Lectrobar

OPTIMUM DESIGN

LECTRO Busduct System
[Series LSB A/ 250A - 5500A]

Providing Efficient Distribution of Electrical Power with Minimum Power Loss

Since 1975

Certified DEKRA

KEMA KEUR

Introduction

Since 1975, Lectro has manufactured and installed hundreds of thousands of meters of busducts for large and small projects , both for the domestic market and for exports around the globe.

The production takes place in a state of the art facility, using latest generation precision techniques including CNC, automation systems and robotics. Lectro products have been type tested by DEKRA laboratories of the Netherlands.

Lectro busduct systems contain high quality components and are trusted for their high safety factor and long life.

Lectro Bimetal range, «series LSB A» busduct provide currents from 250A to 5500A.

We pride ourselves in delivering systems which exceed the expectation of our customers, both in terms of quality and in the level of customer service we provide.



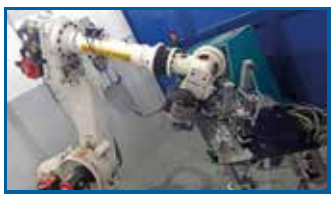






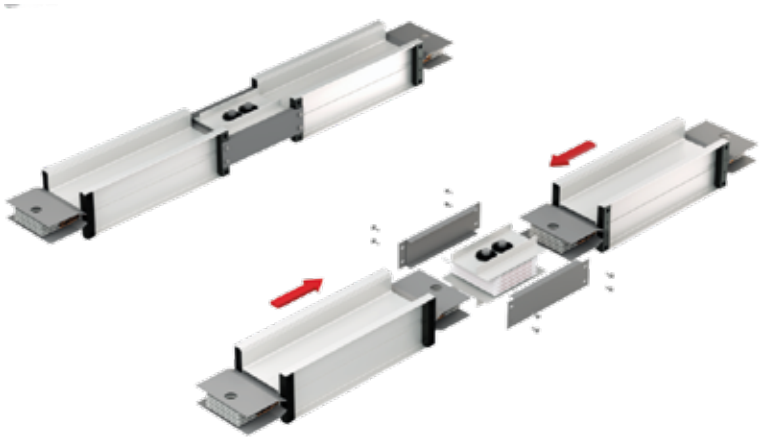







Lectrobar
OPTIMUM DESIGN

Busducts



Busduct Versus Cable and Trays

» Flexibility:
Reusable, Expandable

- Tap-off units enable the drawing down of additional power to be easy and compact
- Modular design of busducts means that the distribution supply can be easily changed
- Can be easily dismantled, relocated and reused

» Efficiency:
Cost Savings

- Half the man-hours:
  Installation requires only half the time as compared to conventional methods resulting in considerable savings on installation costs
- Zero shut downs:
  Continuity can be maintained as servicing times are really short and needs no operational shutdowns

» Less space

- Thanks to the sandwich design, busducts have very compact cross sectional sizes and occupy far less space compared to cables

Applications of Busducts

» Multiple Loads

- Feeding multi-loads distributed throughout a building / manufacturing facility is easy and time saving with busducts
- Conveniently placed tap-offs ensure that plugs can be installed and removed safely in no time
- For higher ampere ratings, 'bolted on' tap-offs provide up to 1600A protection at every joint

» Vertical Riser

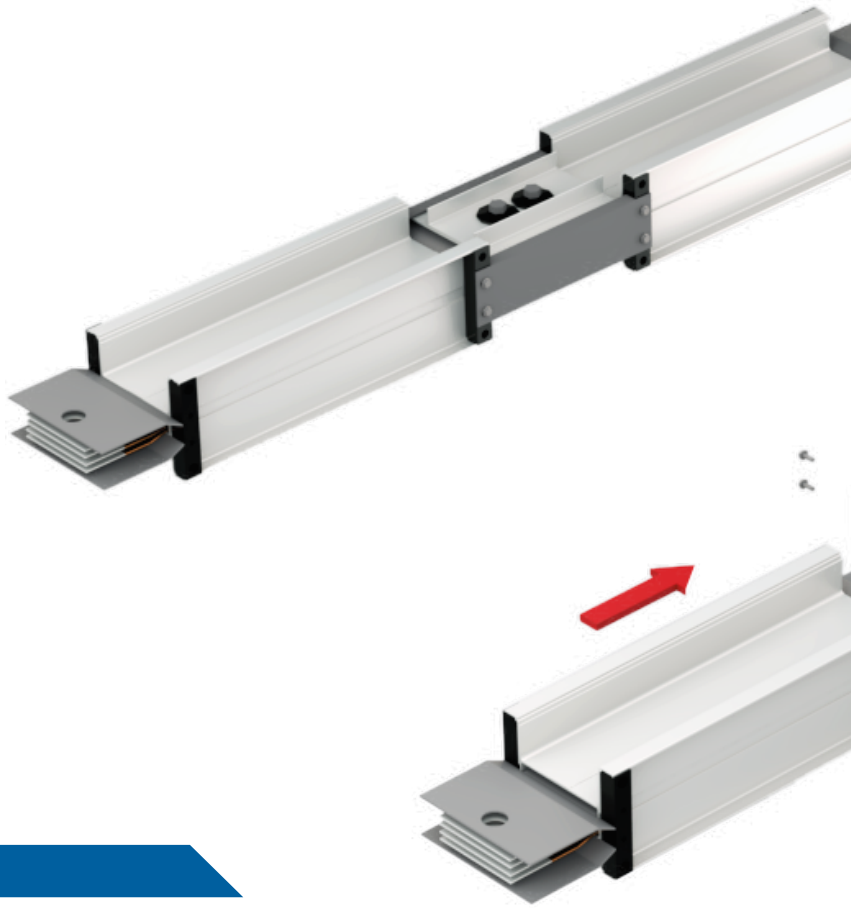
- The efficient method to feed high rise buildings, as distribution to different floors is achieved through convenience tap-offs

» Service Entrance and Single Load

- From the utility transformer to the main switchboard (service entrance), busduct provides the most hassle free feeding solution
- Normally used for feeding load concentrated in one area, feeder busduct is the choice of connection for a switchboard to switchboard tie / switchboard to remote Motor Control Center / switchboard to single load.

Lectrobar Busducts - Unique Features

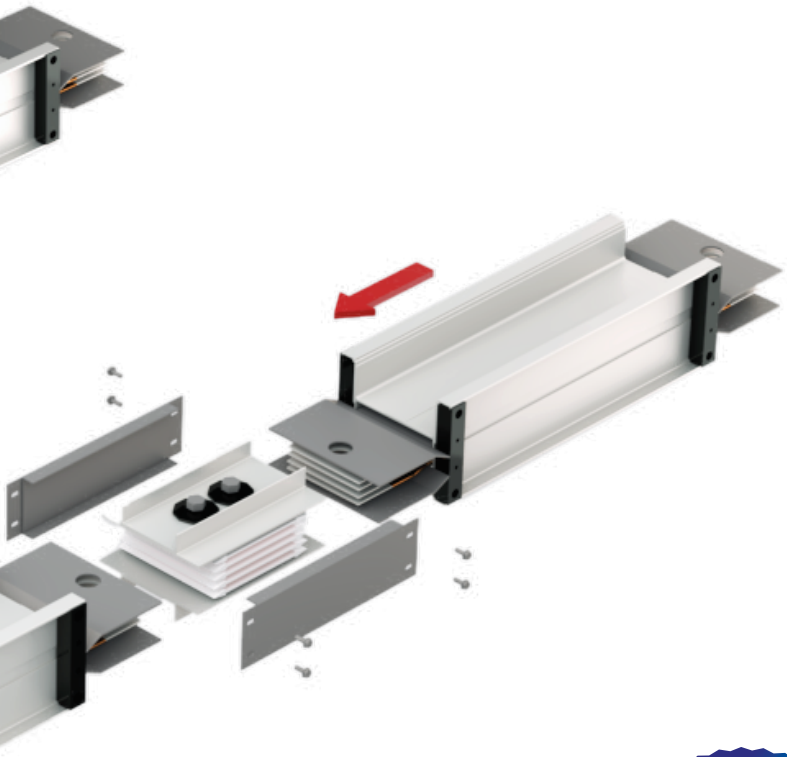
Since 1975, Lectrobar has manufactured thousands of meters of installed busducts. State of the art ISO certified manufacturing facility has their products type tested by DEKRA of Netherlands. Lectrobar busducts are trusted for their high safety factor & long life span.



