



STARLINE SERIES HP

High Power Busway Product Selection Guide

Starline®
A brand of **legrand®**

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STARLINE SERIES HP SYSTEM SOLUTION



INDUSTRY

The Starline Series HP features easy to install and ensures large capacity of energy transmission while providing space efficiency.

We also can provide real time monitoring system using temperature and power monitoring.



PLANT

Optimal solution for factory and plant power distribution line due to its special feature satisfying IP68 and non explosive design. NSPB and CR Way type normally used for chemical and power plant especially indoor and outdoor substation room.



DATA CENTER

The flexibility and expandability as well as easy maintenance property of the busway system provides the best alternative to improve the existing problems of the conventional power cable system of data centers, which requires constant extension, reinstallation and capacity modification of loads.



HIGH RISE BUILDING/COMMERCIAL

Although the demands for more electricity for families are growing, the space for EPS area has reduced. Due to the change, the need for busways and multi boxes have increased.



AIRPORT

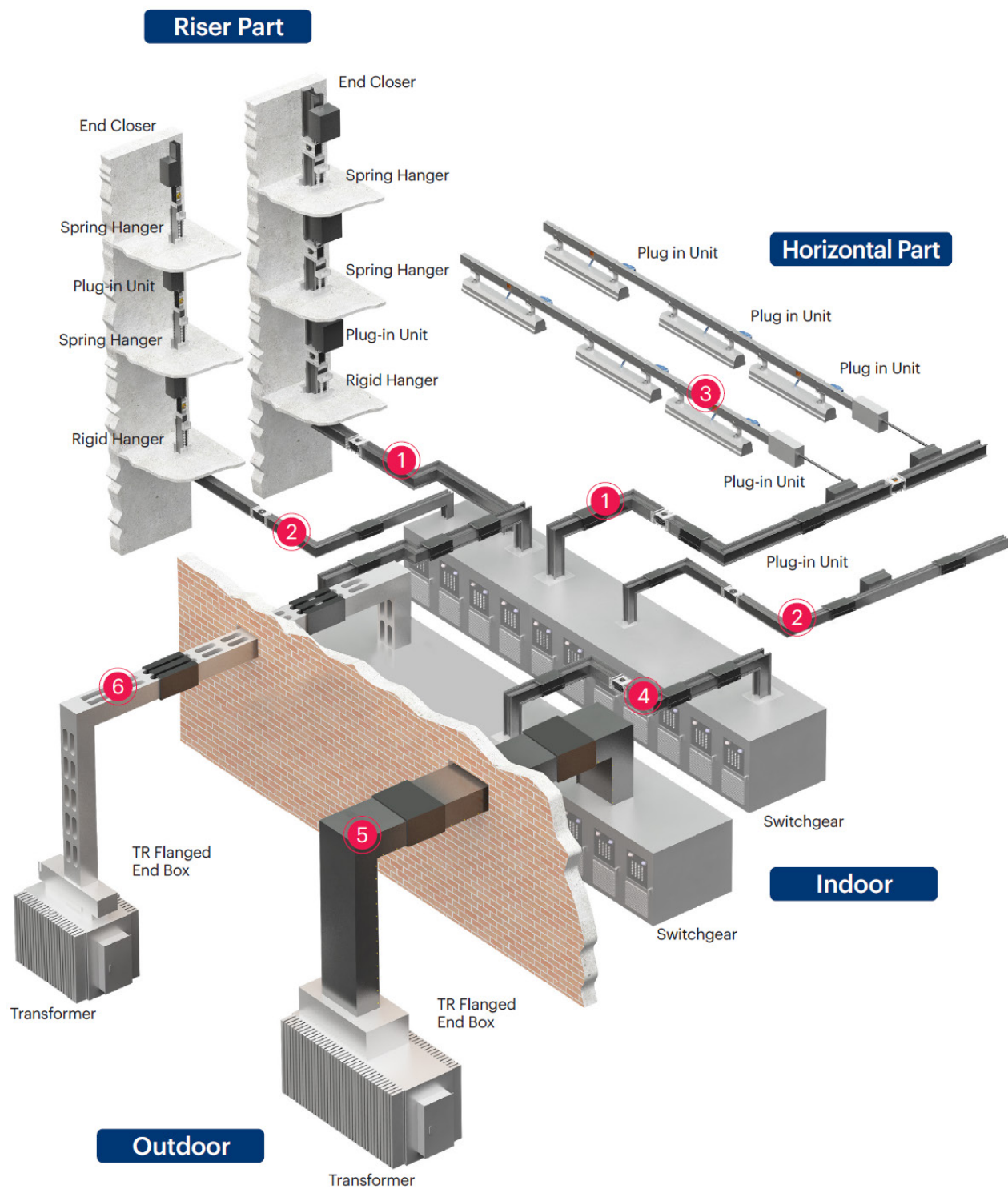
In order to secure the stable power supply of the airport, the busway system provides the best customized solutions by installing high voltage busways at the transmission, low voltage busways at the control tower and general commercial buildings.



STADIUM

The needs for a busway system has been growing for its benefit such as large capacity of power transmission, providing a stable power supply for various loads and an eco friendly property as well as economical quality.

BUSWAY PRODUCT LINE-UP



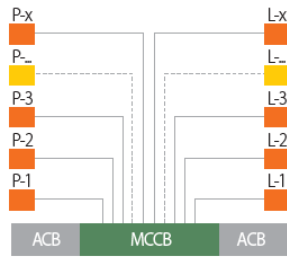
WHY BUSWAY?

EASY DISTRIBUTION OF LOADS

When supplying power using cables, each load has to be connected individually to cables which wastes space, and requires an additional distribution panel.

On the other hand, busways allow electricity to flow from main line and branch through the plug-in unit, simplify the circuit configuration and significantly reduce the cost.

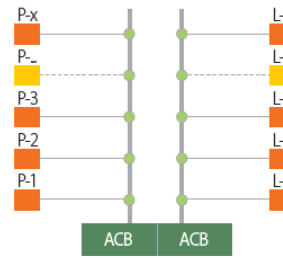
CABLE WIRING SYSTEM



- One-to-one correspondence of power supply and loads
- Additional lines are needed in case of a load change

ACB : Air Circuit Breaker, MCCB :
Molded Case Circuit Breaker

BUSWAY SYSTEM

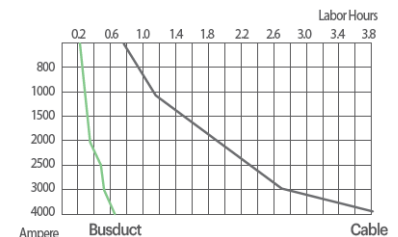


- One-to-many correspondence of power supply for specific power supply
- Additional lines are not necessary in case of a load change

EASY INSTALLATION

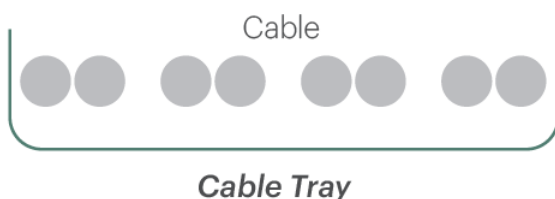
Cable installation requires cable pulling and cable tray job which are difficult and require long-term construction period.

On the other hand, busway installation method is very simple. Just connect a certain length of feeder, reducing the amount of labor hours required as shown in the comparison graph.

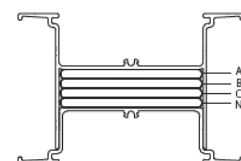


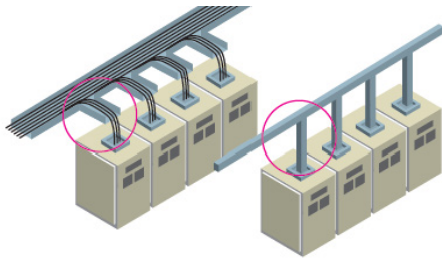
COMPACT

The compact design of the busway system provides high space efficiency at up to 50% compared to the cables. While cables require larger space to install multi lines as well as additional space for coiling areas, the busways use proper fittings to maximize space efficiency.



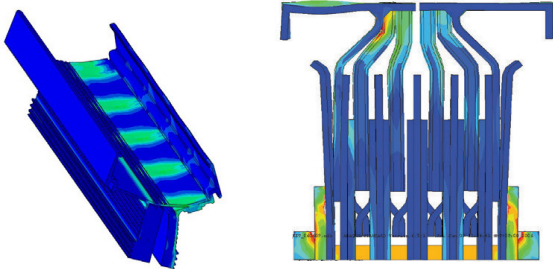
The space
required reduces
by 50%





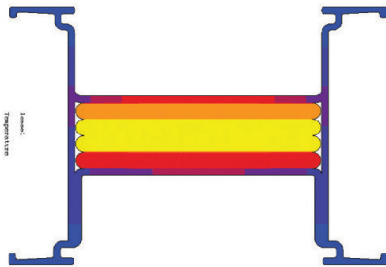
ADAPTABILITY TO VARIOUS INSTALLATION ENVIRONMENT WITH CONVENIENCE

The busway system comes with various fittings such as elbow, off-set and tee, and can transmit high capacity currents without electrical and mechanical loss.



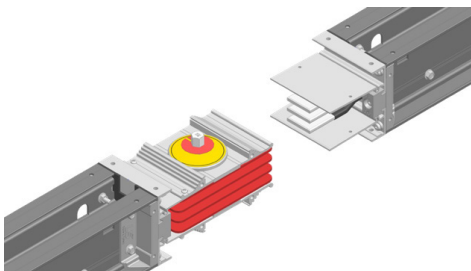
EXCELLENT SHORT CIRCUIT STRENGTH

The busway system has a high tolerance for short circuit. Its stability and reliability make it perfect for a high capacity energy transmission system.



HIGH CURRENT DENSITY

Cable maximum allowable current ampacity limit is 1000A, in case requires higher current, additional lines is needed. Busway systems can transmit up to 6000A, by providing high current density, saving cost and time.



EASY MAINTENANCE

The design of the busway system makes it easy to detect abnormalities during installations, and ensures easy maintenance. When humidity or dust causes a malfunction on the system, the easy-to -maintain design allows replacing only the damaged part.



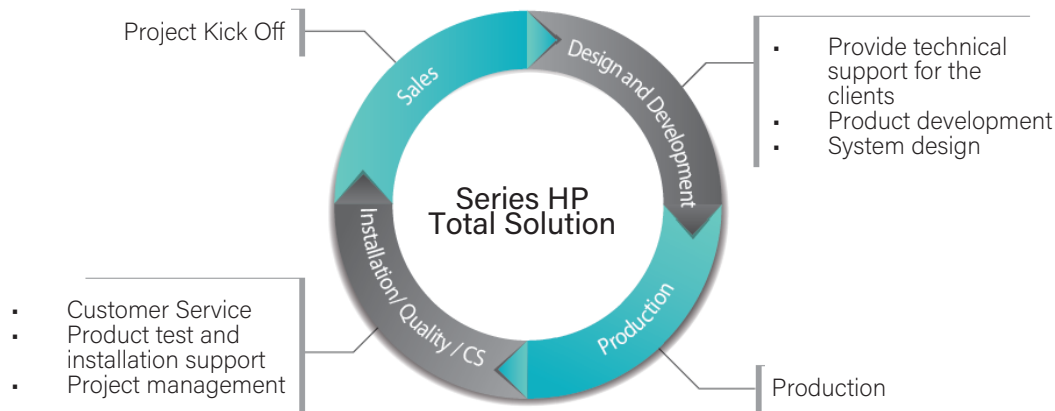
OUTSTANDING FEATURES OF EMC AND EMI

Unlike cables, busways do not require a shield, instead, the housing itself performs as a shield which enhances the features of EMC and EMI.

TOTAL SOLUTION

- Our engineers will be available from the onset of the project to assist with questions and provide timely support.
- The Series HP Support Team will offer full services for design, production, installation and testing for complete customer satisfaction.
- Starline Services Group offers a series of post-sale support packages to ensure successful start-up and maintenance of the product.

PROCESS



TECHNICAL EXCELLENCE

Unparalleled Reliability

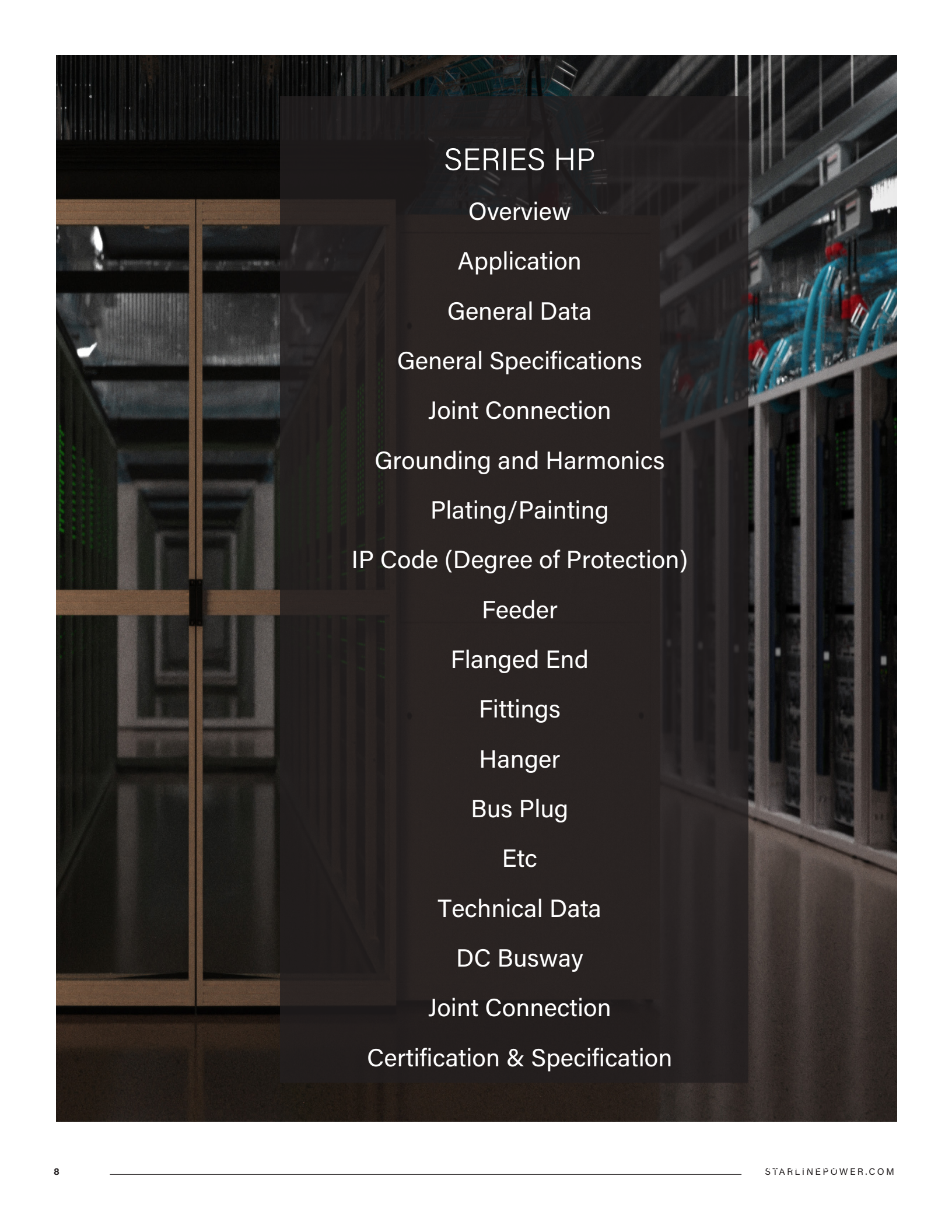
- UL Certified
- Safe use in hazardous zones
- Uses qualified insulation such as epoxy and PET film for efficient insulation

Eco Friendly

- Fully recyclable
- Halogen free
- Does not contain RoHS 6 hazardous substance
- No toxicity in fire & Fire-Retardant
- Non Explosive

Total Engineering Technology

- Provide the optimal design by experienced engineers
- Unique and exclusive design program for the busway system
- Design based on structure stability inspection
- The excellent heat –radiating property of the aluminum housing, which ensures large capacity of power transmission
- Low weight & low cost
- Easy installation
- Deployable where access is difficult
- Automated epoxy insulation facility
- Unique joint kit connections



SERIES HP

Overview

Application

General Data

General Specifications

Joint Connection

Grounding and Harmonics

Plating/Painting

IP Code (Degree of Protection)

Feeder

Flanged End

Fittings

Hanger

Bus Plug

Etc

Technical Data

DC Busway

Joint Connection

Certification & Specification

OVERVIEW

SERIES HP BUSWAY

The AC Busway system components are designed to carry voltage range below 600VAC, and to carry the current range of 630A to 6000A. The DC Busway system components are designed to carry voltage range below 600VDC, and to carry the current range of 800A to 6000A. Joint kit connections provide more space to connect which reduce the contact resistance to its minimum while connecting products. The standard offering for the system is IP54 rated, however, it can be upgraded to an indoor or outdoor IP65 rating on request. Series HP uses epoxy powder for insulation.

COMPACT SIZE

Series HP uses a high conductivity conductor and an effective heat radiating housing profile which allow more compact size than other busway models.

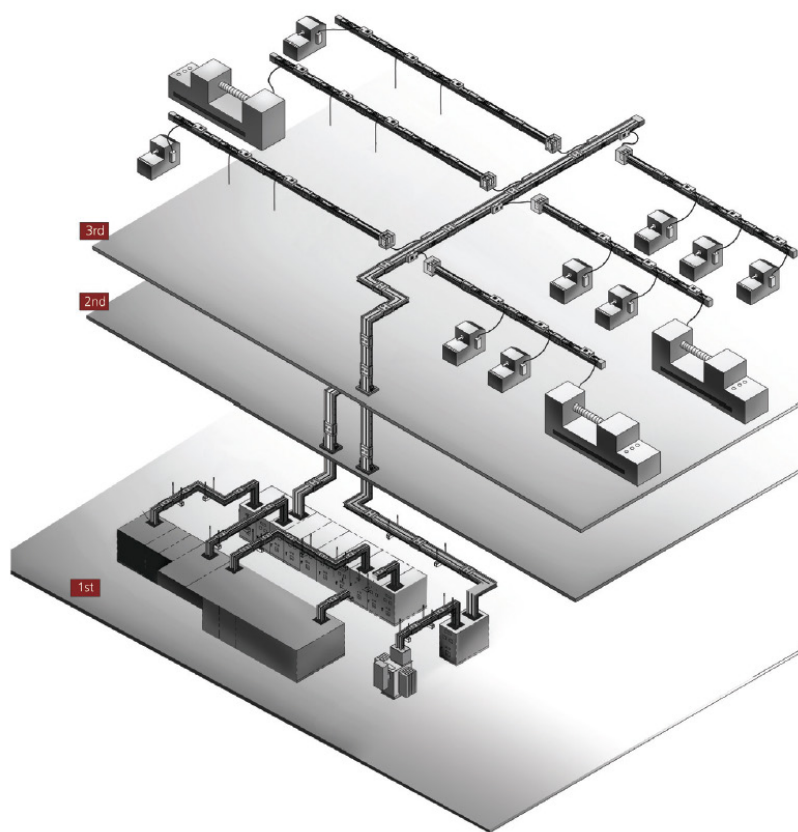
The product's light weight makes installation easier even in small space.

