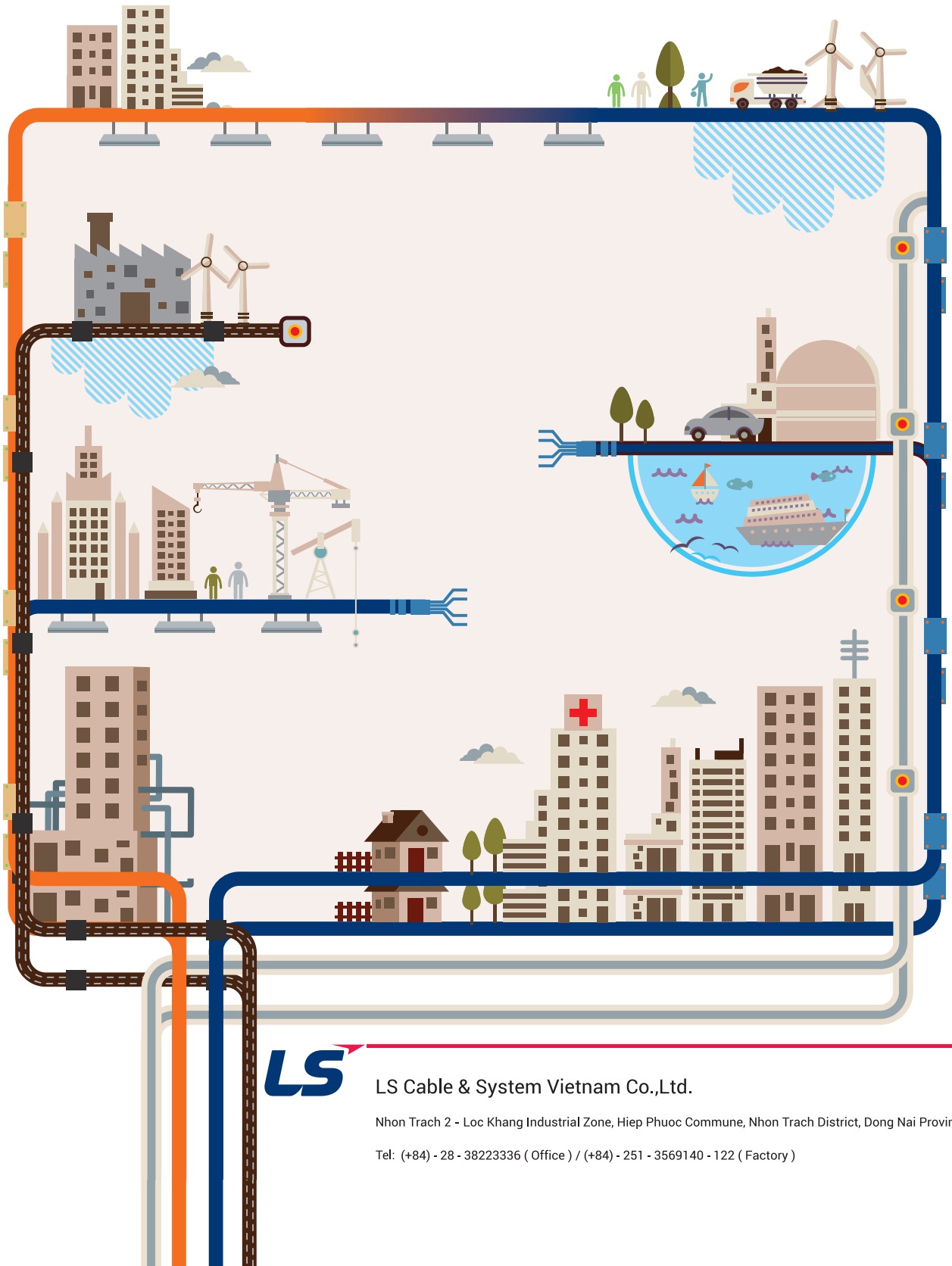
LS Cable & System

LS C&S Busduct System

I-series



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About **LS Cable & System**

**LS spun off from LG in 2003 as a group specializing in the Electrics, Electronics, Energy, and Material.
LS consists of about 40 affiliates including LS Cable & System, LSIS, LS-Nikko Copper, LS Mtron, Gaon Cable, E1 and Yesco.
A leading player in the global cable industry, with over half a century of experience as a manufacturer, providing consolidated expertise in the design and production of premium quality cabling technologies.**

LG

LS

- LS Cable & System
- LSIS
- LS Nikko Copper
- LS Mtron
- E1
- Yesco
- Gaon Cable

LG

- LG Electronics
- LG Chemical
- LG Display
- LG Telecom

GS

- GS Caltex
- GS Engineering & Construction
- GS Retail
- GS Homeshopping

Total Solution Provider for Electric Power and Telecommunication Industries

LS Cable & System, the longtime de facto holding company of LS Group, officially transformed into a holding company in July of 2008. The company's operations now encompass a total solution for electric power and telecommunication industries.

The latest change in corporate structure comes as the company is accelerating efforts to improve management efficiency in rapidly expanding markets. The move also results from efforts to effect a more responsible and transparent management structure. Management is now prepared to take more aggressive action to enhance our businesses and to identify new growth engines. The holding company will take the lead in fostering new growth engines and in identifying lucrative investment opportunities, while the company's other business units will focus on improving management and on making operations more efficient. With the continued support of the holding company, LS Cable & System will spearhead efforts to strengthen our business expertise, corporate competitiveness and management.

Enable the Cabled World!!

LS Cable & System, established in 1962, has been contributing to building power grids and communication networks first in Korea and then in countries all over the world by developing, producing and providing cables and related solutions used in daily life and throughout many industries. Furthermore, the company set the stage for industrial and economic development by capitalizing on our innovative technology to supply various special industrial cables and industrial materials.

We at LS Cable & System are now supplying state-of-the-art products, such as submarine, extra-high voltage, high temperature superconducting and communications cables to power authorities, heavy electric equipment makers and common carriers around the world. Our products can be seen throughout the Americas, Europe, the Middle East and Asia, so we are now recognized as a leading manufacturer serving global industries both in name and reality.

Based on our corporate philosophy, "LS Cable & System Way," we will go beyond simply generating profits to develop forward thinking competencies by innovating our business models, developing environment-friendly high-quality products and reinforcing our partnerships with stakeholders as the best partner that will maximize customer values. We will open a brighter future by innovating and investing in technologies that push the envelope and developing the best total solutions


LS Cable & System
Leading Solution

LS Cable & System
Busduct System Solution

Buildings

The LS C&S Busbuct system is easy to install, and ensures large capacity of energy transmission while providing space efficiency which makes the bus duct system ideal for high-rise buildings, office buildings, data centers and apartment complexes.

Plants

The full lineup Consists of NSPB, CAST RESIN and SIB that can cover up to 27kv, and the lineup thus enables us to provide our clients customized designs. The system is suitable for electrical rooms and power lines, and it features a real time monitoring system using the temperature and power monitoring system.

Data Center

The flexibility and expandability as well as easy maintenance property of the busduct 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.

Apartment Buildings

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

Hospitals

The stability of the power supply in the hospitals is perhaps the most vital element, because its failure could threaten the safety of patients.
The Busduct system distributes larger capacity of electric power, and provides stability of the loads which make it an ideal choice to satisfy the requirements of systematization of hospital complexes and larger hospital equipments.

Airports

In order to secure the stable power supply of the airport, the busduct system provides the best customized solutions by installing high voltage busducts at the transmission, transformation and power distribution lines, and by installing low voltage busducts at the cargo, the control tower and general commercial buildings.

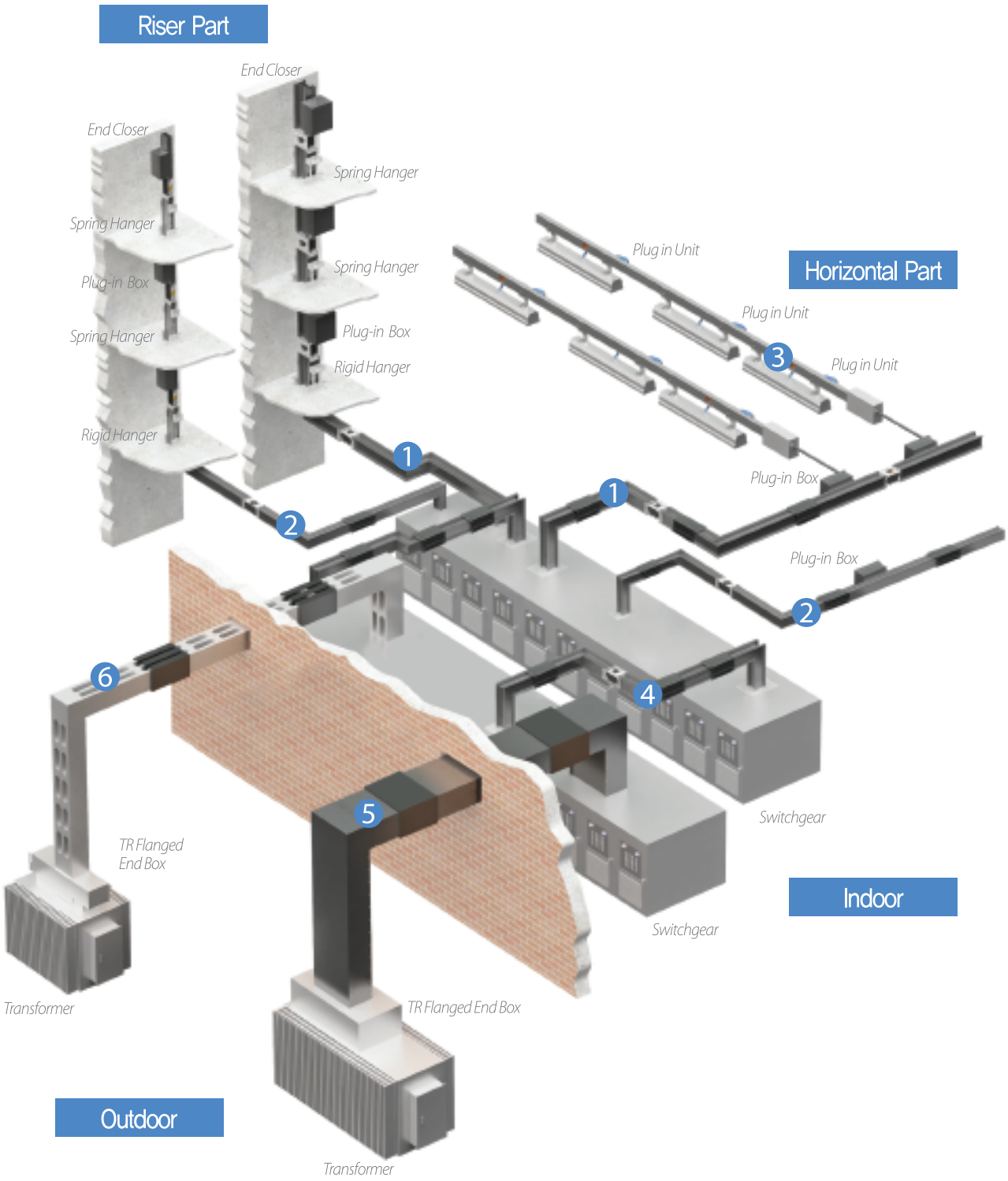
Stadiums

The needs for a busducts 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.

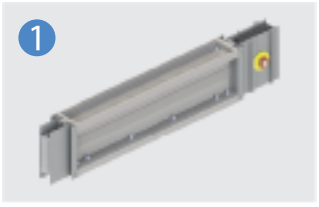
Marine & Wind

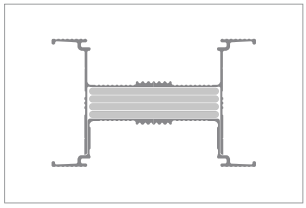
The compact and light weight design of the busduct satisfies the demands of the clients, and comes with an outstanding quack resistance property. The busduct provides stability to the operation of the facilities through a real-time monitoring system using a temperature and power monitoring system. As the needs for renewable energy grows, the demand for our busduct has been increasing teadily.

LS Cable & System Busduct Product Line-up



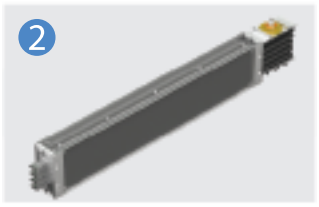
The LS Cable & System Busducts are available in a wide range of products from low current capacity LT-way (25A~63A) to large current capacity (630A~6300A), and the products enable the supply of proper capacity of power for factories and the distribution system. Our products such as the air insulated bus conducts with enhanced safety property and the cast resin busducts with resistance for high temperature, humidity and dusty environment will satisfy various application needs and provide a customized engineering service.

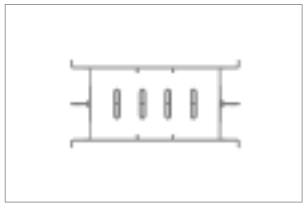




I-Series Busway

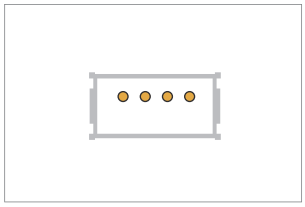
Sandwich Type (PET Film, Epoxy Coating, MICA)/AL Extrusion Housing/Standard IP54/Joint Kit
- Designed for low voltage products below AC 1000V, and between 630A to 6300A.
- The most widely used conventional model.





Mini-way

Air Insulated Type/AL Extrusion Housing/Standard IP54/Joint Kit
- Designed for low voltage products below AC 1000V, and between 160A and 800A.
- Ideal for small distribution system with multi distribution loads (Vertical areas of buildings, data centers, assemble factories)

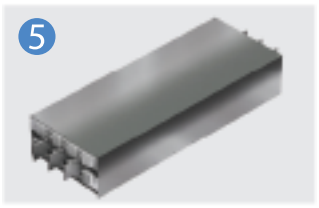


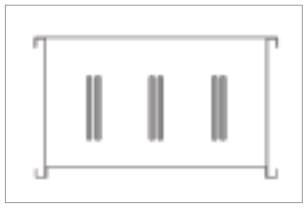
LT-way

Flat Wire Type/Copper Conductor with PVC Extruded Insulation/AL Extrusion Housing/Various Plug Types/Joint Brush
(It can be installed with a live wire.)
- Designed for low voltage products below AC 690V, and between 25A and 63A
- Suitable for Light bulbs, FFU and distribution for small equipments

MS/Wind-way

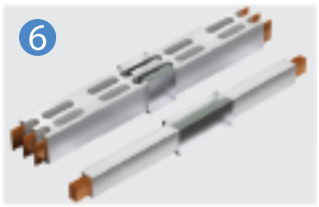
Air Insulated Type/ Compact NSPB Type / One-Bolting Type
Designed for low voltage products below AC 1000V, and between 1000A and 5000A
- A Hybrid incorporating NSPB and sandwich type
- Ideal for ships, wind towers and chemical plants where stability is required.





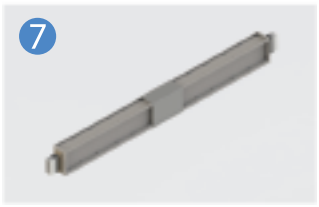
NSPB-LV/MV

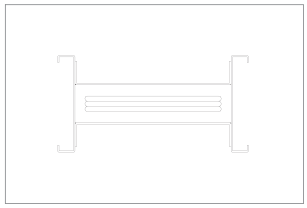
Air Insulated Type/Insulated conductors separated by phase/AL, STS and Steel Housing (optional)/Indoor Type/Outdoor Type
- NSPB-LV : Designed for low voltage products below AC 1000V,and below 4000A
- NSPB-MV: Designed for high voltage products below AC 27kV, and below 4000A
- Suitable for plants where high stability is required.



CR-LV/MV

- Cast Resin Type/IP 68/Epoxy Molding between Conductors
- CR-LV: Designed for low voltage products below AC 1000V, and between 630A and 6300A.
- CR-MV: Designed for high voltage products below AC 27KV, and below 5000A.
- The most safe bus duct suitable for plants where high stability is required.





CR-LV-II

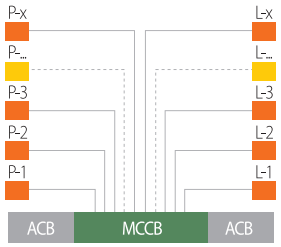
- Cast Resin Type/IP 68/Epoxy Molding between Conductors and Housing
- AL Housing(Steel and SUS as optional)/Indoor/Outdoor
- Designed for low voltage products below AC 1000V, and between 630A and 6300A.
- Suitable for area with high humidity or rapidly changing temperature
- Easily jointed with Sandwich type Busduct

Why Busduct?

Easy Distribution of Loads

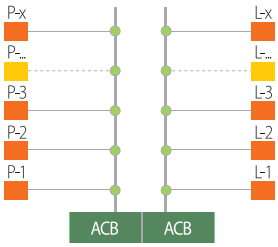
When supplying power using cables, each load has to be connected individually to cables which waste space, and an additional distribution panel is also required.
On the other hand, busducts are separated from a single line at a plug box which simplifies the electric power system. A MCCB can be installed at the plug box to effectively shut off fault current.

Cable Wiring System



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

Busduct Wiring System

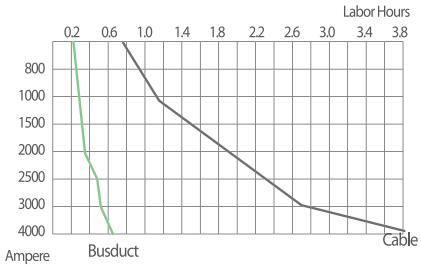


- One –to-many correspondence of power supply for specific power supply
- Additional lines are not necessary in case of a load change

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

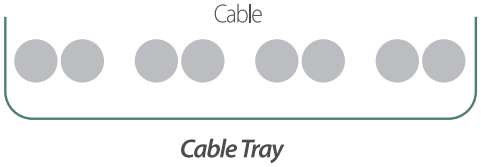
Easy Installation

Pulling and cable tray installation for cables can be difficult, and requires a longer construction period, therefore increases the cost. On the other hand, the busducts use a simple installation method to connect specific length of products, which requires a shorter installation period, and is economically friendly.



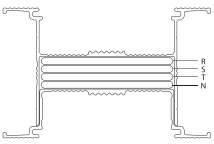
Compact

The compact design of the busduct 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 busducts use proper fittings to maximize space efficiency.