Safe and Versatile Design

- Meet the requirement of IEC 61 - 439
- Tested and approved by different accredited laboratories
- Fully type tested at DEKRA testing facility, Netherlands
- Manufactured in an ISO 9001/2000 certified facility to ensure highest quality control
- Product certified for KEMA KEUR Mark
- Since 1975 in the market

Bimetal Aluminum with Tinned Copper Clad at Contacts	True Sandwich for Both Feeder and Plug-in	High Insulation Tested at 2500V for 1 Minute	Grounding and Neutral Flexibility
■ Bimetallic with copper cladding covering an aluminum core ■ Good Contact	■ No need to separate or flare the bars at the outlet ■ High short circuit withstand for both feeder and plug-in ■ Low impedance and low voltage drop ■ No flame smoke or gas propagation in the housing «Chimney Effect»	■ Two insulation layers used ■ Main insulation Teflon Coated Fiberglass 250°C working temperature and 5000V breakdown or polyester film better than Class B (RTI 140°) ■ Working temperature 50o C, No deration required	■ Integral casing ground as standard, 50% additional ground bar, 100% ground bar available ■ 100% , 200% (Full), 50% (Half) neutral available ■ No need for earth bar, the aluminum housing ground conductor is carried through the joint



Two Bolt Patent Joint Design

- More than two tons pressure on overlapping busbars at each bolt
- Adjacent phases separated with non-flammable (V - 0) PBT UL listed (RTI : 140°C, 23kV/mm)
- Joint alignment with two bolts instead of one in the single bolt to ensure correct installation even with non skilled labour
- Maintenance free joint using special heat treated spring steel conical shape washers
- Unique design for the joint to make its temperature less than the rest of the busduct

5 YEARS WARRANTY

Aluminum Casing

- Excellent heat dissipation
- Significant reduction in reactance and magnetic flux leakage
- Proper ground return path
- Dust and water protection
- Special coating for better heat dissipation

Space Saving Accessories

- Corner elbows, tees, crosses, & reducers etc
- Maximum Layout flexibility
- Optimum utilization of space

Transformer Box

- Enclose flexible joint and transformer bushing
- Protect the system from the entry of any foreign body
- Easy check on transformer oil leakage without de-energizing the system

Single Window from Design to Delivery

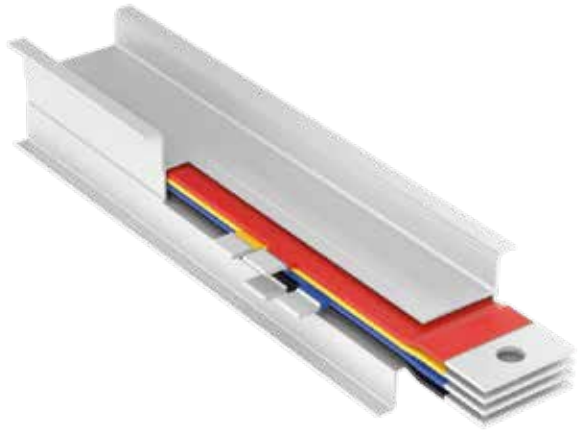
- Exact design, layout & selection aided by support of engineering team
- Detailed drawing in one week from receiving the order
- Lower carbon footprint with shorter shipping time to Middle East, Africa & Europe Markets

Design & Construction

Lectrobar busducts have a sandwich type non-ventilated configuration. The non-ventilated housing design excludes potential points of penetration by moisture and dust.

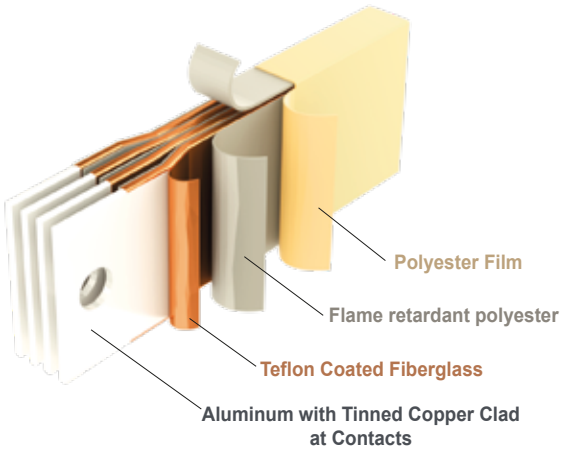
Busbars for plug-in applications, have full size welded conductor tabs. This design extends the contact surfaces outside of the busduct casing and into the plug-in outlet. By this design, true sandwich configuration is maintained throughout the entire busduct length for both feeder and plug-in. This will eliminate the need to seperate or flare the conductor bars at the plug-in opening.

Maintaining a true sandwich design eliminates potential pathways for the propagation of flame, smoke and gas through the busduct casing, commonly referred as the 'chimney effect'. The sandwich structure with low impedance ensures low voltage drop and thus, enables the cost-effective transmission of large amount of power even at long distances.



Busbar and Insulation

Lectro bars are fabricated from high strength pure electrolytic Aluminum with suitable cross section and Tinned Copper Clad at contacts, Tin coating provides surface protection and good contact.



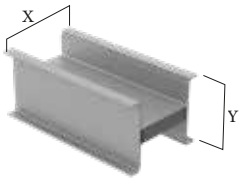
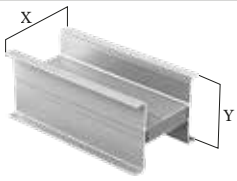
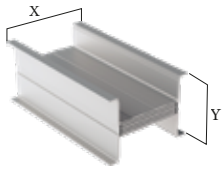
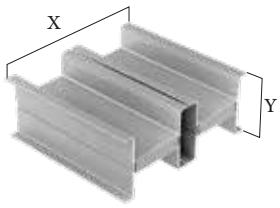
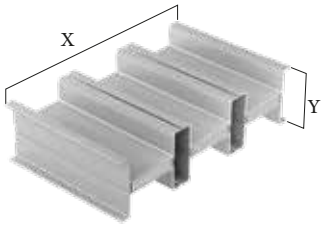
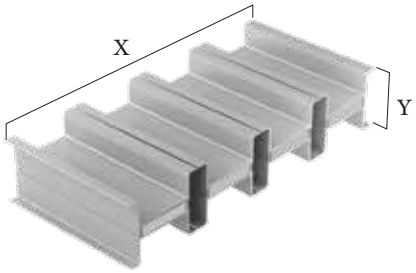
Shown is a section of Lectro busduct insulation consisting of two different insulation materials. Conductors are insulated with Teflon Coated Fiberglass films (10 mil* thickness, 5000 V, 250°C) and layered with Flame retardant polyester film. Alternativley, conductor can be insulated with polyester films (RTI 140°) After assembly all the bars are wrapped together with polyester film. The result is an insulation system that is virtually impervious to the stress of normal operation. The insulation system is tested after assembly with 2500 Volt for one minute. This test is intended to confirm the integrity of the insulation system and helps ensure the highest quality busduct possible. All the insulation materials are rated as class H (minimum) non-flammable hence, no internal fire barrier is needed. Upon request, the bars can be insulated with cycloaliphatic epoxy resin class B 130°C.

Design & Construction

Lectrobar is constructed with extruded aluminum profile. The non-magnetic aluminum housing ensures excellent heat dissipation, a significant reduction in reactance and magnetic flux leakage. Both, the new casing design and the special casing coating ensure the best heat dissipation possible from the system. This allows the system to work without derating up to 50°C. Standard casing is IP54. On request IP55 and IP65 casings can also be supplied.

Aluminum casing provides an excellent ground return path.
DC resistance /meter of the casing is less than 0.03 milliohm.

Hence, integral housing ground is standard and provides full cross section grounding. The system ground continuity is maintained through each joint by the ground path end blocks and joint covers. In addition, the housing ground conductor is carried through the joint. This design ensures that the integrity of the ground path is maintained by the same mechanical pressure used to maintain the continuity of the conductive path (Casing tested as earth at DEKRA Netherlands). An internal ground bus adds no benefit with this method. It adds only unnecessary cost to the system. However, for applications where the clients insist on 50% or 100% earth bar, Lectro can provide it as an optional.

	Ampere Rating (A)	Busducts	No. of Busduct	X (mm)	Y (mm)	Weight (Kg\m)
	250	LSBA3FNHFI025SL3	1	80	140	2.2
	400	LSBA3FNHFI040SL3	1	110	140	4.1
	630	LSBA3FNHFI063SL3	1	140	140	5.9
	900	LSBA3FNHFI090SL3	1	180	140	7.9
	1000	LSBA3FNHFI100SL3	1	180	140	9.2
	1250	LSBA3FNHFI125SL3	1	160	140	13.7
	1350	LSBA3FNHFI135SL3	1	180	140	15.8
	1600	LSBA3FNHFI160SL3	1	210	140	20.5
	2000	LSBA3FNHFI200SL3	2	265	140	18.4
	2300	LSBA3FNHFI230SL3	2	325	140	27.3
	2500	LSBA3FNHFI250SL3	2	365	140	31.5
	3200	LSBA3FNHFI320SL3	2	425	140	41
	4000	LSBA3FNHFI400SL3	3	540	140	47.4
	4500	LSBA3FNHFI450SL3	4	655	140	54.6
	5500	LSBA3FNHFI550SL3	4	735	140	63

Types of Busducts

Feeder Busducts

1600A

2000A, 2300A, 2500A

3200A

4000A

4500A, 5500A

Up to 1350 A

Ampere Rating (A)	Feeder Busducts
250A	LSBA3FNHFI025SL3
400A	LSBA3FNHFI040SL3
630A	LSBA3FNHFI063SL3
900A	LSBA3FNHFI090SL3
1000A	LSBA3FNHFI100SL3
1250A	LSBA3FNHFI125SL3
1350A	LSBA3FNHFI135SL3
1600A	LSBA3FNHFI160SL3
2000A	LSBA3FNHFI200SL3
2300A	LSBA3FNHFI230SL3
2500A	LSBA3FNHFI250SL3
3200A	LSBA3FNHFI320SL3
4000A	LSBA3FNHFI400SL3
4500A	LSBA3FNHFI450SL3
5500A	LSBA3FNHFI550SL3

Standard length 3000 mm

Types of Busducts

Plug - in Busducts

Up to 1350 A

1600A

2000A, 2300A, 2500A

Ampere Rating (A)	Feeder Busducts
250A	LSBA3FNHPI025SL3
400A	LSBA3FNHPI040SL3
630A	LSBA3FNHPI063SL3
900A	LSBA3FNHPI090SL3
1000A	LSBA3FNHPI100SL3
1250A	LSBA3FNHPI125SL3
1350A	LSBA3FNHPI135SL3
1600A	LSBA3FNHPI160SL3
2000A	LSBA3FNHPI200SL3
2300A	LSBA3FNHPI230SL3
2500A	LSBA3FNHPI250SL3
3200A	LSBA3FNHPI320SL3
4000A	LSBA3FNHPI400SL3
4500A	LSBA3FNHPI450SL3
5500A	LSBA3FNHPI550SL3