ECONOMICAL AND EASY INSTALLATION

Series HP uses aluminum housing and joint kit connections to enable easy, quick and low cost installation.

EASY DISTRIBUTION LOADS

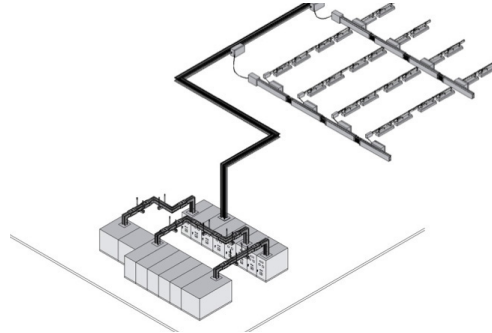
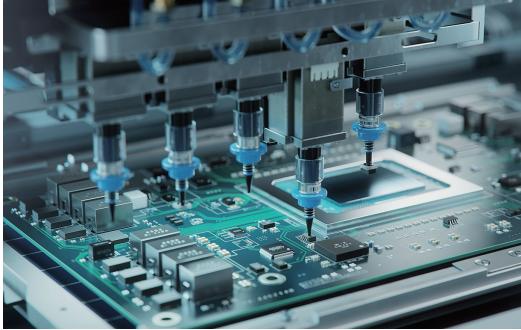
Busways allow electricity to flow from main line and branch through plug-in units, simplifying the circuit configuration and significantly reducing the cost.



APPLICATION

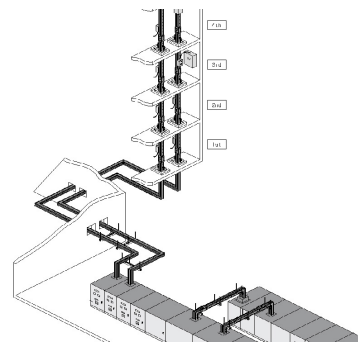
FACTORY / PLANT ETC.

- The busways can be applied to a vast range of industries such as semiconductor, display and petrochemical plants.
- The temperature and the power supply monitoring system allows for easy maintenance.
- The system provides high space efficiency, and allows a significantly reduced installation period.



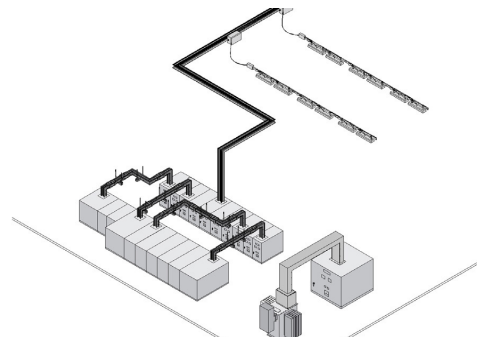
COMMERCIAL / INDUSTRIAL BUILDING

- Provides excellent space efficiency.
- The busways can be applied to high-rise buildings, office buildings, and data centers.
- Multi-box can be applied on request.

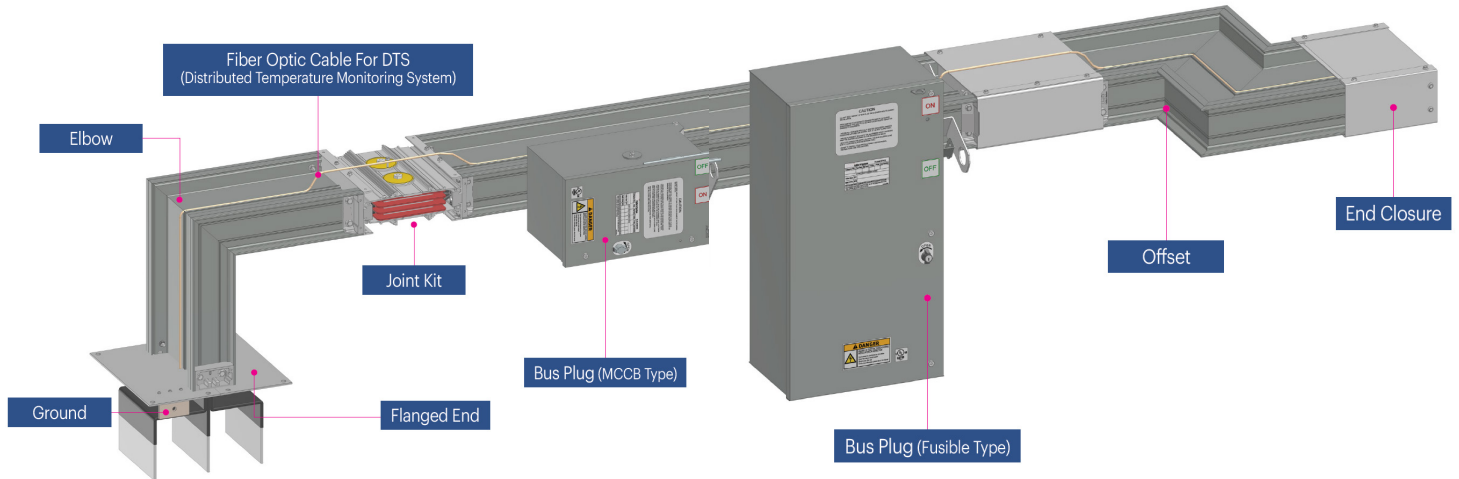


ELECTRICAL ROOMS

- The busway can be installed both horizontally and vertically at the electrical room.
- The maximized safety features are seismic-proof and explosion-proof.
- Provides excellent space efficiency and easy installation compared to cables.



GENERAL DATA



HIGH CURRENT DENSITY

The busway has a compact design utilizing effective heat-radiating housing profile and can carry from 630A up to 6000A with reduced loss of electric power.

LOW VOLTAGE DROP & HIGH SHORT CIRCUIT STRENGTH

Busways provides efficient power transportation through optimal design. Voltage drop is very low due to low impedance. The system is designed to carry high short circuit ratings.

PERMISSIBLE OPERATING TEMPERATURE

The cross sectional areas of the conductor and housing profile are designed to meet the standard permissible operating temperature of UL857.

ECO-FRIENDLY

Series HP is RoHS certified and does not utilize hazardous components or materials, such as lead, cadmium, mercury, chrome, PBBs and PBDEs.

STANDARD

- ANSI/UL857
- NEMA BU 1.1 Busways
- IEC 61439-6
- Busbar Trunking Systems
- BS EN 61439 Busways
- AS / NZS 3439.2

SERVICE CONDITION

- Ambient Temperature : -59°F ~ 131°F, -15°C ~ 55°C
 - Relative Humidity : 95% or below
- (When the service condition of the environment does not meet the requirements listed above, please contact our design team.)

CONDUCTOR

Cu - Conductivity : over 96% , Purity over 99.9%
Al - Conductivity : over 61% , Purity over 99.6%

HOUSING

Series HP uses an effective heat-radiating aluminum housing profile which produces excellent mechanical strength and heat radiation. The aluminum housing can be used as a electrical ground conductor due to its high level conductivity and cross sectional areas. An optional optical fiber temperature sensor can be installed at the housing.

CONNECTION

Joint Kit
Double Head Bolt / Visible Label / Disc Spring
Assembly Torque : 694~868lbf.in / 78~98N.m / 800~1000kgf.cm

INSULATION PROPERTIES

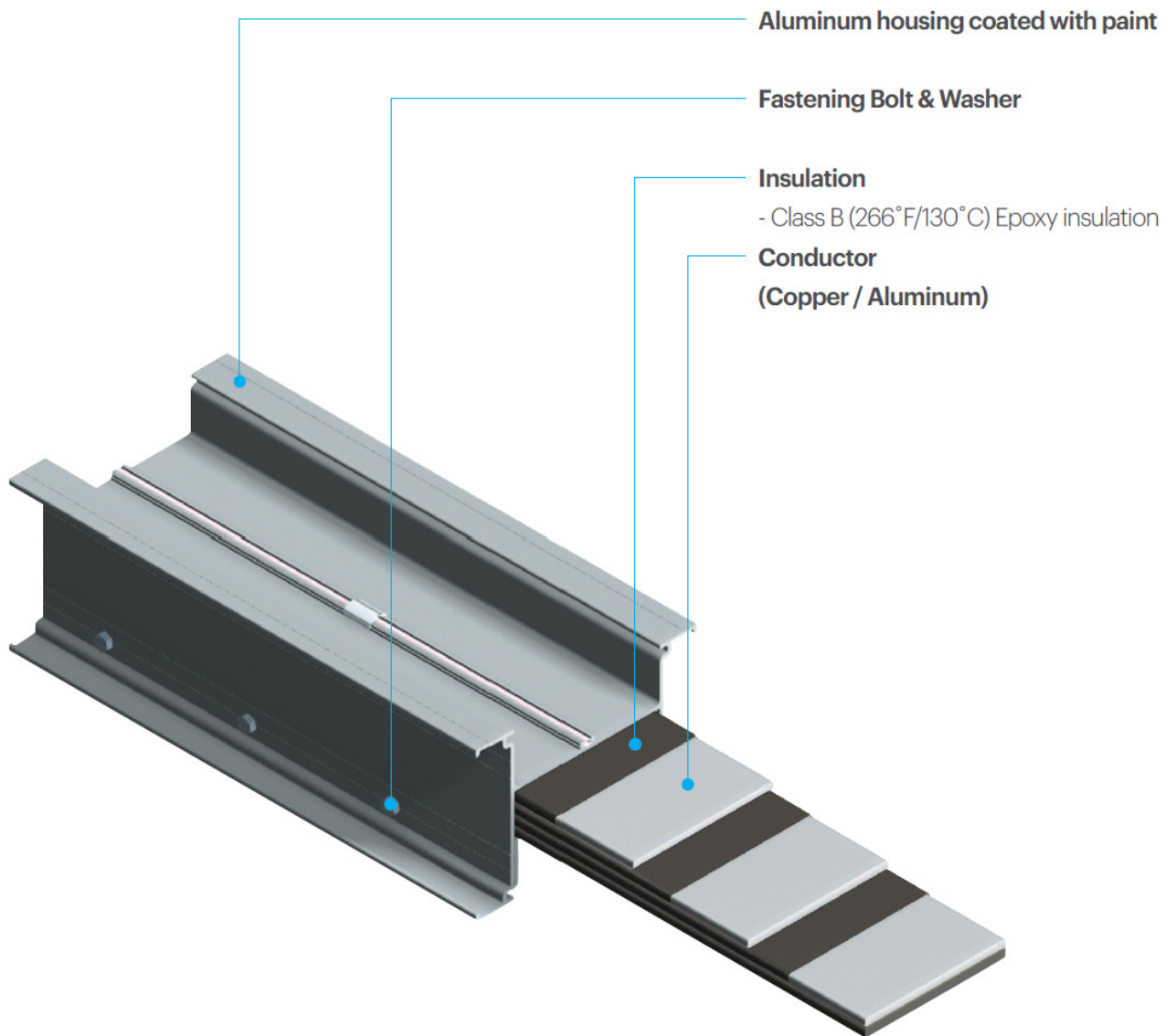
Epoxy Class B (266°F/130°C)

GENERAL SPECIFICATIONS

Each of the busway's conductors are Class B Epoxy insulated to a thermal rating of 266F/130C for each phase and protected with an aluminum enclosure.

The design is a sandwich type structure and can be applied to voltages below 600VAC and range is between 630 and 6000A.

The system and its connections are designed to a standard rating of IP54, with additional ingress protection available.



JOINT CONNECTION

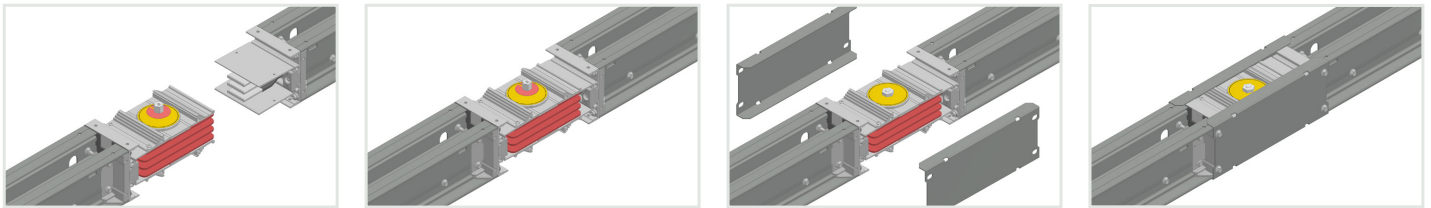
FEATURE

Joint kit plates and conductors are standard tin plated, with the option of silver plating available. This prevents discoloration and corrosion of the joint plate. In order to ensure easy maintenance and reliability, double-headed bolts and visible labels are used to check the application, and a disc spring allows even connection of the contact surface.

DOUBLE HEADED BOLTS

Double-headed bolts are used to ensure a proper torque level when installing the joint kit. If a torque wrench applies a pressure of 694~868lbf.in / 78~98N.m / 800~1000kgf.cm to the outer bolt head, the head of the outer bolt and the tag attached to it will be sheared off automatically. Thus, it allows visual inspection for the proper application of the bolts at the connection. The remaining bolt head can be re-used when tightened to 694lbf.in/800kgf.cm using a torque wrench. After installing joint cover, a red line at the end of double headed bolt should be seen through the inspection cap.

Joint Kit



NUMBER OF DOUBLE HEADED BOLTS

Number of D.H bolts		1	2	4	6
Ampere (A)	AL	630, 800, 1000, 1250	1600, 2000, 2500	3200, 3600, 4000	5000, 6000
	CU	630, 800, 1000, 1250, 1600, 2000	2500, 3200, 3600, 4000	5000	6000

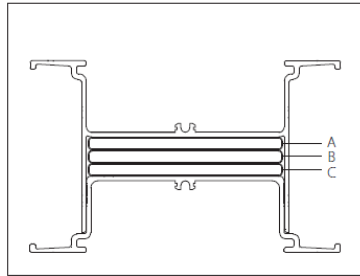
Precaution

- Be sure to clean the interior of the connections prior to installation.
- Do not twist the joint kit while inserting it or after it has been installed.
- Excessive pressure during installation may break the kit.
- Make sure that the double-headed bolts and the red tags are intact.
- If proper torques are not applied at the connection, it may cause heat during operation.

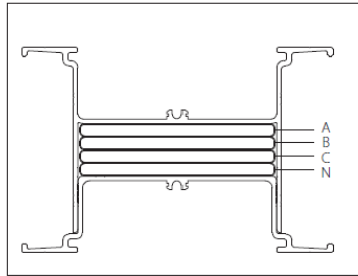
GROUNDING AND HARMONICS

The entire enclosure of the Series HP is made of aluminum, and the cross-sectional area of the enclosure is more than 100% of the conductor of each phase.

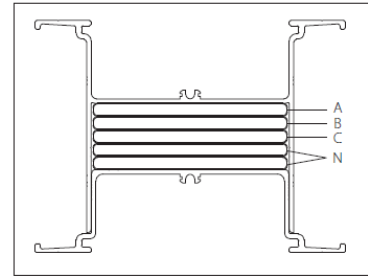
Thus, the aluminum enclosure of the busway serves as a grounding conductor of more than 100% and simultaneously improves the heat dissipation efficiency of the conductor. If additional grounding of 50% or 100% capacity is required, additional internal ground bars can be added to the assembly. Non-linear loads on the power distribution system can increase the amount of harmonic current generated. A 200% Neutral option is available.



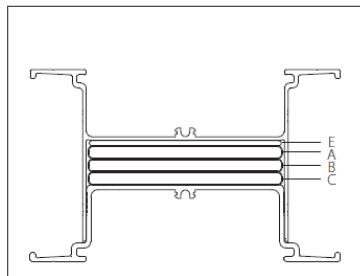
[3P3W+GE]



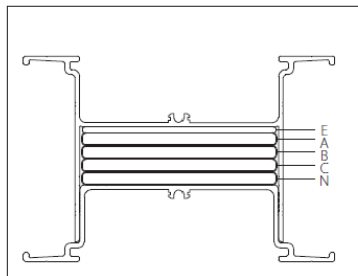
[3P4W(100%N)+GE]



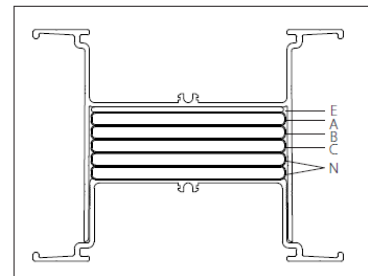
[3P5W(200%N)+GE]



[3P3W+50%E+GE]



[3P4W(100%N)+50%E+GE]



[3P5W(200%N)+50%E+GE]

PLATING/PAINTING

PLATING

Standard tin plating is applied at taps, plugs and connections of conductors using an electroplating method to maintain the electrical characteristics and to prevent corrosion. Silver plating is available on request.

PAINTING

In order to improve heat radiation and to prevent corrosion, apply polyester-epoxy (hybrid) powder coating after treating the surface. A wide range of color options are available to meet the needs of our clients.

* Standard color : ANSI61

DEGREE OF PROTECTION

International protection degree codes provided by IEC 60529 (Degree of Protection Provided by Enclosure-IP Code)

IP

Solid Particle Protection

- | | |
|---|--|
|  | 0 No Protection |
|  | 1 Protection against 50mm diameter solid particles. (back of a hand) |
|  | 2 Protection against 12mm solid particles. (fingers) |
|  | 3 Protection against 2.4mm solid particles. (tools or thick wires) |
|  | 4 Protection against 1mm solid particles. (tools or most wires) |
|  | 5 Protection against dust. |
|  | 6 Complete protection against dust. |

Liquid Ingress Protection

- | | | | |
|---|---|---|---|
|  | 0 No Protection |  | 5 Protection against low pressure jets of water from all directions. |
|  | 1 Protection against falling drops of water. |  | 6 Protection against strong jets of water from all directions. |
|  | 2 Protection against falling drops of water with an enclosure tilted at a 15degree angle from a vertical line |  | 7 Protection against the effects of immersion between 15.0 centimeters and 1.0 meter. |
|  | 3 Protection against spray at a 60degree angle from a vertical line |  | 8 Protection against longer periods of immersion under pressure. |
|  | 4 Protection against water splashed from all directions. | | |

INDOOR TYPE

This product is designed for indoor use with available ratings of IP42, IP54, and/or IP55.