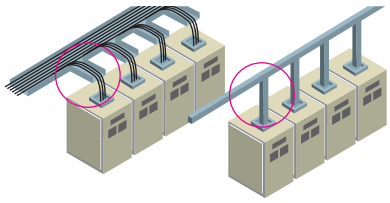
Cable Tray

The space required reduces by 50%



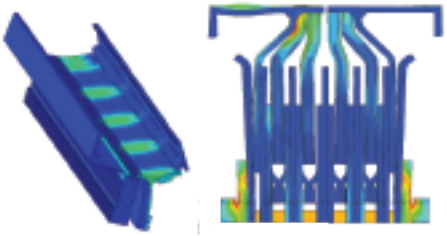
Adaptability to various installation environment with convenience

The busduct system is a power distribution system and can be applied to various complex routes. The busduct system comes with various fittings such as elbow, off-set and tee, and can transmit high capacity currents without electrical and mechanical loss.



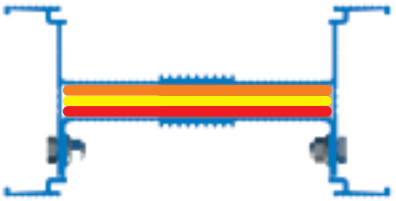
Excellent short circuit strength

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



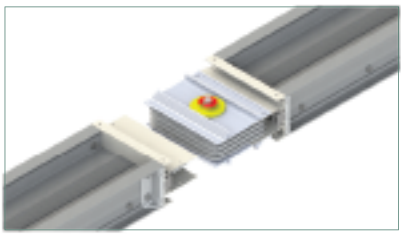
High current density

Cables are connected directly to electric loads using racks. Its maximum allowable current ampacity limit is 1000A, and requires additional lines for a higher current. Each line of the busduct system can transmit up to 6300A, and provides high current density.



Easy maintenance

The design of the busduct 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.



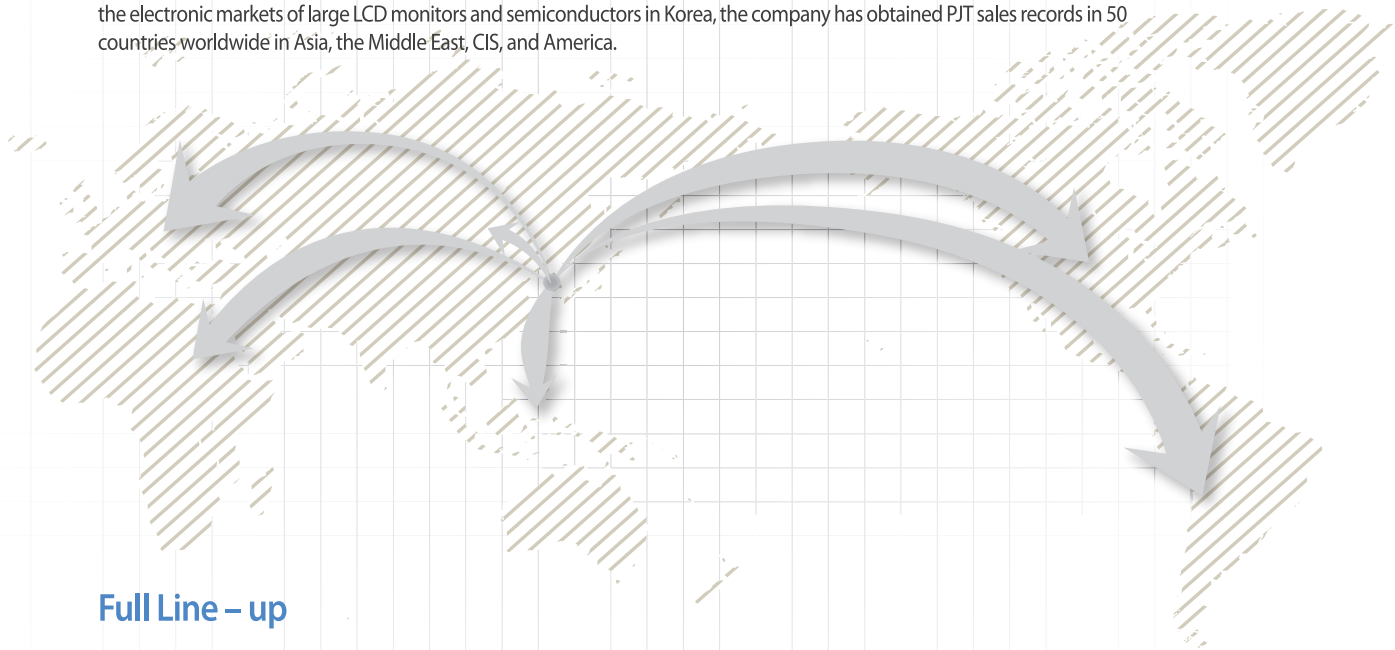
Outstanding features of EMC and EMI

Unlike cables, the busduct system does not require a shield, instead Busduct, the housing itself performs as a shield which enhances the features of EMC and EMI.

Why LS Cable &System Busduct

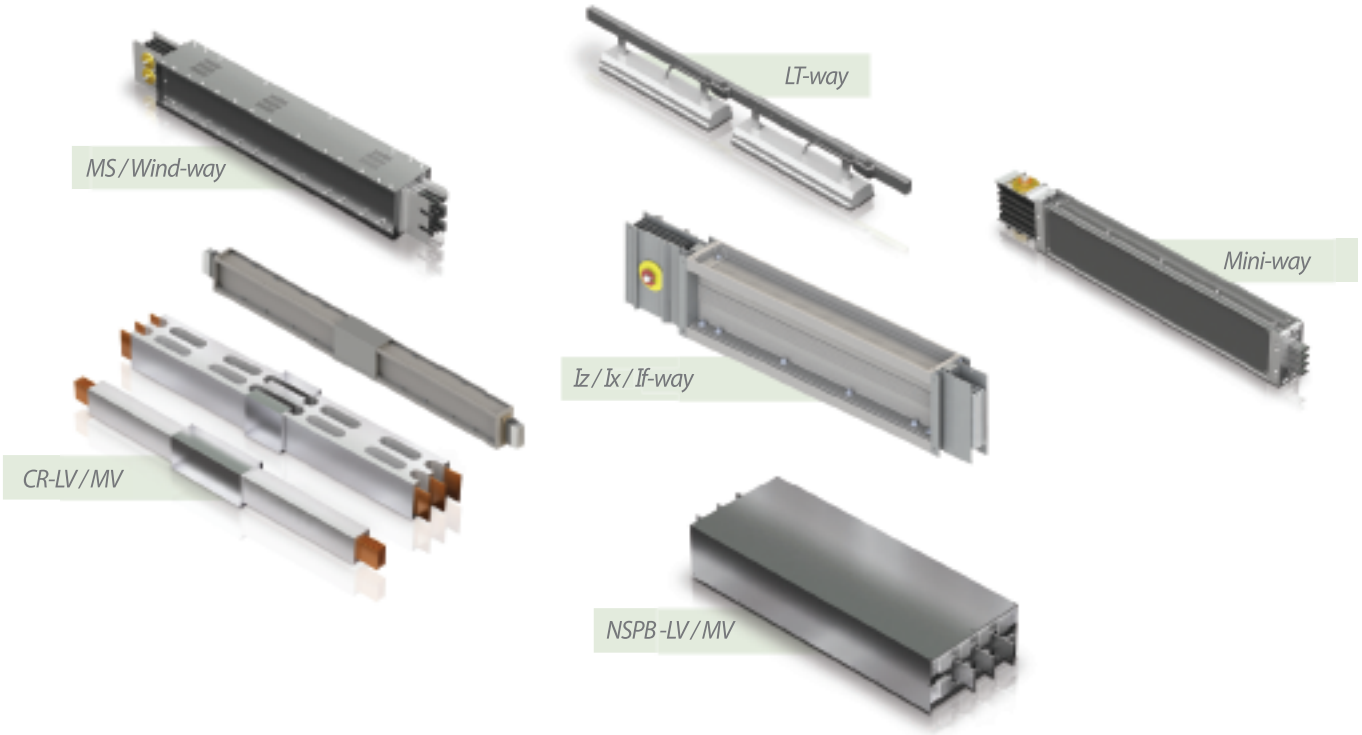
Global Top Tier

LS Cable & System has been a long-time leading Busduct provider in korea. With extensive experience and product line competitiveness, the company provides total solutions for each application to satisfy the needs of its clients. Using its expertise in the electronic markets of large LCD monitors and semiconductors in Korea, the company has obtained PJT sales records in 50 countries worldwide in Asia, the Middle East, CIS, and America.



Full Line – up

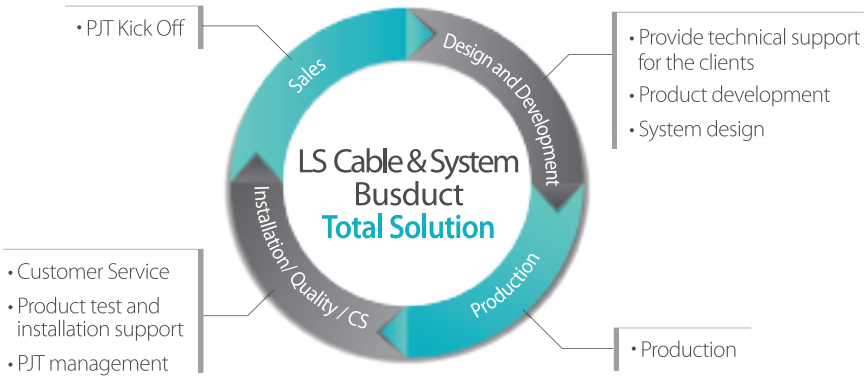
LS Cable & System is the only global company that provides a full line-up of busducts, from low to high voltage and from low to high capacity, to satisfy every need of its clients and provide an optimized solution for each PJT.



Total Solution

- Once PJT launches, our engineer will participate to guide the clients from the initial period in order to produce the best system for our clients, and to respond quickly when the system is changed.
- Our engineers from each department provide full support in design, production, installation and testing at in-bound to satisfy our clients.
- We operate the CS Team, a task force for the busduct system, to make sure efficient after-sale service and maintenance service.

Process



Technical Excellence

Unparalleled Reliability

- Provides standardized design, and owns numerous certifications such as UL Certification, Quack Proof Certification, and Impact Resistance Certification
- The CS team, a task force for the busduct system, provides efficient after-sale service
- Safe use in hazardous zones
- Manage the system using a unique temperature monitor sensor
- Semi-permanent service life
- Used 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

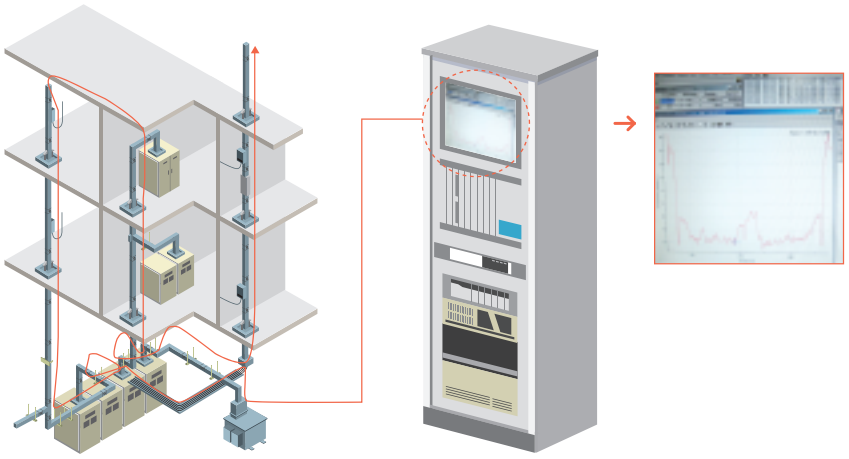
Total Engineering Technology

- Provide the optimal design by experienced engineers
- Design following analysis and inspection of CAE
- Unique and exclusive design program for the busduct 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
- Reduce electromagnetic
- BPMS (Busduct Power Monitoring system)
- BTMS (Busduct Temperature Monitoring system)

The Busduct Temperature Monitoring System
(BTMS : Busduct Temperature Monitoring System)

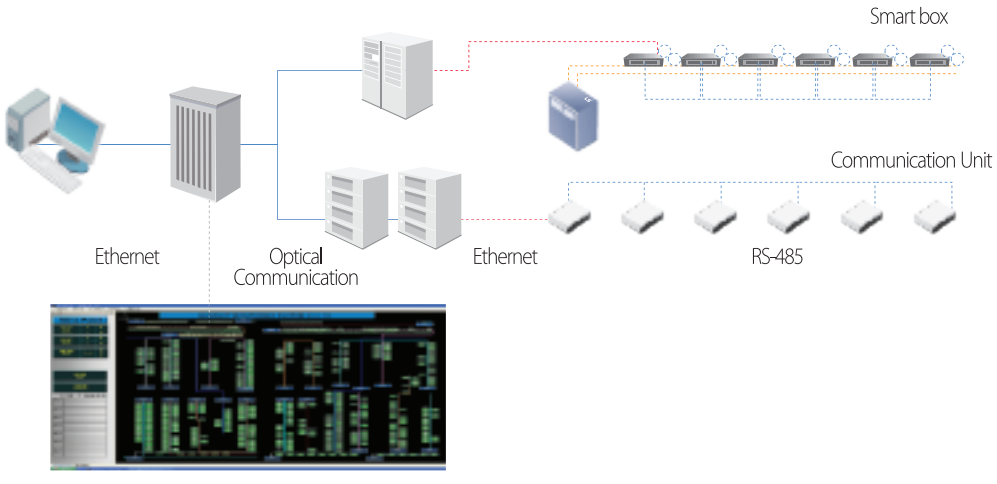
The busduct is a large capacity power distribution system. The insulation of the duct has to stay stable when the Joule lines occur during a power supply of the conductor. The rated current will be set by the insulation type and the temperature rises. These properties of the busduct make it possible to monitor and manage abnormalities of the system by checking the temperature of specific areas of the system.

The temperature monitoring system uses various temperature sensors such as optical fiber cable, IC electric chips and thermo-graphic cameras. Specific areas like the entire system line, joints, plug-in boxes and cable connection can be monitored at the central monitor room using various methods on request.



The Busduct Power Monitoring System
(BPMS : Busduct Power Monitoring System)

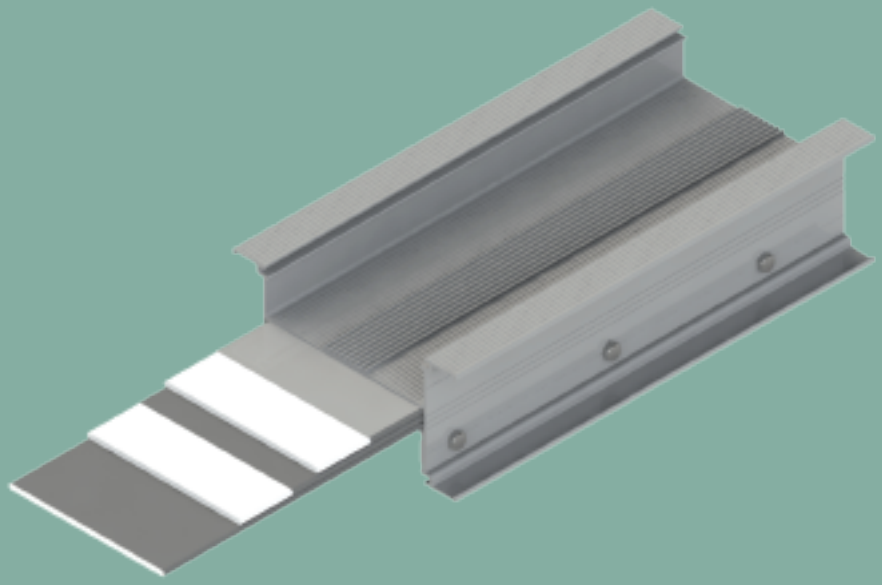
The ongoing trends of the busduct system are more than a simple power supplying system. The growing trend is; 1) the stability of the power system, 2) unmanned system,3)cost cutting, and 4)green and smart grid. While the SCADA system monitors and controls the power of the main system, the BMS monitors low loads of the sub system. The frequency of the resent electrical accidents is higher at the sub system than at the main system. Therefore, the preference for the BMS system has been increasing.



<Monitor Program>

I-SERIES BUSWAY

LS C&S Busbuct System Catalogue



Contents

Overview

The I-Series

The LS C&S I-Series Busducts are designed to carry voltage range below AC 1000V, and to carry the current range of 630A to 6300A. Joint kit connections provide more space to connect which reduce the contact resistance to its minimum while connecting products. LS C&S I-series Busduct comes with a standard IP54rating; however, it can be upgraded to an indoor or outdoor IP65 rating on request. E-Series Busducts have three different types of insulation using polyester film, mica film, or epoxy powder.

Compact Size

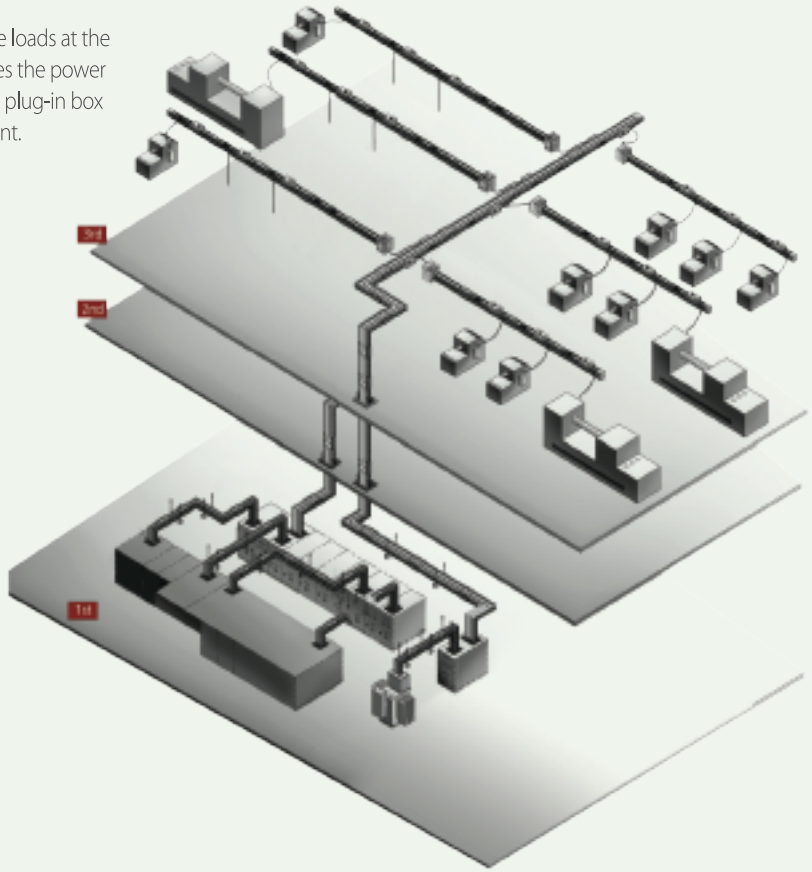
LS C&S I-Series Busduct uses an effective heat radiating housing profile which allows the size of the conductors to be smaller than the existing Busduct models. The light weight of the Busduct also allows easier installation and requires less space.