Standard length 3000 mm

3200A

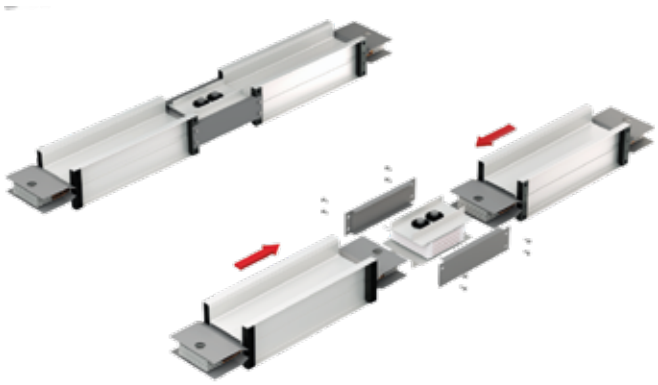
4000A

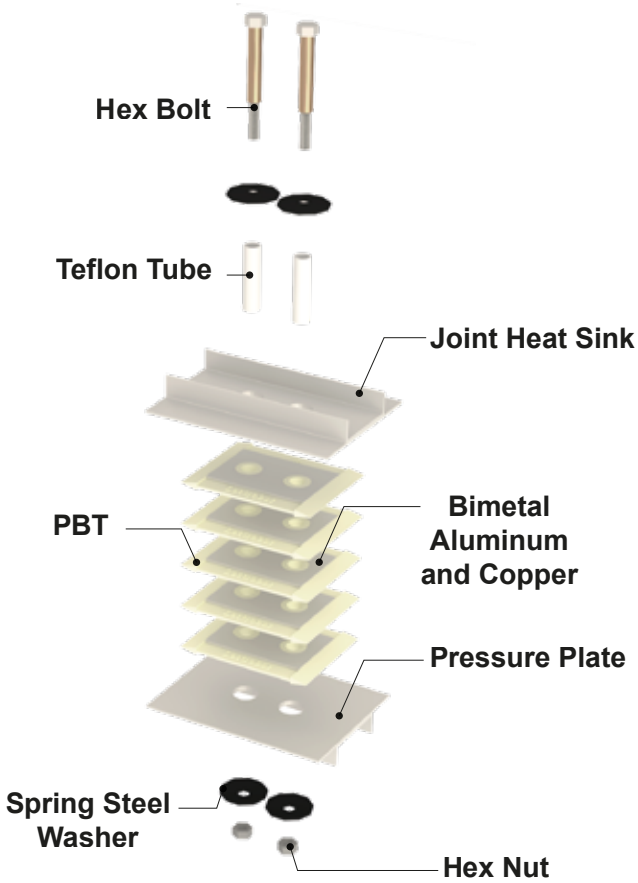
4500A, 5500A

Innovations

Joints:

Joints in all ratings are of a two bolt patent design, which can be checked for tightness without de-energizing the system. This design ensures excellent contact between each set of the busbars and the joint. This method exerts more than two tons of pressure on overlapping bus bars at each bolt. This force is distributed over the contact area by two pairs of large diameter spring steel conical shape washers. These washers ensure maintenance free joint.





Joint alignment is made by two bolts instead of one bolt in the single bolt design. This design ensures the correct installation of the busduct joint even with non skilled labor. The joint temperature is less than rest of the busduct due to the specially designed heat sinks and contact surface. Figure A shows the contact resistance at different torque with the washers. The tightening torque of joint bolt does not run down after initial accomodation, and is maintained at a level that ensures stability of contact resistance and temperature rise.

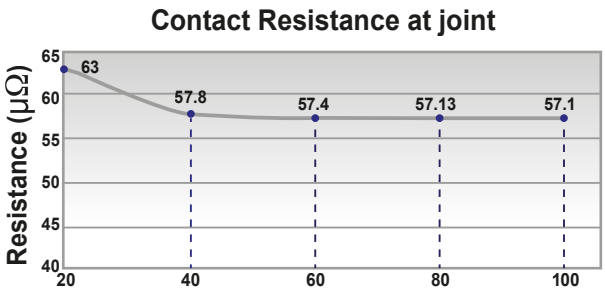
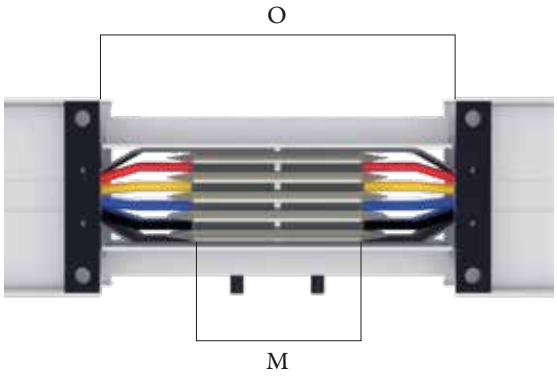


Figure A

Innovations

The bolts are insulated with Teflon Coated Fiberglass and passed through the joint in a Teflon tube to eliminate any problems arising from joint bolts. Joint blocks are used to ensure parallel joints of bars and complete mechanical jointing using non-flammable (V-0) Polybutylene Terephthalate UL listed (RTI :140°C,Dielectric Strength 23kV/mm).

Double head bolts are used as optional. One head breaks at the required torque so no need for torque wrenches. Smart bolts can be used also as optional for critical sites. Using smart bolts results in less fatigue for installers, no repeated torque wrench calibration, no sample re-tightening, no turn-of-nut confirmation required. Installers can easily identify and focus on loose bolts to re-tighten. The ability to visually inspect fasteners also creates safer working conditions particularly in elevated structures and areas exposed to hazardous materials.

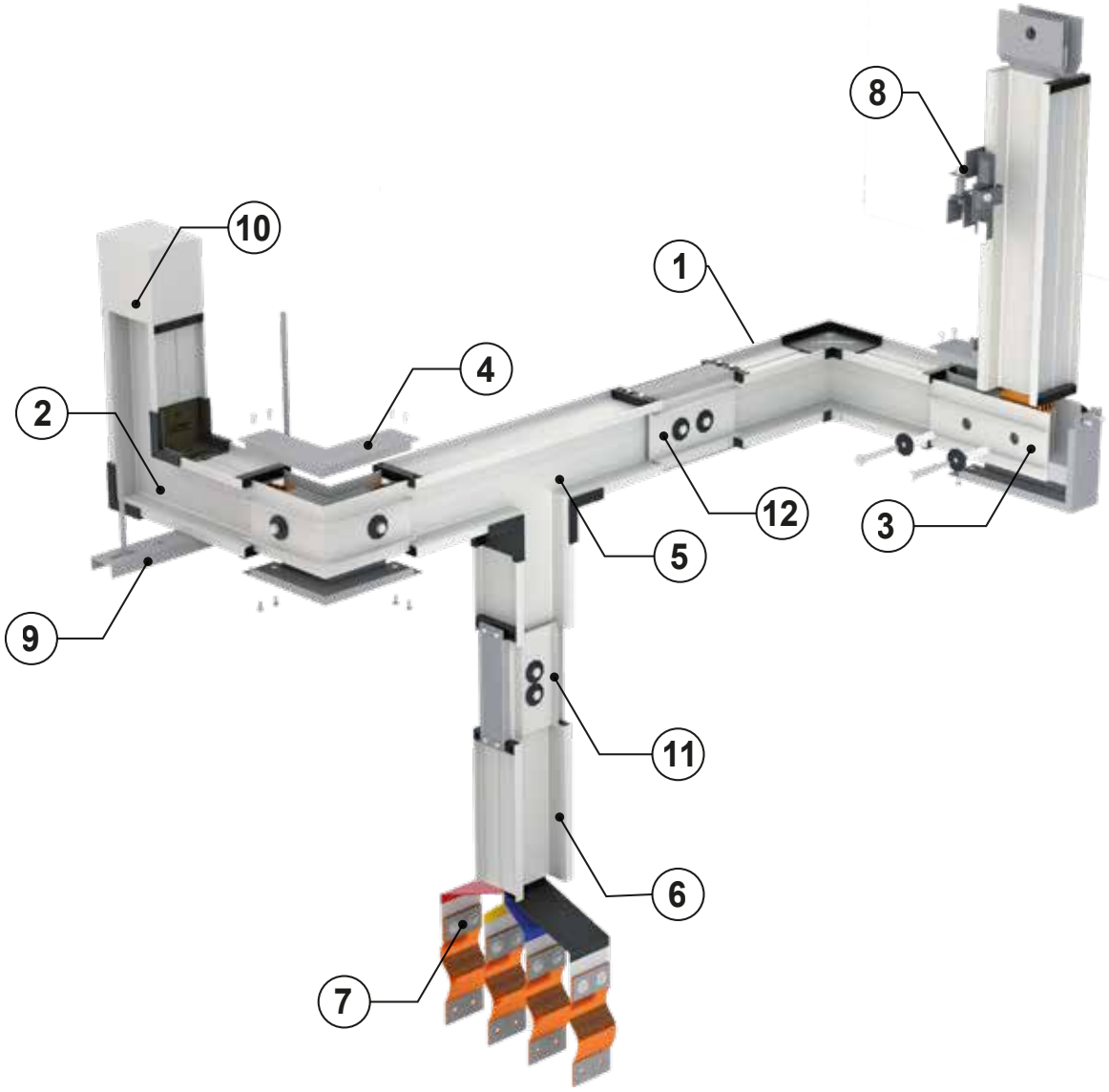


Ampere Rating (A)	No. of Busduct	M (in mm)	O (in mm)
250A	1	120	250
400A	1	120	250
630A	1	120	250
900A	1	120	250
1000A	1	120	250
1250A	1	120	250
1350A	1	120	250
1600A	1	120	250
2000A	2	120	250
2300A	2	120	250
2500A	2	120	250
3200A	4	120	250
4000A	3	120	250
4500A	4	120	250
5500A	4	120	250