IP42 - Indoor, NEMA 1

IP54 - Indoor Sprinkler Proof, NEMA 2

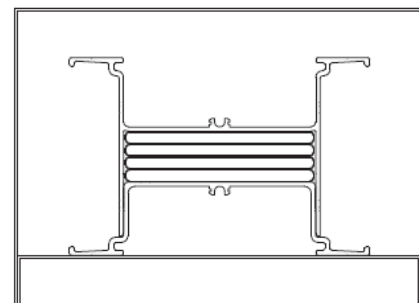
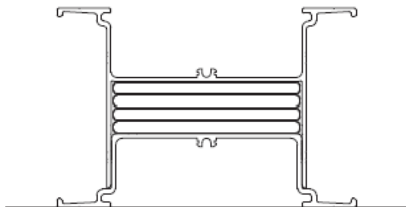
IP55 - Indoor Dust Tight, NEMA12/3

OUTDOOR TYPE

This product is designed with a double enclosure for outdoor use. Available rating of IP65 for protection against dust, gas, rain, and lowpressure jets of water.

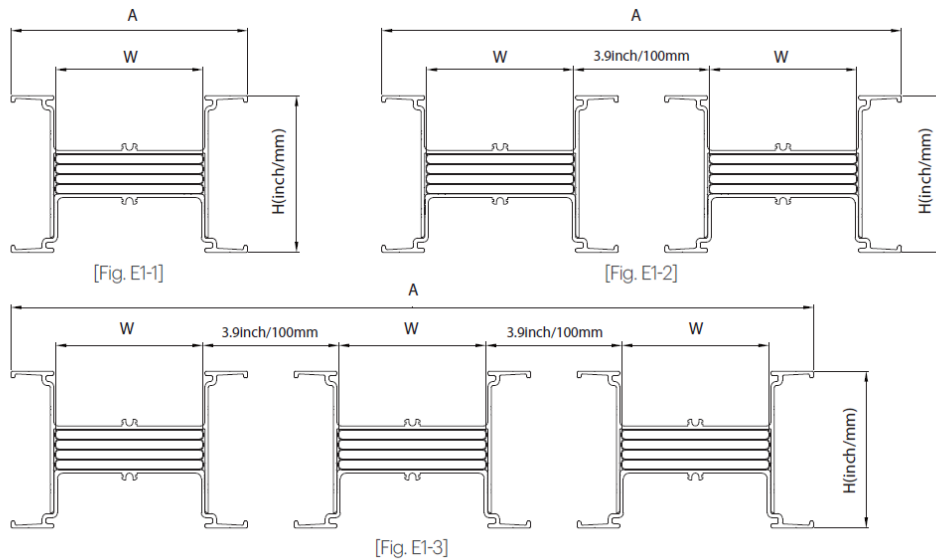
IP65 - Outdoor, NEMA 3R (*/**)

* Fabricated with IP54 Busway, PLUS an additional IP65 Enclosure. ** Feeder Busway ONLY. Plug-In Busway is NOT available.



FEEDER

SECTIONAL VIEW



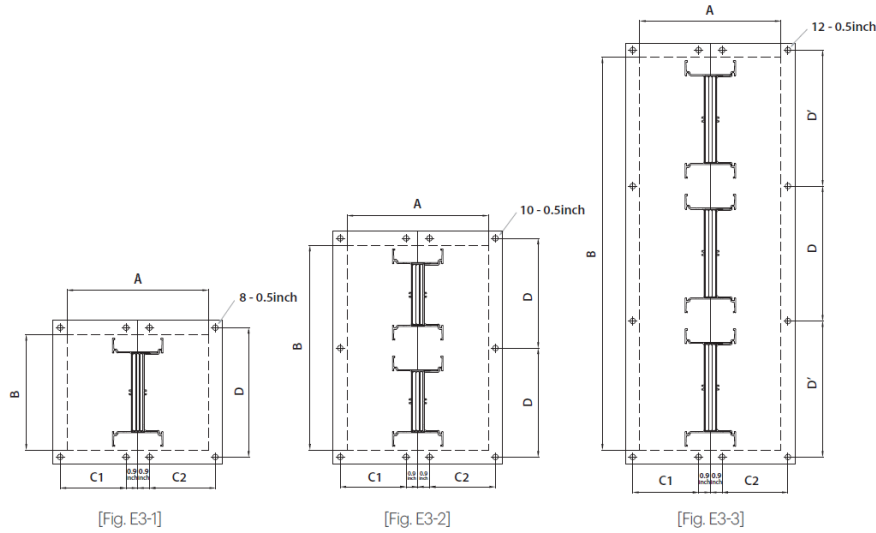
Ampere(A)		t		W		A		3W		4W		4W+50%E		4W+100%E		Fig.
		inch	mm	inch	mm	inch	mm	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	
AL	630	0.25	6.35	1.61	41	4.21	107	4.57	6.81	5.23	7.8	5.51	8.21	5.87	8.75	E1-1
	800			2.44	62	5.04	128	5.64	8.41	6.58	9.81	6.99	10.43	7.5	11.18	
	1,000			3.39	86	5.98	152	6.84	10.2	8.09	12.06	8.66	12.91	9.3	13.87	
	1,250			4.25	108	6.85	174	8.43	12.57	9.96	14.86	10.67	15.91	11.49	17.14	
	1,600			6.46	164	9.06	230	11.61	17.31	13.9	20.73	14.97	22.33	16.12	24.04	
	2,000			8.27	210	10.87	276	14.02	20.91	16.92	25.23	18.29	27.27	19.72	29.41	E1-2
	2,500			4.96	126	16.46	418	18.24	27.2	21.8	32.51	23.46	34.98	25.3	37.73	
	3,200			6.46	164	19.45	494	22.64	33.77	27.22	40.6	29.38	43.81	31.78	47.39	
	3,600			7.24	184	21.02	534	24.76	36.93	29.87	44.55	32.28	48.14	39.7	59.2	
	4,000			8.27	210	23.07	586	27.49	41	33.29	49.64	36.04	53.74	44.4	66.22	E1-3
	5,000			7.24	184	32.2	818	36.87	54.98	44.53	66.41	48.15	71.8	59.33	88.48	
CU	6,000	0.25	6.35	8.27	210	35.28	896	40.96	61.09	49.66	74.06	53.79	80.21	66.47	99.13	E1-1
	630			1.61	41	4.21	107	8.36	12.49	10.29	15.34	11.2	16.7	13.95	20.81	
	800			1.61	41	4.21	107	8.36	12.47	10.29	15.34	11.2	16.7	13.95	20.81	
	1,000			2.24	57	4.84	123	10.61	15.83	13.23	19.73	14.48	21.6	18.2	27.14	
	1,250			2.87	73	5.47	139	12.84	19.15	16.14	24.07	17.74	26.45	22.52	33.59	
	1,600			4.25	108	6.85	174	18.15	27.06	22.92	34.18	25.24	37.64	27.55	41.09	E1-2
	2,000			5.71	145	8.31	211	23.46	34.98	29.84	44.5	32.96	49.16	36.06	53.77	
	2,500			7.68	195	10.28	261	30.76	45.87	39.3	58.61	43.5	64.87	47.72	71.17	
	3,200			4.25	108	15.04	382	35.96	53.62	45.58	67.98	50.28	74.98	55.11	82.18	
	3,600			4.96	126	16.46	418	41.04	61.21	52.22	77.87	57.67	86.01	63.1	94.1	E1-3
	4,000			5.71	145	17.95	456	46.43	69.24	59.22	88.32	65.49	97.67	71.77	107.03	
	5,000			7.68	195	21.89	556	61.04	91.03	78.15	116.55	86.56	129.08	94.98	141.64	
	6,000			6.46	164	29.84	758	77.93	116.21	99.76	148.77	110.39	164.62	121.15	180.67	

* H : 107.5mm/4.23"(3W+GE, 3W+50%E) / 115mm/4.53"(4W+GE, 4W+50%E) / 130mm/5.12"(4W+100%E, 3P+200%N)

FLANGE END / FLANGE END BOX CONNECTION

Flanged End for direct equipment connection (I.E. Switchgear, Switchboard, Panelboard, Transformer, etc.).

Equipment Opening & Drilling Pattern Dimensions for Flanged End Connection listed below (inch).



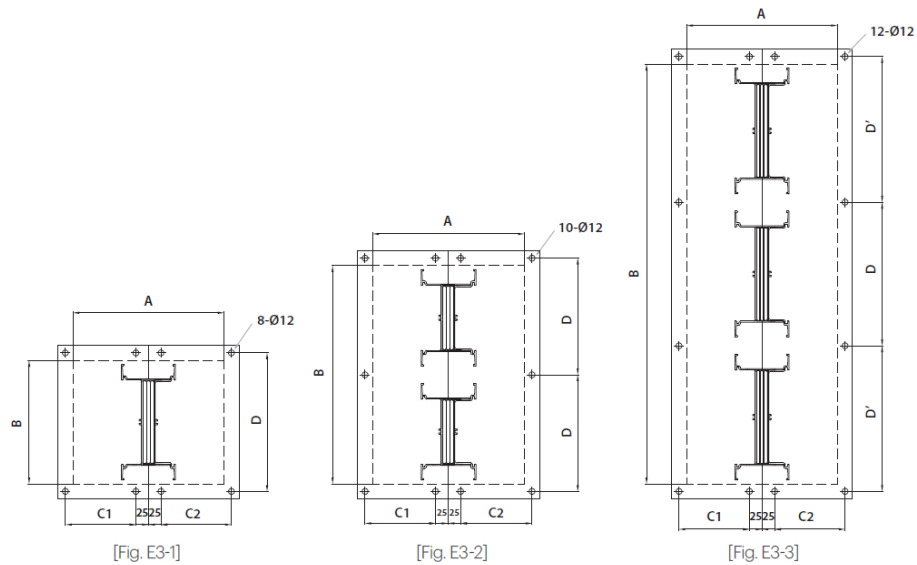
(inch)

Conductor	Rating (A)	3W Standard Dimension					4W Standard Dimension					4W+50%E, 100%E Standard Dimension						Fig.	
		A	B	C1, C2	D	D'	A	B	C1, C2	D	D'	A	B	C1	C2	D	D'		
AL	630	9.45	4.8	4.33	5.98	-	13.39	4.8	6.3	5.98	-	16.14	4.8	9.06	6.3	5.98	-	E3-1	
	800	9.45	5.63	4.33	6.81	-	13.39	5.63	6.3	6.81	-	16.14	5.63	9.06	6.3	6.81	-		
	1,000	9.45	6.57	4.33	7.76	-	13.39	6.57	6.3	7.76	-	16.14	6.57	9.06	6.3	7.76	-		
	1,250	9.45	7.44	4.33	8.62	-	13.39	7.44	6.3	8.62	-	16.14	7.44	9.06	6.3	8.62	-		
	1,600	9.45	9.65	4.33	10.83	-	13.39	9.65	6.3	10.83	-	16.14	9.65	9.06	6.3	10.83	-		
	2,000	9.45	11.46	4.33	12.64	-	13.39	11.46	6.3	12.64	-	16.14	11.46	9.06	6.3	12.64	-	E3-2	
	2,500	11.81	17.05	5.51	9.11	-	16.93	17.05	8.07	9.11	-	19.69	17.05	10.83	8.07	9.11	-		
	3,200	11.81	20.04	5.51	10.61	-	16.93	20.04	8.07	10.61	-	19.69	20.04	10.83	8.07	10.61	-		
	3,600	11.81	21.61	5.51	11.4	-	16.93	21.61	8.07	11.4	-	19.69	21.61	10.83	8.07	11.4	-		
	4,000	11.81	23.66	5.51	12.42	-	16.93	23.66	8.07	12.42	-	19.69	23.66	10.83	8.07	12.42	-		E3-3
5,000	11.81	32.8	5.51	11.22	11.38	16.93	32.8	8.07	11.22	11.38	19.69	32.8	10.83	8.07	11.22	11.38			
6,000	11.81	35.87	5.51	12.24	12.4	16.93	35.87	8.07	12.24	12.4	19.69	35.87	10.83	8.07	12.24	12.4			
CU	630	9.45	4.8	4.33	5.98	-	13.39	4.8	6.3	5.98	-	16.14	4.8	9.06	6.3	5.98	-	E3-1	
	800	9.45	4.8	4.33	5.98	-	13.39	4.8	6.3	5.98	-	16.14	4.8	9.06	6.3	5.98	-		
	1,000	9.45	5.43	4.33	6.61	-	13.39	5.43	6.3	6.61	-	16.14	5.43	9.06	6.3	6.61	-		
	1,250	9.45	6.06	4.33	7.24	-	13.39	6.06	6.3	7.24	-	16.14	6.06	9.06	6.3	7.24	-		
	1,600	9.45	7.44	4.33	8.62	-	13.39	7.44	6.3	8.62	-	16.14	7.44	9.06	6.3	8.62	-		
	2,000	9.45	8.9	4.33	10.08	-	13.39	8.9	6.3	10.08	-	16.14	8.9	9.06	6.3	10.08	-	E3-2	
	2,500	9.45	10.87	4.33	12.05	-	13.39	10.87	6.3	12.05	-	16.14	10.87	9.06	6.3	12.05	-		
	3,200	11.81	15.63	5.51	8.41	-	16.93	15.63	8.07	8.41	-	19.69	15.63	10.83	8.07	8.41	-		
	3,600	11.81	17.05	5.51	9.11	-	16.93	17.05	8.07	9.11	-	19.69	17.05	10.83	8.07	9.11	-		
	4,000	11.81	18.54	5.51	9.86	-	16.93	18.54	8.07	9.86	-	19.69	18.54	10.83	8.07	9.86	-		E3-3
5,000	11.81	22.48	5.51	11.83	-	16.93	22.48	8.07	11.83	-	19.69	22.48	10.83	8.07	11.83	-			
6,000	11.81	30.43	5.51	10.43	10.59	16.93	30.43	8.07	10.43	10.59	19.69	30.43	10.83	8.07	10.43	10.59			

FLANGE END / FLANGE END BOX CONNECTION

Flanged End for direct equipment connection (I.E. Switchgear, Switchboard, Panelboard, Transformer, etc.).

Equipment Opening & Drilling Pattern Dimensions for Flanged End Connection listed below (mm).

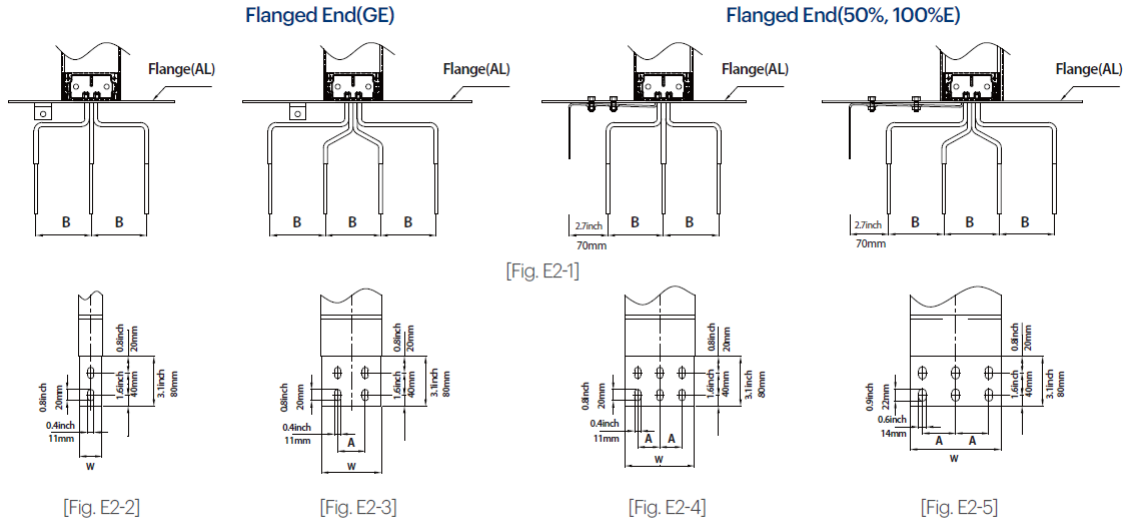


(mm)

Conductor	Rating (A)	3W Standard Dimension					4W Standard Dimension					4W+50%E, 100%E Standard Dimension						Fig.
		A	B	C1, C2	D	D'	A	B	C1, C2	D	D'	A	B	C1	C2	D	D'	
AL	630	240	122	110	152	-	340	122	160	152	-	410	122	230	160	152	-	E3-1
	800	240	143	110	173	-	340	143	160	173	-	410	143	230	160	173	-	
	1,000	240	167	110	197	-	340	167	160	197	-	410	167	230	160	197	-	
	1,250	240	189	110	219	-	340	189	160	219	-	410	189	230	160	219	-	
	1,600	240	245	110	275	-	340	245	160	275	-	410	245	230	160	275	-	
	2,000	240	291	110	321	-	340	291	160	321	-	410	291	230	160	321	-	E3-2
	2,500	300	433	140	231.5	-	430	433	205	231.5	-	500	433	275	205	231.5	-	
	3,200	300	509	140	269.5	-	430	509	205	269.5	-	500	509	275	205	269.5	-	
	3,600	300	549	140	289.5	-	430	549	205	289.5	-	500	549	275	205	289.5	-	
	4,000	300	601	140	315.5	-	430	601	205	315.5	-	500	601	275	205	315.5	-	E3-3
	5,000	300	833	140	285	289	430	833	205	285	289	500	833	275	205	285	289	
	6,000	300	911	140	311	315	430	911	205	311	315	500	911	275	205	311	315	
CU	630	240	122	110	152	-	340	122	160	152	-	410	122	230	160	152	-	E3-1
	800	240	122	110	152	-	340	122	160	152	-	410	122	230	160	152	-	
	1,000	240	138	110	168	-	340	138	160	168	-	410	138	230	160	168	-	
	1,250	240	154	110	184	-	340	154	160	184	-	410	154	230	160	184	-	
	1,600	240	189	110	219	-	340	189	160	219	-	410	189	230	160	219	-	
	2,000	240	226	110	256	-	340	226	160	256	-	410	226	230	160	256	-	E3-2
	2,500	240	276	110	306	-	340	276	160	306	-	410	276	230	160	306	-	
	3,200	300	397	140	213.5	-	430	397	205	213.5	-	500	397	275	205	213.5	-	
	3,600	300	433	140	231.5	-	430	433	205	231.5	-	500	433	275	205	231.5	-	
	4,000	300	471	140	250.5	-	430	471	205	250.5	-	500	471	275	205	250.5	-	E3-3
	5,000	300	571	140	300.5	-	430	571	205	300.5	-	500	571	275	205	300.5	-	
	6,000	300	773	140	265	269	430	773	205	265	269	500	773	275	205	265	269	E3-3

FLANGED CONDUCTOR DETAIL

Dimension and spacing details of Flange End Conductors.