Economical and Easy Installation

LS C&S I-Series Busduct uses aluminum housing and joint kit connections which enable easy installation with less time and low cost.

Easy Distribution of Loads

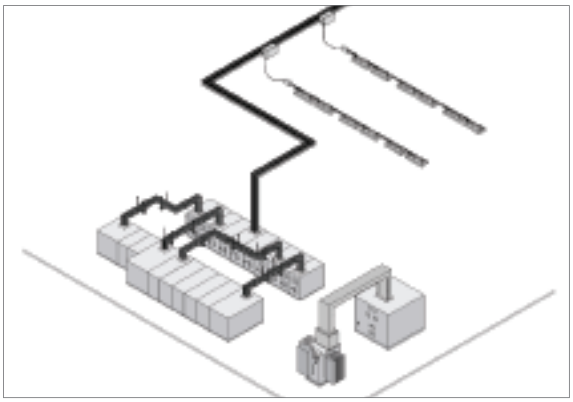
LSC&S I-Series Busduct can directly distribute the loads at the plug-in box using a single line, and thus simplifies the power supply system. The MCCB can be installed in the plug-in box on request to effectively shut off the faulty current.



Application

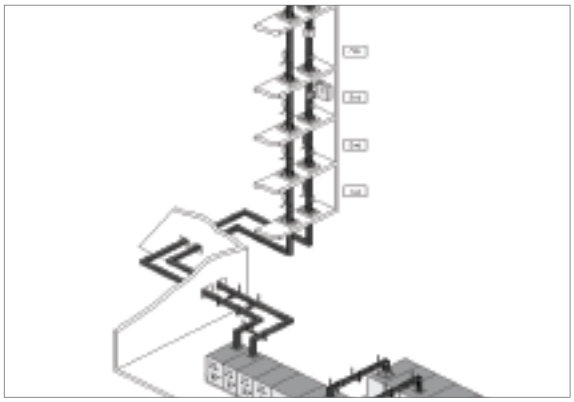
Electrical Rooms

- The busduct 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.



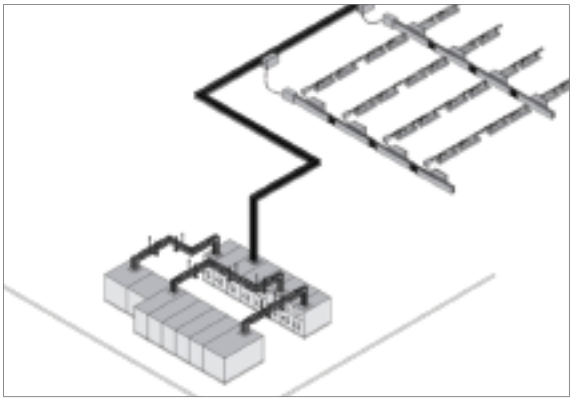
Commercial / Housing Building etc.

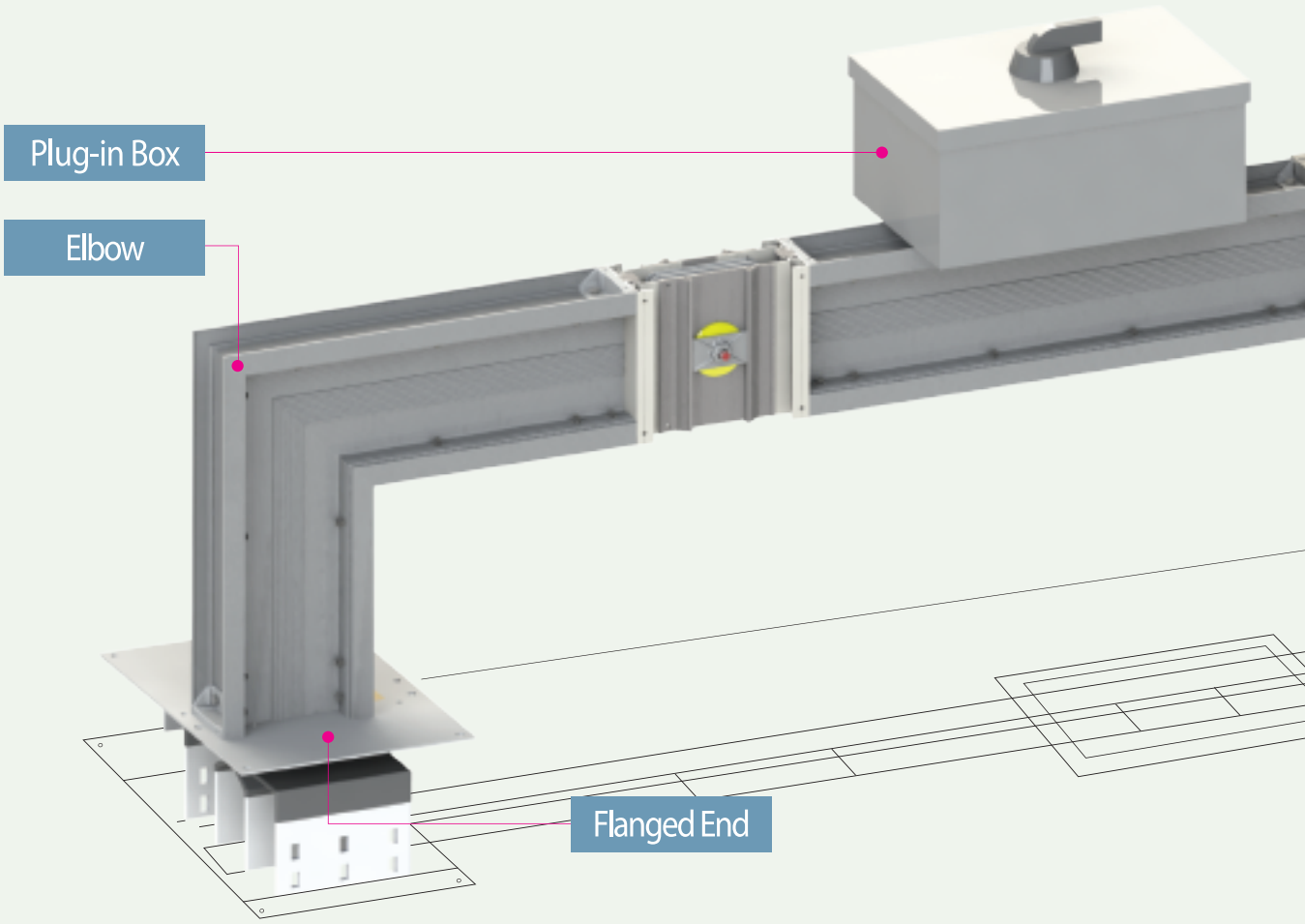
- Provides excellent space efficiency.
- The busducts can be applied to high-rise buildings, office buildings, and data centers.
- Multi-box can be applied on request.



Factory / Plant etc.

- The busducts 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 easy maintenance.
- The busducts provides high space efficiency, and allows a significantly reduced installation period.





High Current Density

The busduct has a compact design compared to the existing models by using an effective heat-radiating housing profile and can carry from 630A up to 6300A with reduced loss of electric power. It is an ideal power distribution system that provides high efficiency, stability, economy-friendliness and convenience. The design of the conductor allows flexibility to extend and relocate depending on the environment.

Eco - Friendly

The LS C&S Busbucts acquired RoHS certification, and only uses components without hazardous substances such as lead, cadmium, mercury, chrome, PBBs and PBDEs.

Low Voltage Drop and High Short Circuit Strength

Thanks to the optimum design, power can be transmitted with the greatest possible efficiency, and the resultant voltage drop is low due to extremely low impedance. In addition, the LS C&S Busducts is designed to have high short circuit strength.
Reinforced type is available. contact our engineering staff

Standard

- IEC 61439-1 [(previous standard)IEC 60439-1] Power Switch gear and Control gear Assemblies
- IEC 61439-6 [(previous standard)IEC 60439-2] Busbar Trunking Systems
- BS EN 61439 Busways
- NEMA BU 1.1 Busways
- AS / NZS 3439.2

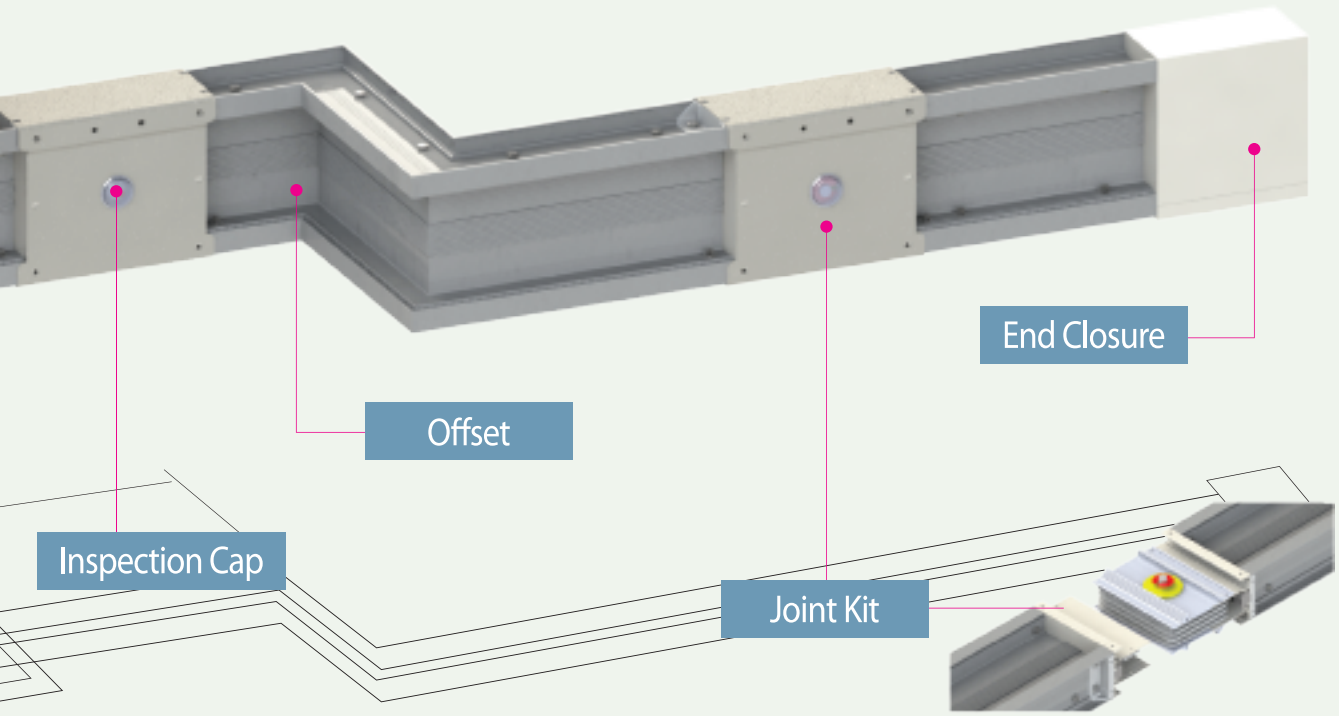
Permissible Operating Temperature

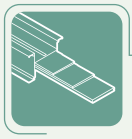
The cross sectional areas of the conductor and housing profile are designed to meet the standard permissible operating temperature of IEC 61439-1 and 6. Therefore the temperature rise limit of the housing is within 55K or less of the ambient temperature.

Service Condition

- Ambient Temperature : -15°C ~ 50°C
- Relative Humidity : 95% or below

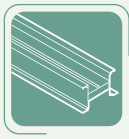
(When the service condition of the environment does not meet the requirements listed above, please contact our design team.)





Conductors

The I-Series uses either copper conductors with conductivity over 98% and purity over 99.9%, or aluminum conductor with conductivity over 61% and purity over 99.6%



Housing

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

Insulation Properties

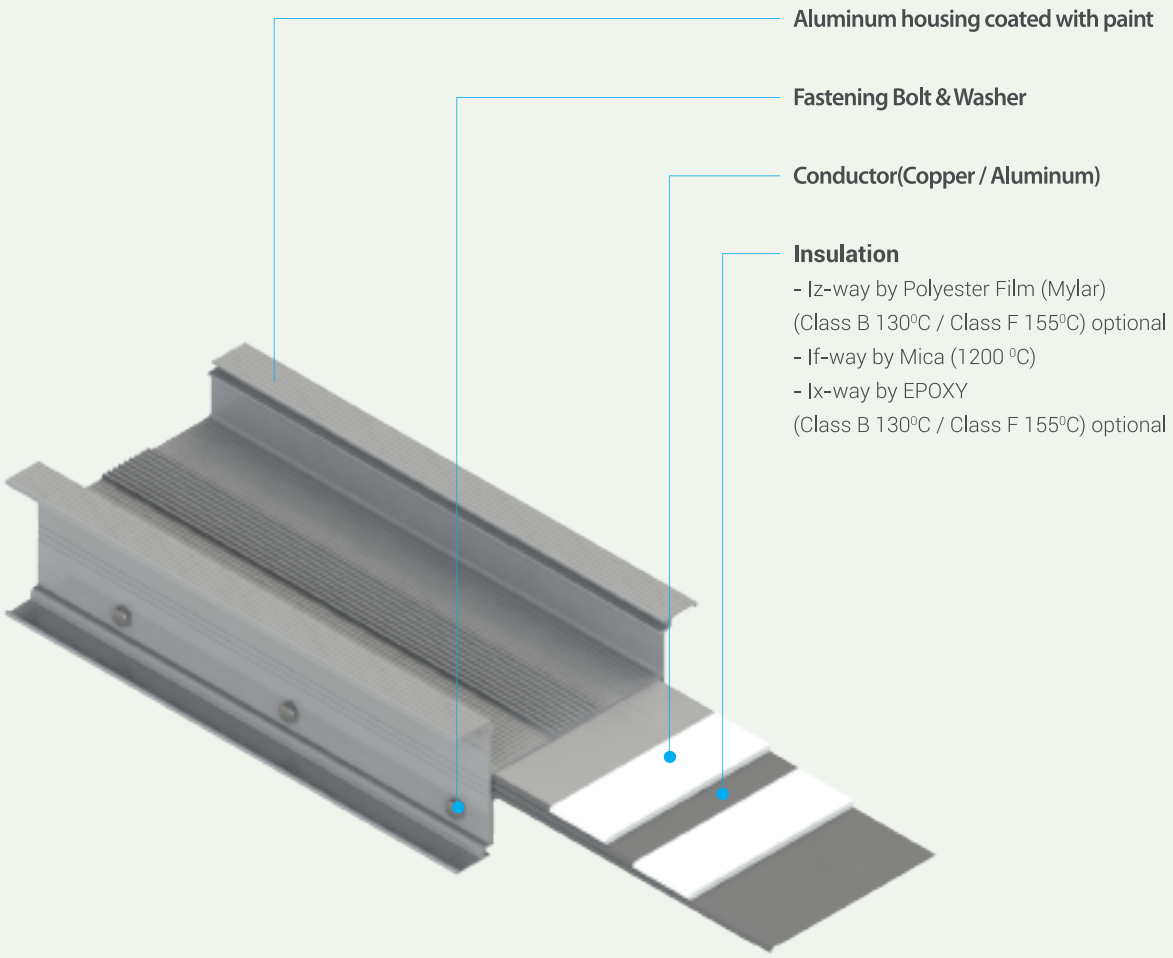
An insulator of thermal class rating Class B(130°C) (Class F(155°C) optional) is applied to the I-Series. Other insulation options such as Epoxy, PET and MICA (Fire proof up to 1200°C) are also available. FRP (Fiber Reinforced Plastic) with high dielectric property is used as insulation at the connection which performs as insulation between phases and housing.

Connection

• **Kit :** DH (dual head) bolts and Visible-label (Redtag) Check for installation using the contact
To exert a uniform force on the entire connection can Disc Spring A structure. (Assembly Torque 800 ~ 1000kgf.cm)

General Specifications

I-series Busduct uses insulation with a thermal class rating over 130°C for each phase. A sandwich type design is applied to the Busduct to protect the aluminum housing, and it can be used at the voltage range of AC 1000V or less, and the current range between 630A to 6300A. It is designed to use a joint kit connection and general IP54 rating.



Joint Connection

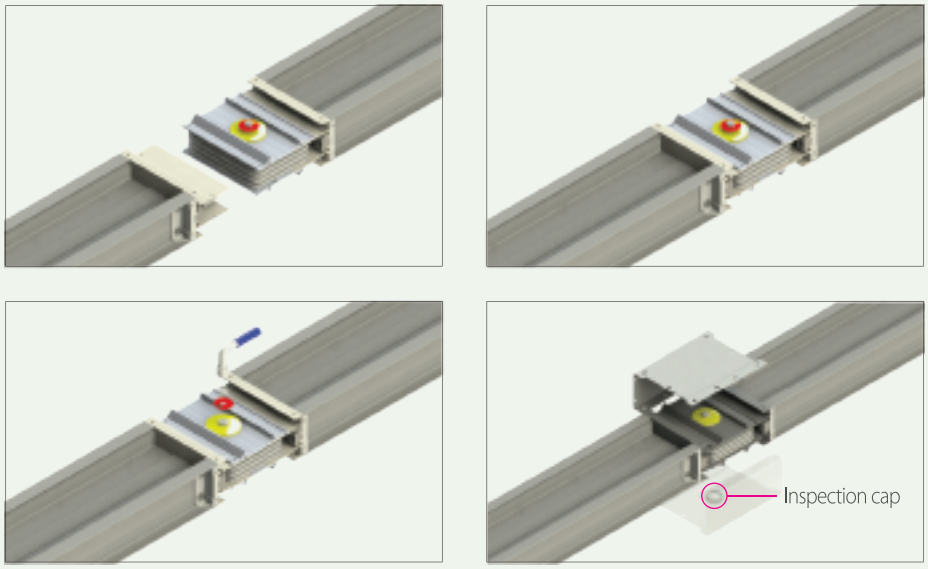
Feature

Both joint plates of the joint kit and the conductors are tin plated. (A silver plated option is available.)
It prevents the joint plate from discoloration and corrosion. 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 800 to 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 800kgf . cm using a torque wrench.
After installing joint cover, 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	3	4	6
Ampere (A)	AL	630, 800, 1000, 1250, 1600	2000, 2500, 3200	5000	4000	6300
	CU	630, 800, 1000, 1250, 1600, 2000	2500, 3200, 4000	5000, 6300	-	-

Precaution

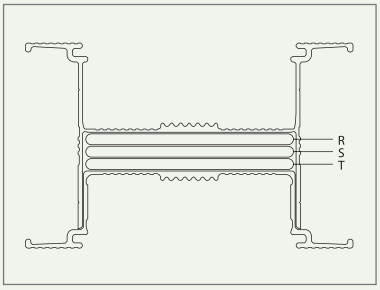
Be sure to clean the interior of the connections prior to installation. Use caution not to twist the joint kit while inserting it, and after it is inserted.
An excessive pressure during installation may break the kit.
Make sure that the double-headed bolts and the red tags are intact.
If proper torqueses are not applied at the connection, it may cause heat during operation.

