (Amps)	Stack	Standard mm		Min	Max
		X	Y	X & Y	X & Y
1000	Single	350	350	250	700
1250	Single	350	350	250	700
1600	Single	350	350	250	700
2000	Single	350	350	275	700
2500	Single	350	350	300	700
3200	Single	350	350	325	700
4000	Double	500	500	375	700
5000	Double	500	500	415	700
6300	Double	500	500	485	700

Edgewise Elbows

Edgewise elbows are used to make directional changes to busbar runs usually at 90° to the direction of travel. In addition to providing left and right elbows in standard 90° it is possible to have custom angles manufactured.

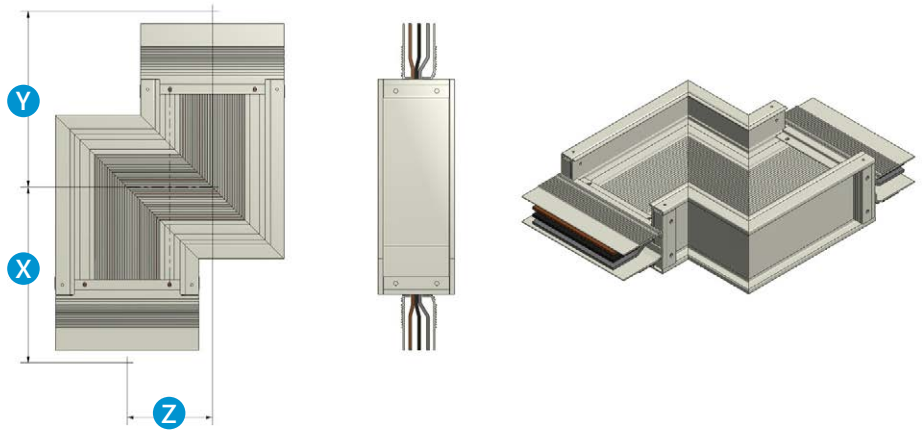




Standard X & Y = 350mm, Min. X & Y = 275mm, Max. X & Y = 600mm

Flatwise Offsets

Offsets are commonly used to avoid small obstructions and obstacles that the use of two elbows would make inefficient. The four variants of offset are edgewise left & right and flatwise left & right.

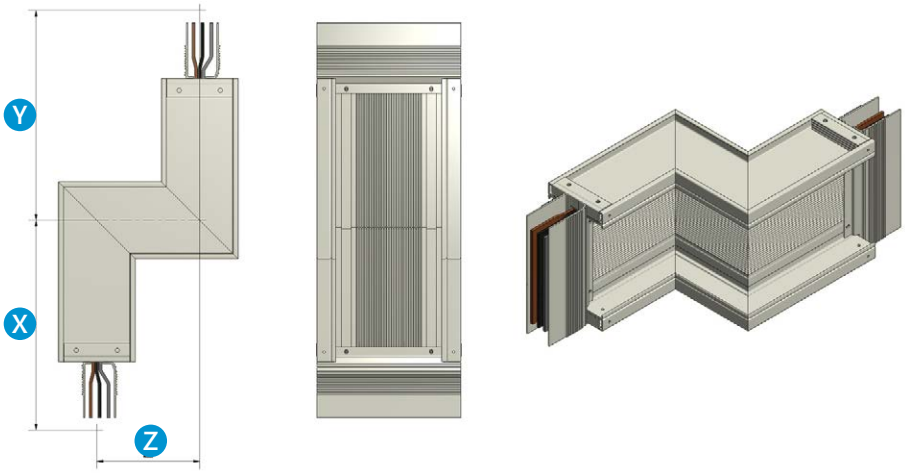


HXC (Copper) Systems

Rating (Amps)	Stack	Standard	Min	Max	Min	Max
		X	X & Y	X & Y	Z	Z
1000	Single	350	250	650	50	700
1250	Single	350	250	650	50	700
1600	Single	350	250	650	50	700
2000	Single	350	275	650	50	675
2500	Single	350	300	650	50	640
3200	Single	350	325	650	50	570
4000	Double	500	375	650	50	675
5000	Double	500	415	650	50	640
6300	Double	500	485	650	50	570

Edgewise Offsets

Offsets are commonly used to avoid small obstructions and obstacles that the use of two elbows would make inefficient. The four variants of offset are edgewise left & right and flatwise left & right.