Ampere(A)		t		W		A		B		Fig.
		inch	mm	inch	mm	inch	mm	inch	mm	
AL	630	0.25	6.35	1.61	41	-	-	3.94	130	E2-2
	800			2.44	62	-	-			
	1,000			3.39	86	1.57	40			E2-3
	1,250			4.25	108	1.97	50			
	1,600			6.46	164	2.36	60	5.12	130	E2-5
	2,000			8.27	210	2.76	70			
	2,500			4.96	126	1.57	40			E2-4
	3,200			6.46	164	2.36	60			
	3,600			7.24	184	2.36	60			
	4,000			8.27	210	2.76	70			E2-5
CU	5,000	0.25	6.35	7.24	184	2.36	60	5.12	130	
	6,000			8.27	210	2.76	70			
	630			1.61	41	-	-	3.94	130	E2-2
	800			1.61	41	-	-			
	1,000			2.24	57	-	-			E2-3
	1,250			2.87	73	1.57	40			
	1,600			4.25	108	1.97	50	5.12	130	E2-4
	2,000			5.71	145	1.97	50			
	2,500			7.68	195	2.76	70			E2-5
	3,200			4.25	108	1.97	50			
	3,600			4.96	126	1.57	40			E2-3
	4,000			5.71	145	1.97	50			E2-4
	5,000			7.68	195	2.76	70	5.12	130	
	6,000			6.46	164	2.36	60			E2-5

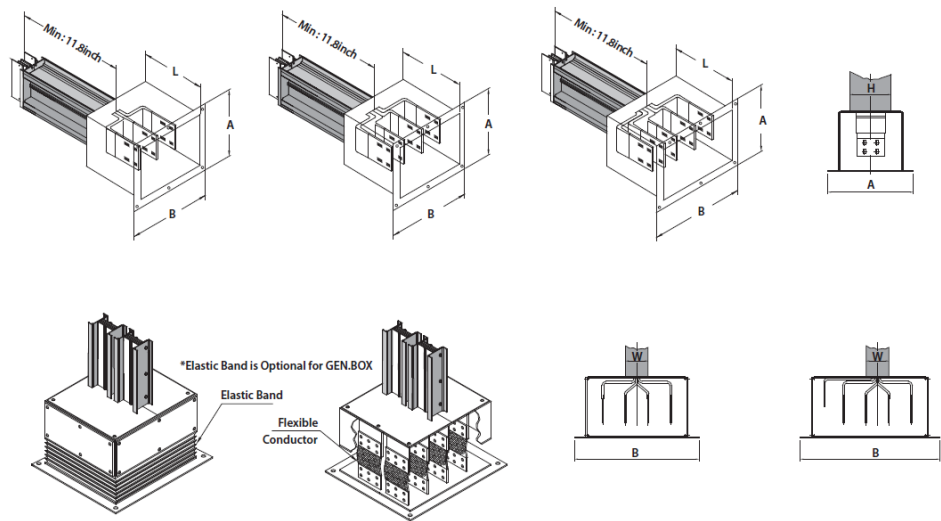
* Contact our engineering staff for more detail

END CABLE TAP BOX / END FLANGE BOX CONNECTION

End Cable Tap Box for Conduit & Conductor Termination.

End Flange Box for Equipment & Conductor Termination (I.E. Pull Box, Top Hat, Generator, Switchgear, Switchboard, Panelboard, Transformer, etc.).

Standard Tap Box and/or Flange Dimensions listed below (inch).



(inch)

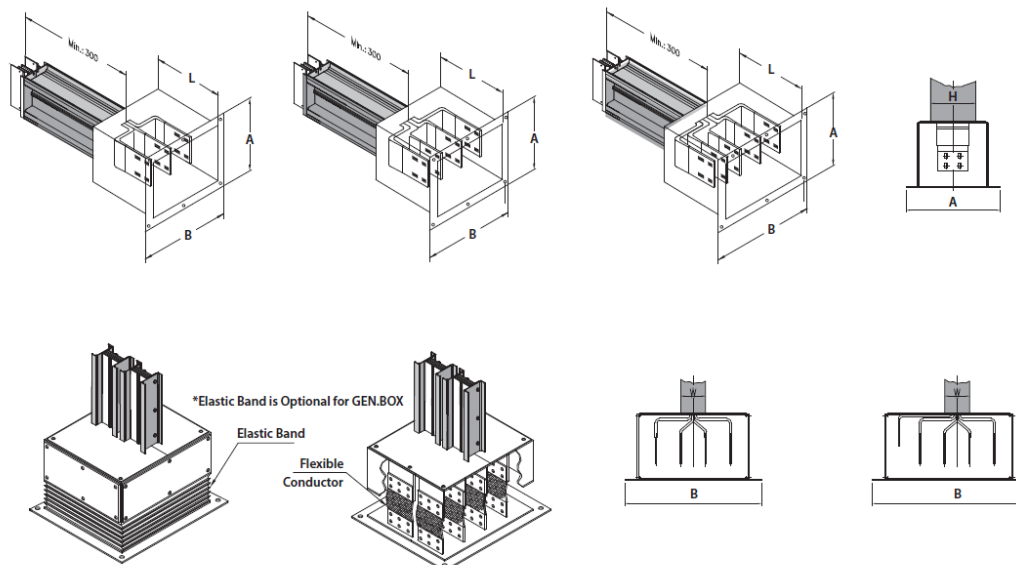
Rating (A)		3W Standard Dimension			4W Standard Dimension			4W+50%E, 100%E Standard Dimension		
		A	B	L	A	B	L	A	B	L
AL	630	7.17	14.17	23.62	7.17	19.29	23.62	7.17	22.05	23.62
	800	7.99	14.17	23.62	7.99	19.29	23.62	7.99	22.05	23.62
	1,000	8.94	14.17	23.62	8.94	19.29	23.62	8.94	22.05	23.62
	1,250	9.80	14.17	23.62	9.80	19.29	23.62	9.80	22.05	23.62
	1,600	12.01	14.17	23.62	12.01	19.29	23.62	12.01	22.05	23.62
	2,000	13.82	14.17	23.62	13.82	19.29	23.62	13.82	22.05	23.62
	2,500	19.41	14.17	23.62	19.41	19.29	23.62	19.41	22.05	23.62
	3,200	22.40	14.17	23.62	22.40	19.29	23.62	22.40	22.05	23.62
	3,600	23.98	14.17	23.62	23.98	19.29	23.62	23.98	22.05	23.62
	4,000	26.02	14.17	23.62	26.02	19.29	23.62	26.02	22.05	23.62
	5,000	35.16	14.17	23.62	35.16	19.29	23.62	35.16	22.05	23.62
CU	630	7.17	14.17	23.62	7.17	19.29	23.62	7.17	22.05	23.62
	800	7.17	14.17	23.62	7.17	19.29	23.62	7.17	22.05	23.62
	1,000	7.80	14.17	23.62	7.80	19.29	23.62	7.80	22.05	23.62
	1,250	8.43	14.17	23.62	8.43	19.29	23.62	8.43	22.05	23.62
	1,600	9.80	14.17	23.62	9.80	19.29	23.62	9.80	22.05	23.62
	2,000	11.26	14.17	23.62	11.26	19.29	23.62	11.26	22.05	23.62
	2,500	13.23	14.17	23.62	13.23	19.29	23.62	13.23	22.05	23.62
	3,200	17.99	14.17	23.62	17.99	19.29	23.62	17.99	22.05	23.62
	3,600	19.41	14.17	23.62	19.41	19.29	23.62	19.41	22.05	23.62
	4,000	20.91	14.17	23.62	20.91	19.29	23.62	20.91	22.05	23.62
	5,000	24.84	14.17	23.62	24.84	19.29	23.62	24.84	22.05	23.62
	6,000	32.80	14.17	23.62	32.80	19.29	23.62	32.80	22.05	23.62

END CABLE TAP BOX / END FLANGE BOX CONNECTION

End Cable Tap Box for Conduit & Conductor Termination.

End Flange Box for Equipment & Conductor Termination (I.E. Pull Box, Top Hat, Generator, Switchgear, Switchboard, Panelboard, Transformer, etc.).

Standard Tap Box and/or Flange Dimensions listed below (mm).



(mm)

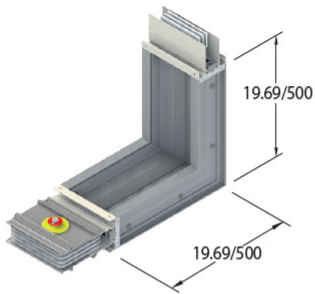
Rating (A)		3W Standard Dimension			4W Standard Dimension			4W+50%E, 100%E Standard Dimension		
		A	B	L	A	B	L	A	B	L
AL	630	182	360	600	182	490	600	182	560	600
	800	203	360	600	203	490	600	203	560	600
	1,000	227	360	600	227	490	600	227	560	600
	1,250	249	360	600	249	490	600	249	560	600
	1,600	305	360	600	305	490	600	305	560	600
	2,000	351	360	600	351	490	600	351	560	600
	2,500	493	360	600	493	490	600	493	560	600
	3,200	569	360	600	569	490	600	569	560	600
	3,600	609	360	600	609	490	600	609	560	600
	4,000	661	360	600	661	490	600	661	560	600
	5,000	893	360	600	893	490	600	893	560	600
	6,000	971	360	600	971	490	600	971	560	600
CU	630	182	360	600	182	490	600	182	560	600
	800	182	360	600	182	490	600	182	560	600
	1,000	198	360	600	198	490	600	198	560	600
	1,250	214	360	600	214	490	600	214	560	600
	1,600	249	360	600	249	490	600	249	560	600
	2,000	286	360	600	286	490	600	286	560	600
	2,500	336	360	600	336	490	600	336	560	600
	3,200	457	360	600	457	490	600	457	560	600
	3,600	493	360	600	493	490	600	493	560	600
	4,000	531	360	600	531	490	600	531	560	600
	5,000	631	360	600	631	490	600	631	560	600
	6,000	833	360	600	833	490	600	833	560	600

FITTINGS

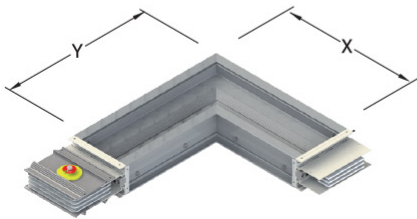
Series HP has a wide range of fittings to satisfy any layout configuration. A variety of elbow angles and offsets are available. Fitting designs are shown in the following figures, and they consist of the source-side and the load-side. Offset or combination elbows can be used where standard elbows are not feasible. (Dimensions for each fitting are shown in the following figures. Contact our design team for a minimum dimension.)

* Dimension(inch/mm)

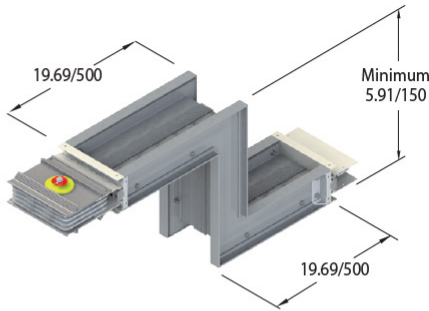
Elbow
[Horizontal Edgewise Orientation]



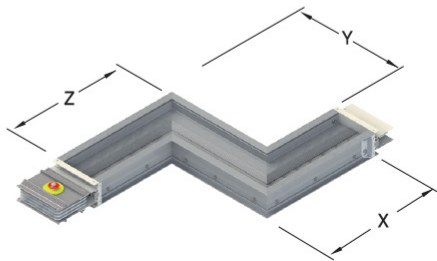
[Vertical Edgewise Orientation]



Offset
[Horizontal Edgewise Orientation]



[Vertical Edgewise Orientation]



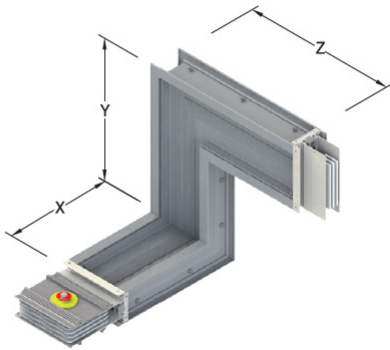
VERTICAL ELBOW

Rating		X		Y	
		inch	mm	inch	mm
AL	630~1,250	19.69	500	19.69	500
	1,600~2,000	23.62	600	23.62	600
	2,500~4,000	27.56	700	27.56	700
	5,000~6,000	35.43	900	35.43	900
CU	630~1,600	19.69	500	19.69	500
	2,000~3,200	23.62	600	23.62	600
	3,600~5,000	27.56	700	27.56	700
	6,000	31.5	800	31.5	800

VERTICAL OFFSET

Rating		X		Y		Z	
		inch	mm	inch	mm	inch	mm
AL	630~1,250	19.69	500	5.91	150	19.69	500
	1,600~2,000	23.62	600	5.91	150	23.62	600
	2,500~4,000	27.56	700	5.91	150	27.56	700
	5,000~6,000	35.43	900	5.91	150	35.43	900
CU	630~1,600	19.69	500	5.91	150	19.69	500
	2,000~3,200	23.62	600	5.91	150	23.62	600
	3,600~5,000	27.56	700	5.91	150	27.56	700
	6,000	31.5	800	5.91	150	31.5	800

Combination

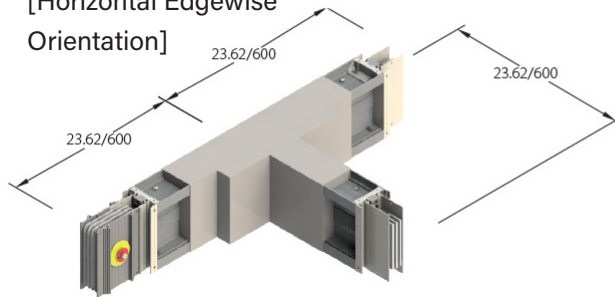


COMBINATION

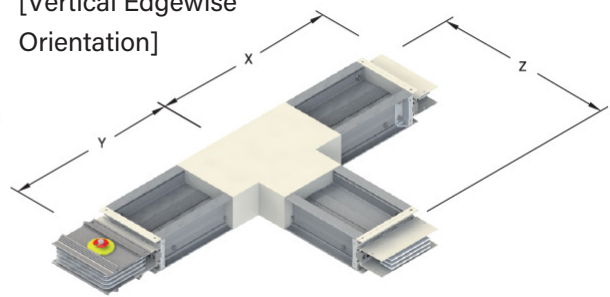
Rating		X		Y		Z	
		inch	mm	inch	mm	inch	mm
AL	630~1,250	19.69	500	19.69	500	19.69	500
	1,600~2,000	23.62	600	23.62	600	23.62	600
	2,500~4,000	27.56	700	27.56	700	27.56	700
	5,000~6,000	35.43	900	35.43	900	35.43	900
CU	630~1,600	19.69	500	19.69	500	19.69	500
	2,000~3,200	23.62	600	23.62	600	23.62	600
	3,600~5,000	27.56	700	27.56	700	27.56	700
	6,000	31.5	800	31.5	800	31.5	800

Tee

[Horizontal Edgewise Orientation]



[Vertical Edgewise Orientation]



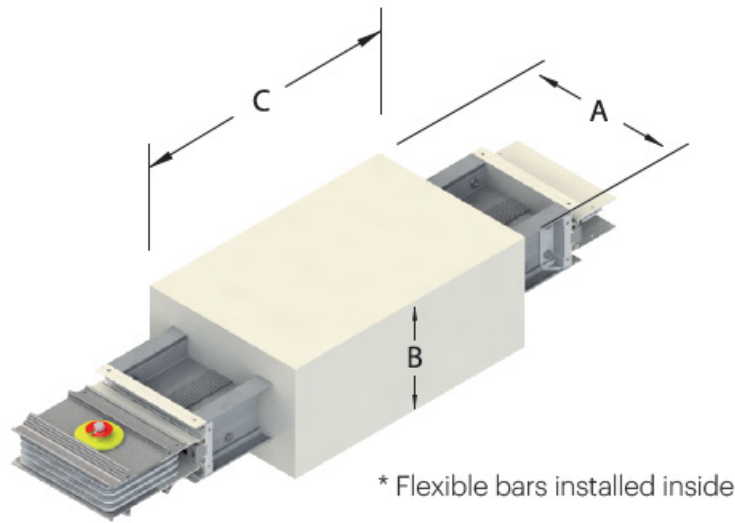
VERTICAL TEE

Rating		X		Y		Z	
		inch	mm	inch	mm	inch	mm
AL	630~1,250	19.69	500	19.69	500	19.69	500
	1,600~2,000	23.62	600	23.62	600	23.62	600
	2,500~4,000	27.56	700	27.56	700	27.56	700
	5,000~6,000	35.43	900	35.43	900	35.43	900
CU	630~1,600	19.69	500	19.69	500	19.69	500
	2,000~3,200	23.62	600	23.62	600	23.62	600
	3,600~5,000	27.56	700	27.56	700	27.56	700
	6,000	31.5	800	31.5	800	31.5	800

EXPANSION FITTING

Expansion Fitting is designed to allow a 50mm expansion of a straight line busway run.

* Recommended every 200 Linear Feet and/or at every building expansion joint.