Smart bolts *

* Upon request

Accessories

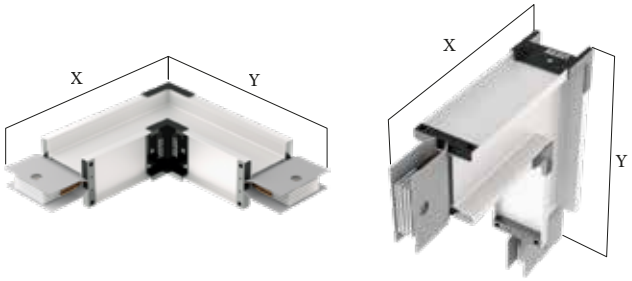
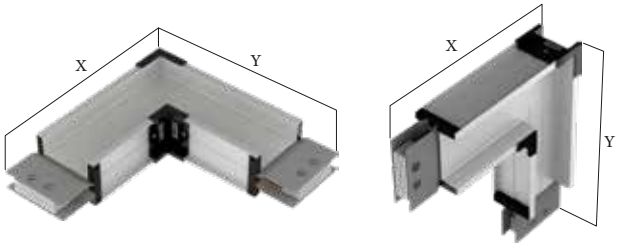
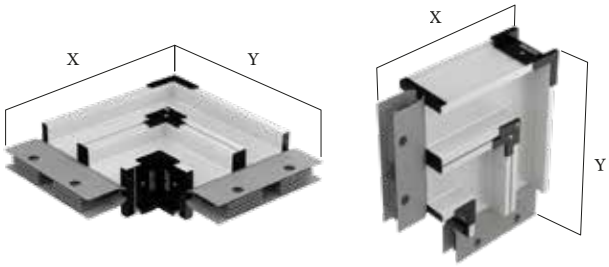
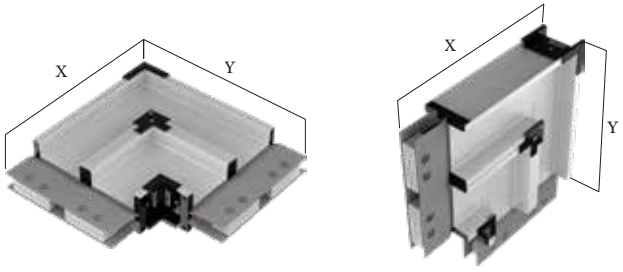
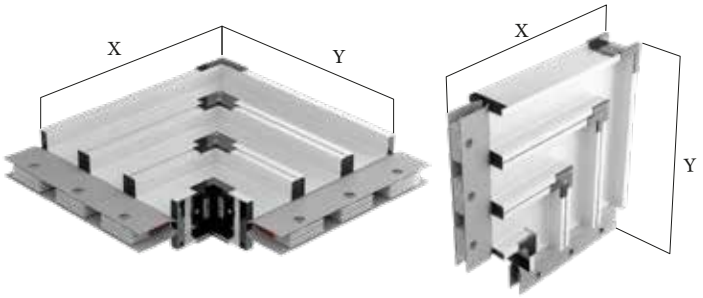
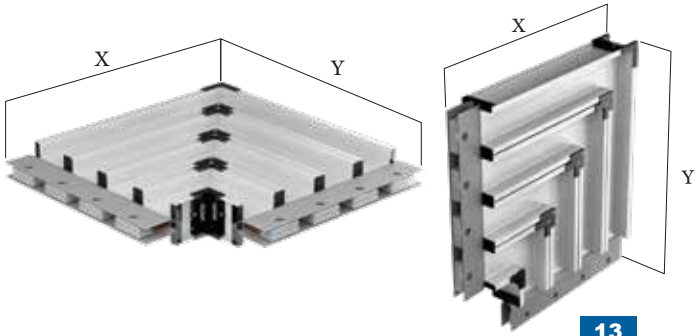


Complete line of ‘standard fittings’ or ‘made to fit’ accessories with wide varieties are available to meet every application need.

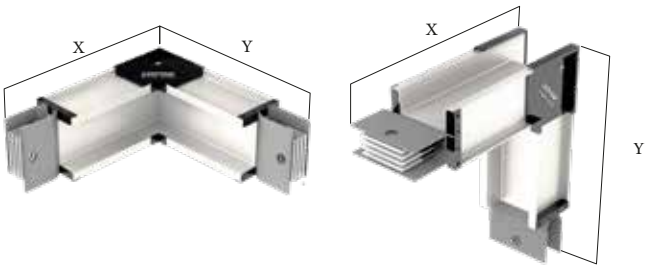
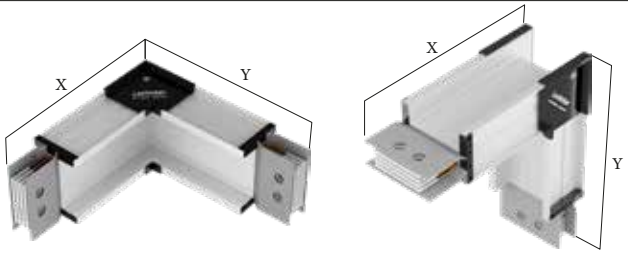
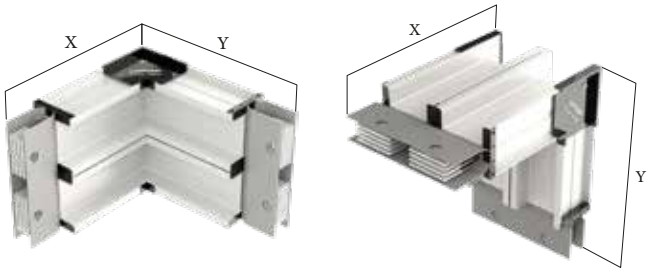
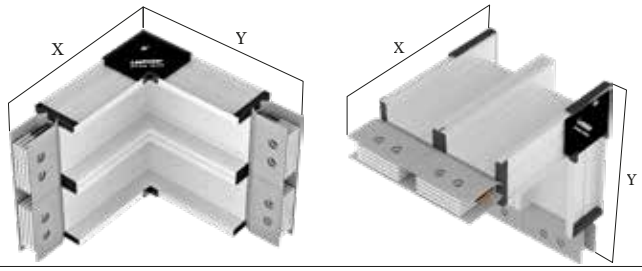
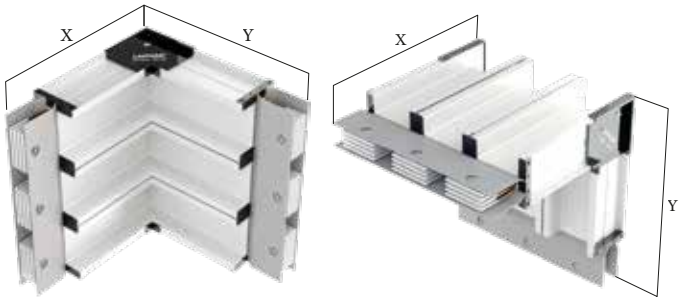
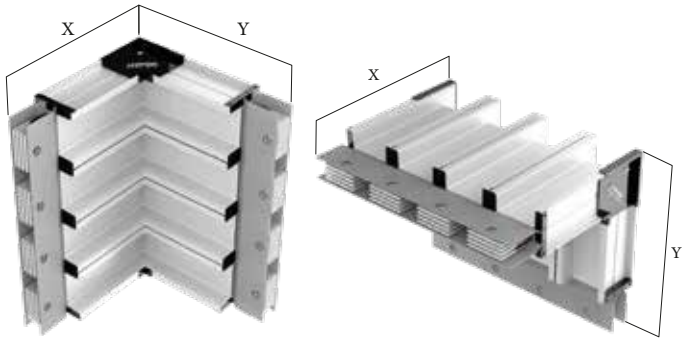
These accessories include :

1. Edgewise Elbows
2. Flat Elbows
3. Corner Flat Elbows
4. Corner Edgewise Elbows
5. Tees and Crosses
6. Transformer and Switchboard Flanges
7. Flexible joints
8. Spring Riser
9. Angle Hanger
10. End Closure
11. Standard Joint
12. Long Joint

Accessories - Flat Elbow

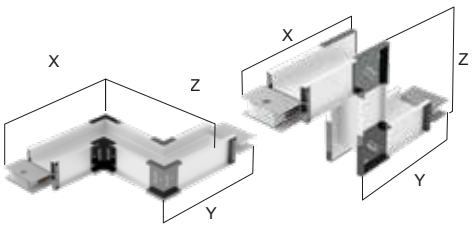
Ampere Rating (A)	Flat Elbow	Min X,Y (mm)	
250A	LSBA3FNHFI025EF	250	
400A	LSBA3FNHFI040EF	280	
630A	LSBA3FNHFI063EF	310	
900A	LSBA3FNHFI090EF	330	
1000A	LSBA3FNHFI100EF	330	
1250A	LSBA3FNHFI125EF	310	
1350A	LSBA3FNHFI135EF	330	
1600A	LSBA3FNHFI160EF	365	
2000A	LSBA3FNHFI230EF	0000	
2300A	LSBA3FNHFI230EF	475	
2500A	LSBA3FNHFI250EF	515	
3200A	LSBA3FNHFI320EF	580	
4000A	LSBA3FNHFI400EF	----	
4500A	LSBA3FNHFI450EF	805	
5500A	LSBA3FNHFI550EF	880	