Standard X & Y = 350mm, Min. X & Y = 275mm, Max. X & Y = 650mm
Min. Z = 75mm, Max. Z = 700mm

Straight Panel Flanges

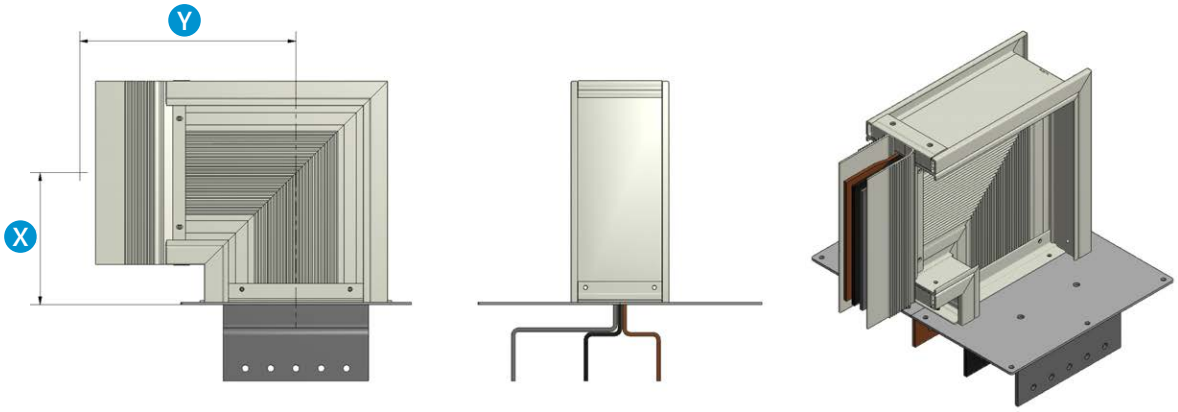
Panel flanges are the standard fittings used to make connections to other items of LV equipment such as switchboards and transformers etc. Each rating of flange has set dimensions for the cutout and fixing points that are supplied on drawings with each unit. Phase rotation from other equipment to a busbar system needs careful coordination and all phase details must be highlighted and approved at design stage.

Standard / Min. X = 250mm, Max. X = 800mm

Flatwise Panel Flanges

Panel flanges are the standard fittings used to make connections to other items of LV equipment such as switchboards and transformers etc. Panel flanges with integrated 90° change of direction allow for low headroom applications and are available in flatwise and edgewise formats.

Each rating of flange has set dimensions for the cut out & fixing points identical to that of straight type units the details of which are supplied on drawings with each unit. Phase rotation from other equipment to a busbar system needs careful coordination and all phase details must be highlighted and approved at design stage.



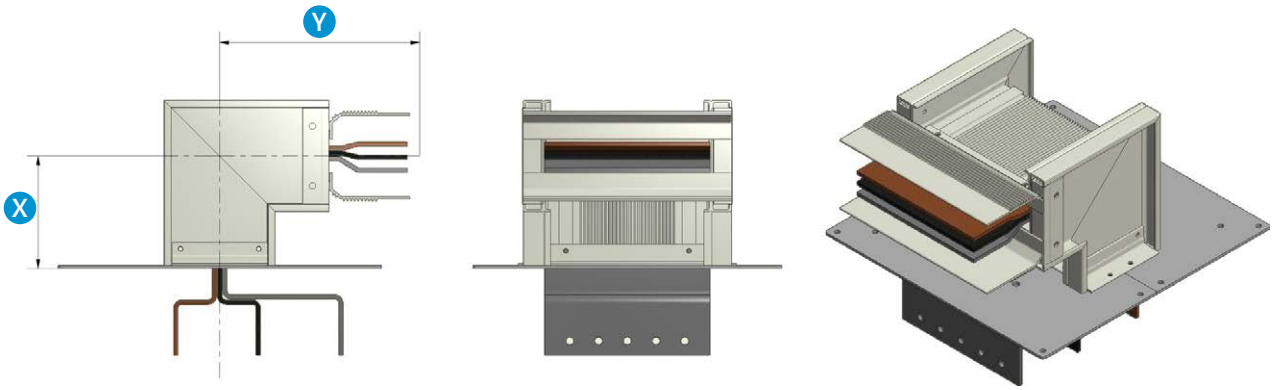
HXC (Copper) Systems

Rating (Amps)	Stack	Minimum		Maximum	
		X	Y	X	Y
1000	Single	115	250	800	500
1250	Single	115	250	800	500
1600	Single	115	250	800	500
2000	Single	140	275	800	500
2500	Single	165	300	800	500
3200	Single	190	325	800	500
4000	Double	240	375	800	500
5000	Double	280	415	800	500
6300	Double	350	485	800	500