EXPANSION FITTING (INCH)

***TYPICAL**

Expansion		3W Standard Dimension			4W Standard Dimension			Phase Flexible			Phase Flexible			Earth Flexible Tube		
Conduc- tor	Rating (A)	A	B	C	A	B	C	Each Cross Section (in ²)	Quantity (EA)	Total Cross Section (in ²)	Each Cross Section (in ²)	Quantity (EA)	Total Cross Section (in ²)	Model	Quantity (EA)	Length
AL	630	12.09	23.62	25.59	12.09	25.98	25.59	16.54	1	16.54	6.69	2	13.39	GSHS- 1635F 0.6T x 3"	2	17.72
	800	12.91	23.62	25.59	12.91	25.98	25.59	21.65	1	21.65	6.69	2	13.39		2	17.72
	1000	13.86	23.62	25.59	13.86	25.98	25.59	25.98	1	25.98	6.69	2	13.39		2	17.72
	1250	14.72	23.62	25.59	14.72	25.98	25.59	17.72	2	35.43	6.69	2	13.39		2	17.72
	1600	16.93	23.62	25.59	16.93	25.98	25.59	25.98	2	51.97	12.80	2	25.59		2	17.72
	2000	18.74	23.62	25.59	18.74	25.98	25.59	32.48	2	64.96	12.80	2	25.59		2	17.72
	2500	24.33	23.62	25.59	24.33	25.98	25.59	19.49	4	77.95	12.80	4	51.18		4	17.72
	3200	27.32	23.62	25.59	27.32	25.98	25.59	25.98	4	103.94	12.80	4	51.18		4	17.72
	3600	28.90	23.62	25.59	28.90	25.98	25.59	28.35	4	113.39	12.80	4	51.18		4	17.72
	4000	30.94	23.62	25.59	30.94	25.98	25.59	32.48	4	129.92	12.80	4	51.18		4	17.72
	5000	40.08	23.62	25.59	40.08	25.98	25.59	25.98	6	155.91	12.80	4	51.18		4	17.72
CU	6000	43.15	23.62	25.59	43.15	25.98	25.59	32.48	6	194.88	12.80	4	51.18		4	17.72
	630	12.09	23.62	25.59	33.46	25.98	25.59	16.54	1	16.54	6.69	2	13.39		2	17.72
	800	12.09	23.62	25.59	33.46	25.98	25.59	21.26	1	21.26	6.69	2	13.39		2	17.72
	1000	12.72	23.62	25.59	33.46	25.98	25.59	12.99	2	25.98	6.69	2	13.39		2	17.72
	1250	13.35	23.62	25.59	33.46	25.98	25.59	17.32	2	34.65	6.69	2	13.39		2	17.72
	1600	14.72	23.62	25.59	33.46	25.98	25.59	21.26	2	42.52	12.80	2	25.59		2	17.72
	2000	16.18	23.62	25.59	33.46	25.98	25.59	25.98	2	51.97	12.80	2	25.59		2	17.72
	2500	18.15	23.62	25.59	33.46	25.98	25.59	32.48	2	64.96	12.80	4	51.18		4	17.72
	3200	22.91	23.62	25.59	33.46	25.98	25.59	21.26	4	85.04	12.80	4	51.18		4	17.72
	3600	24.33	23.62	25.59	33.46	25.98	25.59	23.62	4	94.49	12.80	4	51.18		4	17.72
	4000	25.83	23.62	25.59	33.46	25.98	25.59	25.98	4	103.94	12.80	4	51.18		4	17.72
	5000	29.76	23.62	25.59	33.46	25.98	25.59	32.48	4	129.92	12.80	4	51.18		4	17.72
	6000	37.72	23.62	25.59	33.46	25.98	25.59	28.35	6	170.08	12.80	4	51.18		4	17.72

EXPANSION FITTING

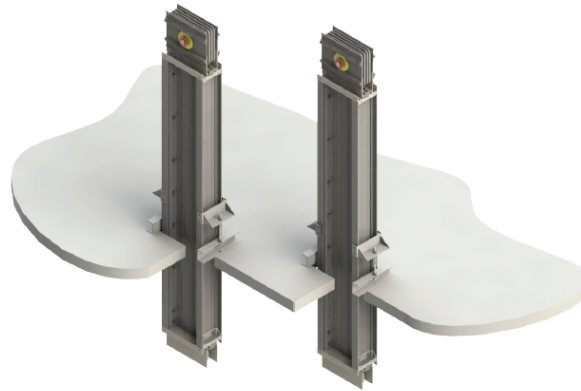
EXPANSION FITTING (MM)

Expansion		3W Standard Dimension			4W Standard Dimension			Phase Flexible			Phase Flexible			Earth Flexible Tube		
Conductor	Rating (A)	A	B	C	A	B	C	Each Cross Section (mm²)	Quantity (EA)	Total Cross Section (mm²)	Each Cross Section (mm²)	Quantity (EA)	Total Cross Section (mm²)	Model	Quantity (EA)	Length
AL	630	307	600	650	307	660	650	420	1	420	170	2	340	GSHS-1635F 0.6T x 3"	2	450
	800	328	600	650	328	660	650	550	1	550	170	2	340		2	450
	1000	352	600	650	352	660	650	660	1	660	170	2	340		2	450
	1250	374	600	650	374	660	650	450	2	900	170	2	340		2	450
	1600	430	600	650	430	660	650	660	2	1320	325	2	650		2	450
	2000	476	600	650	476	660	650	825	2	1650	325	2	650		2	450
	2500	618	600	650	618	660	650	495	4	1980	325	4	1300		4	450
	3200	694	600	650	694	660	650	660	4	2640	325	4	1300		4	450
	3600	734	600	650	734	660	650	720	4	2880	325	4	1300		4	450
	4000	786	600	650	786	660	650	825	4	3300	325	4	1300		4	450
	5000	1018	600	650	1018	660	650	660	6	3960	325	4	1300		4	450
	6000	1096	600	650	1096	660	650	825	6	4950	325	4	1300		4	450
CU	630	307	600	650	850	660	650	420	1	420	170	2	340		2	450
	800	307	600	650	850	660	650	540	1	540	170	2	340		2	450
	1000	323	600	650	850	660	650	330	2	660	170	2	340		2	450
	1250	339	600	650	850	660	650	440	2	880	170	2	340		2	450
	1600	374	600	650	850	660	650	540	2	1080	325	2	650		2	450
	2000	411	600	650	850	660	650	660	2	1320	325	2	650		2	450
	2500	461	600	650	850	660	650	825	2	1650	325	4	1300		4	450
	3200	582	600	650	850	660	650	540	4	2160	325	4	1300		4	450
	3600	618	600	650	850	660	650	600	4	2400	325	4	1300		4	450
	4000	656	600	650	850	660	650	660	4	2640	325	4	1300		4	450
	5000	756	600	650	850	660	650	825	4	3300	325	4	1300		4	450
	6000	958	600	650	850	660	650	720	6	4320	325	4	1300		4	450

HANGER

VERTICAL MOUNTING HANGERS

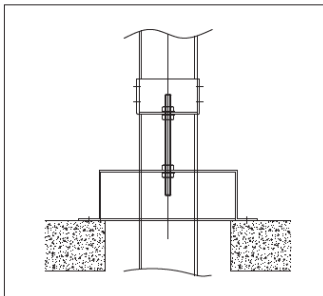
Rigid hangers are used on the bottom floors, top floors, after change of direction, and/or every 40m. Spring hangers are used to support busway between the top/bottom floors and/or any floor between those with Rigid hangers. The number of springs shall depend on the weight of the installed busway and bus plugs. Spring Hanger's height can be easily adjusted during installation. A Medium hanger is recommended on floors exceeding 15ft.



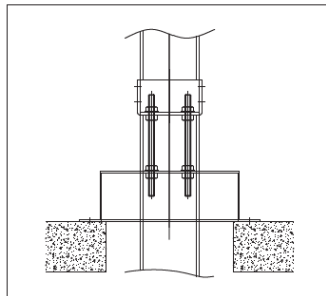
[Rigid Hanger]

[Spring Hanger]

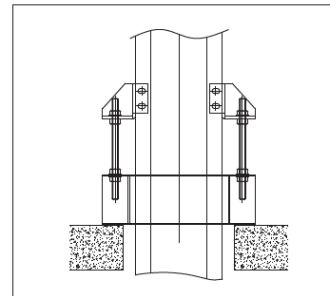
Rigid Hanger



[1 Row]

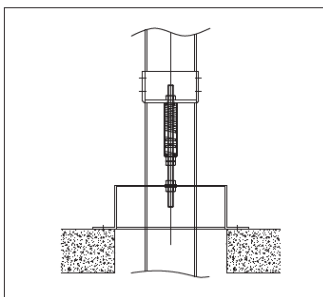


[2 Row]

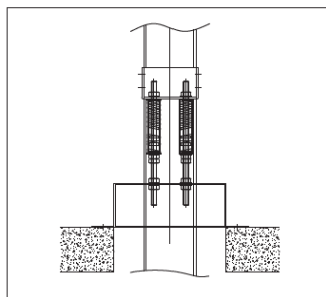


[Side View]

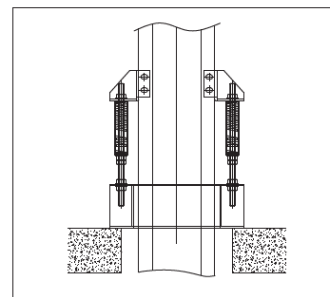
Spring Hanger



[1 Row]



[2 Row]

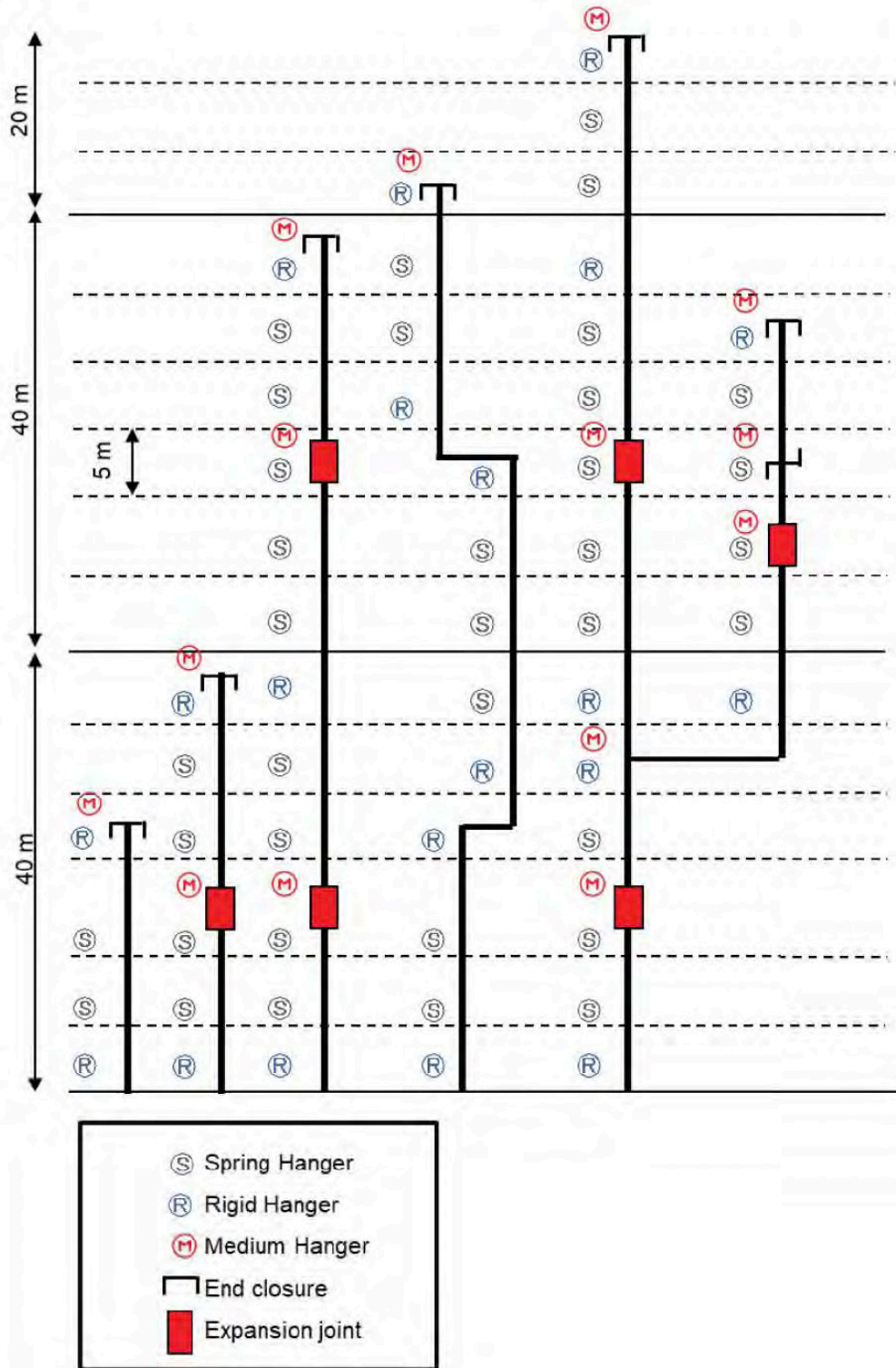


[Side View]

* Hangers with more than 2 rows depending on the installation environment are also available on request.

Please contact the design team for further information.

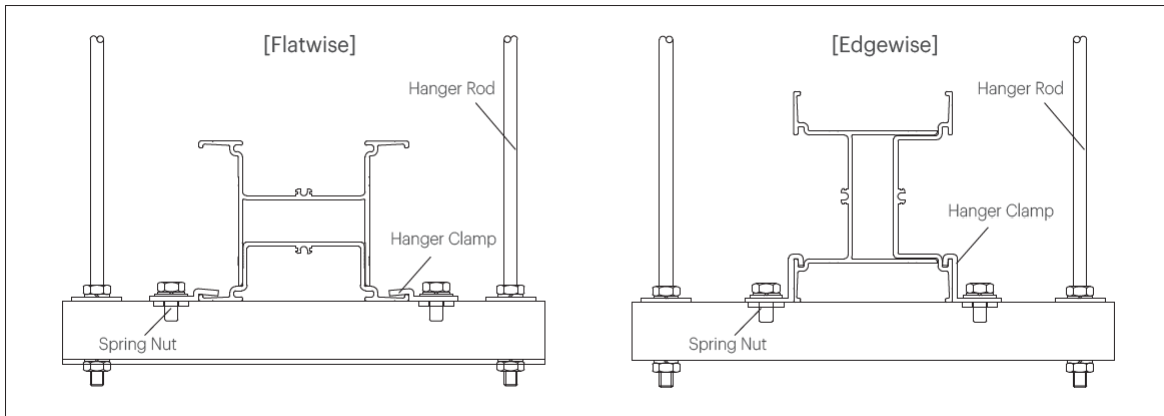
VERTICAL HANGER MOUNTING DETAIL



HORIZONTAL HANGERS

General Hangers

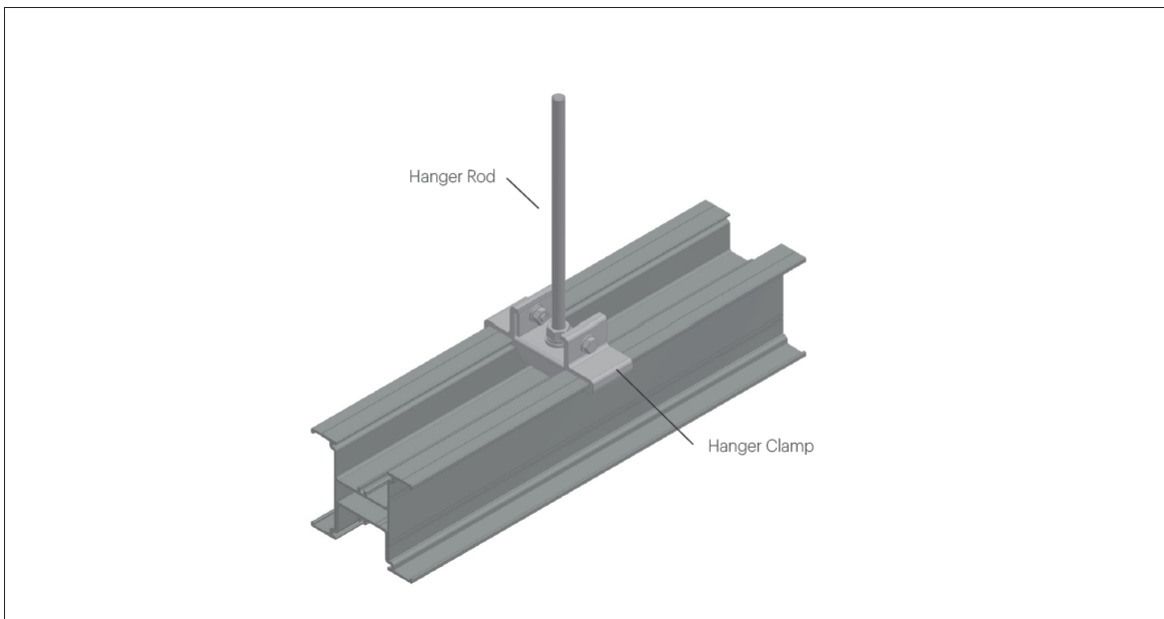
The standard installation method for these hangers is to install them horizontally at 5ft intervals/1.5 meters. They generally require 0.5inch/12mm diameter stud bolts.



NOTE: *Hanger Clamps and Spring Nuts are provided. Hanger Rod, Trapeze, and misc Hardware provided by installing contractor.

Single drop rod hanger

Single drop rod hangers are available for up to 1600A. It supports the product in flatwise directions on 10ft centers and sway bracing is required. Additional hangers may be necessary depending on the installation site. The contractor must provide the drop rods to assembly for single drop rod hangers.

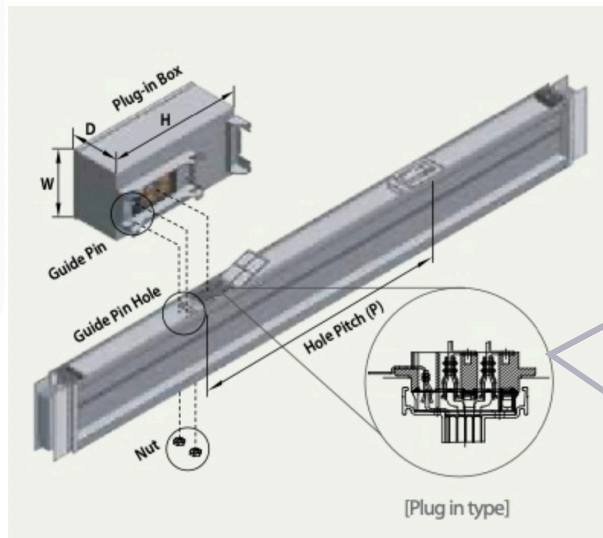


NOTE: *Hanger Clamps and Spring Nuts are provided. Hanger Rod, and misc Hardware provided by installing contractor.