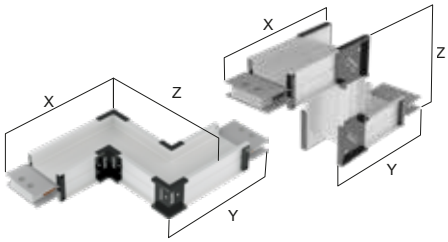
Accessories - Edgewise Elbow

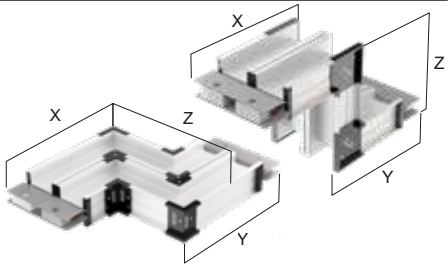
Ampere Rating (A)	Edgewise Elbow	Min X,Y (mm)	
250A	LSBA3FNHFI025EE	280	
400A	LSBA3FNHFI040EE	280	
630A	LSBA3FNHFI063EE	310	
900A	LSBA3FNHFI090EE	310	
1000A	LSBA3FNHFI100EE	310	
1250A	LSBA3FNHFI125EE	290	
1350A	LSBA3FNHFI135EE	290	
1600A	LSBA3FNHFI160EE	290	
2000A	LSBA3FNHFI200EE	290	
2300A	LSBA3FNHFI230EE	290	
2500A	LSBA3FNHFI250EE	290	
3200A	LSBA3FNHFI320EE	290	
4000A	LSBA3FNHFI400EE	290	
4500A	LSBA3FNHFI450EE	290	
5500A	LSBA3FNHFI550EE	290	

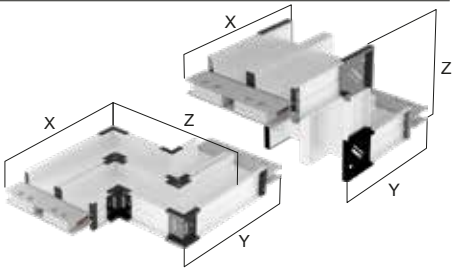
Accessories - Offset Elbow

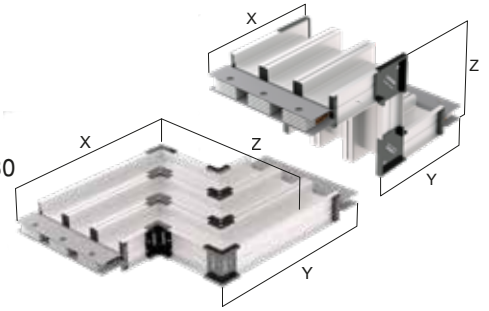
Ampere Rating (A)	Offset Elbow Flat	Min X,Y (mm)	Min Z (mm)	Offset Elbow Edgewise	Min X,Y (mm)	Min Z (mm)	
250A	LSBA3FNHFI025OF	250	320	LSBA3FNHFI025OE	310	330	
400A	LSBA3FNHFI040OF	290	350	LSBA3FNHFI040OE	310	330	
630A	LSBA3FNHFI063OF	330	370	LSBA3FNHFI063OE	310	330	
900A	LSBA3FNHFI080OF	330	410	LSBA3FNHFI090OE	310	330	
1000A	LSBA3FNHFI100OF	330	410	LSBA3FNHFI100OE	310	330	
1250A	LSBA3FNHFI125OF	330	370	LSBA3FNHFI125OE	290	330	
1350A	LSBA3FNHFI135OF	330	410	LSBA3FNHFI135OE	290	330	
1600A	LSBA3FNHFI160OF	360	470	LSBA3FNHFI160OE	290	330	
2000A	LSBA3FNHFI200OF	----	----	LSBA3FNHFI200OE	290	330	
2300A	LSBA3FNHFI230OF	475	535	LSBA3FNHFI230OE	290	330	
2500A	LSBA3FNHFI250OF	515	595	LSBA3FNHFI250OE	290	330	
3200A	LSBA3FNHFI320OF	575	685	LSBA3FNHFI320OE	290	330	
4000A	LSBA3FNHFI400OF	----	----	LSBA3FNHFI400OE	290	330	
4500A	LSBA3FNHFI450OF	805	865	LSBA3FNHFI450OE	290	330	
5500A	LSBA3FNHFI550OF	880	965	LSBA3FNHFI550OE	290	330	

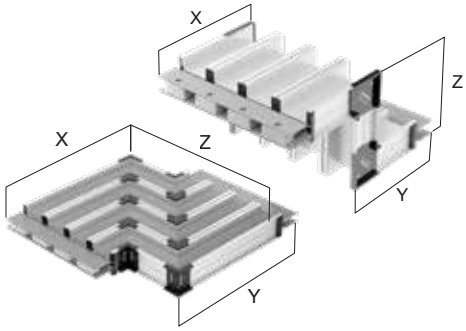










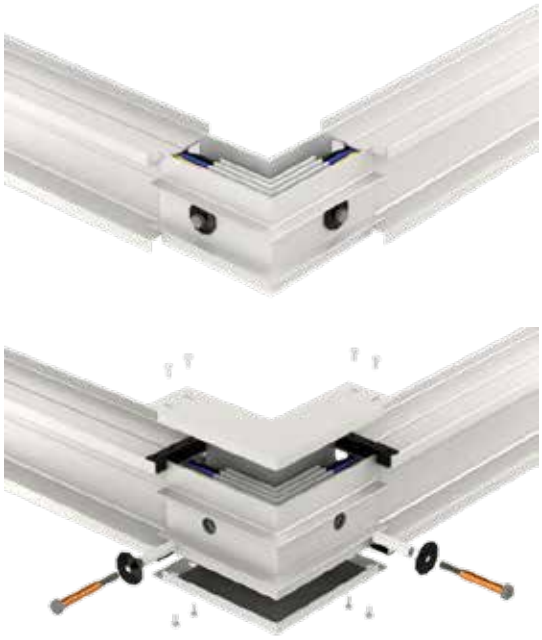


Accessories - Corner Elbow

In addition to these fittings, Lectro offers a space saving corner joint elbow. This elbow has the same construction of Lectro Joints in the form of elbow. Due to its compact design, the corner joint allow optimum utilization of space.

Edgewise: With a minimum leg length of 13 cm for an edgewise elbow, the corner joint elbow can solve any serious path problems and helps to achieve optimum layout with minimal space requirements.

Ampere Rating (A)	Corner Elbow (Edgewise)
250A	LSBA3FNHFI025CE
400A	LSBA3FNHFI040CE
630A	LSBA3FNHFI063CE
900A	LSBA3FNHFI090CE
1000A	LSBA3FNHFI100CE
1250A	LSBA3FNHFI125CE
1350A	LSBA3FNHFI135CE
1600A	LSBA3FNHFI160CE
2000A	LSBA3FNHFI200CE
2300A	LSBA3FNHFI230CE
2500A	LSBA3FNHFI250CE
3200A	LSBA3FNHFI320CE
4000A	LSBA3FNHFI400CE
4500A	LSBA3FNHFI450CE
5500A	LSBA3FNHFI550CE



Flat: The space saving flat elbow takes no additional space up to 1600A. It is a regular joint rotated 90 degree. These elbows are constructed with non-flammable Fiberglass 2mm thickness sheets with a 8kV/mm.

Ampere Rating (A)	Corner Elbow (Edgewise)
250A	LSBA3FNHFI025CF
400A	LSBA3FNHFI040CF
630A	LSBA3FNHFI063CF
900A	LSBA3FNHFI090CF
1000A	LSBA3FNHFI100CF
1250A	LSBA3FNHFI125CF
1350A	LSBA3FNHFI135CF
1600A	LSBA3FNHFI160CF
2000A	LSBA3FNHFI200CF
2300A	LSBA3FNHFI230CF
2500A	LSBA3FNHFI250CF
3200A	LSBA3FNHFI320CF
4000A	LSBA3FNHFI400CF
4500A	LSBA3FNHFI450CF
5500A	LSBA3FNHFI550CF

Accessories - Tees and Crosses

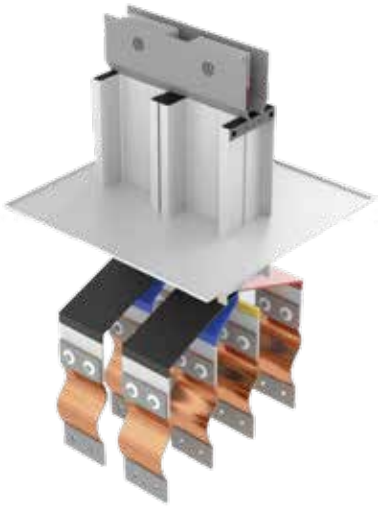
Tees are busduct fittings for connection in three directions.
Crosses are suitable for connection in four directions. Crosses are applied when a bus run must branch off in three directions in the same plane.