Grounding and Harmonics

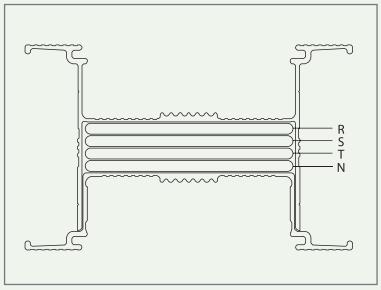
I-Series Busduct comes with aluminum housing, and the cross-section area of the housing is over 100% of each phase conductor. Therefore, the aluminum housing alone works as 100% or more of ground bar, and the housing also improves the heat radiation of the conductors.

If increased ground capacity is required, additional internal ground bars can be added to the assembly, providing a 50% or 100% increase in ground path.

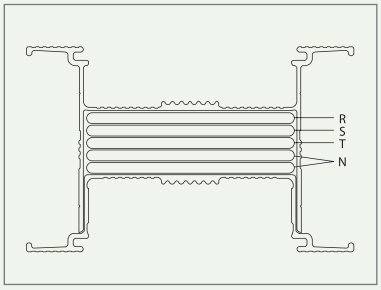
The 200% N type Busduct is used for a nonlinear load that generates harmonic current. Lately, the needs for non-linear loads at the power distribution system of buildings are increasing due to the increase of office automation and computer facilities. The harmonic current produced by the system can flow more than 100% of over current at phase N. The LS C&S 200% N type busduct is safe to be used at the distribution system where the harmonic current can be generated.



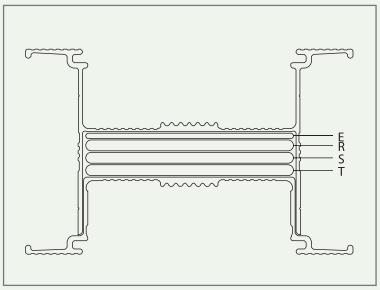
[3W+GE]



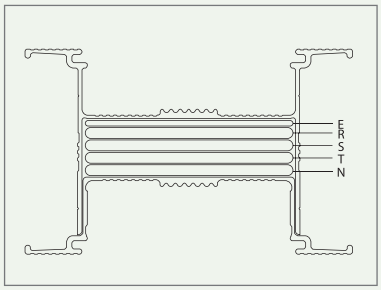
[4W+GE]



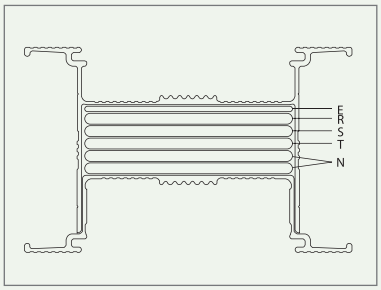
[4W(200%N)+GE]



[3W+HE(50%E), FE(100%E)]



[4W+HE(50%E), FE(100%E)]



[4W200%N)+HE(50%E)]

Plating/Coating

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.

Coating

In order to improve heat radiation and to prevent corrosion, as well as to fit in with the surroundings, we apply polyester-epoxy (hybrid) power coating after treating the surface. A wide range of color is available to meet the needs of our clients.

*Standard color : Munsell 5Y7/1

IP Code (Degree of Protection)

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

NEMA STANDARD : • IP54=NEMA 12, 12K, 13 • IP55=NEMA 3, 3X, 3S, 3SX • IP66=NEMA 4.4X • IP67=NEMA 6
* As the standard differs, it is a similar substitution, not 1:1 substitution.

The degree of protection against water of the LS C&S I-Series is a standard IP54; however, it can be adjusted from IP42 to IP65 depending on the environment and on request.

IP □ □

Solid Particle Protection

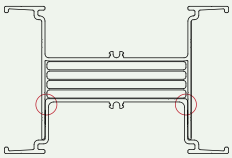
- 0 No Protection
- 1 Protection against 50mm diameter solid particles. (back of a hand)
- 2 Protection against 12mm solid particles. (fingers)
- 3 Protection against 2.4mm solid particles. (tools or thick wires)
- 4 Protection against 1mm solid particles. (tools or most wires)
- 5 Protection against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

Liquid Ingress Protection

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

Degree of Protection IP54

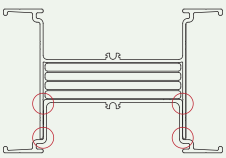
IP54 is applied to the feeder, plug-in and tap-off, and can be used during water leakages and near sprinklers.



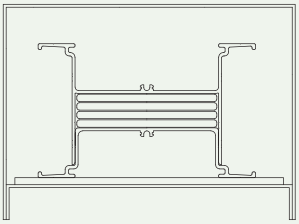
Indoor

Degree of Protection IP55/IP65 (Indoor/Outdoor)

With the IP65 rating, the busduct is ideal for corrosive environments. The special sealing between the housing sections seals off water, dust and gasses.



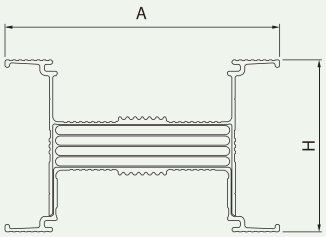
Indoor Type
(IP55/65)



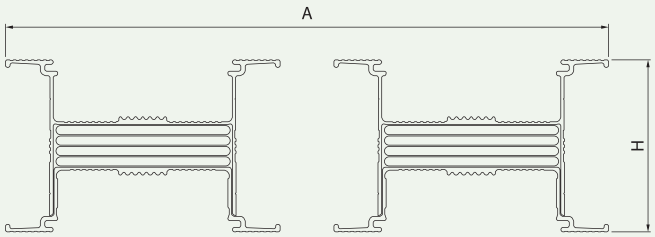
Outdoor Type
(IP65)

Feeder

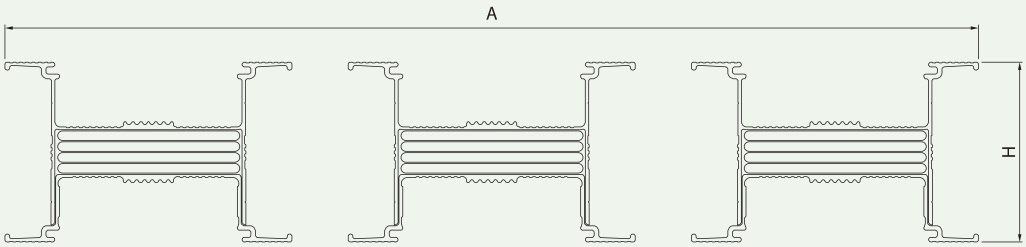
Sectional View



[Fig. E1-1]



[Fig. E1-2]



[Fig. E1-3]

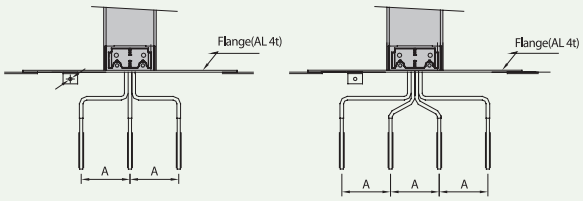
AL Rating(A)	Dimension (mm)	Weight(kg/m)				CU Rating(A)	Dimension (mm)	Weight(kg/m)				Fig.
	A	3W	3H	4W	4H		A	3W	3H	4W	4W	
630	107	6.93	7.50	7.69	8.50	630	112	8.75	9.69	10.45	11.72	E1-1
800	117	7.77	8.43	9.13	9.63	800	127	10.41	11.56	12.54	13.74	
1,000	137	9.37	10.25	11.26	11.86	1,000	147	12.73	14.27	15.54	17.14	
1,250	162	11.45	12.64	13.95	14.78	1,250	147	17.62	20.01	22.05	24.61	
1,600	197	14.67	16.23	17.82	19.09	1,600	167	21.32	24.33	26.85	30.03	
2,000	242	18.43	20.51	22.67	24.32	2,000	207	28.59	32.64	36.16	40.51	
2,500	357	23.42	25.93	27.74	30.36	2,500	327	36.25	41.36	45.43	47.00	E1-2
3,200	427	29.89	33.15	35.55	39.04	3,200	367	43.41	49.66	54.71	57.84	
4,000	517	37.39	41.70	44.91	49.47	4,000	447	58.41	66.90	73.96	80.57	
5,000	687	47.74	53.14	57.16	62.74	5,000	597	70.62	80.96	89.27	96.28	E1-3
6,300	822	59.08	65.68	69.83	78.52	6,300	717	93.90	107.72	119.04	128.81	

* H : 107.5(3W+GE, 3W+50%E) / 115(4W+GE, 4W+50%E) / 130(4W+100%E)

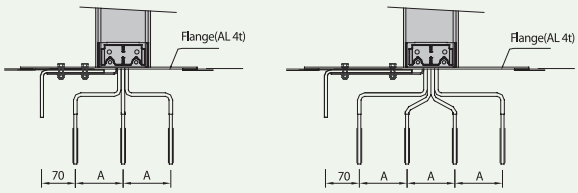
Flanged End

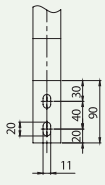
Flanged end is connected to either a transformer or panel. Dimension details are listed below.

Flanged End(GE)

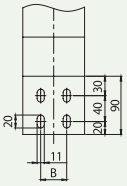


Flanged End(50%, 100%E)

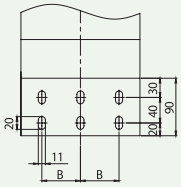




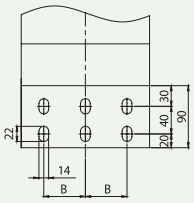
[Fig. E2-1]



[Fig. E2-2]



[Fig. E2-3]



[Fig. E2-4]

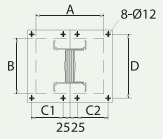
AL Rating(A)	Dimension(mm)		Fig.
	B	A	
630	-	100	E2-1
800	-		
1,000	40		E2-2
1,250	50		
1,600	40		E2-3
2,000	60		E2-4
2,500	50	130	E2-2
3,200	40		E2-3
4,000	60		E2-4
5,000	50		E2-3
6,300	60		E2-4

CU Rating(A)	Dimension(mm)		Fig.
	B	A	
630	-	100	E2-1
800	-		
1,000	40		E2-2
1,250	40		
1,600	50		
2,000	50		E2-3
2,500	40	130	E2-2
3,200	50		
4,000	50		E2-3
5,000	50		E2-2
6,300	50		E2-4

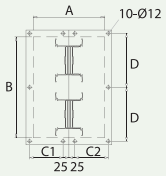
* Contact our engineering staff for more detail

Flanged End

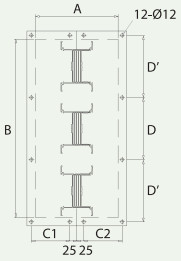
Drilling Pattern for Flanged End



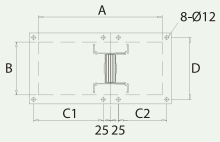
[Fig. E3-1]



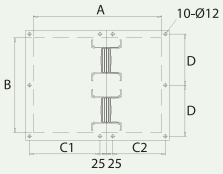
[Fig. E3-2]



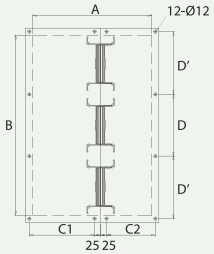
[Fig. E3-3]



[Fig. E4-1]



[Fig. E4-2]

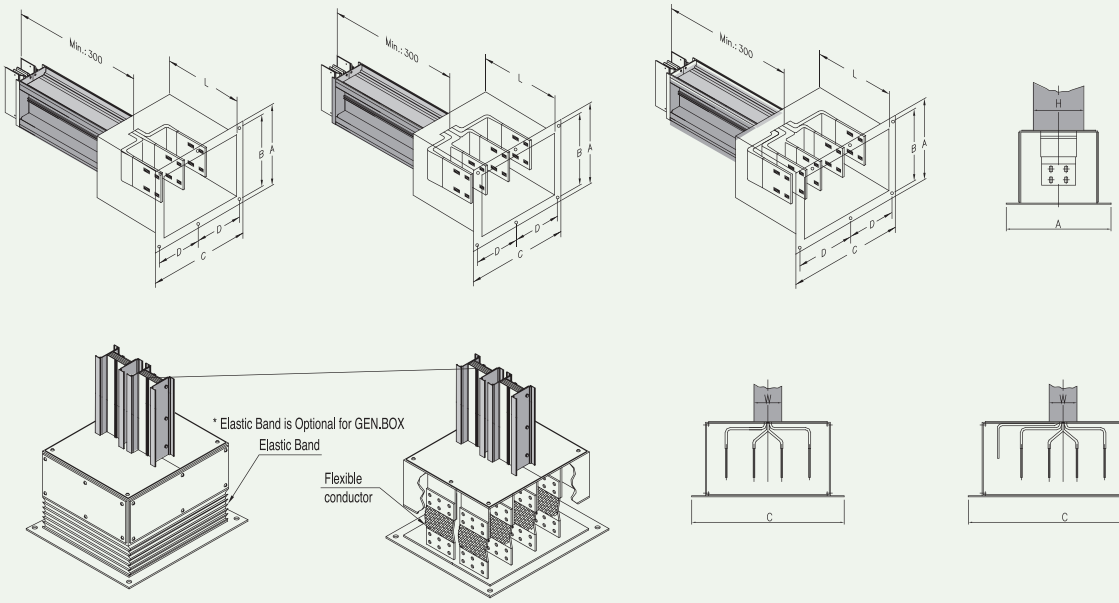


[Fig. E4-3]

Ampere (A)		3W Dimension(mm)					4W Dimension(mm)					Fig.	4W+50%E/100%E Dimension(mm)						Fig.
		A	B	C1,C2	D	D'	A	B	C1,C2	D	D'		A	B	C1	C2	D	D'	
AL	630	240	121	110	151	-	340	121	160	151	-	E3-1	410	121	230	160	151	-	E4-1
	800	240	131	110	161	-	340	131	160	161	-		410	131	230	160	161	-	
	1,000	240	151	110	181	-	340	151	160	181	-		410	151	230	160	181	-	
	1,250	240	176	110	206	-	340	176	160	206	-		410	176	230	160	206	-	
	1,600	240	211	110	241	-	340	211	160	241	-		410	211	230	160	241	-	
	2,000	240	256	110	286	-	340	256	160	286	-		410	256	230	160	286	-	
	2,500	300	371	140	200.5	-	430	371	205	200.5	-	E3-2	500	371	275	205	200.5	-	E4-2
	3,200	300	441	140	235.5	-	430	441	205	235.5	-		500	441	275	205	235.5	-	
	4,000	300	531	140	280.5	-	430	531	205	280.5	-		500	531	275	205	280.5	-	
	5,000	300	701	140	241	245	430	701	205	241	245	E3-3	500	701	275	205	241	245	E4-3
	6,300	300	836	140	286	290.5	430	911	205	285	290.5		500	836	275	205	286	290	
CU	630	240	126	110	156	-	340	126	160	156	-	E3-1	410	126	230	160	156	-	E4-1
	800	240	141	110	171	-	340	141	160	171	-		410	141	230	160	171	-	
	1,000	240	161	110	191	-	340	161	160	191	-		410	161	230	160	191	-	
	1,250	240	161	110	191	-	340	161	160	191	-		410	161	230	160	191	-	
	1,600	240	181	110	211	-	340	181	160	211	-		410	181	230	160	211	-	
	2,000	240	221	110	251	-	340	221	160	251	-		410	221	230	160	251	-	
	2,500	300	341	140	185.5	-	430	341	205	185.5	-	E3-2	500	341	275	205	185.5	-	E4-2
	3,200	300	381	140	205.5	-	430	381	205	205.5	-		500	381	275	205	205.5	-	
	4,000	300	461	140	245.5	-	430	461	205	245.5	-		500	461	275	205	245.5	-	
	5,000	300	611	140	211	215	430	611	205	211	215	E3-3	500	611	275	205	211	215	E4-3
	6,300	300	731	140	251	255	430	731	205	250	255.5		500	731	275	205	251	255	

* Contact our engineering staff for more detail

Flanged End Box / Feed in Box



Ampere (A)		3W Dimension(mm)				4W Dimension(mm)				4W+50%E/100%E Dimension(mm)			
		A	B	C	D	A	B	C	D	A	B	C	D
AL	630	346	296	410	180	346	296	510	230	346	296	580	265
	800	356	306	410	180	356	306	510	230	356	306	580	265
	1,000	376	326	410	180	376	326	510	230	376	326	580	265
	1,250	401	351	410	180	401	351	510	230	401	351	580	265
	1,600	436	386	410	180	436	386	510	230	436	386	580	265
	2,000	481	431	410	180	481	431	510	230	481	431	580	265
	2,500	596	546	470	210	596	546	600	275	596	546	670	310
	3,200	666	616	470	210	666	616	600	275	666	616	670	310
	4,000	756	706	470	210	756	706	600	275	756	706	670	310
	5,000	926	876	470	210	926	876	600	275	926	876	670	310
	6,300	1061	1011	470	210	1061	1011	600	275	1061	1011	670	310
CU	630	351	301	410	180	351	301	510	230	351	301	580	265
	800	366	316	410	180	366	316	510	230	366	316	580	265
	1,000	386	336	410	180	386	336	510	230	386	336	580	265
	1,250	386	336	410	180	386	336	510	230	386	336	580	265
	1,600	406	356	410	180	406	356	510	230	406	356	580	265
	2,000	446	396	410	180	446	396	510	230	446	396	580	265
	2,500	566	516	470	210	566	516	600	275	566	516	670	310
	3,200	606	556	470	210	606	556	600	275	606	556	670	310
	4,000	686	636	470	210	686	636	600	275	686	636	670	310
	5,000	836	786	470	210	836	786	600	275	836	786	670	310
	6,300	956	906	470	210	956	906	600	275	956	906	670	310

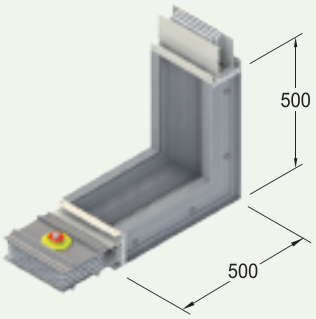
* Contact our engineering staff for more detail

Fittings

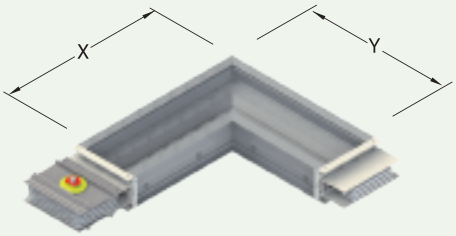
I-Series Busduct has a wide range of fittings to satisfy any layout of buildings. Elbow angles other than 90° are also available. Fitting designs are shown in the following figures, and they consist of the source-side and the load-side. Offset or combination elbows can be used where standard elbows are not feasible.
(Dimensions for each fitting are shown in the following figures. Contact our design team for a minimum dimension.)