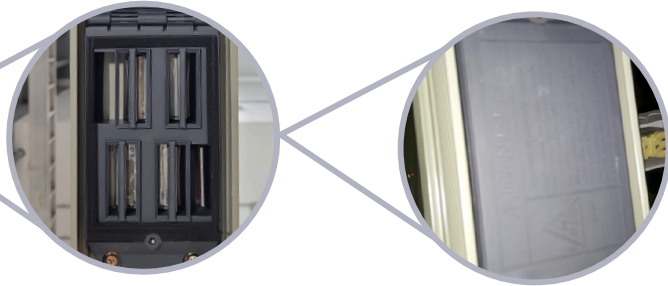
BUS PLUGS

PLUG-IN UNIT DESCRIPTIONS

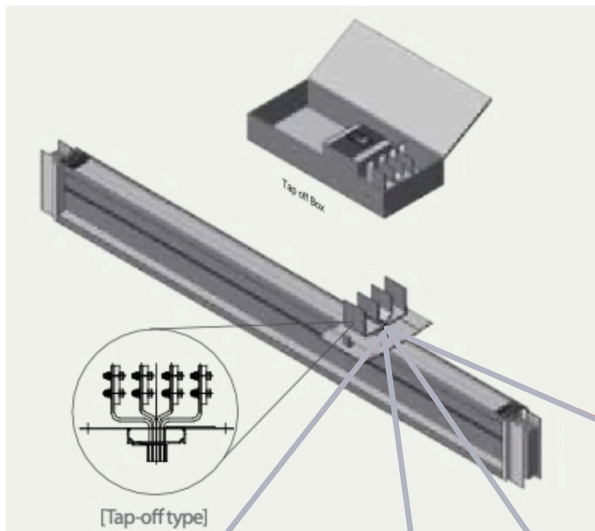
Plug-in type: Connection for bus plugs up to 600A



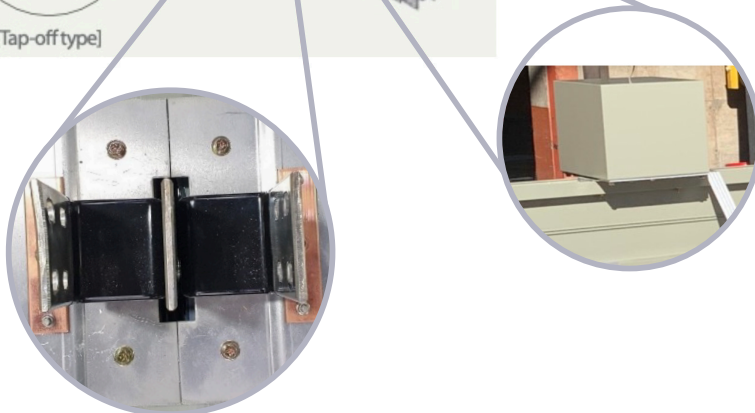
Plug-in hole connection & plug-in hole Cover for protection if the bus plug is not installed



Tap-off type: Connection for bus plugs from 800A up to 1200A

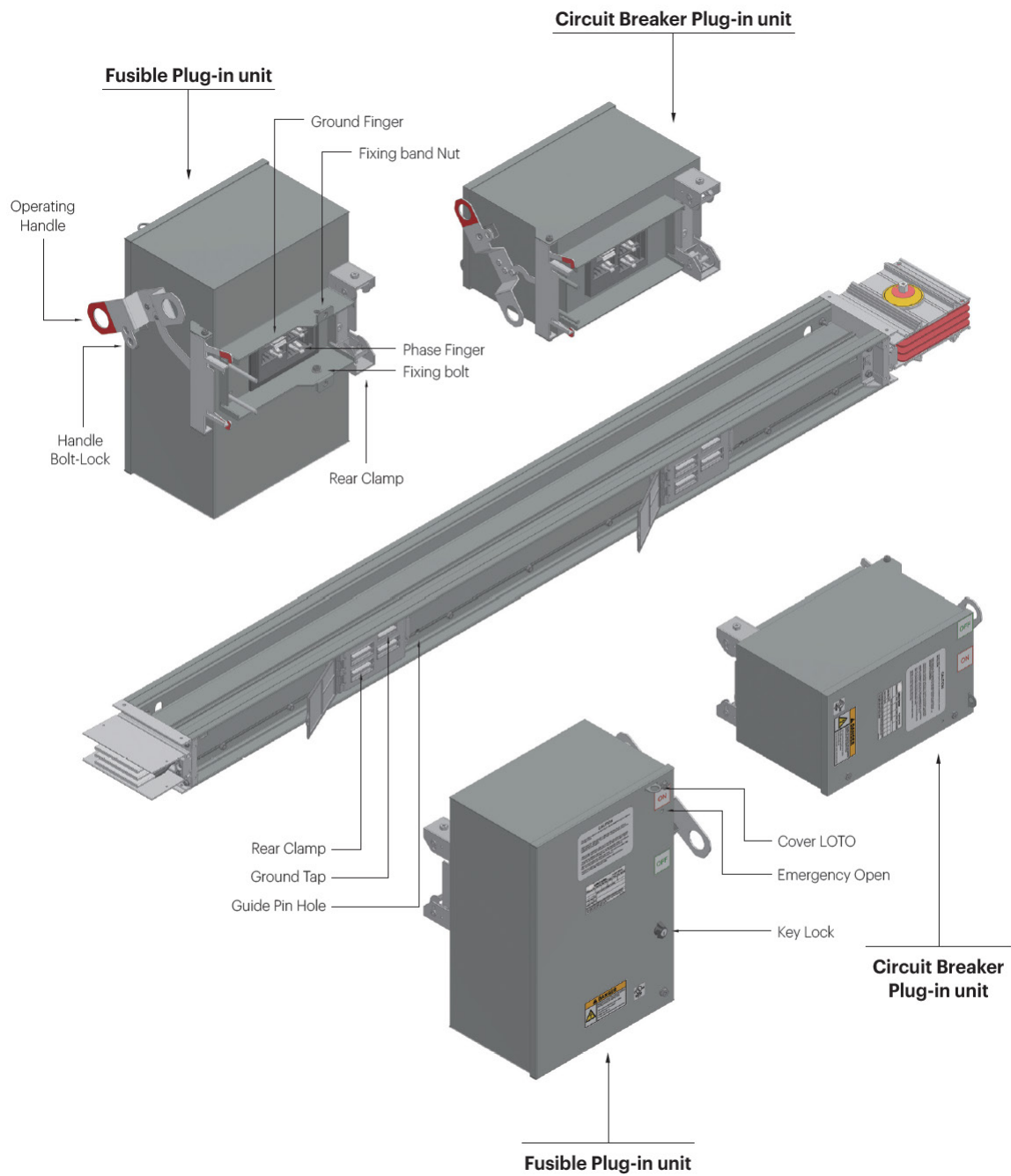


Tap-off busbar connection & tap-off busbar cover for protection if the tap-off is not installed



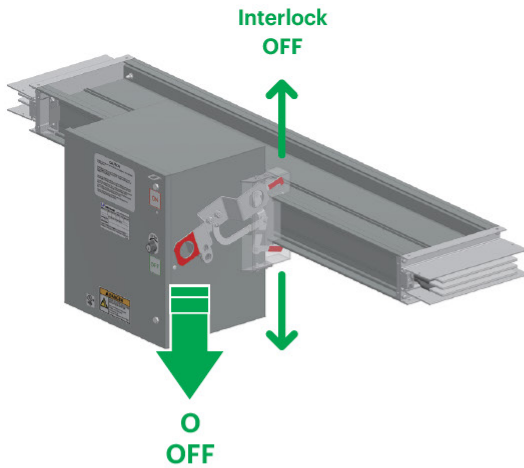
BUS PLUGS

PLUG-IN UNIT DESCRIPTIONS

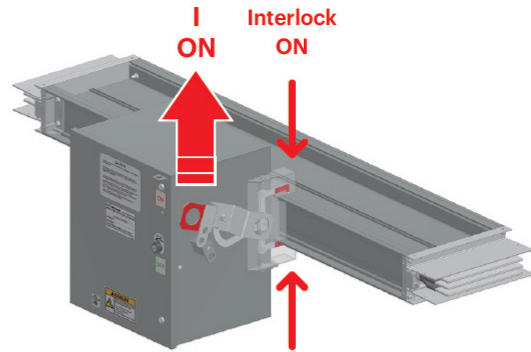


INTERLOCK & FINGER SAFETY

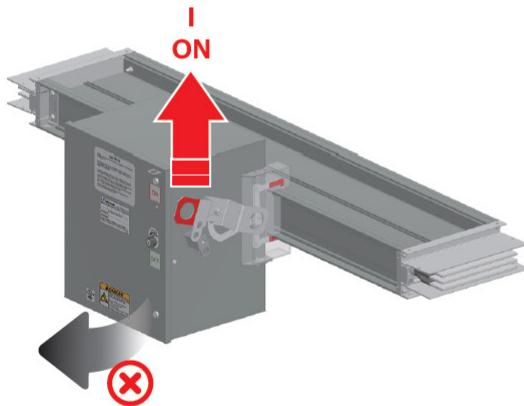
Main Device is On status, the bus plug is not separated from the feeder



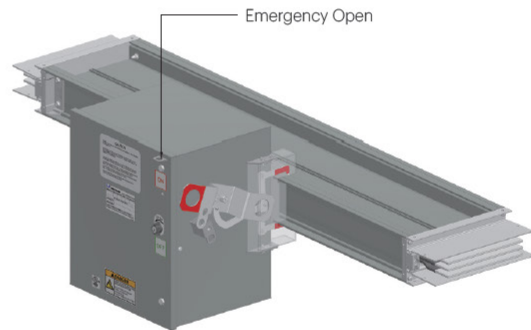
Main Device is On status, the Front door can't open



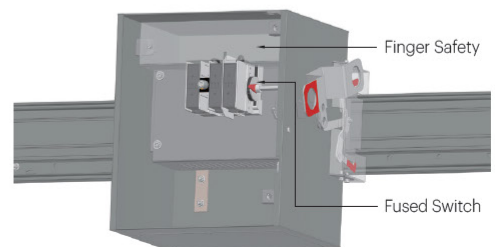
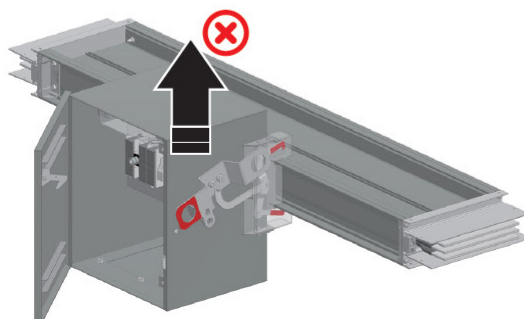
Door Interlock will be released, in case press Emergency Hole



Front door is opened, the Main Device can't On status



Insulation partition is installed to prevent body access to the primary side



BUS PLUGS

TAP-OFF UNIT DESCRIPTIONS

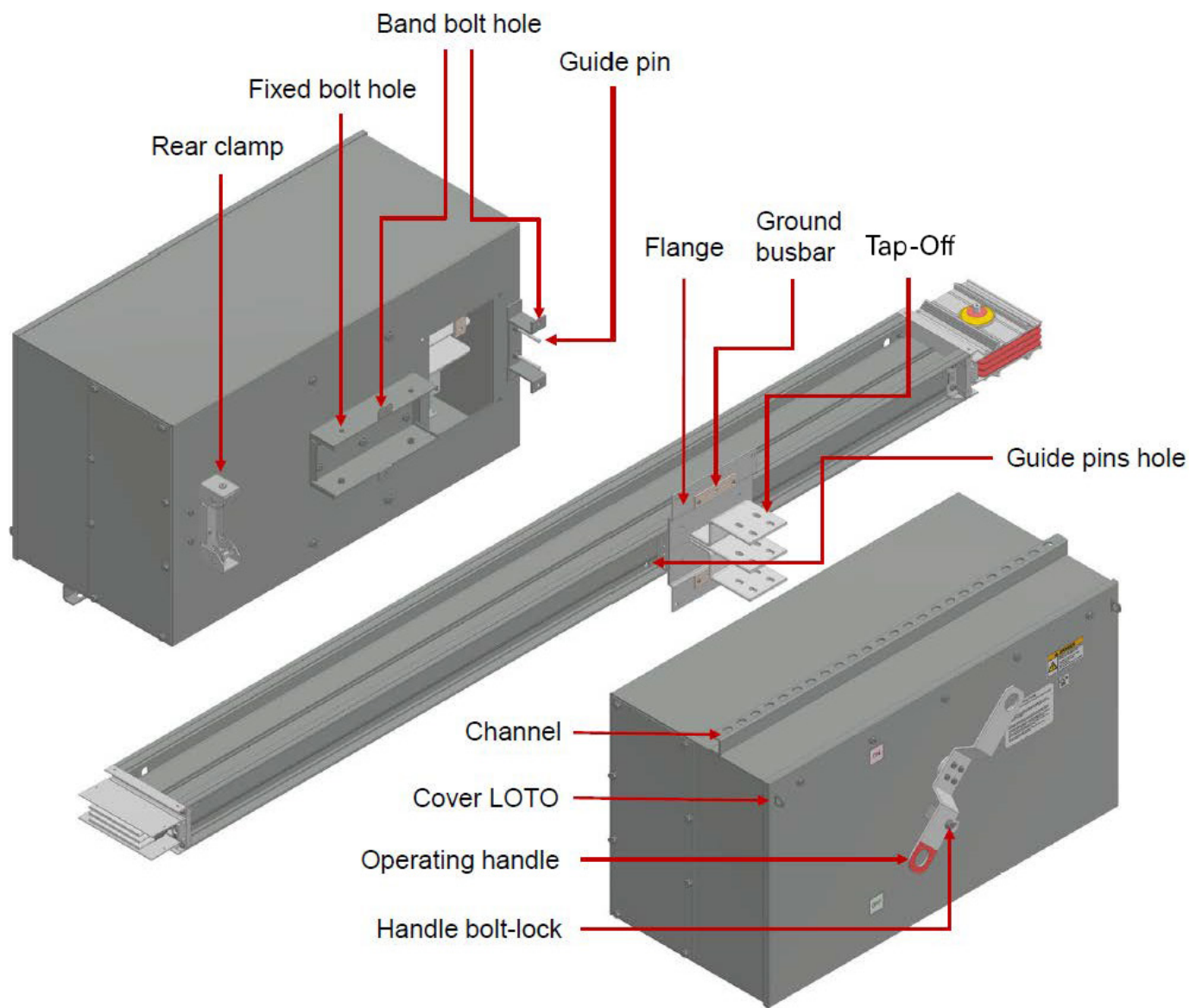


Figure 33. Tap-Off unit and Feeder Description

BUS PLUGS

TAP-OFF UNIT DESCRIPTIONS

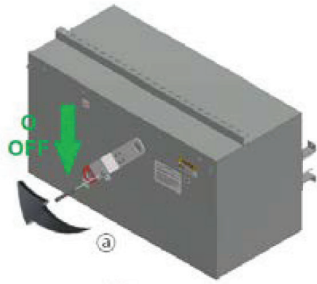


Figure 35. Tap-Off unit Pre-installation

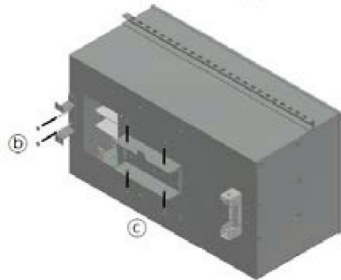


Figure 36. Rear Clamp

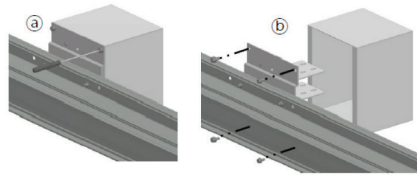


Figure 34. Busway Pre-installation

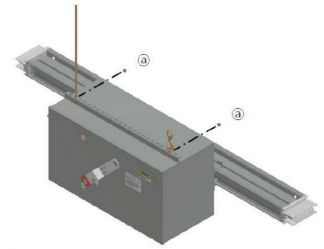


Figure 43. Drop Rod or Latch Installation

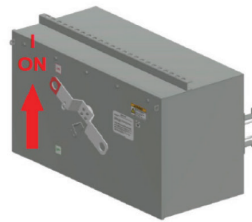


Figure 44. Turn-on

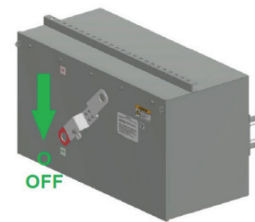


Figure 45. Turn-off

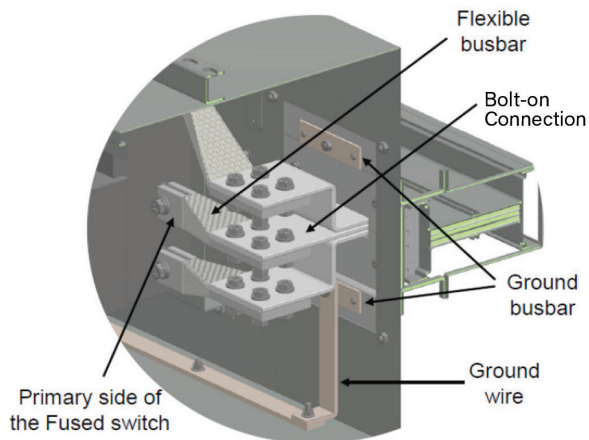


Figure 37. Mounting

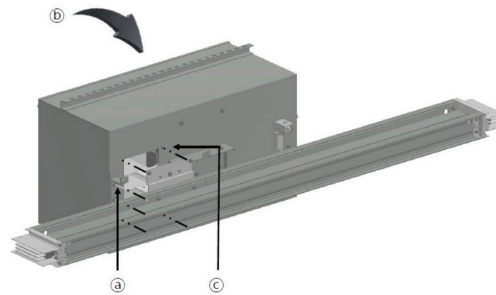


Figure 38. Guide pins nuts

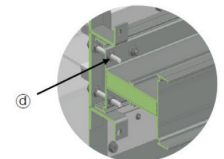


Figure 39. Fixing bolts

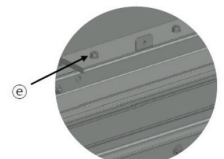


Figure 40. Rear clamp

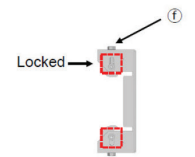
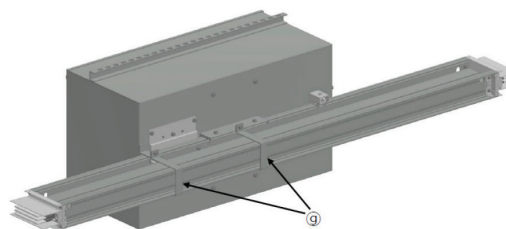


Figure 42. Locked state

BUS PLUGS

MCCB DETAILS



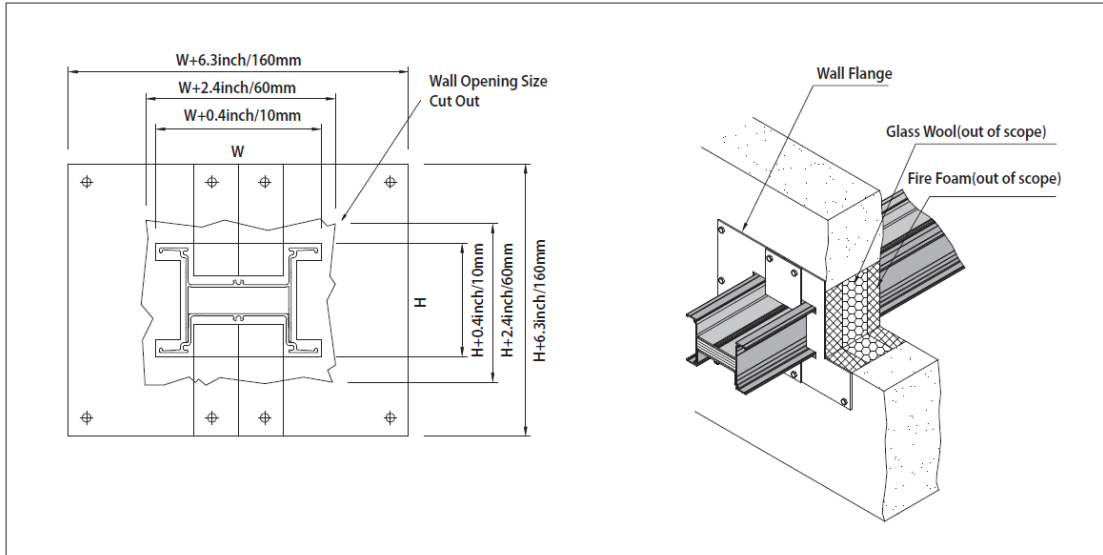
Model Number		UTE100			UTS150			UTS250		
Ampere Frame		100A		30A	150A			250A		
Pole		3			3			3		
IR Type		E	N	H	N	H	L	N	H	L
Interrupting rating	120/240V	50	65	100	-	-	-	-	-	-
	240V	50	65	100	65	100	150	65	100	150
	480V	25	35	65	35	65	100	35	65	100
	600V	-	-	-	18	35	50	18	35	50
	600Y/347V	14	18	35	-	-	-	-	-	-
Trip units		Thermal magnetic trip units			Thermal magnetic, Electronic trip units					