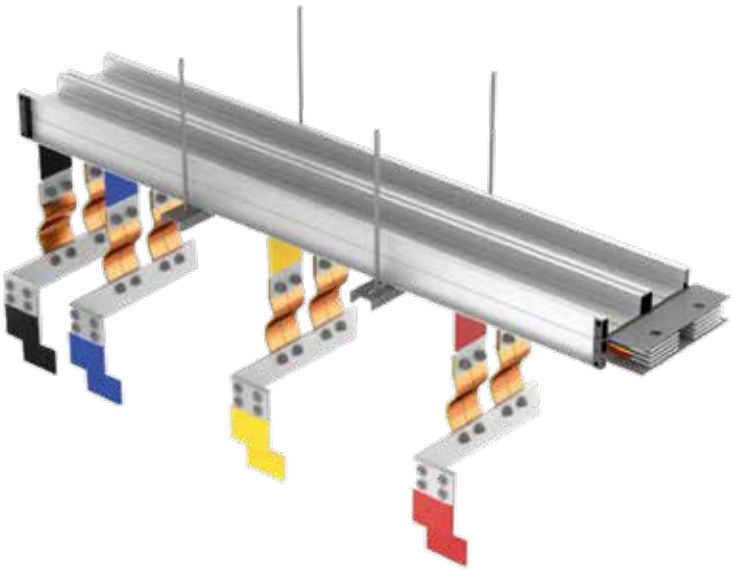
Flat

Edgewise

Ampere Rating (A)	T-Elbow Edgewise	T-Elbow Flat	Cross Edgwise	Cross Flat
250A	LSBA3FNHFI025TE	LSBA3FNHFI025TF	LSBA3FNHFI025CE	LSBA3FNHFI025CF
400A	LSBA3FNHFI040TE	LSBA3FNHFI040TF	LSBA3FNHFI040CE	LSBA3FNHFI040CF
630A	LSBA3FNHFI063TE	LSBA3FNHFI063TF	LSBA3FNHFI063CE	LSBA3FNHFI063CF
900A	LSBA3FNHFI090TE	LSBA3FNHFI090TF	LSBA3FNHFI090CE	LSBA3FNHFI090CF
1000A	LSBA3FNHFI10TE	LSBA3FNHFI10TF	LSBA3FNHFI10CE	LSBA3FNHFI10CF
1250A	LSBA3FNHFI125TE	LSBA3FNHFI125TF	LSBA3FNHFI125CE	LSBA3FNHFI125CF
1350A	LSBA3FNHFI135TE	LSBA3FNHFI135TF	LSBA3FNHFI135CE	LSBA3FNHFI135CF
1600A	LSBA3FNHFI160TE	LSBA3FNHFI160TF	LSBA3FNHFI160CE	LSBA3FNHFI160CF
2000A	LSBA3FNHFI200TE	LSBA3FNHFI200TF	LSBA3FNHFI200CE	LSBA3FNHFI200CF
2300A	LSBA3FNHFI230TE	LSBA3FNHFI230TF	LSBA3FNHFI230CE	LSBA3FNHFI230CF
2500A	LSBA3FNHFI250TE	LSBA3FNHFI250TF	LSBA3FNHFI250CE	LSBA3FNHFI250CF
3200A	LSBA3FNHFI320TE	LSBA3FNHFI320TF	LSBA3FNHFI320CE	LSBA3FNHFI320CF
4000A	LSBA3FNHFI400TE	LSBA3FNHFI400TF	LSBA3FNHFI400CE	LSBA3FNHFI400CF
4500A	LSBA3FNHFI450TE	LSBA3FNHFI450TF	LSBA3FNHFI450CE	LSBA3FNHFI450CF
5500A	LSBA3FNHFI550TE	LSBA3FNHFI550TF	LSBA3FNHFI550CE	LSBA3FNHFI550CF

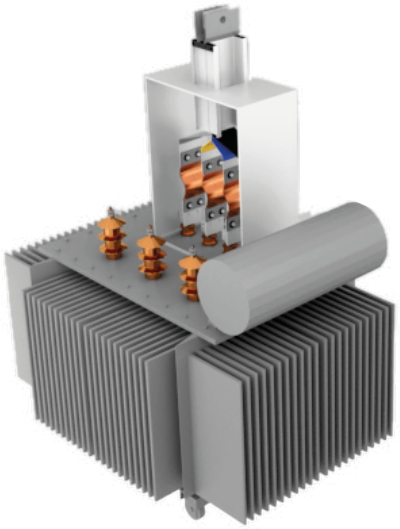
Accessories - Transformer Connection



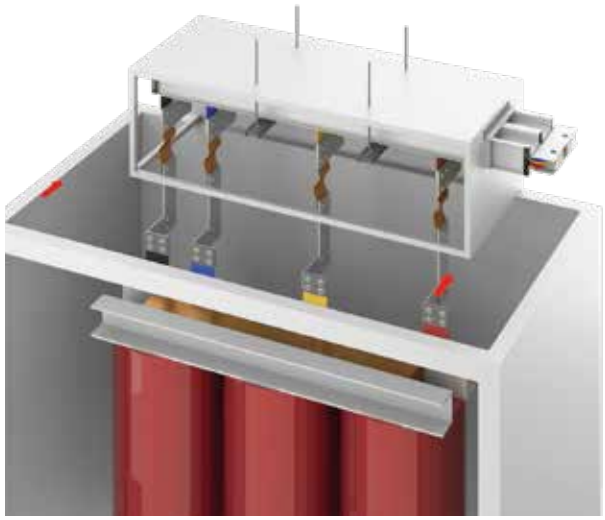


Transformer Box

The transformer connection is equipped with the necessary flexible joints and is totally enclosed in an IP43 box that is uniquely provided by Lectrobar. The box is equipped with a Plexi Glass door to allow the check of the presence of an oil leak without de-energizing the system. The flexible connection is used to allow for busduct expansion and contraction on the low voltage spades.



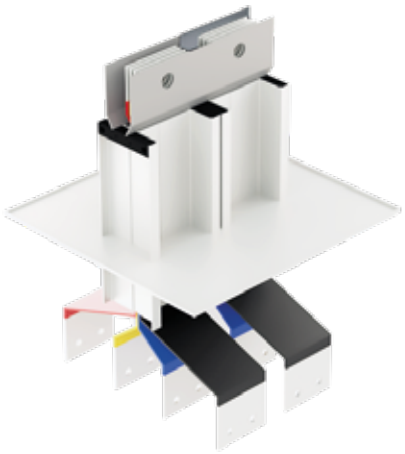
Connection with oil type transformer



Connection with dry type transformer

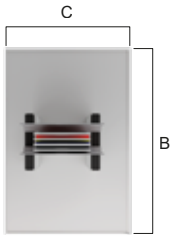
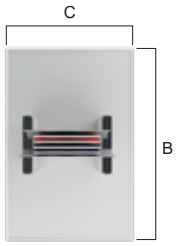
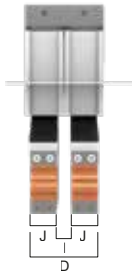
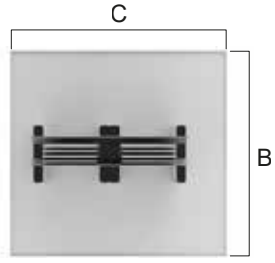
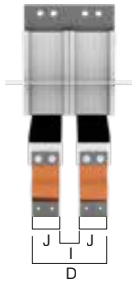
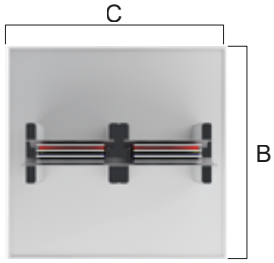
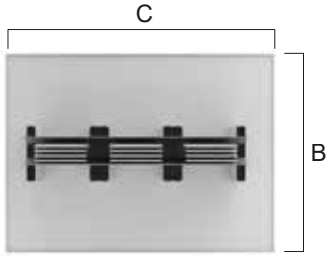
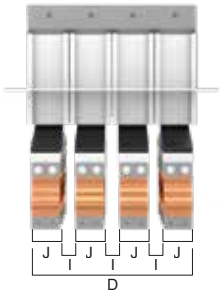
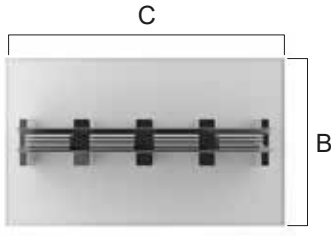
Transformer & Swichboard Flanges

Both Lectro feeder and plug-in busduct can be connected on both sides of transformer and switchboard by a coordinated system in simple and easy way which saves 20% of switchboard size. Also, it guarantees safe connection in minimum installation time. Lectro busduct enters the switchboard or leaves the transformer by special attachment which is tailored according to the dimension and design of both transformer and switchboard. Cut out dimensions and drilling plans are provided with the customer drawings. For proper coordination between busduct and other equipment, detailed drawings including orientation, room plan and height, distance between transformer bushing, transformer and switchboard dimensions should be given. Lectro design and planning group will prepare all necessary drawings and coordination.



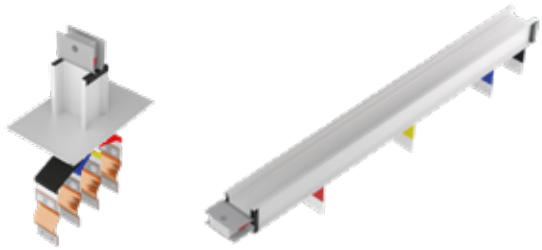
Transformer Flange Oil Type		Transformer Flange Dry Type		Swichboard Flange	
Ampere Rating (A)	Oil Type	Ampere Rating (A)	Dry Type	Ampere Rating (A)	Swichboard Flange
250A	LSBA3FNHFI025TFOT	250A	LSBA3FNHFI025TFDT	250A	LSBA3FNHFI025SE
400A	LSBA3FNHFI040TFOT	400A	LSBA3FNHFI040TFDT	400A	LSBA3FNHFI040SE
630A	LSBA3FNHFI063TFOT	630A	LSBA3FNHFI063TFDT	630A	LSBA3FNHFI063SE
900A	LSBA3FNHFI090TFOT	900A	LSBA3FNHFI090TFDT	900A	LSBA3FNHFI090SE
1000A	LSBA3FNHFI100TFOT	1000A	LSBA3FNHFI100TFDT	1000A	LSBA3FNHFI100SE
1250A	LSBA3FNHFI125TFOT	1250A	LSBA3FNHFI125TFDT	1250A	LSBA3FNHFI125SE
1350A	LSBA3FNHFI135TFOT	1350A	LSBA3FNHFI135TFDT	1350A	LSBA3FNHFI135SE
1600A	LSBA3FNHFI160TFOT	1600A	LSBA3FNHFI160TFDT	1600A	LSBA3FNHFI160SE
2000A	LSBA3FNHFI200TFOT	2000A	LSBA3FNHFI200TFDT	2000A	LSBA3FNHFI200SE
2300A	LSBA3FNHFI230TFOT	2300A	LSBA3FNHFI230TFDT	2300A	LSBA3FNHFI230SE
2500A	LSBA3FNHFI250TFOT	2500A	LSBA3FNHFI250TFDT	2500A	LSBA3FNHFI250SE
3200A	LSBA3FNHFI320TFOT	3200A	LSBA3FNHFI320TFDT	3200A	LSBA3FNHFI320SE
4000A	LSBA3FNHFI400TFOT	4000A	LSBA3FNHFI400TFDT	4000A	LSBA3FNHFI400SE
4500A	LSBA3FNHFI450TFOT	4500A	LSBA3FNHFI450TFDT	4500A	LSBA3FNHFI450SE
5500A	LSBA3FNHFI550TFOT	5500A	LSBA3FNHFI550TFDT	5500A	LSBA3FNHFI550SE