Edgewise Panel Flanges

Panel flanges are the standard fittings used to make connections to other items of LV equipment such as switchboards and transformers etc. Panel flanges with integrated 90° change of direction allow for low headroom applications and are available in flatwise and edgewise formats.

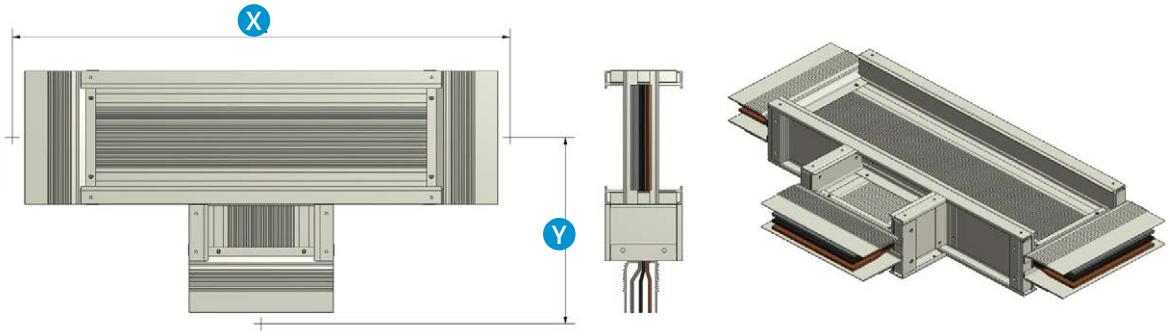
Each rating of flange has set dimensions for the cut out & fixing points identical to that of straight type units. The details of which are supplied on drawings with each unit. Phase rotation from other equipment to a busbar system needs careful coordination and all phase details must be highlighted and approved at design stage.



Min. X = 140mm, Max. X = 800mm, Min. Y = 275mm, Max. Y = 500mm

Flatwise Tees

Tee units are used to make branched busbar runs. The tee units create a 90° branch to accomodate multiple end supply points from a single source and can, in certain applications, be a more efficient way of creating a widespread distribution backbone. Tee's are available in compact form in flatwise construction.



HXC (Copper) Systems

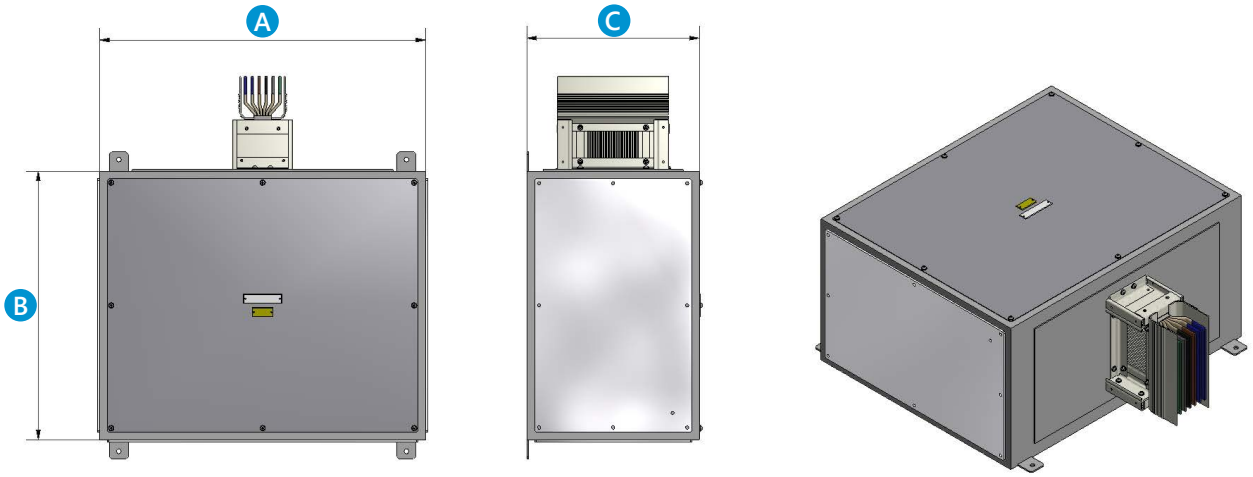
Rating (Amps)	Stack	Standard	Min	Max	Min	Max
		X	X & Y	X & Y	Z	Z
1000	Single	350	250	650	50	700
1250	Single	350	250	650	50	700
1600	Single	350	250	650	50	700
2000	Single	350	275	650	50	675
2500	Single	350	300	650	50	640
3200	Single	350	325	650	50	570
4000	Double	500	375	650	50	675
5000	Double	500	415	650	50	640
6300	Double	500	485	650	50	570