Elbow

[Horizontal]

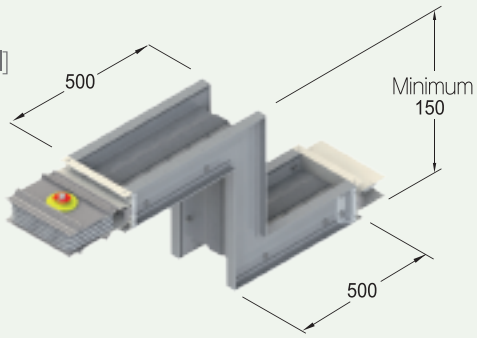


[Vertical]

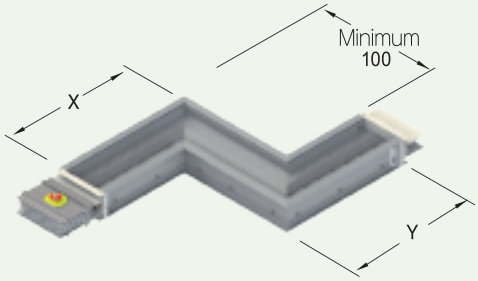


Offset

[Horizontal]



[Vertical]



Vertical Elbow

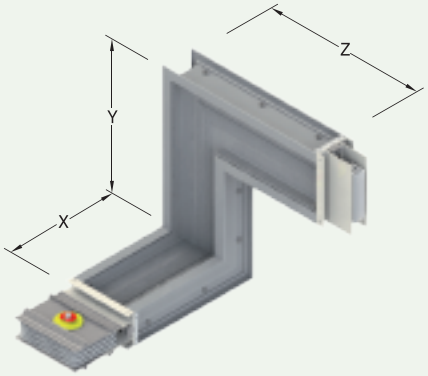
Ampere(A)		Dimension(mm)	
		X	Y
AL	630~2,500	500	500
	3,200~4,000	600	600
	5,000	700	700
	6,300	800	800
CU	630~2,500	500	500
	3,200~4,000	600	600
	5,000~6,300	700	700

Vertical Offset

Ampere(A)		Dimension(mm)		
		X	Y	Z
AL	630~2,500	500	150	500
	3,200~4,000	600	150	600
	5,000	700	150	700
	6,300	800	150	800
CU	630~2,500	500	150	500
	3,200~4,000	600	150	600
	5,000~6,300	700	150	700

* Contact our engineering staff for more detail

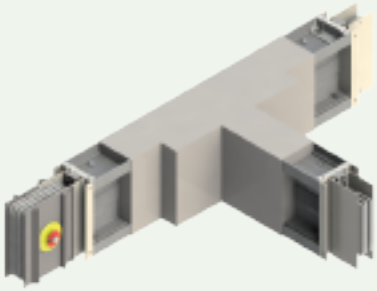
Combination



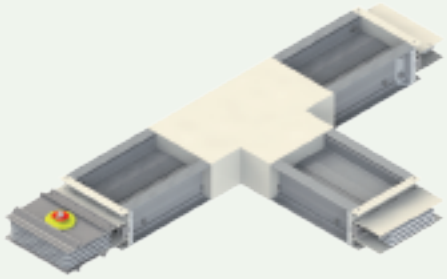
Rating(A)		Dimension(mm)		
		X	Y	Z
AL	630~2,500	500	500	500
	3,200~4,000	600	600	600
	5,000	700	700	700
	6,300	800	800	800
CU	630~2,500	500	500	500
	3,200~4,000	600	600	600
	5,000~6,300	700	700	700

Tee

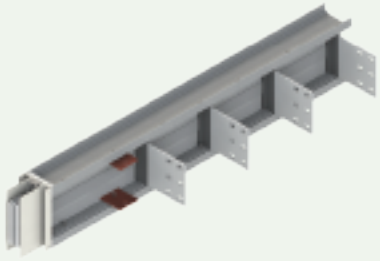
[Horizontal]



[Vertical]



T/R Connection Feeder



* Contact our engineering staff for more detail

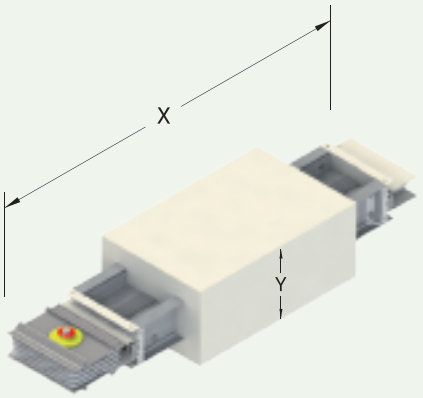
Fittings

Expansion

The fitting is designed to allow a 60mm extension of a straight line.

Rating	Standard Dimension(mm)	
	X	Y
630~6,300A	1,500	360

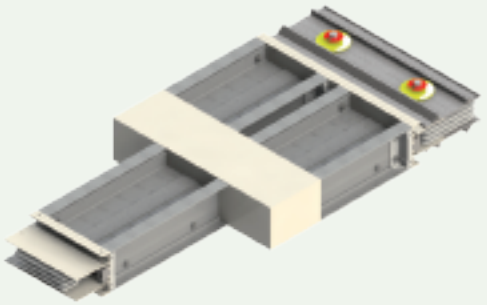
* Flexible bars installed inside



Reducer

A reducer is used to connect a large capacity busduct to a small capacity busduct. It can be used for an economical setup to distribute loads.

*Any change made to load distribution or to capacities follows electricity regulations.

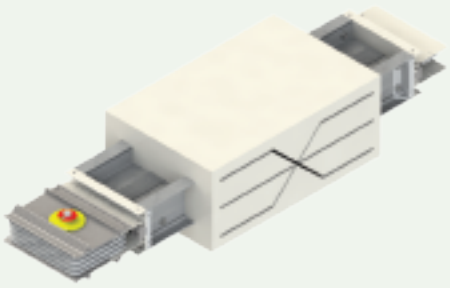


Reducer Box

If a overcurrent breaker needs to be mounted on the reducer by customer request, it is possible to use the reducer box.

Phase Transposition Feeder

A phase transposition feeder is used when the setup transforms the phase.



* Contact our engineering staff for more detail

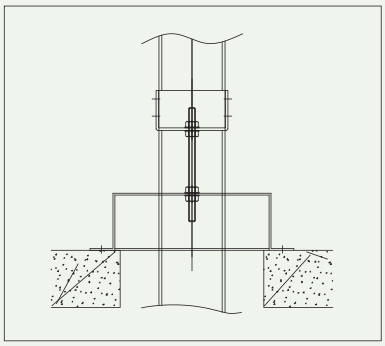
Hanger

Vertical Mounting Hangers

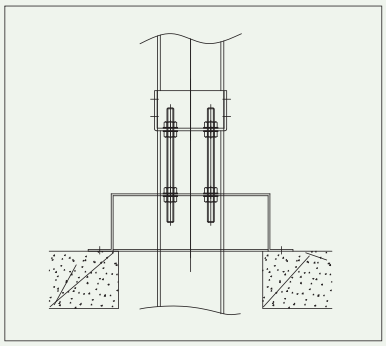
Spring hangers are used to support the busducts between floors. The number of springs depends on the weight of the installed busduct and plug-in boxes. A medium hanger should be installed if the height between the floors exceeds 4.5 meters, and the height of the installed spring hangers can be easily adjusted. Rigid hangers (no spring type) are used on the lowest floor, and they can be used instead of spring hangers depending on the set up design.

[Rigid Hanger] [Spring Hanger]

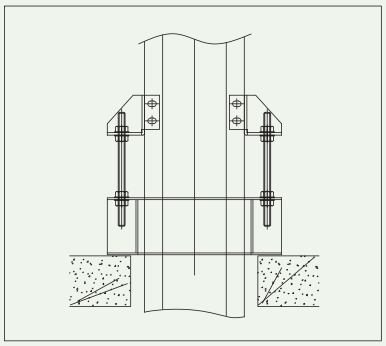
Rigid Hanger



[1 Row]

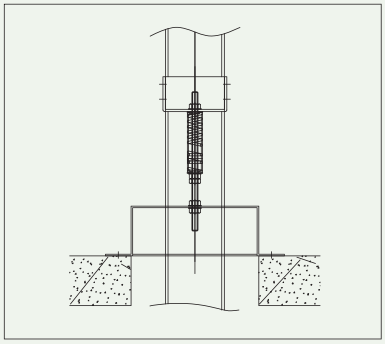


[2 Row]

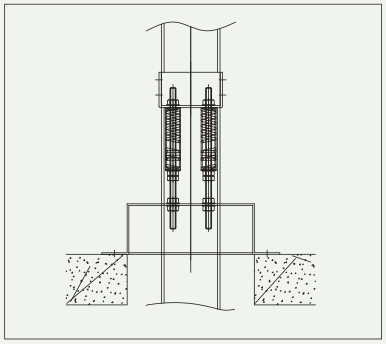


[Side View]

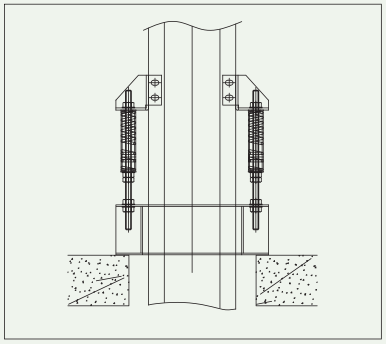
Spring Hanger



[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.

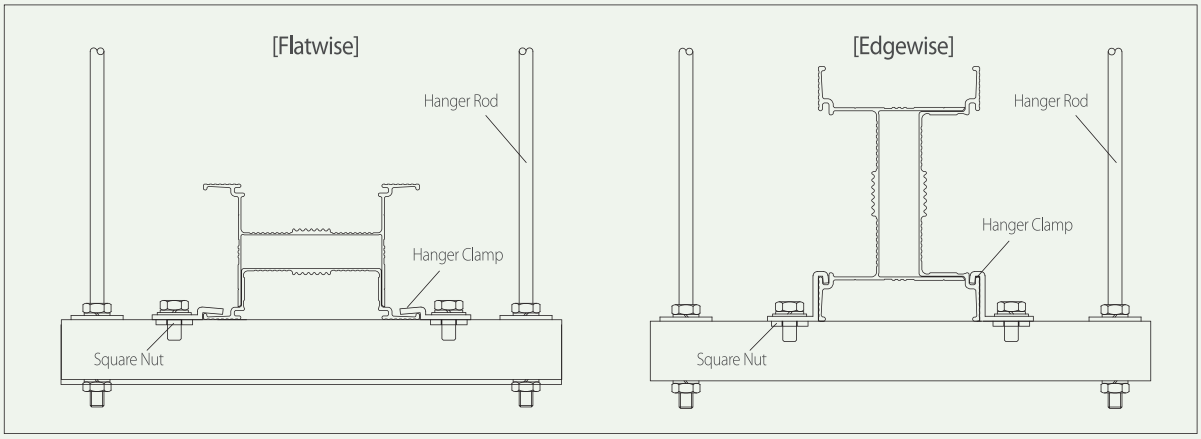
* Contact our engineering staff for more detail

Hanger

Horizontal Hangers

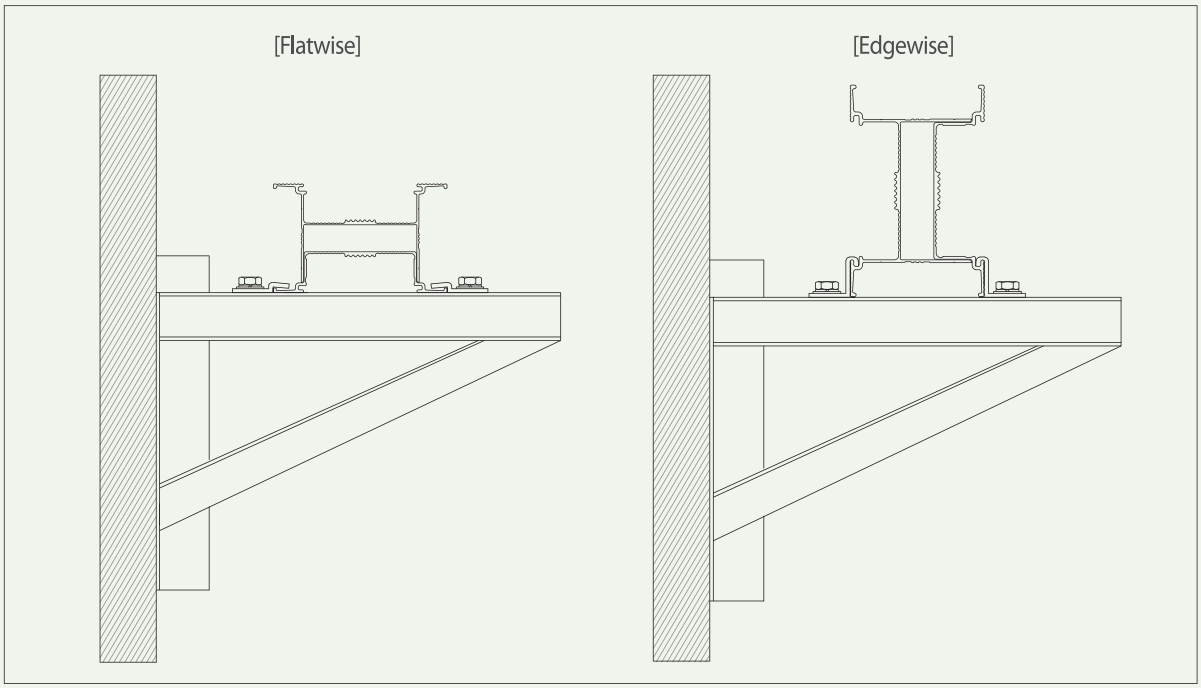
General Hangers

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



Wall Bracket

Wall brackets can be installed on a wall where general hangers are not feasible.



* Contact our engineering staff for more detail

Plug-in Unit

Straight Lengths: Plug-in / Tap-off Intervals

This busduct comes with an overcurrent blocking device (MCCB, fuse) in order to protect the wires while distributing loads.
The required minimum intervals of a plug-in(800A or less)and a tap-off(1000A, 1250A, 1600A) are shown below.
A length longer than the required minimum intervals can be predestinated on request.

Plug-in Feeder

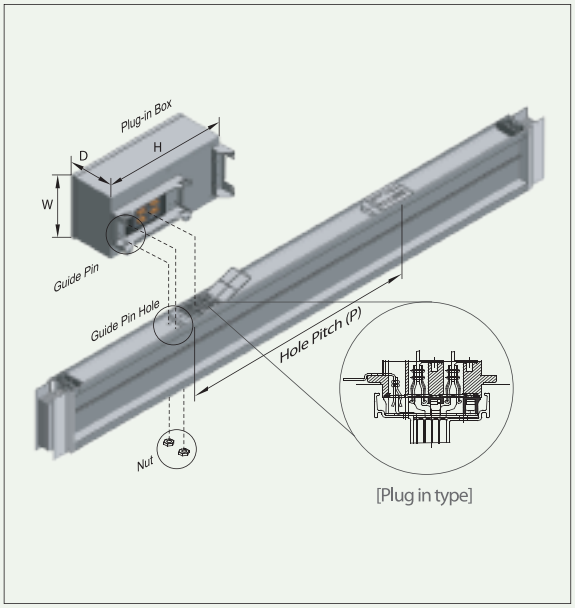
MCCB Frame (AF)	Plug-in Hole Intervals(P) (mm)
125, 250	650
400	900
630, 800	1,000
1000, 1250	1,300

* 1600AF, please contact our engineering team

Plug-in Box

MCCB Frame (AF)	Dimensions(mm)				Fig.
	W		D	H	
	3W	4W			
125	200	230	200	360	E5-1
250	200	230	200	360	
400	230	280	200	800	
630, 800	300	370	200	800	
1000, 1250	400	450	230	1200	E5-2

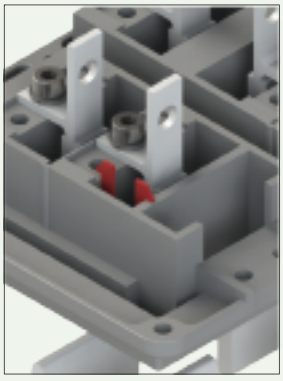
* 1600AF, please contact our engineering team



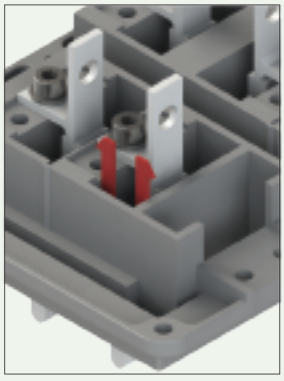
[Fig. E5-1]

Inspection Pin

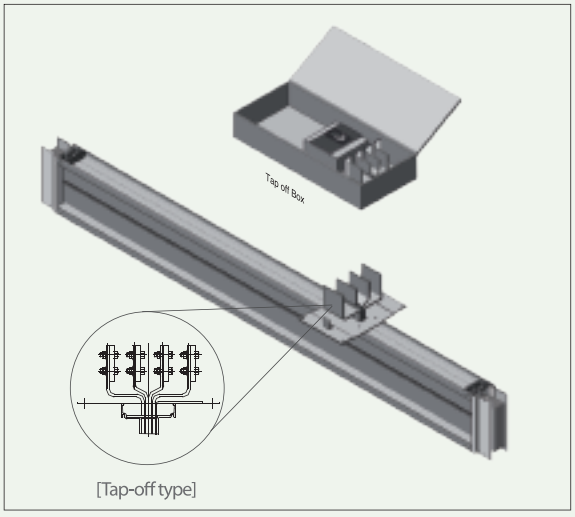
This pin is used to check the insertion of the box.
*Available from 400AF box



[Before]



[After]



[Fig. E5-2]

* Contact our engineering staff for more detail

Plug-in Unit

Plug-in Box Attachments

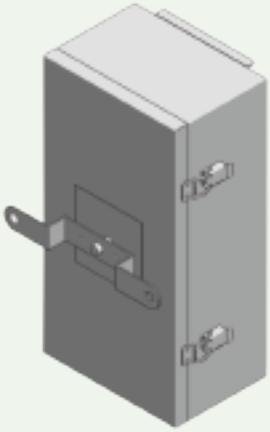
Attachments such as CT, TD and PT can be installed in a plug-in box to control and to supervise the current, voltage and wattage remotely.