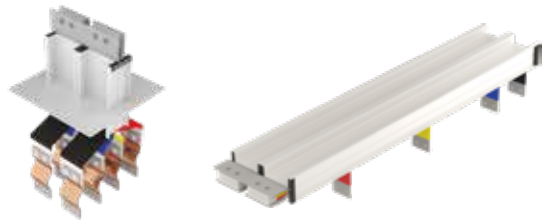
Panel Flange

Dimensions in mm						Flange	Panel Collar
Ampere (A)	B	C	D	I	J		
250A	470	250	-	-	30		
400A	470	300	-	-	60		
630A	470	300	-	-	90		
900A	470	300	-	-	120		
1000A	470	305	-	-	120		
1250A	470	350	-	-	100		
1350A	470	350	-	-	120		
1600A	470	400	-	-	150		
2000A	470	550	305	65	120		
2300A	470	470	265	65	100		
2500A	470	550	305	65	120		
3200A	470	700	365	65	150		
4000A	470	75	490	65	100		
4500A	470	800	595	65	100		
5500A	470	900	675	65	120		

Accessories - Transformer Connection

Ampere Rating (A)	Oil Type	Dry Type	Oil Type	Dry Type
250A	LSBA3FNHFI025SL3OT	LSBA3FNHFI025DT		
400A	LSBA3FNHFI040SL3OT	LSBA3FNHFI040DT		
630A	LSBA3FNHFI063SL3OT	LSBA3FNHFI063DT		
900A	LSBA3FNHFI090SL3OT	LSBA3FNHFI090DT		
1000A	LSBA3FNHFI100SL3OT	LSBA3FNHFI100DT		
1250A	LSBA3FNHFI125SL3OT	LSBA3FNHFI125DT		
1350A	LSBA3FNHFI135SL3OT	LSBA3FNHFI135DT		
1600A	LSBA3FNHFI160SL3OT	LSBA3FNHFI160DT		
2000A	LSBA3FNHFI200SL3OT	LSBA3FNHFI200DT		
2300A	LSBA3FNHFI230SL3OT	LSBA3FNHFI230DT		
2500A	LSBA3FNHFI250SL3OT	LSBA3FNHFI250DT		
3200A	LSBA3FNHFI320SL3OT	LSBA3FNHFI320DT		
4000A	LSBA3FNHFI400SL3OT	LSBA3FNHFI400DT		
4500A	LSBA3FNHFI450SL3OT	LSBA3FNHFI450DT		
5500A	LSBA3FNHFI550SL3OT	LSBA3FNHFI550DT		

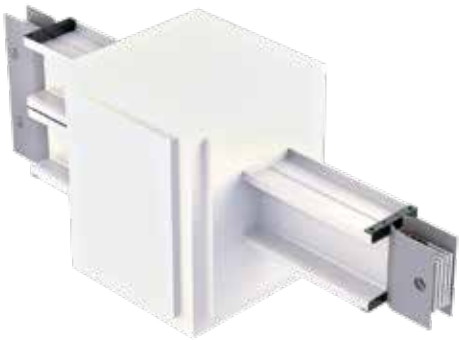




Accessories - Reducers

Non Protected Reducer

Non-protected reducers are used to reduce the capacity of busduct without protection device. No protection is required where busduct is reduced in size provided that the length of the smaller busduct is less than 15m and has a current rating of at least 1/3 of the larger busduct. The reduction is made by a patent joint design to make the reduction in minimum space.



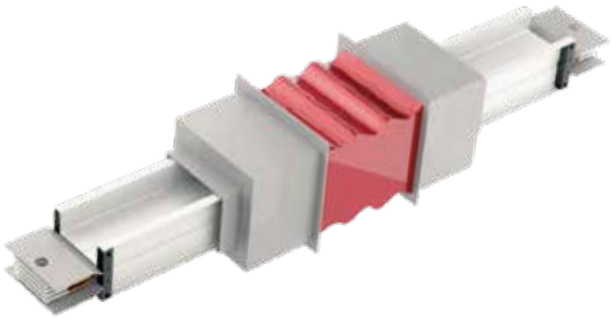
Protected Reducers

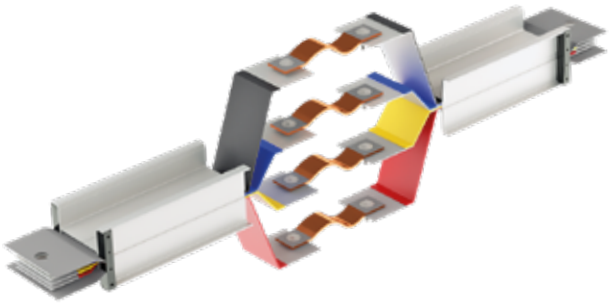
Reducer boxes with circuit breakers or fuses are used for protection and as a disconnecting means.

Reduction in bus capacity is made within the box .Minimum length of the protected reducer is 80cm.

Expansion Coupling

Lectro busduct is designed to expand as a load is applied and the temperature of the busbar increases. If the installation can accept this movement, then no expansion coupling is required. Generally, horizontal runs do not require expansion lengths. However, if both ends of the busduct are fixed, normal expansion is restricted. In this case, expansion coupling will be necessary. Expansion couplings are manufactured using a layered laminated flexible section bolted to the adjacent Bimetal conductors. Expansions are individually insulated within the truncking body and identified by means of a label attached to the side of the expansion length box.





Accessories

End Closure

End closures terminate a busduct run and can be used to close right or left ends. It is constructed from thick Fiberglass sheets laid between the busduct bars.

Vertical Hangers

A spring suspension type is used for vertical runs. This hanger equalizes the weight of vertically mounted busduct along all supports. These hangers compensate for expansion and contraction of the busduct . At least, one vertical hanger must be used for each floor.

Busduct Final Fit Piece

A final fit section of busduct is typically an elbow or a short length; left intentionally for later shipment. Its purpose is to effectively manage the dimensional uncertainties that may involve in busduct layout.

Fixation and Hangers

Horizontal Hangers

Angle Hangers are provided for every 1 meters of horizontally mounted busduct . The type of hanger supplied is determined by the specific mounting.

Feed Box

Feed units are used to supply power to the busduct. The box is made from sheet steel containing either connection strip, circuit breaker or fuses. However, it is recommended to feed busducts over 1600A directly from the distribution panel. The minimum length of the feed unit depends on the size of cables entering the box, but normally it is greater than 80cm.

Tap-offs

- An ON-OFF handle mounted on tap-off to operate the breaker without opening the cover.

The tap-off boxes are made from sheet steel painted with electrostatic paint or galvanized. Tap-off with breakers have the following precautions to ensure safe operation:

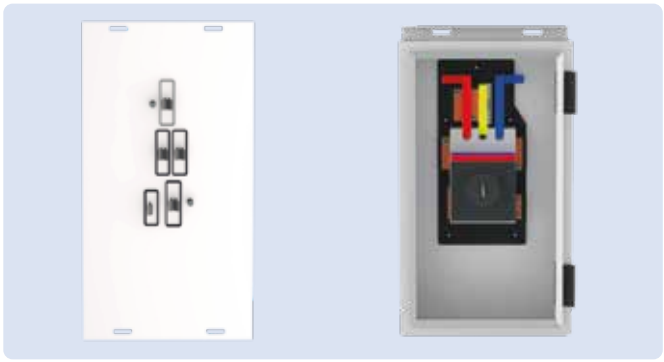
- A cover interlock to prevent opening while the tap-offs in the ON position
- An ON-OFF handle mounted on tap-off to operate the breaker without opening the cover
- A switch interlock to prevent putting the device into operation when the cover is open
- A safety interlock to prevent insertion or removal of the plug while in the ON position

To ensure that the tap-off plugs are seated onto the busduct, the box is equipped with a clamping mechanism.
This mechanism will draw the unit tight on to the busduct housing as the installer tightens the clamps. The contact resistance between plug pins and the tinned busbars is constant even after years of operation due to the high contact pressure.

Bolted On

Bolt-on tap-offs are used as power take-off up to 1600 A. When the required current is higher than the capacity of the plug-in, tap-off unit bolts directly to the contact surfaces of the busbar joint. This unit can carry either a circuit breaker or fuses.