Connection Boxes

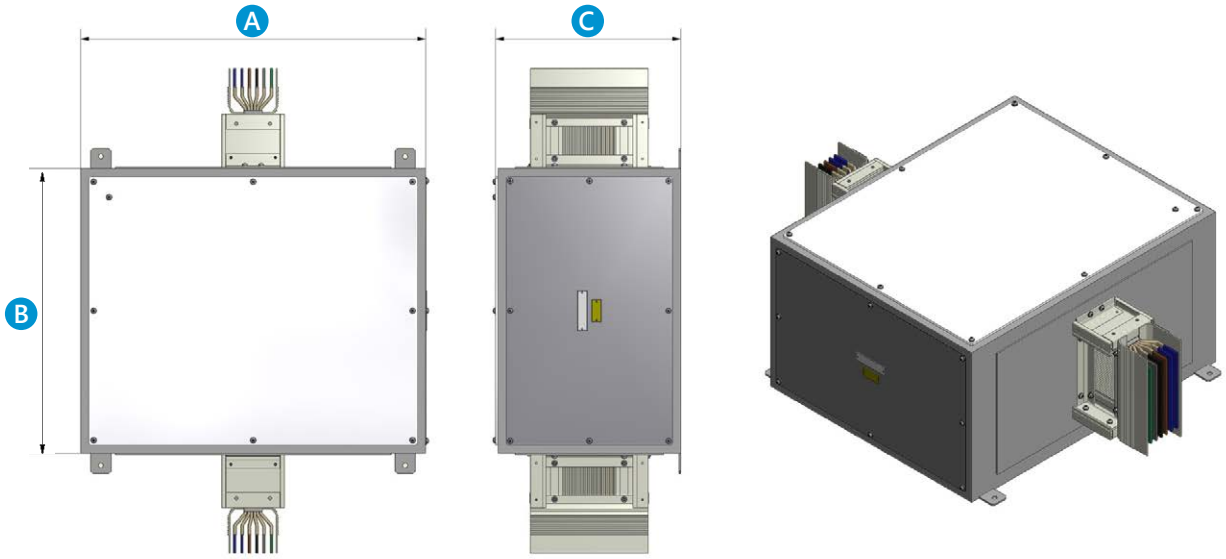
Centre feed units are used to connect cables to feed a busbar run. A centre feed unit can be situated somewhere along the busbar run feeding power to both branches that connect whereas an end feed unit is positioned on one end of a run / branch. Side and bottom glanding areas allow for the greatest flexibility when it comes to cabling the unit.

The size of an end feed is generally governed by the size, type and number of cables being connected. See below for the standard sizes available. Special sizes and configurations can be designed to suit particular applications.

End Feed



Centre Feed



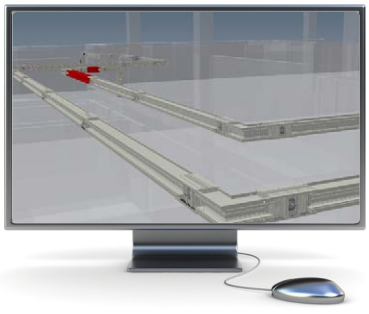
Single Stack Busbar : A = 600mm, B = 600mm, C = 350mm

Double Stack Busbar : A = 600mm, B = 800mm, C = 650mm

Applications Engineering

Our experienced team of in-house applications engineers are on hand to make using IBAR a hassle free process utilising a catalogue of standard and customisable parts they are able to create bespoke solutions tailored to the most demanding requirements.