Door Types of the Plug-in Unit

Various design of doors for the plug-in box is available to satisfy the demands of our clients.
The available types are shown below.

External handle

Push Button



External lever interlock

Bolt Fastening

Key Lock

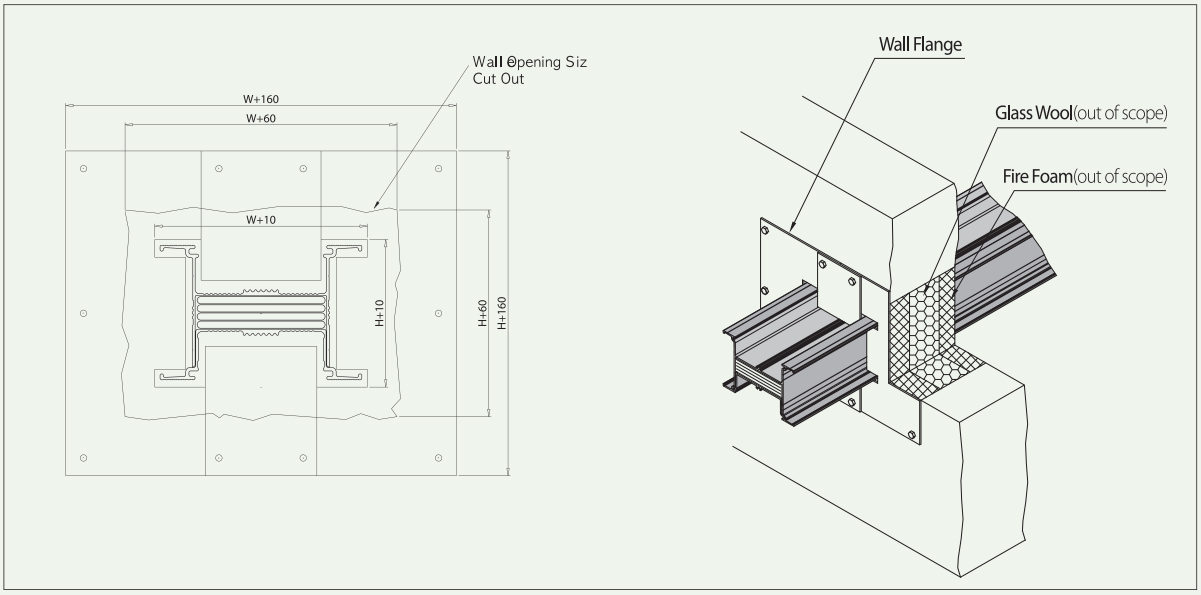
Outlet

* Contact our engineering staff for more detail

Etc.

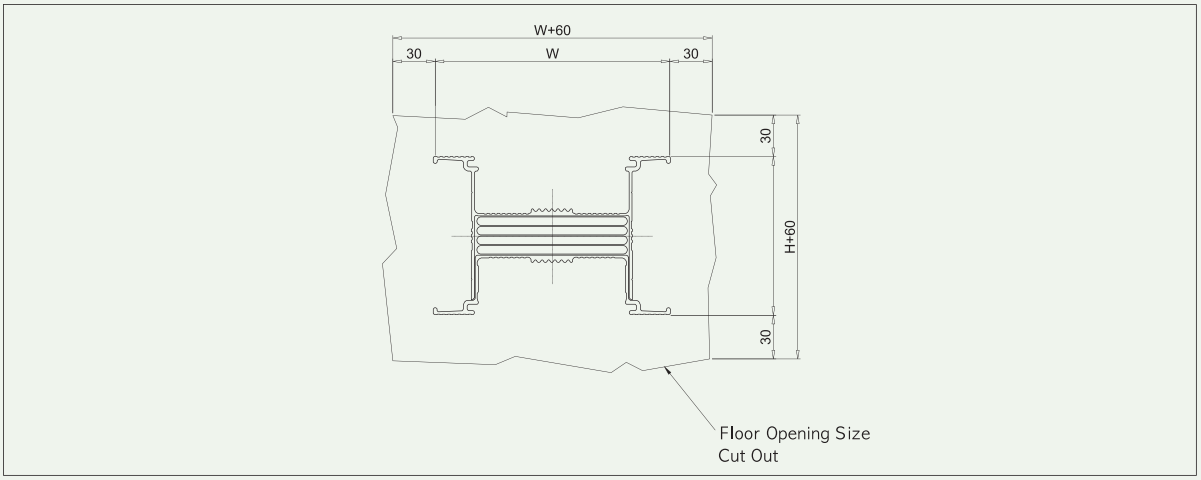
Wall Flange

A wall flange is used to seal the gaps produced during installation of busducts at the walls, ceilings and floor. The standard dimensions of a wall opening should be 30mm larger than the external dimensions of the E-Series Busduct.



Floor Openings

The standard dimensions of a floor opening should be 30mm larger than the external dimensions of the I-Series Busduct.

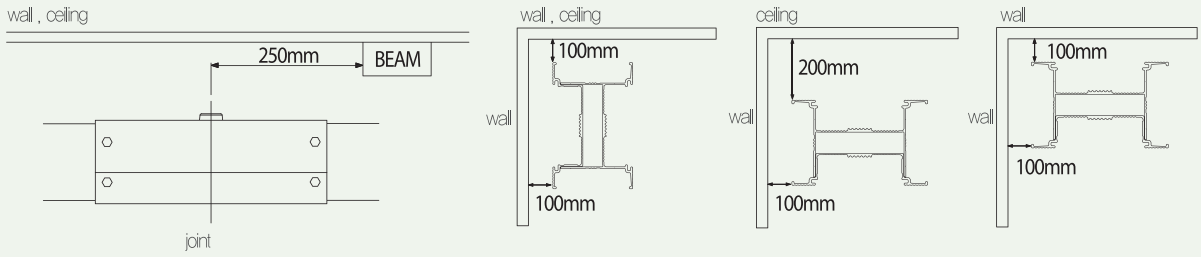


* Contact our engineering staff for more detail

Etc.

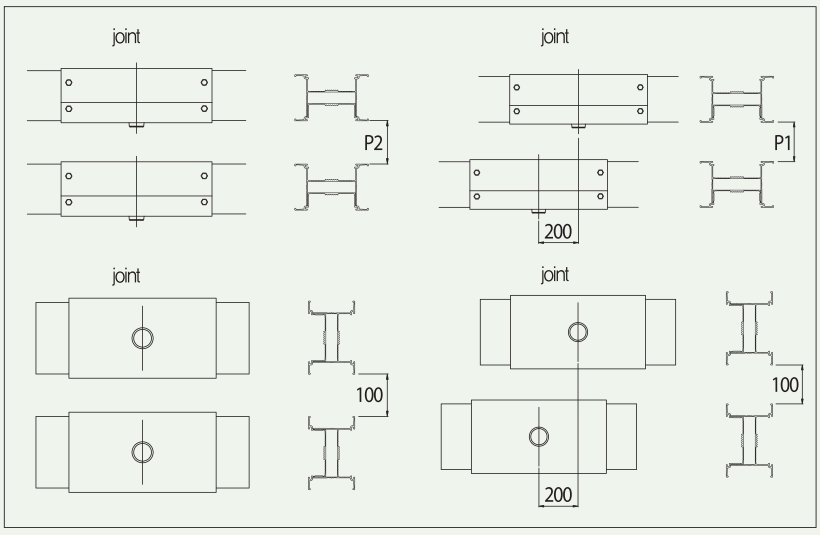
The Required Minimum Distances from a Wall for Heat Dissipation and Maintenance

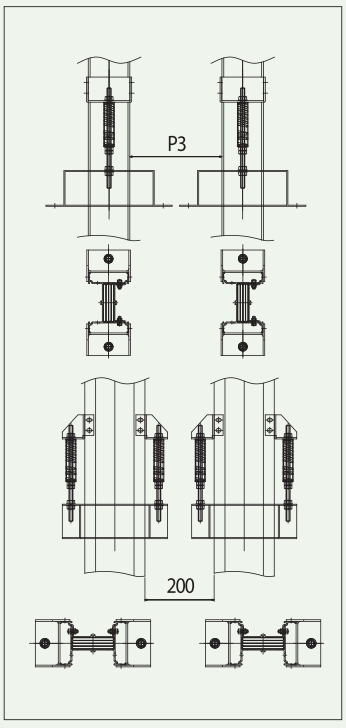
The required minimum distances between a busduct and a wall, or a ceiling are shown below.



The required minimum distances between busducts

The required minimum distances between busducts are shown below.





	Standard Dimension (mm)		
	3W and 3W	3W and 4W	4W and 4W
P1	110	135	130
P2	150	175	180
P3	190	215	230

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

* Contact our engineering staff for more detail

Technical Data

Impedance and Voltage Drop

The formula to measure the voltage drop of a busduct 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 50Hz.

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

V_d = voltage drop[V] · I = rated road amperes[A] · R = resistance[Ω] · X = reactance[Ω] / cos = power factor / sim = reactive factor

- 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) α = 1, concentrated load (a place such as an electrical room)

α = 0.5, Distributed load (a place such as a vertical section)

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

Ampere(A)		Impedance(10^{-3} Ω /100m, 50Hz)			Voltage Drop			
		R (AC)	X	Z	0.7	0.8	0.9	1
AL	630	12.22	3.14	12.62	11.78	12.73	13.50	13.34
	800	9.84	2.66	10.19	12.18	13.12	13.88	13.64
	1,000	7.12	2.04	7.41	11.15	11.99	12.64	12.34
	1,250	5.34	1.58	5.57	10.53	11.30	11.89	11.56
	1,600	4.00	1.20	4.17	10.13	10.86	11.42	11.08
	2,000	3.06	0.92	3.20	9.70	10.39	10.93	10.61
	2,500	2.67	0.85	2.80	10.72	11.45	12.00	11.54
	3,200	2.00	0.64	2.10	10.26	10.97	11.50	11.07
	4,000	1.53	0.48	1.60	9.79	10.47	10.98	10.59
	5,000	1.24	0.33	1.29	9.56	10.32	10.93	10.78
	6,300	0.97	0.31	1.02	9.80	10.48	10.99	10.59
CU	630	13.48	1.94	13.62	11.81	13.04	14.16	14.71
	800	10.18	1.52	10.29	11.38	12.55	13.61	14.11
	1,000	7.71	1.18	7.80	10.81	11.91	12.91	13.36
	1,250	4.77	1.62	5.04	9.74	10.37	10.83	10.33
	1,600	3.89	1.34	4.11	10.19	10.85	11.32	10.78
	2,000	2.88	0.99	3.05	9.44	10.04	10.48	9.99
	2,500	2.39	0.88	2.54	9.94	10.54	10.95	10.33
	3,200	1.95	0.71	2.07	10.37	10.99	11.43	10.78
	4,000	1.44	0.52	1.53	9.55	10.14	10.55	9.99
	5,000	1.19	0.44	1.27	9.95	10.54	10.95	10.31
	6,300	0.90	0.33	0.96	9.45	10.03	10.43	9.87

Technical Data

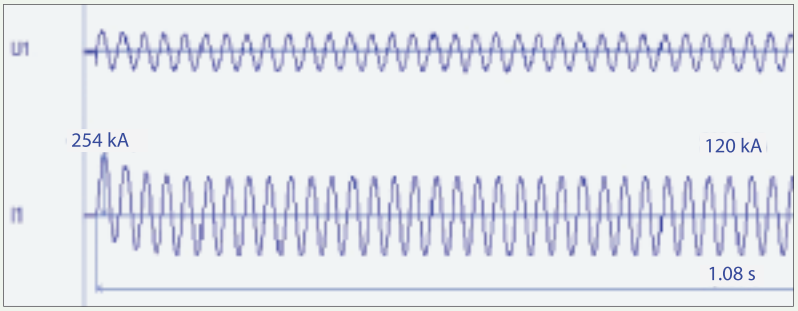
Short Circuit Strength

LS C&S Busduct has been tested under actual short circuit conditions according to IEC 61439-1 and 6 [(previous standard) IEC 60439-1 and 2] at KEMA and ASTA. The result and the graph are shown below.

Phase to Phase Short Circuit Ratings

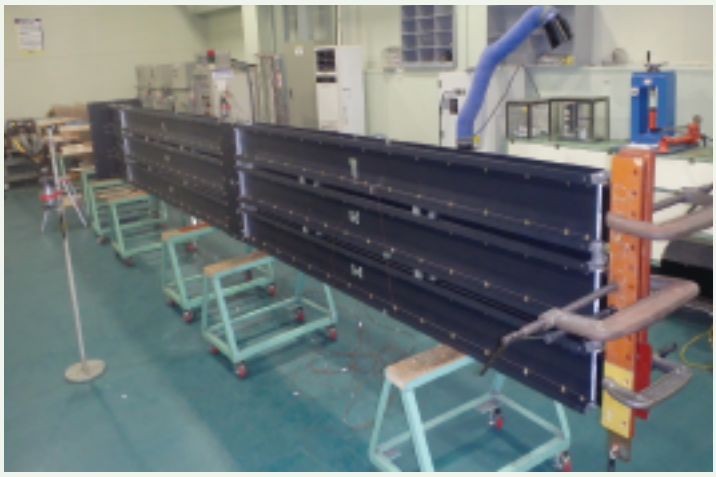
Ampere(A)	AL (kA)			CU (kA)		
	1 sec	3 sec	Peak	1 sec	3 sec	Peak
630	25	14	52.5	20	11	40
800	40	23	84	20	11	40
1,000	50	28	105	35	20	73.5
1,250	65	37	143	50	28	105
1,600	65	37	143	50	28	105
2,000	65	37	143	65	37	143
2,500	100	57	220	105	60	231
3,200	100	57	220	105	60	231
4,000	150	69	330	105	60	231
5,000	150	69	330	105	60	231
6,300	150	69	330	120	69	254

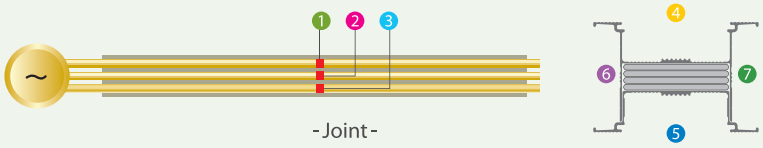
* Reinforced type available

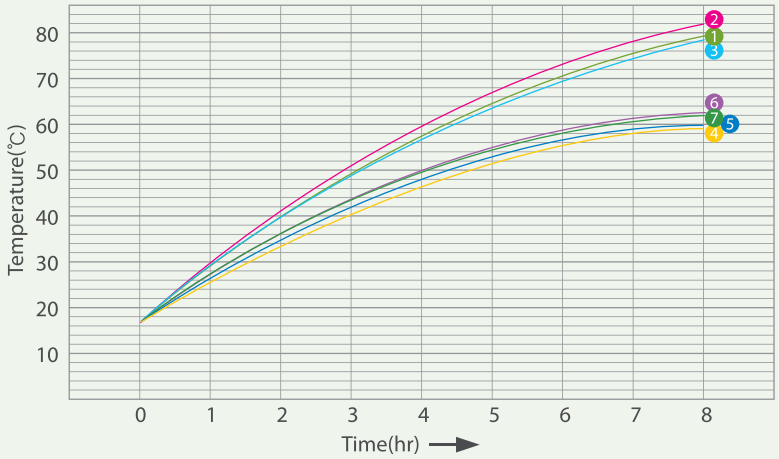


Temperature Rise

The temperature rise limit is an important property which determines the performance of busducts. The temperature rise limit of the busduct is designed that when a busduct is operated with a rated current , the temperature limit values of the housing are within 55K as specified in IEC61439-1 and 6 [(previous standard) IEC 60439-1 and 2].

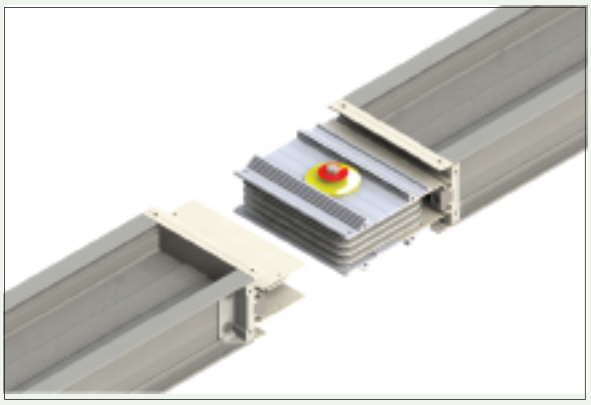




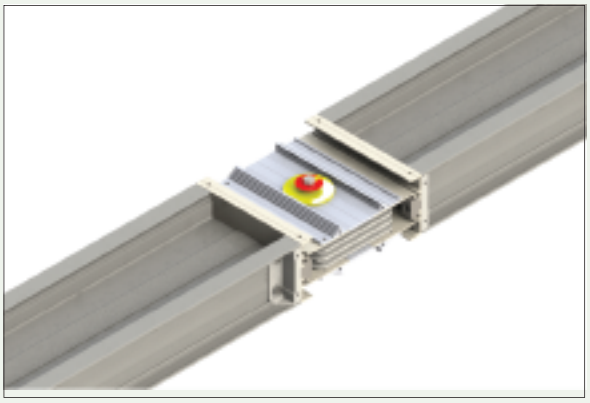


Joint Connection

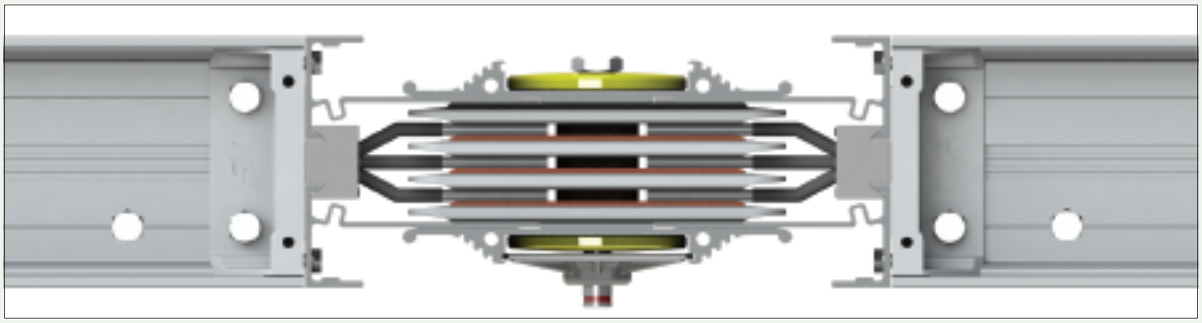
Joint KIT



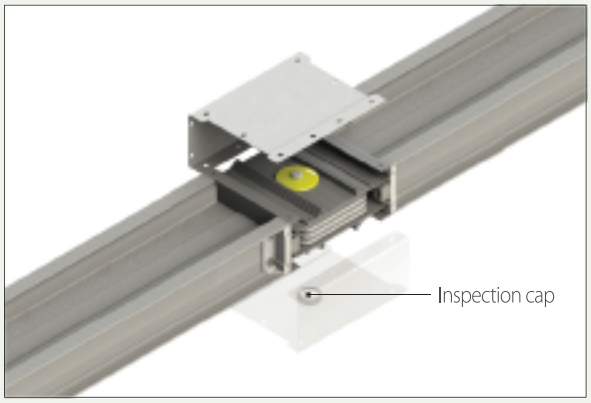
Both parts should be aligned at the top and the bottom and the left and the right as well as horizontally and vertically. (This also applies to the joint connection of the horizontal and vertical ducts.) Make sure that the joint kit is not tilted. (We recommend a jig tool for the installation.)