Rated Current	X (cm)	Y (cm)	Z (cm)
Up to 63A (MCB)	25	20	15
Up to 160A	40	30	25
200A to 250A	50	30	25
320A to 400A	60	30	26
400A to 630A	70	30	26
Up to 800A	80	40	33
Up to 1000A	90	40	33



Electrical Data Sheet

Description

Casing	: Extruded Aluminium
Protection Degree (IP)	: Standard - IP54, Optional - IP55, IP65, IP67
Rated Insulation Volltage (V)	: 1000V
Rated Operation Volltage (V)	: up to 1000V
Rated Impulse Volltage (kV)	: 8kV
Frequency (Hz)	: 50Hz or 60Hz

Bimetal Aluminum Copper Clad

Ampere Rating (A)															
	250	400	630	900	1000	1250	1350	1600	2000	2300	2500	3200	4000	4500	5500
Short Circuit Current															
Short circuit current for 1sec (kA)**	10	15	35	45	45	50	50	60	80	100	100	100	100	100	100
Peak Short Circuit (kA)	20	30	73.5	94.5	94.5	105	105	132	176	220	220	220	220	220	220
Characteristics under normal operation															
Phase resistance (μΩ/m)	300	150	90.1	75.1	56.3	49.2	41	35.6	28.15	24.73	21.1	16.87	13.66	12.9	10.12
Phase reactance (μΩ/m)	13.5	13.25	13	12.33	12	22.37	20	15.44	6	8.08	9.39	5.7	6.7	6.18	3.49
Phase impedance (μΩ/m)	300.3	15.25	91.03	76.1	57.5	54	45.6	38.8	28.8	26	23.09	17.8	15.2	14.3	10.7
Casing resistance (μΩ/m)	39	36	33	30	30	28	26	16	15	14	13	11	9	8	6
Voltage drop for distributed load*(μV/m)/A (for Loading 75% or less) (A)															
CosΦ = 0.8	214.6	110.6	69.09	58.36	45.18	45.6	38.75	32.65	22.59	21.3	19.47	14.63	12.91	12.13	8.81
CosΦ = 0.9	238.18	124.8	75.09	63.15	48.39	46.8	39.53	33.59	24.19	22.33	20	15.3	13.17	12.39	9.2
CosΦ = 1.0	259.5	129.75	77.93	64.96	48.69	42.5	35.46	30.79	24.31	21.39	18.25	14.59	11.82	11.15	8.75
Voltage drop for distributed load*(μV/m)/A (full load current) (B)															
Phase resistance at full load (μΩ/m)	342	165	120	101	70	71.3	57.4	49.5	30	32.99	28.7	23.9	19	18	13.84
CosΦ = 0.8	214	110	89.78	76.29	54.66	60.9	50.1	42.26	25.63	27	24.7	19.49	18.11	15.66	11.38
CosΦ = 0.9	238.7	121.8	98.36	83.32	59	64	52.29	44.41	26.9	28.75	25.9	20.77	18.46	16.36	12.1
CosΦ = 1.0	259.5	129.75	103.8	87.36	60.55	61.67	49.65	42.81	25.95	28.53	24.82	20.67	16.55	15.57	11.97

*The value of the voltage drop is for distributed load.

For voltage drop in μ V/m multiply the table values by the actual current.

Shown values are line to line voltage drop.

Note: for current loading between 75% & full load take voltage drop average of both values (A+B)/2

DSLB Busduct Catalogue Numbering System

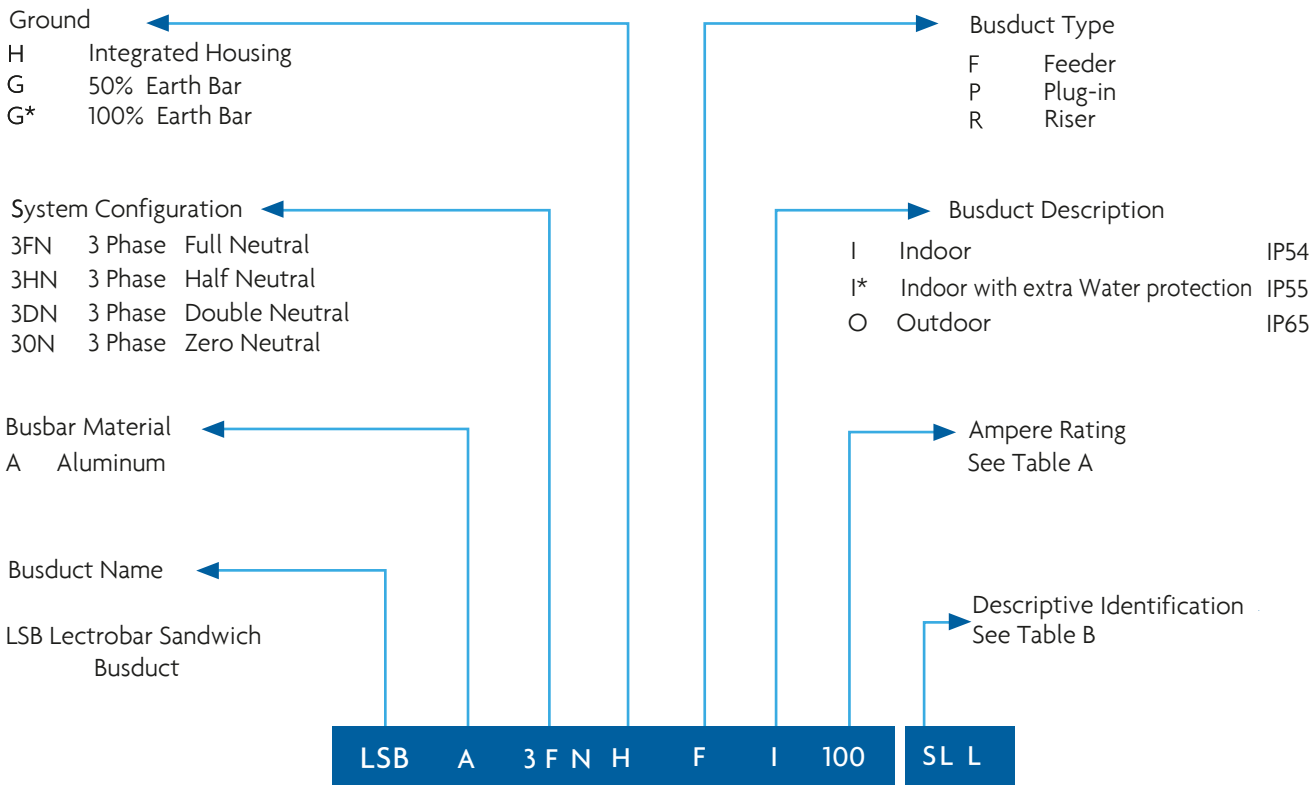


Table A

25	250
40	400
63	630
90	900
100	1000
125	1250
135	1350
160	1600
200	2000
230	2300
250	2500
320	3200
400	4000
450	4500
550	5500

Table B

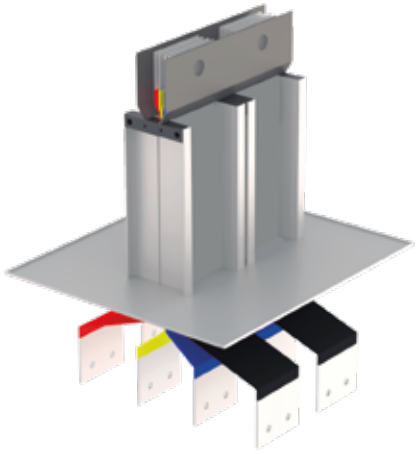
SL L	Straight Length of L meters
OSL L	Plug-in of L meters
EF XY	Flat Elbow with X,Y Dimentions
EE XY	Edgewise Elbow with X,Y Dimentions
OF XY	Offset Elbow-flat with X,Y Dimentions
OE XZY	Offset Elbow-Edgewise with X,Y,Z Dimentions
COE XZY	Combination Elbow with X,Y,Z Dimentions
CEE XY	Corner Elbow Edgewise with X,Y Dimentions
CEF XY	Corner Elbow Flat with X,Y Dimentions
TE XZY	T-Elbow Edgewise with X,Y,Z Dimentions
TF XZY	T-Elbow Flat with X,Y,Z Dimentions
CE XY	Cross Edgewise with X,Y Dimentions
CF XY	Cross Flat with X,Y Dimentions
TFOT L	Transformer Flange - Oil Type of L meters
TFDT L	Transformer Flange - Dry Type of L meters
SF L	Switchboard Flange of L meters
PR L	Protected Reducer of L meters
EX L	Expansion of L meters
FB L	Feed Box of L meters

LSB Series

Lectro Sandwich Busduct

Bimetal Aluminum Copper Clad

at Contacts



900 A

1000 - 1250 A

1600 A

2000 - 2300 A

2500 A

3200 A

4500 A

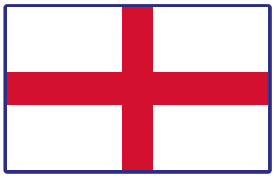
Certified DEKRA

KEMA KEUR

5000 - 5500 A

Lectrobar
OPTIMUM DESIGN

International Projects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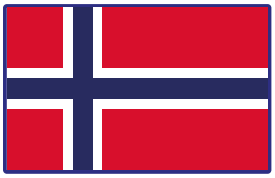
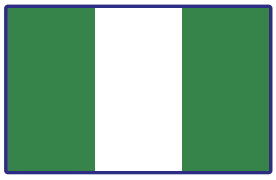
KOREA


NORWAY


U.A.E


KSA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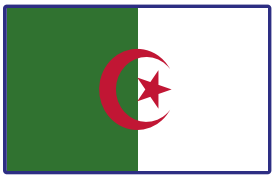
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IRAQ


OMAN

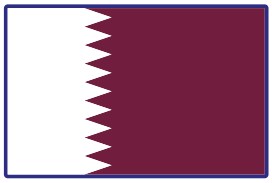

KENYA


TANZANIA


ZAMBIA


CHAD


JORDAN


QATAR


SUDAN


BAHRAIN