Model Number		UTS400			UTS600			UTS800			UTS1200			
Ampere Frame		400A			600A			800A			1200A			
Pole		3			3			3			3			
IR Type		N	H	L	N	H	L	N	H	L	N	H	P	L
Interrupting rating	120/240V	-	-	-	-	-	-	-	-	-	-	-	-	-
	240V	65	100	150	65	100	150	65	100	150	50	100	65	150
	480V	35	65	100	35	65	100	35	65	100	35	65	50	100
	600V	18	35	50	18	35	50	18	35	50	18	25	50	35
	600Y/347V	-	-	-	-	-	-	-	-	-	-	-	-	-
Trip units		Thermal magnetic, Electronic trip units						Electronic trip units						

WALL FLANGE

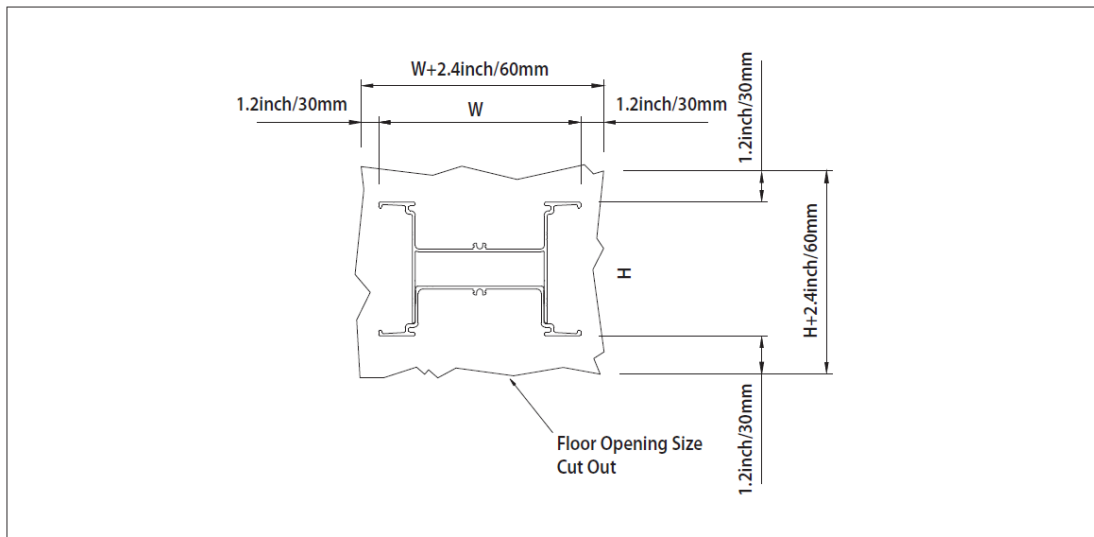
Wall flange is a product used to close the space between the busway and the wall when penetrating the wall. Glass wool and fire foam is used to fill the wall cavity around the busway. It is not provided by the manufacturer. The standard dimensions of a wall opening should be 1.2inch/30mm larger than the external dimensions of the busway.



NOTE: *Fireproofing & Fireproofing materials are NOT included. To be provided and/or performed by the installing contractor.

FLOOR FLANGE

Floor flange is a product used to close the space between the busway and the floor when penetrating the floor. Glass wool and fire foam are not provided by the manufacturer. The standard dimensions of a floor opening should be 1.2inch/30mm larger than the external dimensions of the busway.



NOTE: *Fireproofing & Fireproofing materials are NOT included. To be provided and/or performed by the installing contractor.

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* Outdoor installation requires further discussion with our design team about proper distance.

TECHNICAL DATA (FT)

IMPEDANCE AND VOLTAGE DROP

The formula to measure the voltage drop of a busway is shown below. The impedance and voltage drop values for aluminum and copper conductors are shown in the table below. The values listed are measured between upper and middle lines at 60Hz. For a 50Hz installation, multiply the reactance (X) by 0.83.

$$V_d = I \times \sqrt{3} (R \cos\theta + X \sin\theta)$$

V_d = voltage drop[V] · I = rated load amperes[A] · R = resistance[Ω] · X = reactance[Ω] / $\cos$ = power factor / $\sin$ = reactive factor

$$\text{Actual voltage Drop} = \alpha \times V_d \times \frac{\text{Actual load current}}{\text{Rated load current}} \times \frac{\text{Actual length of the line (ft)}}{100\text{ft}}$$

α (Load Constant) $\alpha = 1$, concentrated load
(a place such as an electrical room)

$\alpha = 0.5$, Distributed load
(a place such as a vertical section)



• F : Flanged End (panel connections)
• P : Plug-In Unit

Ampere(A)		10 ⁻⁵ Ω/ft (=10 ⁻³ Ω/100ft)(60hz)			Voltage Drop(/100ft)			
		R	X	Z	0.7	0.8	0.9	1
AL	630	4.26	1.24	4.44	4.22	4.53	4.77	4.65
	800	2.43	0.80	2.56	3.15	3.36	3.51	3.36
	1,000	2.08	0.67	2.19	3.36	3.59	3.76	3.61
	1,250	1.69	0.55	1.78	3.42	3.65	3.82	3.66
	1,600	1.16	0.37	1.23	3.00	3.21	3.36	3.23
	2,000	0.94	0.30	0.99	3.04	3.24	3.39	3.25
	2,500	0.73	0.24	0.77	2.97	3.17	3.31	3.17
	3,200	0.58	0.19	0.61	2.99	3.19	3.35	3.22
	3,600	0.52	0.17	0.55	3.04	3.25	3.41	3.27
	4,000	0.47	0.15	0.49	3.03	3.23	3.38	3.24
	5,000	0.35	0.11	0.37	2.82	3.01	3.15	3.03
CU	630	2.28	1.24	2.60	2.71	2.81	2.83	2.49
	800	2.28	1.17	2.57	3.37	3.51	3.56	3.16
	1,000	1.67	0.91	1.91	3.15	3.27	3.30	2.90
	1,250	1.34	0.75	1.53	3.18	3.29	3.31	2.90
	1,600	0.94	0.52	1.08	2.87	2.96	2.99	2.62
	2,000	0.73	0.41	0.84	2.80	2.88	2.90	2.54
	2,500	0.57	0.32	0.65	2.70	2.79	2.81	2.46
	3,200	0.47	0.26	0.54	2.85	2.94	2.97	2.61
	3,600	0.41	0.23	0.47	2.80	2.90	2.93	2.57
	4,000	0.37	0.20	0.42	2.78	2.87	2.89	2.53
	5,000	0.28	0.16	0.32	2.69	2.78	2.80	2.45
	6,000	0.22	0.12	0.25	2.63	2.72	2.75	2.43

IMPEDANCE & VOLTAGE DROP

TECHNICAL DATA (MM)

The formula to measure the voltage drop of a busway is shown below. The impedance and voltage drop values for aluminum and copper conductors are shown in the table below. The values listed are measured between upper and middle lines at 60Hz. For a 50Hz installation, multiply the reactance (X) by 0.83.

$$V_d = I \times \sqrt{3} (R \cos\theta + X \sin\theta)$$

V_d = voltage drop [V] · I = rated load amperes [A] · R = resistance [Ω] · X = reactance [Ω] / $\cos$ = power factor / $\sin$ = reactive factor

$$\text{Actual voltage Drop} = \alpha \times V_d \times \frac{\text{Actual load current}}{\text{Rated load current}} \times \frac{\text{Actual length of the line (m)}}{100\text{m}}$$

· α (Load Constant) $\alpha = 1$, concentrated load
(a place such as an electrical room)

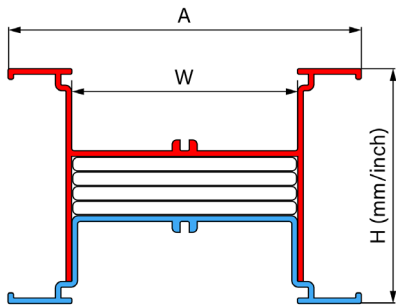
$\alpha = 0.5$, Distributed load
(a place such as a vertical section)



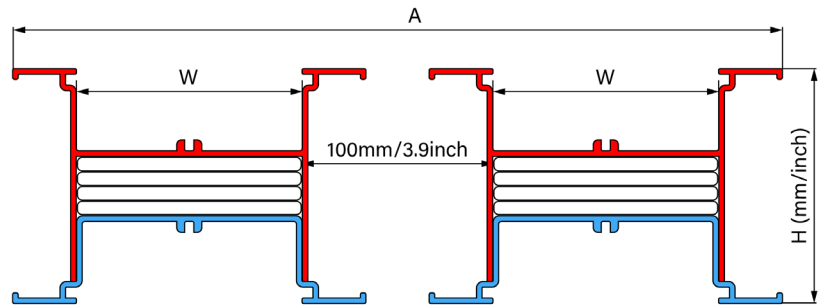
· F: Flanged End (panel connections)
· P: Plug-in Unit

Ampere(A)		10 ⁻⁵ Ω/m (=10 ⁻³ Ω /100m) (60hz)			Voltage Drop(/100m)			
		R	X	Z	0.7	0.8	0.9	1
AL	630	13.98	4.07	14.56	13.85	14.87	15.66	15.25
	800	7.97	2.62	8.39	10.32	11.01	11.52	11.04
	1,000	6.83	2.21	7.18	11.02	11.77	12.32	11.84
	1,250	5.55	1.82	5.84	11.22	11.97	12.52	12.01
	1,600	3.82	1.23	4.02	9.85	10.52	11.02	10.60
	2,000	3.08	1.00	3.24	9.96	10.63	11.12	10.67
	2,500	2.40	0.80	2.53	9.74	10.39	10.86	10.40
	3,200	1.91	0.61	2.00	9.82	10.48	10.98	10.56
	3,600	1.72	0.55	1.81	9.99	10.67	11.18	10.74
	4,000	1.54	0.50	1.62	9.93	10.60	11.09	10.64
	5,000	1.15	0.37	1.21	9.24	9.87	10.34	9.94
CU	630	7.49	4.07	8.53	8.90	9.21	9.30	8.18
	800	7.49	3.84	8.42	11.07	11.50	11.67	10.38
	1,000	5.49	2.99	6.25	10.35	10.72	10.82	9.52
	1,250	4.39	2.45	5.03	10.44	10.78	10.86	9.50
	1,600	3.10	1.71	3.54	9.40	9.72	9.80	8.60
	2,000	2.40	1.35	2.76	9.17	9.46	9.53	8.32
	2,500	1.86	1.05	2.13	8.87	9.16	9.22	8.06
	3,200	1.54	0.85	1.76	9.34	9.66	9.75	8.55
	3,600	1.35	0.74	1.54	9.20	9.51	9.60	8.42
	4,000	1.20	0.67	1.37	9.13	9.42	9.49	8.29
	5,000	0.93	0.52	1.06	8.84	9.13	9.19	8.03
	6,000	0.73	0.39	0.83	8.62	8.93	9.02	7.97

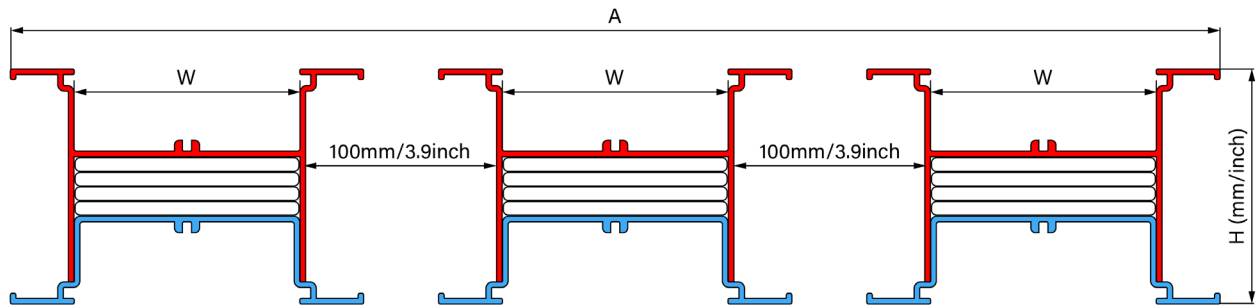
ALUMINUM HOUSING GROUND CAPACITY (MM)



[Fig. E1-1]



[Fig. E1-2]



[Fig. E1-2]

AL Conductor

Rating	Stack	Housing		
		Upper Housing	Lower Housing	Total Area (mm²)
630A	1	489.9	731.3	1221.2
800A	1	531.9	773.3	1305.2
1000A	1	579.9	821.3	1401.2
1250A	1	719.6	1036	1755.6
1600A	1	859.6	1184	2043.6
2000A	1	974.6	1299	2273.6
2500A	2	1529.4	2157	3686.4
3200A	2	1719.2	2368	4087.2
3600A	2	1819.4	2461.4	4280.8
4000A	2	1949.2	2598	4547.2
5000A	3	2729.1	3692.1	6421.2
6000A	3	2923.8	3897	6820.8

CU Conductor

Rating	Stack	Housing		
		Upper housing	Lower housing	Total area (mm²)
630A	1	489.9	731.3	1221.2
800A	1	489.9	731.3	1221.2
1000A	1	521.9	763.3	1285.2
1250A	1	553.9	795.3	1349.2
1600A	1	719.6	1036	1755.6
2000A	1	812.1	1128	1940.1
2500A	1	937.1	1261	2198.1
3200A	2	1439.2	2072	3511.2
3600A	2	1529.4	2157	3686.4
4000A	2	1624.2	2256	3880.2
5000A	2	1874.2	2522	4396.2
6000A	3	2578.8	3552	6130.8

ALUMINUM HOUSING GROUNDING CAPACITY FOR SERIES HP (MM) (UL)

Type	Ampere	Busbar Cross Section (mm ²)	AL AL Housing Cross Section (mm ²)	Housing Area Conversion (mm ²)	Housing Grounding- Grounding (%)
4W AL-AL AL Conductor : 61% AL Housing : 50%	630A	260	1221.2	976.96	375
	800A	394	1305.2	1044.16	265
	1000A	546	1401.2	1120.96	205
	1250A	686	1755.6	1404.48	205
	1600A	1041	2043.6	1634.88	157
	2000A	1334	2273.6	1818.88	136
	2500A	1600	3686.4	2949.12	184
	3200A	2083	4087.2	3269.76	157
	3600A	2337	4280.8	3424.64	147
	4000A	2667	4547.2	3637.76	136
	5000A	3505	6421.2	5136.96	147
	6000A	4001	6820.8	5456.64	136
4W CU -AL CU Conductor : 100% AL Housing : 50%	630A	260	1221.2	605.7152	233
	800A	260	1221.2	605.7152	233
	1000A	362	1285.2	637.4592	176
	1250A	464	1349.2	669.2032	144
	1600A	686	1755.6	870.7776	127
	2000A	921	1940.1	962.2896	105
	2500A	1238	2198.1	1090.2576	88
	3200A	1372	3511.2	1741.5552	127
	3600A	1600	3686.4	1828.4544	114
	4000A	1842	3880.2	1924.5792	105
	5000A	2477	4396.2	2180.5152	88
	6000A	3124	6130.8	3040.8768	97

SCCR & AIC

SHORT CIRCUIT CURRENT RATING (SCCR) & AMPS INTERRUPTING CAPACITY (AIC) TECHNICAL DATA

Series HP has been tested under actual short circuit conditions according to UL 857. The results are shown in the table below.

FEEDER

Rating(A)	AL (kAIC)		CU (kAIC)	
	Standard	Option	Standard	Enhanced
630	30	85	35	85**
800	30	85	35	85**
1,000	65	100	50	100**
1,250	65	100	50	100**
1,600	65	125	50	125**
2,000	85	150	85	150**
2,500	125	200	85	150**
3,200	125	200	125	200**
3,600	125	200	125	200**
4,000	125	200	125	200**
5,000	125	200	125	200**
6,000	125	200	125	200**

BUS PLUG (MCCB)

MCCB Frame (AF)	Main Device (MCCB)	Short-circuit Rating (rms, kA)		
		240V	480V	600V
100	UTE100	100	65	-
150	UTS150	150	100	50
250	UTS250	150	100	50
400	UTS400	150	100	50
600	UTS600	150	100	50
800	UTS800	150	100	50
1,200	UTS1200	150	100	35

* Above data is for 3 cycles.

** CU (kAIC) Enhanced currently NOT available.

** PENDING UL LISTING (Q4 FY'25 - Q1 FY'26).

1) Maximum 150kA. (Please contact Starline representatives for details)

BUS PLUG (FUSIBLE)

Fuse Class	UNIT Frame	Main Device (Disconnect Switch)	Poles	Short Circuit Rating	Max. Horsepower Rating		
	(AF)			rms (kAIC)	240V	480V	600V
R	30	OT160G03	3	200	40	75	100
	60			200	40	75	100
	100			200	40	75	100
	200	OT200US03		200	75	150	200
	400	OT200US03		200	125	250	350
	600	OT200US03		100	200	450	500
J	30	OS30FAJS30	3	200	7.5	15	20
	60	OS60GJS30		200	15	30	50
	100	OS100GJS30		200	30	60	75
	200	OS200JS30		200	60	125	150
	400	OS400JS30		200	125	250	350
	600	OS600JS30		200	200	400	500
L	800	OS800L12	3	200	250	500	500
	1,200	OS1200L03		200	-	-	-

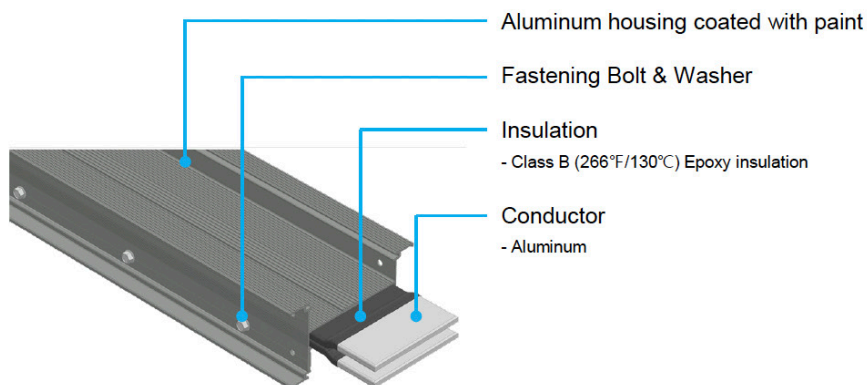
* Disconnect Switch manufactured by ABB.