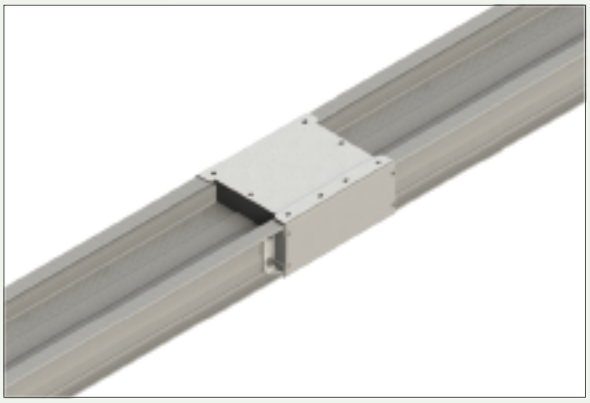
Using a torque wrench, slowly tighten the exposed bolt head of a double headed bolt. The head of the double headed bolt is designed to break off at 800~1000Kgf • cm. Continue tightening the exposed head until it breaks off.



Once the exposed head and the red tag attached to it have been cut off, a red line should be visible, which means they are properly connected. Be sure to check the distance from the housing, and the gaps between the conductors at the kit after the installation.



Before applying the connection cover, check the space between the end block and the holes of the connection cover. The red line should be visible through the transparent cap.



Perform the last inspection of the connection.

LS C&S Project References in Vietnam

- Major projects
- Other projects

Major projects

Grand Plaza Hanoi

Grand Plaza's is a combination of commercial centers, hotels, offices for lease that opened in late 2010. The owner of Grand Plaza is the CharmVit Group of South Korea, with a total capital of $120 million. Currently, the South Korean corporation still holds the hotel while the commercial center and the leasing offices were sold to IDJ Group of Vietnam.

Time and place	Hanoi, 2010
Field	Complex
Owner	CharmVit Group
Busway system	LS C&S Ex-way Al-Al 1600A, 2000A, 4000A

Keangnam Hanoi Landmark

Keangnam Hanoi Landmark Tower (Landmark 72) is the new symbol of Hanoi capital with the largest area scale of the world (609.673 ㎡), 1.3 times larger than Burj Khalifa in Dubai. Being the highest buildings in Vietnam (72 floors, 350m), Keangnam Hanoi Landmark Tower is the project with the biggest investment scale in Vietnam and a complex model with advanced technical the of Keangnam company, receiving positive supports from Vietnam Government.

Time and place	Hanoi, 2010
Field	Complex
Owner	Keangnam Enterprise Co., Ltd
Busway system	LS C&S Ex-way Cu-Al 3200A, 5000A; Al-Al 1600A, 2500A

Major projects

Royal City

Royal City is a great urban complex of intelligent connections between functional and public facilities, and is designed to eco-architecture standards with a large green coverage of about 70,000m2, providing a clean, natural and tranquil ambience right in the heart of the city. Vincom Mega Mall Royal City is the Asia's largest underground retail and entertainment complex.

Time and place	Hanoi, 2013
Field	Complex
Owner	VinGroup
Busway system	LS C&S Ex-way Al-Al 1000A, 1600A, 2000A, 3200A, 4000A, 5000A

Times City

The urban complexes **Times City Hanoi** is divided into several functional areas including: luxury condos system, high-class commercial center, Giant Park and entertainment, restaurants system, the biggest aquarium in Hanoi, unique indoor skating rink, general hospital, schools, international standard kindergartens, string of green parks and lakes across 100.000m2.

Time and place	Hanoi, 2013
Field	Complex
Owner	VinGroup
Busway system	LS C&S Ex-way Al-Al 1600A, 2500A, 3200A, 4000A

Major projects

Vinhomes Times City - Park Hill

Located next to **Vinhomes Times City**, the Park Hill is Inspired by Singapore's green architecture, the condominium complex combines urban living with a resort lifestyle. Park Hill reserves more than 70% of its area for landscaping, highlighted by an iconic clock tower, a green hill overlooking the development, a splash park, and an outdoor and indoor swimming pool system. Furthermore, the project boasts high-end facilities such as international-standard schools and a hotel-style hospital, a Vincom Mega Mall, sport centers and open space for family activities.

Time and place	Hanoi, 2016
Field	Complex
Owner	Vingroup
Busway system	LS C&S Ex-way AL- AL 1250A, 1600A, 2500A, 3200A, 4000A

HCMC Children hospital

The big new Children hospital with 939 beds, including 1 basement, 3 storeyed paraclinical building with the height of 23m, 8 storeyed stay-in building with its height of 43.6 m and auxiliary buildings such as infection area, rubbish storage, waste water treatment area, medical gas area, electrical substation, guard houses, liquid oxygen house of from one to three storeys. Especially, this New Hospital has a landing field, car parking area, and children playing ground. Total construction area is approx. 125,000 m2.

Time and place	Ho Chi Minh, 2016
Field	Hospital
Owner	HCMC Department of health
Busway system	LS C&S Ex-way Cu- AL 1000A, 1250A, 2000A, 2500A, 3200A, 4000A, 5000A

Major projects

AEON MALL BINH TAN

One of the largest dining zones in Ho Chi Minh City with the floor area is approximately 114.000 m2

Time and place	Ho Chi Minh, 2016
Field	Commercial
Owner	AEON VIETNAM Co.,LTD
Busway system	LS C&S Ex-way AL-AL 1250A, 1600A, 2500A, 3200A, 4000A

Ministry National Academy Apartment

Ministry National Academy Apartment is located near alley 20 Hoang Quoc Viet, Xuan La Ward, Tay Ho District, Ha Noi City, the project insures secure and full convenient public facilities.

Time and place	Hanoi, 2015
Field	Apartment
Owner	Ministry National Defence
Busway system	LS C&S, Ex-way, AL-AL 800A, 1000A, 1600A, 3200A

Major projects

Kumho Asiana Plaza

Soaring through the sky in a dazzling display of steel and glass, **Kumho Asiana Plaza Saigon** is set to take life and work in Saigon to new heights of sophistication. Located in the heart of District 1, this exclusive development brings together an intelligent Grade A office building, hotel, apartments and luxury retail to serve the needs of Saigon's most demanding consumers.

Time and place	HCMC, 2010
Field	Complex
Owner	Kumho Asiana Corp
Busway system	LS C&S Ex-way Al-Al 2500A, 3200A, 4000A

Becamex Tower

Becamex invested over VND 500 billion in the **Becamex Tower**. The building of 25 floors has a total area of 50,000 square meters for office space; and a total area of 12,500 square meters for commercial area. It is located on Binh Duong Boulevard, Thu Dau Mot City, Binh Duong.

Time and place	Binhduong, 2011
Field	Office Building
Owner	Becamex IDC Corp
Busway system	LS C&S Ex-way Al-Al 1600A, 3200A, 4000A

Major projects

Binh Duong Integrated Political – Administrative Center
The Binh Duong Centralized Political - Administrative Center consists of the Central Building where the Party and the Government's bodies work, along with functional bodies of Binh Duong province such as the Court, People's Procuracy, Vietnam Social Security, Customs Department, State Bank, State Treasury...

Time and place	Binh Duong, 2013
Field	Office Building
Owner	People's Committee of Binh Duong Province
Busway system	LS C&S Ex-way Cu-Al 1250A, 1600A, 3600A, 4000A

Petroland Tower

Petroland Tower is located in Phu My Hung central area and worth over VND 1 trillion in investment capital with the total floor space of 57,000 square meters consists of commercial center, office building and high-grade apartments.

Time and place	HCMC, 2012
Field	Office Building
Owner	Petro Capital & Infrastructure Investment JSC
Busway system	LS C&S Ex-way Cu-Al 1600A, 2000A, 2500A

Major projects

REE Tower

REE Tower is a pioneering premium grade office tower strategically located just inside district four, less than five minutes from the central business district of Ho Chi Minh City.
This twenty one storey building has over 18,000 net square meters available for lease and a flexible floor plate design also makes it suitable for most office types.

Time and place	HCMC, 2010
Field	Office Building
Owner	REE Corp
Busway system	LS C&S Ex-way Cu-Al 1600A, 2500A

Diamond Island

Diamond Island Luxury Residences in Ho Chi Minh City offers fully-furnished apartments with private balconies providing panoramic views of the stunning surroundings in one of the most spectacular districts in the city.

Time and place	Ho Chi Minh City, 2011
Field	Apartment
Owner	Binh Thien An Corp
Busway system	LS C&S Ex-way Al-Al 2000A, 3600A

Major projects

Imperia An Phu

Imperia An Phu is located in the District 2 area of Ho Chi Minh City. It's an ideal place for people in search of modern living, tranquility, fresh air and scenery while staying in touch with the bustling city. Majority of the ground area is showcased by a tropical garden, pristine swimming pools and shaded areas for relaxation and recreational purposes.

Time and place	HCMC, 2011
Field	Apartment
Owner	Inveskia Co., Ltd
Busway system	LS C&S Ex-way Cu-Al 2500A, 3200A

Sunrise City Central Towers

Sunrise City is a luxury apartment project of Novaland Corporation, located at the gateway to the Saigon South New Urban Area and connected to Thu Thiem Financial Center. It is designed under standard of five-star hotel of Vietnam National Administration of Tourism with full and high quality facilities.

Time and place	Ho Chi Minh City, 2014
Field	Apartment
Owner	Novaland
Busway system	LS C&S Ex-way Al-Al 1250A, 2000A, 2500A, 3200A

Major projects

Crowne Plaza

The Crowne Complex is owned by Tran Hong Quan Trading Company Limited and located in My Dinh 2 Ward, Hanoi. The property comprises hotel, serviced residences and sits on a site spanning 11,053 sq meters with an additional 15,000 sq meters in the basement. The hotel and residences are managed by InterContinental Hotels Group.

Time and place	Hanoi, 2010
Field	Hotel
Owner	Tran Hong Quan Trading Co., Ltd
Busway system	LS C&S Ex-way Al-Al 1600A, 2500A, 3200A

AEON Mall Binh Duong

Aeon Binh Duong Canary Shopping Center project has a total area of 62,000 m2 at The Canary Complex project and being built adjacent Vietnam - Singapore 1 industrial zone (VSIP 1). Aeon will manage and operate this shopping center and also operate the restaurants, bars, entertainment for children, billiard, bowling, electronic games, sports center, etc.

Time and place	Binhduong, 2014
Field	Shopping Mall
Owner	AEON Vietnam
Busway system	LS C&S Ex-way Al-Al 2500A, 3200A, 4000A

Major projects

Lotte Mart Binh Duong

Lotte Mart, an arm of South Korea's retailer Lotte Group, has gradually become a leading retailer in Vietnam. The Lotte Mart Binh Duong which has a total investment of nearly US$30 million, covers more than 21,300 square meters in The Seasons Binh Duong urban area in Thuan An District.

Time and place	Binhduong, 2013
Field	Shopping Mall
Owner	Lotte Mart Corp
Busway system	LS C&S Ex-way Al-Al 2000A, 2500A, 3200A

The Crescent Mall

The Crescent Mall brings unique design, fantastic customer service and an array of upscale retail outlets together under one roof. In addition to international brands, some of which are opening their first store in Vietnam, every category of shopping is covered and a variety of food and drink options is sure to satisfy.

Time and place	Ho Chi Minh City, 2010
Field	Shopping Mall
Owner	Phu My Hung Corp
Busway system	LS C&S Ex-way Cu-Al 1600A, 2000A, 4000A

Major projects

Dong Nai Hospital Phase 1

Dong Nai Hospital has more than 1,400 beds scale and the same high quality service as the largest hospitals in Southeast Asia. It will operate as a satellite of several large hospitals in Ho Chi Minh City to meet the increasing health care needs as well as provide senior health services to citizens and expatriates in Dong Nai province and the vicinity.

Time and place	Dong Nai, 2013
Field	Hospital
Owner	Dong Nai General Hospital JSC
Busway system	LS C&S Ex-way Cu-Al 1600A, 2500A, 3200A, 4000A, 5000A

Mien Dong Hospital

Being built on an area of 12.76ha (5 phases) by Becamex IDC, **Mien Dong International General Hospital** provides medical treatment services to all types of people, including foreigners working or traveling in Binh Duong Province and the vicinity.

Time and place	Binhduong, 2012
Field	Hospital
Owner	Becamex IDC
Busway system	LS C&S Ex-way Al-Al 1600A, 2500A

Major projects

University Medical Center

Ho Chi Minh City University Medical Center is a public general hospital and operating under the advanced model which combined between University and Hospital to improve the quality and efficiency of health care, training and science research.

Time and place	Ho Chi Minh City, 2010
Field	Hospital
Owner	Medical and Pharmaceutical University (of HCMC)
Busway system	LS C&S Ex-way Cu-Al 630A, 1000A, 1600A, 2500A, 3600A

Samsung Mobile Vietnam Factory

Samsung Mobile's first factory was constructed in the northern province of Bac Ninh with an initial investment of $670 million (now a total investment of about $1.5 billion). The factory has been selling products since April 2009. Every month the Bac Ninh-based plant produces 13-15 million products and more than 90 percent of them are exported.

Time and place	Bac Ninh, 2009
Field	Factory
Owner	Samsung Electronic Co., Ltd
Busway system	LS C&S Ex-way Al-Al 2000A, 3200A, 4000A

Major projects

Blooming Tower

Blooming Tower is in Da Phuoc International city area (Hai Chau District, Danang City), located in Han Estuary looking forward Danang Bay, near the foot of Thuan Phuoc Bridge. Blooming Tower is a twin tower built in the area over 10,773.18 m2, with the height of 37 floors including 1 basement. Blooming Tower Danang has over 120,216.67 m2 of total floor area including 671 appartments, offices, commercial center, entertainment and sport areas, parking space... The Project is invested by Korea Investment and Development Co., Ltd with total capital up to 90 million USD

Time and place	Danang, 2017
Field	Apartment
Owner	KID Co.
Busway system	LS C&S, Ex-way, AL-AL 1000A, 1600A, 2000A

Cancer Hospital

Cancer Hospital is located in the District 9 of Ho Chi Minh city. It's one of five projects to invest in the construction of 5 new hospitals, the Central Hospital & the End Hospital in Ho Chi Minh City approved by the Prime Minister in 2014. The hospital scale of 1,000 beds, with a total floor area of 120,000m2, divided into 3 blocks with many functional departments

Time and place	HCMC, 2017
Field	Hospital
Owner	HCMC Health Department
Busway system	LS C&S, Ex-way, Cu-AL 630A, 800A, 1000A, 1250A, 1600A, 2000A, 3200A

Major projects

Ariyana Nha Trang

Ariyana Nha Trang is the filtered quintessence of the creation to form a project which is both the hotel with the wide, high-class condotel apartments like the five star suite rooms and "the second home" for those who love "Far East Pearl" and wish to enjoy the vocations with the blue sea and white sands.

Time and place	Nhatrang, 2017
Field	Hotel
Owner	Nhat Minh Tourist JSC
Busway system	LS C&S, Ex-way, AL-AL 1600A, 2500A, 3600A, Ef-way AL-AL 3200A

Vinpearl Empire Condotel

Vinpearl Empire Condotel is located in the most prime place in Nha Trang city – 44-46 Le Thanh Ton street. Sea is on the front, mountain is behind, Condotel project of Vingroup conglomerate is really a perfect combination of modern architecture and majestic beauty of the sea. Vinpearl Condotel apartments have prosperous feng shui which could bring fortune to customers and investors.

Time and place	Nhatrang, 2017
Field	Hotel
Owner	Vingroup
Busway system	LS C&S, Ex-way, AL-AL 1250A

Major projects

Vinhomes Metropolis Lieu Giai

Vinhomes Metropolis Lieu Giai is latest project from Vingroup – the most famous real estate company in Viet Nam A symbol of prosperity and success, Vinhomes Metropolis is a combination of modern architecture and a touch of classical elegance. This luxury apartment promises to bring its residents an experience of staying in a 5 stars resort inside their house.

Time and place	Hanoi, 2017
Field	Apartment
Owner	Vingroup
Busway system	LS C&S, IX-WAY, AL-AL 1000A, 1250A

Vinhomes Golden River

Vinhomes Golden River will be constructed on the Ba Son grounds along the Saigon river, in the heart of District 1. Together with Tan Cang, the Ba Son area is part of Zone 3 of the planned new center for Ho Chi Minh City. With a total development area of 25.3 ha and a contruction density of 18,6%, Vinhomes Golden River was include luxurious residental buidings, villas, office and comercial towers.

Time and place	HCMC, 2017
Field	Complex
Owner	Vingroup
Busway system	LS C&S, Ex-way, AL-AL 1000A, 1250A, 1600A

Major projects

Vinhomes Central Park

Vinhomes Central Park was inspired by the famous Central Park in New York City, with a total area of 43.9 hectares situated on a prime stretch of Saigon's riverfront spanning more than one kilometer, Vinhomes Central Park promises to bring to its residents the ideal living environment - harmony with nature combined with a five-star city lifestyle. Vinhomes Central Park is a place to build true life values worthy of this most modern and classy township development.

Time and place	HCMC, 2017
Field	Complex
Owner	Vingroup
Busway system	LS C&S, Ex-way, AL-AL 1000A, 1250A, 1600A, 2000A, 2500A

Vinpearl Beachfront Condotel

Vinpearl Beachfront Condotel is positioned at Tran Phu Street, a seaside area adjacent to the city center. Located on one of the most famous beautiful bays in the world, Vinpearl Beachfront Nha Trang perfectly blends modern architecture and magnificent natural scenery. This is the ideal place to fully enjoy a luxury vacation with the amenities of 5-star resorts.