Our teams work closely with other infrastructure and power system providers to coordinate critical elements such as phase orientation.

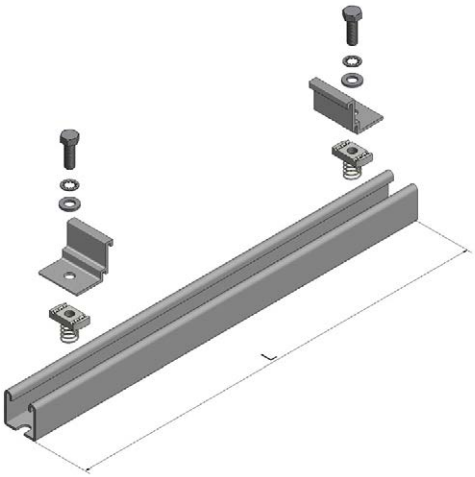


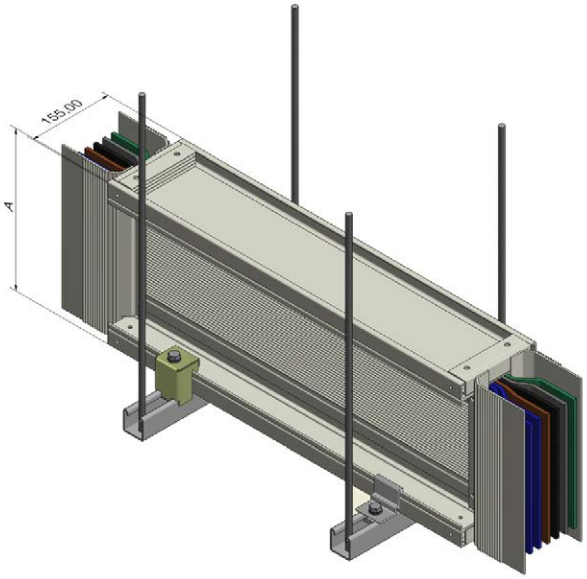
Hangars and Fixings

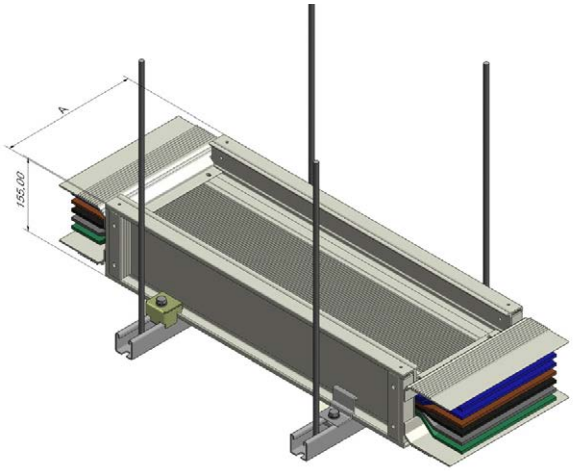
Correct mounting of the busbar trunking run is a critical element of ensuring a trouble free system. The IBAR HX system has a range of mounting and clamping hardware that is fully compatible with the widely available Unistrut system.

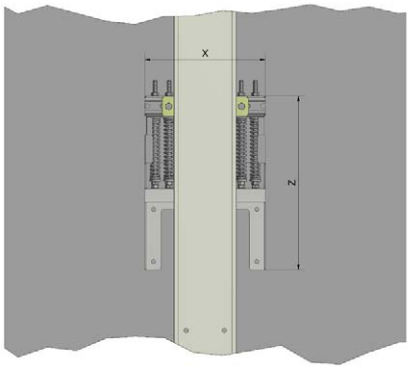
Horizontal installations will make use of the universal fixing clamp that is able to accommodate flatwise and edgewise orientations and fixed clamps that are typically used on long, straight runs where expansion needs to be controlled. Both of these clamps fit onto standard 41x41mm Unistrut as illustrated below.