DC BUSWAY

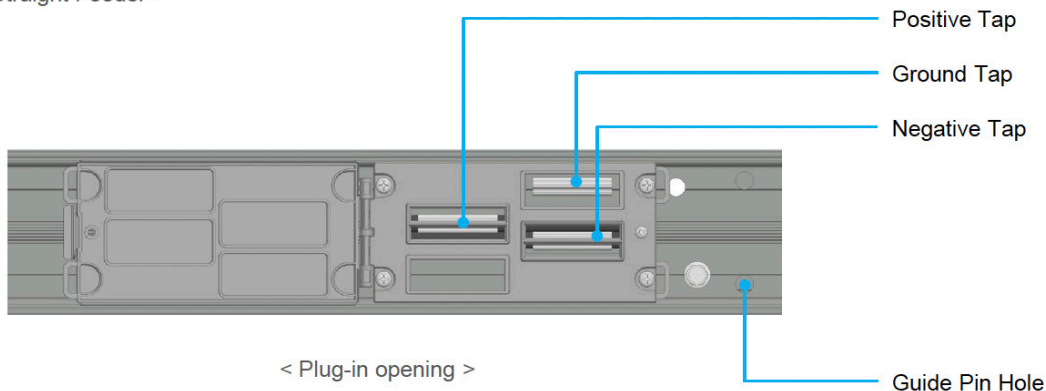
BUSWAY SECTIONS

Busways and fittings: Straight feeder, Plug-in feeder, Phase Transition. End tap box, Elbow, Tee, Offset, Combination, Expansion, Flanged end.

Stacks	Material	Bus Bar (mm)		Bus Bar (in)		IEC			UL		
		Width	Thickness	Width	Thickness	Voltage (V)	Ampere (A)	Short-circuit rating (kAIC, 1 sec)	Voltage (V)	Ampere (A)	Short-circuit rating (kAIC, 6 cycles)
1	AL	40	10	1.57	0.39	1500	1000	100	600	800	100
		50		1.97			1250			1000	
		80		3.15			1600			1200	
		100		3.94			2000			1600	
		140		5.51			2500			2000	
		185		7.28			3200			2500	
		210		8.27			3600			-	
2	AL	110	10	4.33	0.39	1500	-	100	600	3200	200
		125		4.92			4000			3600	
		160		6.30			5000			4000	
		210		8.27			6300			5000	
3	AL	140	10	5.51	0.39	1500	7000	100	600	-	200
		175		6.89			8000			6000	
		210		8.27			10000			-	



< Straight Feeder >



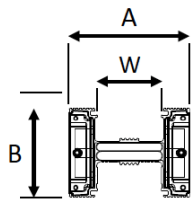
DC BUSWAY

DIMENSIONS

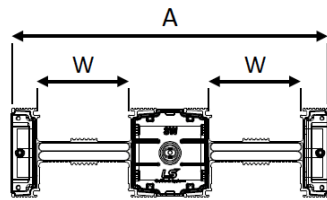
Feeder:

Stacks	Bus Bar (mm)		Bus Bar (in)		IEC		UL	Dimension (mm)		Dimension (in)		Figure No.
	Width	Thickness	Width	Thickness	Ampere (A)	Ampere (A)		A	B	A	B	
1	40	10	1.57	0.39	1000	800		107	107.5	4.21	4.23	1
	50		1.97		1250	1000		117		4.61		
	80		3.15		1600	1200		147		5.79		
	100		3.94		2000	1600		167		6.57		
	140		5.51		2500	2000		207		8.15		
	185		7.28		3200	2500		252		9.92		
	210		8.27		3600	-		277		10.91		
2	110	10	4.33	0.39	-	3200		387	107.5	15.24	4.23	2
	125		4.92		4000	3600		417		16.42		
	160		6.30		5000	4000		487		19.17		
	210		8.27		6300	5000		587		23.11		
3	140	10	5.51	0.39	7000	-		687	107.5	27.05	4.23	3
	175		6.89		8000	6000		792		31.18		
	210		8.27		10000	-		897		35.31		

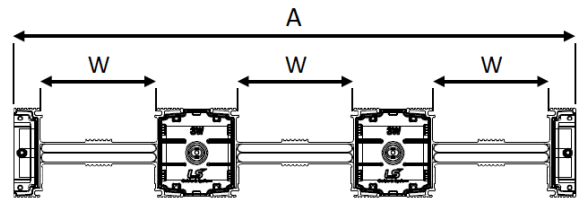
Sectional View



< Fig.1 >



< Fig.2 >

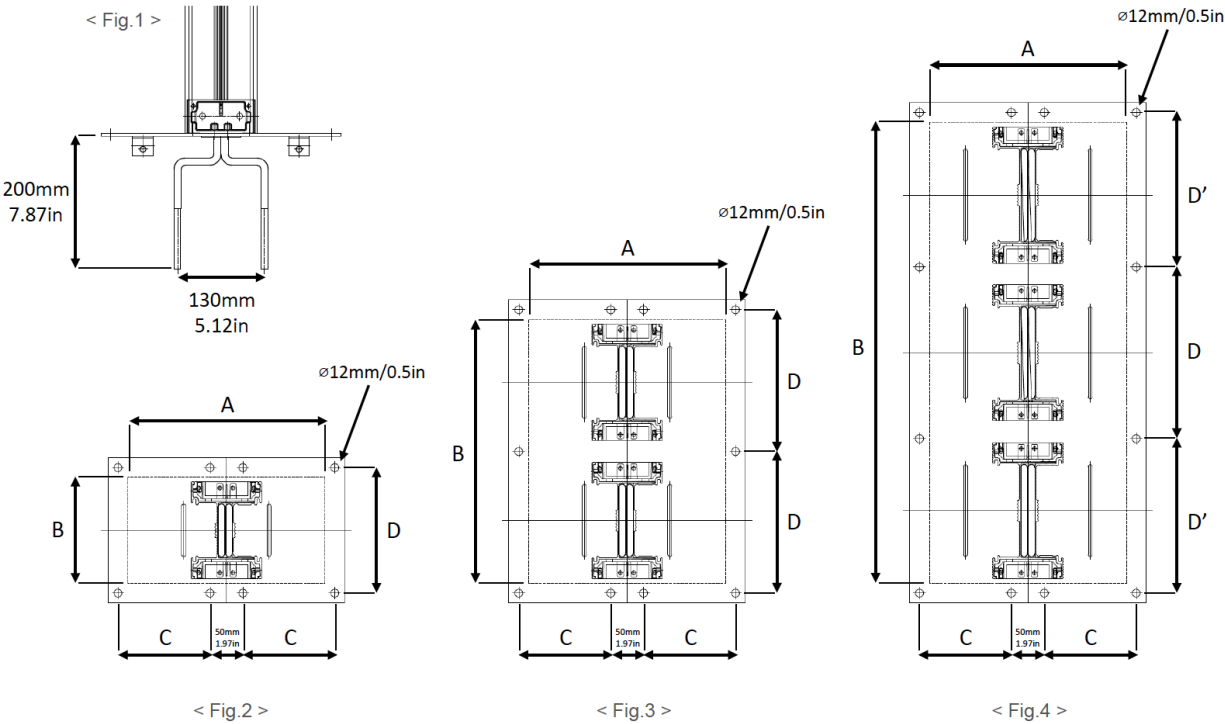


< Fig.3 >

DC BUSWAY

DIMENSIONS

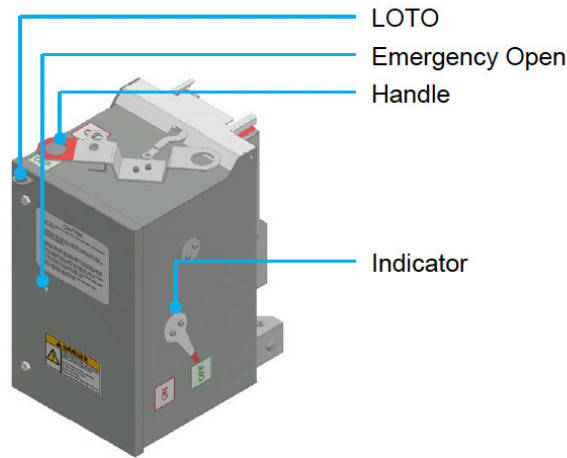
Flanged end:



Stacks	IEC	UL	Dimension (mm)					Dimension (in)					Figure No.
	Ampere (A)	Ampere (A)	A	B	C	D	D'	A	B	C	D	D'	
1	1000	800	300	121	140	151	-	11.81	4.76	5.51	5.94	-	2
	1250	1000		131		161			5.16		6.34		
	1600	1200		161		191			6.34		7.52		
	2000	1600		181		211			7.13		8.31		
	2500	2000		221		251			8.70		9.88		
	3200	2500		266		296			10.47		11.65		
	3600	-		291		321			11.46		12.64		
2	-	3200	300	401	140	215.5	-	11.81	15.79	5.51	8.48	-	3
	4000	3600		431		245.5			16.97		9.67		
	5000	4000		501		315.5			19.72		12.42		
	6300	5000		601		415.5			23.66		16.36		
3	7000	-	300	701	140	251	240	11.81	27.60	5.51	9.88	9.45	4
	8000	6000		806		286	275		31.73		11.26	10.83	
	10000	-		911		321	310		35.87		12.64	12.20	

MCCB BUS PLUGS

CIRCUIT BREAKER BUS PLUGS



< MCCB Bus plug 160AF >



< ABB MCCB XT2 >

MCCB			Enclosure Size (mm)			Enclosure Size (in)			IEC				UL			
									Ampere (A)		Interruption Ratings (kA)			Ampere (A)		Interruption Ratings (kA)
Model	Poles	MFG	Width	Height	Depth	Width	Height	Depth			250V	500V	750V			250V
XT2	3	ABB	230	370	240	9.06	14.57	9.45	160	100	100	-	125	85	85	-
XT4	3	ABB	300	500	240	11.81	19.69	9.45	250	100	100	70	250	100	-	85
XT5	3	ABB	350	660	240	13.78	25.98	9.45	400	100	100	100	400	100	100	70
XT5	3	ABB	350	800	240	13.78	31.50	9.45	630	100	100	100	600	100	100	70
XT6	3	ABB	400	900	340	15.75	35.43	13.39	800	70	50	36	800	70	50	35

CIRCUIT BREAKER INFORMATION (IEC)

① XT2

Manufacturer	:	ABB				
Model No.	:	XT2				
Standard	:	IEC 60947-2				
Rated Voltage (Vdc)	:	500				
Frame Size (A)	:	125				
Poles	:	3, 4				
Interruption Rating (kA)	:	N	S	H	L	V
250Vdc 2poles		36	50	70	85	100
500Vdc 3poles		36	50	70	85	100
Trip units	:	TMD/TMA, MF/MA				

② XT4

Manufacturer	: ABB						
Model No.	: XT4						
Standard	: IEC 60947-2						
Rated Voltage (Vdc)	: 750						
Frame Size (A)	: 250						
Poles	: 3, 4						
Interruption Rating (kA)	N	S	H	L	V	X	
250Vdc 2poles	36	50	70	85	100	100	
500Vdc 2poles	36	50	70	85	100	100	
500Vdc 3poles	36	50	70	85	100	100	
750Vdc 3poles	-	-	-	-	50	70	
Trip units	: TMD/TMA, MF/MA						

③ XT5

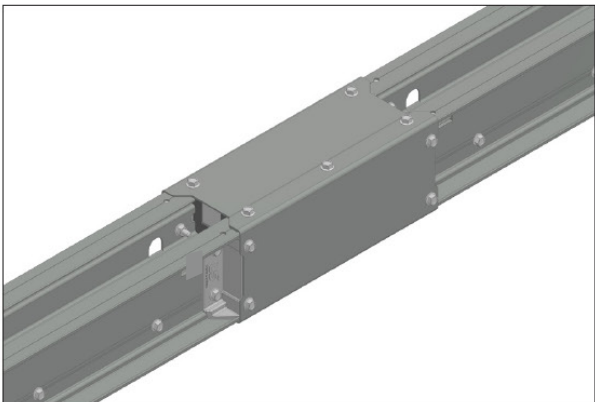
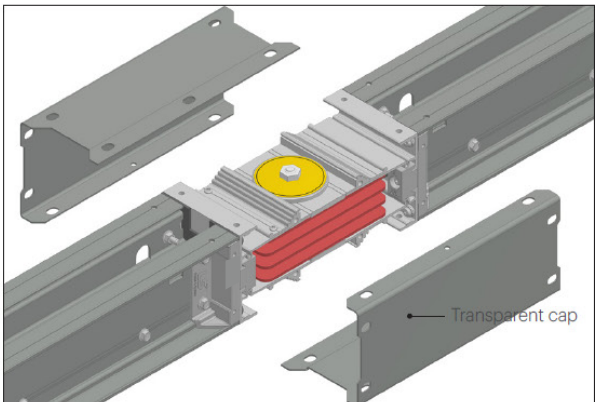
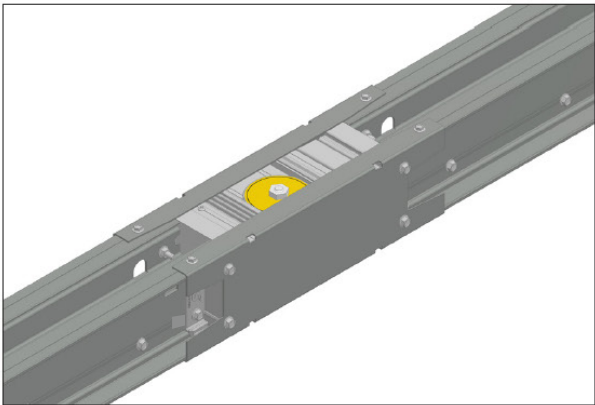
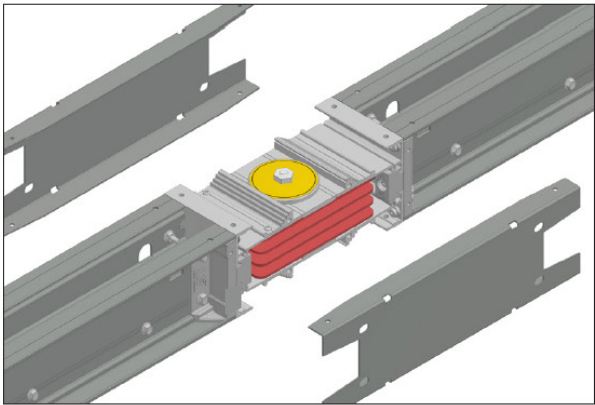
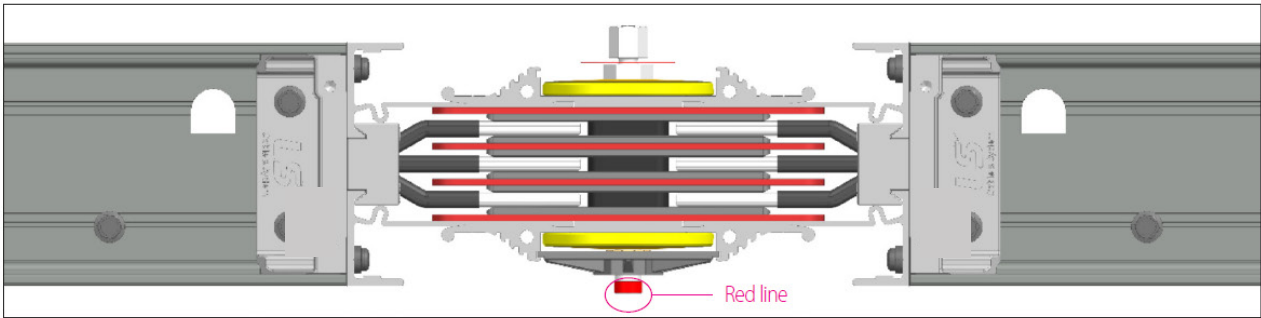
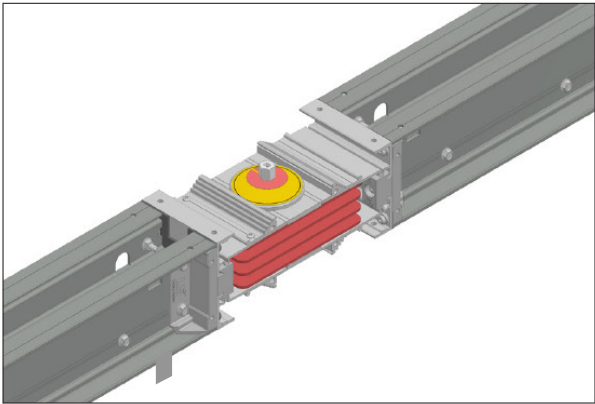
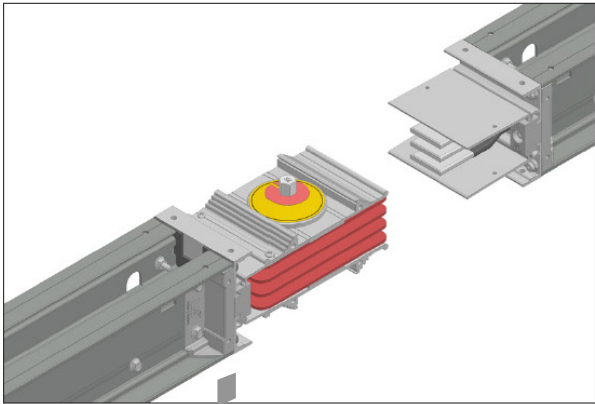
Manufacturer	: ABB						
Model No.	: XT5						
Standard	: IEC 60947-2						
Rated Voltage (Vdc)	: 750						
Frame Size (A)	: 400-630						
Poles	: 3, 4						
Interruption Rating (kA)	N	S	H	L	V	X	
250Vdc 2poles	25	35	50	70	85	100	
500Vdc 2poles	25	35	50	70	85	100	
750Vdc 3poles	-	-	-	-	85	100	
Trip units	: TMD/TMA, TMG						

④ XT6

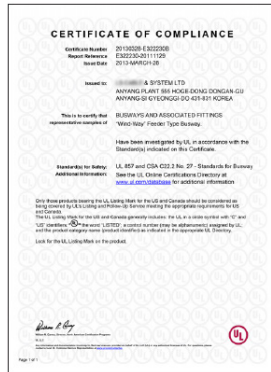
Manufacturer	:	ABB			
Model No.	:	XT6			
Standard	:	IEC 60947-2			
Rated Voltage (Vdc)	:	750			
Frame Size (A)	:	800			
Poles	:	3, 4			
Interruption Rating (kA)	:	N	S	H	
250Vdc 2poles		35	50	70	
500Vdc 2poles		20	35	50	
750Vdc 3poles		18	24	36	
Trip units	:	TMD/TMA			

JOINT CONNECTION

JOINT KIT



CERTIFICATION & SPECIFICATION



cUL Certification



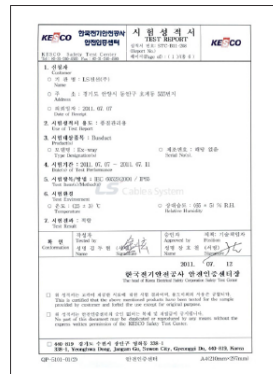
Seismic Qualification
(SEISMIC ZONE4)



ISO 9001



ISO 14001



Dust and Water Proof Certification

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