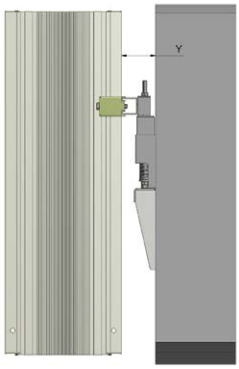
Vertical riser installations make use of the fixed clamps and proprietary spring brackets used to distribute load evenly across the building structure and isolate the bar from excessive vibration or building movement.











Component Visual Reference Guide

Feeder Lengths

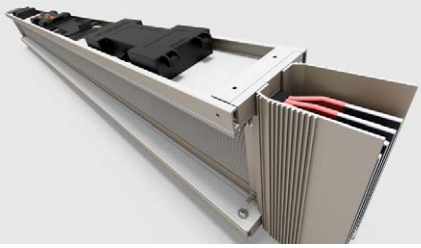
Standard lengths:

- 3m
- 2m
- 1m

Edgewise Installation Brackets

Flatwise Installation Brackets

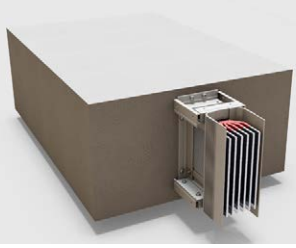
Distribution Lengths



Up to 5no tap-off points per 3m length

Vertical Hangars

Transition Unit (Cast Resin)

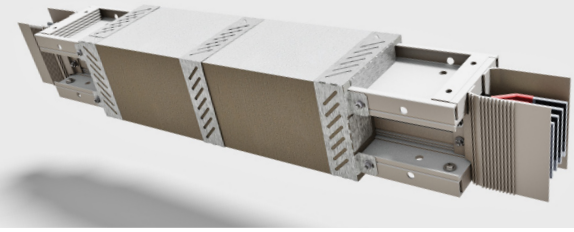


Flatwise Elbow

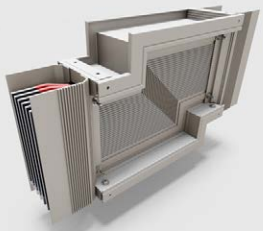
Edgewise Elbow

Custom Elbow

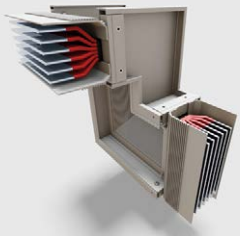
4 Hour Fire Barrier



Flatwise Offset

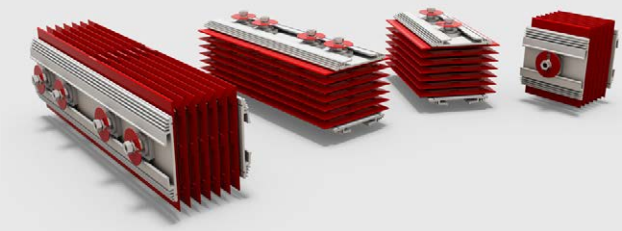


Combination Elbow / Offset



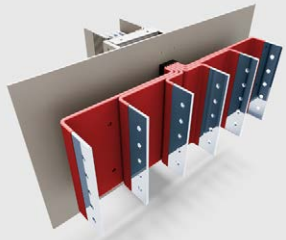
Expansion Unit

Joint Packs

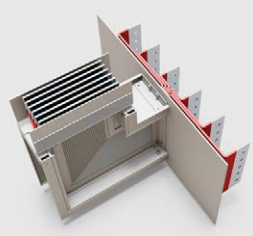


Transformer / Parallel Flange

Panel Flange

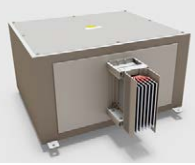


Flatwise Elbow Panel Flange



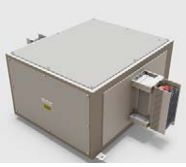
'Tee' Section

End Feed



End Cap

Centre Feeder



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About Anord Mardix

Anord Mardix is a leading provider of power distribution and protection equipment to the global market. We are a vendor of choice to many of the world's leading data center and cloud computing industries. We produce the most comprehensive product range in the market - from power, control, and monitoring solutions to our unique service capability. Our ability to customize and produce on a large scale delivers the most reliable end-to-end power systems to all our customers, from independent providers to hyper-scale leaders.

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