Time and place	Nhatrang, 2017
Field	Hotel
Owner	Vingroup
Busway system	LS C&S, Ex-way, AL-AL 1250A

Major projects

Hoa Binh Green Da Nang

Hoa Binh Green Da Nang is located on the right bank of the Han River, the most convenient location for the business. The apartments have beautiful views of My Khe beach, the beautiful Tien Sa beach. Hoa Binh Green Da Nang is a large real estate project of 12.627m2, a 27 storey tower cover 3 service floors and with the 24 floor apartments, with 1,728 units including 1,536 one-bedroom units and 192 two-bedroom units.

Time and place	Danang, 2017
Field	Hotel
Owner	Hoa Binh Corp.
Busway system	LS C&S, Ex-way, Cu-AL 1250A, 2000A, 3200A

The Everich Infinity

The Everich Infinity is idesigned in a closed compound model as a resort and brings the peace, stillness that will not easily find in the heart of bustling Saigon. It is the entrance to the trees, the site covered by a pergola, with gurgling waterfalls constantly .... Here, the employer can find peaceful place of soul, relax enjoy the colors of the beautiful life, away from the hustle shelter, crowded city.

Time and place	HCMC, 2017
Field	Apartment
Owner	Phat Dat Corp.
Busway system	LS C&S, Ex-way, AL-AL 1250A, 2000A

Major projects

Vincom Ha Tinh

Vincom Ha Tinh is spreaded over 57,000 m2, was located next to Ham Nghi Street in the north and Ha Huy Tap Street in the east of the city. It included a five star hotel with 36 floors and 300 rooms , a Vincom commercial centre and a Vinhomes Ha Tinh with 115 villas and houses.

Time and place	Hatinh, 2017
Field	Complex
Owner	Vingroup
Busway system	LS C&S, Ex-way, AL-AL 1000A

Diamond Island Phase 2

Diamond Island Phase 2 includes 5 towers named after 5 most beautiful islands in the world: Hawaii, Bora Bora, Malpes, Bahamas and Canary. The project has 02-storey podium with area of 40,500 sqm and 05 towers ranging from 23 floors to 29 floors heights with total floor area of 148,000 sqm.

Time and place	HCMC, 2017
Field	Apartment
Owner	Kusto Home
Busway system	LS C&S, Ex-way, AL-AL 800A, 1000A, 2500A, 3200A

Major projects

The Botanica

The Botanica is located between Gia Dinh Park and Hoang Van Thu Park, The Botanica looks like a quite and calm garden in the crowded city, The Botanica gives you the experience of a peaceful garden with its fullness of trees and parks which you could not find any where else.

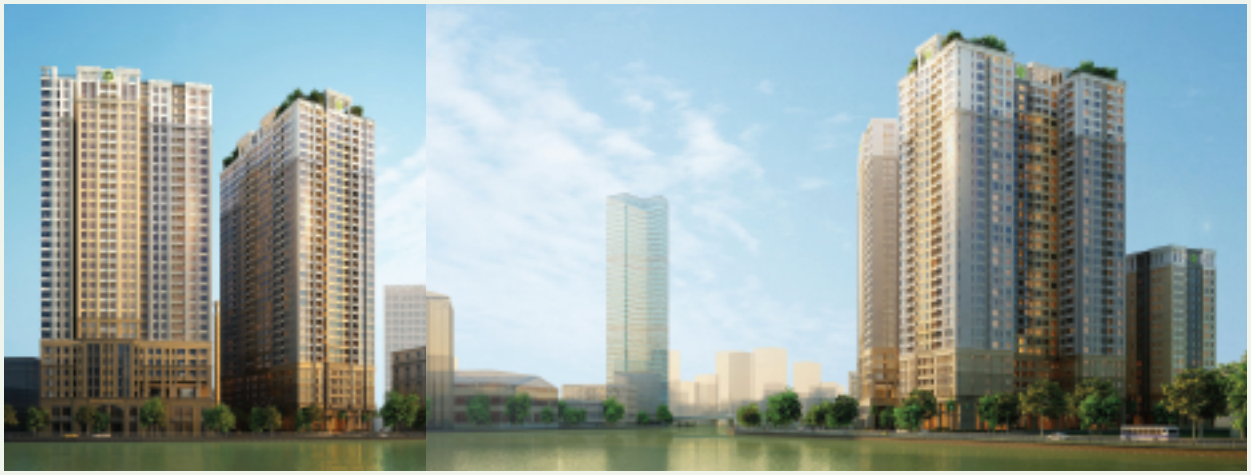
Time and place	HCMC, 2017
Field	Apartment
Owner	Novaland
Busway system	LS C&S, Ex-way, AL-AL 1250A

Rivergate

River Gate is designed in luxurious and modern way is a most high quality residence project in central region that Novaland is developing now. The project is a harmonious combination between offices, commercial centers and apartment into a perfect unity.

Time and place	HCMC, 2017
Field	Apartment
Owner	Novaland
Busway system	LS C&S, Ex-way, AL-AL 1000A, 1250A

Major projects



The Tresor

The Tresor is located at 39 – 39B Ben Van Don street, Ward 12, District 4, HCM City. The Tresor Apartment Buildings are full of all the advanced facilities: swimming pool, community room, supermarket, commercial center, nursery, cafe, gym, etc. and especially relaxing rooftop garden.

Time and place	HCMC, 2017
Field	Apartment
Owner	Novaland
Busway system	LS C&S, Ex-way, AL-AL 1000A, 1250A

Golden Mansion

Golden Mansion is located at 119 Pho Quang Street, Ward 9, Phu Nhuan District, HCMC. The project fully converged all the facilities of a luxury residential building: swimming pool, retail center, nursery, children's play area, internal parks, community room, etc.

Time and place	HCMC, 2017
Field	Apartment
Owner	Novaland
Busway system	LS C&S, Ex-way, AL-AL 1000A , 1250A

Major projects

Richstar

Richstar is located on 239 - 241 - 278 Hoa Binh, Hiep Tan Ward, Tan Phu Dist. Richstar has 22 floors . Richstar at Ho Chi Minh has the following facilities: air conditioning, bbq area, cctv, fitness, garden, library, parking, playground, security, swimming pool, tennis.

Time and place	HCMC, 2017
Field	Apartment
Owner	Novaland
Busway system	LS C&S, Ex-way, AL-AL 1000A , 1250A

The Sun Avenue

The Sun Avenue is located at front of Mai Chi Tho, An Phu ward, District 2, Ho Chi Minh City, is located in the center of administrative Thu Thiem and stretches over 500 meters frontage of Mai Chi Tho Avenue. The Sun Avenue owned an advantageous regional location convenient for transportation. The Sun Avenue Apartment also possesses outstanding design of ventilation, ensuring unrestricted visibility and various internal facility.

Time and place	HCMC, 2017
Field	Apartment
Owner	Novaland
Busway system	LS C&S, Ex-way, AL-AL 630A, 1000A, 1250A, 1600A

Major projects

Sunrise City View

Sunrise City View apartment is located in the Him Lam Tan Hung residential area, which has been developed rapidly, combined with Nam Saigon urban area, Phu My Hung is a dynamic and developed area of Ho Chi Minh City for many years. At Sunrise CityView. The project consists of 2 towers: Block A: 36 floors, Block B: 37 floors with 3 basements with the size larger than 29,700 m^2

Time and place	HCMC, 2017
Field	Apartment
Owner	Novaland
Busway system	LS C&S, Ex-way, AL-AL 1250A, 1600A, 2000A

Sunrise Riverside

Sunrise Riverside is located in a Tran Thai residential area, bordered with South Saigon urban area so that it should inherit the infrastructure development and synchronized planning. The project also linked to existing Sunrise City apartments, forming a civilized and high-grade urban area.

Time and place	HCMC, 2017
Field	Apartment
Owner	Novaland
Busway system	LS C&S, Ex-way, AL-AL 1250A, 2000A

Major projects

Saigon Royal Residence

Saigon Royal Residence is located 34-35 Ben Van Don Street, ward 12, District 4, HCMC. It's a complex of apartments Commerce - Office-tel being located in a favourable location of Saigon's most bustling center.

Time and place	HCMC, 2017
Field	Apartment
Owner	Novaland
Busway system	LS C&S, Ex-way, AL-AL 1250A, 1600A, 2000A, 2500A, 3200A

Xuan Mai Complex

Xuan Mai Complex is located in the West of Ha Dong District, Ha Noi City. This project is designed with ideal that is attach citizen with nature. this create a modern life, liberal and close with nature.

Time and place	Hanoi, 2017
Field	Complex
Owner	Xuan Mai Corp
Busway system	LS C&S, Ex-way, AL-AL 1000A, 1600A, 2000A, 3200A

Major projects

Discovery Complex

Discovery Complex is located Cau Giay Distric. Eco-friendly design with outstanding corporate facilities brings the residents a "green nest" with high-level of modern lifestyle. It has total area of 10.218m2 with fully converged all the facilities.

Time and place	Hanoi, 2017
Field	Complex
Owner	Kinh Đô TCI
Busway system	LS C&S, Ex-way, AL-AL 1250A, 2500A

The Link Ciputra

The Link Ciputra is developed by Citra Westlake City Development Co. Ltd., The Link Ciputra is a modern, three-tower residential complex of more than 600 two and three-bedroom units located in Hanoi.

Time and place	Hanoi, 2017
Field	Apartment
Owner	Ciputra
Busway system	LS C&S, Ex-way, AL-AL 2500A, 3200A

Major projects

U-Silk

U-Silk is one in the largest projects under construction in Vietnam and comprises nine up-market 28-50-storey residential highrises and a wide range of public leisure and shopping facilities in the interlinking, greened pedestal storey.

Time and place	Hanoi, 2017
Field	Apartment
Owner	Hải Phát
Busway system	LS C&S, Ex-way, AL-AL 800A, 1000A, 1250A, 2500A, 3200A

Xuan Mai Riverside

Xuan Mai Riverside continued the success of many other projects of Xuan Mai Corp, the unique feature of Xuan Mai Riverside is the spacious apartments with all modern facilities.

Time and place	Hanoi, 2017
Field	Apartment
Owner	Xuân Mai Corp
Busway system	LS C&S, Ex-way, AL-AL 1000A, 2500A.

Major projects

Silver Star

Silver Star is located at front of Nguyen Huu Tho street, Phuoc Kien Ward, Nha Be District, Ho Chi Minh City. It has total areal of 8.437 m2 with full facilities

Time and place	HCMC, 2017
Field	Apartment
Owner	Hung Loc Phat
Busway system	LS C&S, Ex-way, AL-AL 400A, 800A, 1250A, 2000A

Golden Star

The Golden Star is the one of the big projects of Hung Loc Phat Corp. It has a campus area of 9.229 square meters, include 2 Blocks and 26 upper floors

Time and place	HCMC, 2017
Field	Apartment
Owner	Hung Loc Phat
Busway system	LS C&S, Ex-way, AL-AL 1250A, 2000A

Major projects

Van Hanh Mall

Van Hanh Mall is located 11 Su Van Hanh Street, District 10, HCM City. Its has scope 1basement floors and 7 upper floors with total investment is nearly 18 millions USD

Time and place	HCMC, 2017
Field	Shopping Mall
Owner	Bac Binh
Busway system	LS C&S, Ex-way, AL-AL 1600A, 2500A, 3200A, 4000A

The Art

The Art is located at district 9, Ho Chi Minh City. It has a large campus area of over 30,000 square meters with ten 18-floor tower blocks and one 4-commercial center named global famous artists.

Time and place	HCMC, 2017
Field	Apartment
Owner	Gia Hoa
Busway system	LS C&S, Ex-way, AL-AL 1250A

Major projects

Florita

Florita is located in Him Lam Tan Hung urban area, district 7, Ho Chi Minh city. Form there, the residents easily move to center of city just few minutes

Time and place	HCMC, 2017
Field	Apartment
Owner	Khai Huy Quan Corp.
Busway system	LS C&S, Ex-way, AL-AL 1000A, 2000A

Hilton Da Nang

Hilton Da Nang is a modern hotel overlooking this picturesque region and the Han River. Enjoy attentive service and thoughtful amenities including rooms with river views, all-day dining, a Sky Bar, fitness center, outdoor pool, Executive Lounge and elegant event space.

Time and place	Danang, 2016
Field	Hotel
Owner	Service Hotel Bach Dang Da Nang JSC
Busway system	LS C&S, Ex-way, Cu-AL 800A

Major projects

Vinhomes Gardenia

Vinhomes Gardenia Urban is greencity urban including modern villas, houses, shophouses, apartments, commercial center, international schools and hospital, and green park invested and built under total area of 17.6 ha. Vinhomes Gardenia project will be an ideal home for the city's residents.

Time and place	Hanoi, 2016
Field	Complex
Owner	Vingroup
Busway system	LS C&S, Ex-way, AL-AL 1600, 3200, 4000A

M One

M-ONE Saigon South is developed by TCO Development and Thao Dien Investment - renowned for Masteri Thao Dien, built by CotecCons, Vietnam's leading construction company.Ideally located in central of district . It's offer the up-market facilities and the high living standard: Green and tranquil living space next to the park, Kenh Te river and Song Tan Canal Various outdoor facilities such as swimming pool, BBQ area, park, greenery landscape, etc

Time and place	HCMC, 2016
Field	Apartment
Owner	TCO Development, Thao Dien Investment JSC
Busway system	LS C&S, Ex-way, AL-AL 1250A, 2000A, 2600A, 3200A, 4000A

Major projects

Goldsilk

Goldsilk is located at 430 Van Phuc Street, Van Phuc Warrd, Ha Dong District, Ha Noi City. From Goldsilk you can easily get into Hanoi city center via two major routes: Quang Trung - Nguyen Trai; To Huu - Le Van Luong extended. Goldsilk Residence will give you a European-style lifestyle with full facilities. Goldsilk Residence will give you a Europe-an-style lifestyle with full facilities

Time and place	Hanoi, 2016
Field	Complex
Owner	Hanovid Real Estate JSC
Busway system	LS C&S, Ex-way, AL-AL 1600A, 4000A

Imperia Sky Garden

Imperia Sky Garden by MIK Group is a truly immersive residential complex at the southwest gate of Hanoi city which combines eco-friend-ly features and green spaces along with modern conveniences.

Time and place	Hanoi, 2016
Field	Complex
Owner	M.I.K Group
Busway system	LS C&S, Ex-way, AL-AL 1250A, 1600A, 2000A, 2500A, 3200A

Major projects

Five Star Garden

Five Star Garden is located at 02 Kim Giang Street, Thanh Xuan District, Ha Noi City, with total slap area is 140.000 m2, include 2 Blocks 30 upper floors and 2 basement

Time and place	Hanoi, 2016
Field	Apartment
Owner	Five Star
Busway system	LS C&S, Ex-way, AL-AL 800A, 1250A, 1600A

Vincom Xuan Khanh Can Tho

Vincom Xuan Khanh Can Tho, located conveniently at Ninh Kieu Quay. It can be said that Vincom Plaza Xuan Khanh is a full convergence of catering sectors of modern life. The project has trendy space of both domestic and international brands with over 2,000sqm floor.

Time and place	Cantho, 2016
Field	Complex
Owner	Vingroup
Busway system	LS C&S, Ex-way, AL-AL 1000A

Major projects

Nippon Charmiphar Viet Nam Factory

Nippon Charmiphar Viet Nam Factory is the biggest project that Nippon Pharmaceutical Industry Corp. invested in oversea.It has area of over 10,522 square meters with invested capital is 50 milions USD

Time and place	Binhduong, 2016
Field	Factory
Owner	Mektec Manufacturing
Busway system	LS C&S, Ex-way, AL-AL 4000A

The Ascent Lake Side

The Ascent Lakeside is invested by the cooperation between Tien Phat Corp and Sanyo Home. It has total areal of 3.354 m2 with full facilities

Time and place	HCMC, 2016
Field	Apartment
Owner	Tien Phat - Sanyo Home
Busway system	LS C&S, Ex-way, AL-AL 630A, 1250A

Major projects

Hoa Binh Green (Ha Noi)

Hoa Binh Green (Ha Noi) is locate at Buoi Road, Vinh Phuc Ward, Ba Dinh District, Ha Noi City. The project have full facilities: indoor gym, sauna , golf, mini - mart... with 24/7 secure and reception.

Time and place	Hanoi, 2015
Field	Apartment
Owner	Hoa Binh Corp.
Busway system	LS C&S, Ex-way, AL-AL 800A, 1250A, 1600A, 2000A, 4000A

Sunrise City North Tower

Sunrise City North Tower is located 23 - 25 - 27 Nguyen Huu Tho Street, Tan Hung Ward, District 7, HCMC with an area of 12,597 m2. It includs 2 towers with various types of small and diverse apartments, tennis courts, swimming pool and beautiful garden. The North Towers has a basement and 34 floors. The ground floor to the 5th floor is the financial center, office, commercial with full facilities.

Time and place	HCMC, 2015
Field	Apartment
Owner	Novaland
Busway system	LS C&S, Ex-way, AL-AL 1000A, 1250A, 2000A, 4000A

Other projects

Complex

MC Plaza	Binhduong, 2012	Cantavil Premier	HCMC, 2013
Sai Gon Airport Plaza	HCMC, 2012	Toyota Plaza	Cantho, 2013
Vinhomes Nguyen Chi Thanh	Ha Noi, 2015	Vincom Xuan Khanh Can Tho	Cantho, 2016

Office Building

189 Nguyen Thi Minh Khai	HCMC, 2009	Licogi 13 Building	Hanoi, 2012
Hong Ngoc Building	HCMC, 2009	VMS Mobifone District 10	HCMC, 2012
VIPCO Tower	Haiphong, 2009	319 Corp Headquarter	Hanoi, 2013
VNPT Giai Phong	Hanoi, 2009	Eximbank Ky Dong	HCMC, 2013
Detech Tower	Hanoi, 2010	FICO Tower	HCMC, 2013
Hoang Cau Building	Hanoi, 2010	HCMC Stock Exchange Center	HCMC, 2014
Sonadezi Building	Dongnai, 2010	HOSE Data Center	HCMC, 2014
Vietsovpetro Building	Vungtau, 2010	Robot Tower	HCMC, 2014
ACB Bank CMT8	HCMC, 2012	Sai Gon Giai Phong Building	HCMC, 2014
Hoang Thanh Building	Hanoi, 2012	Vietbank Tower	HCMC, 2014
58 Truong Dinh	HCMC, 2015	Dong Nhan office	HCMC, 2016

Apartment

Sinh Loi Apartment	HCMC, 2009	Dragon Hill Residence	HCMC, 2012
16B Nguyen Thai Hoc	Hanoi, 2010	PARC Spring	HCMC, 2012
Becamex City Center	Binhduong, 2010	The Sails Tower	Hanoi, 2012
My Duc D Apartment	HCMC, 2010	Carillon Apartment	HCMC, 2013
Ngoc Khanh Building	HCMC, 2010	CT07 Co Nhue	Hanoi, 2013
Phu Thanh Apartment	HCMC, 2010	Hei Tower	Hanoi, 2013
Riverpark Residence	HCMC, 2010	New Pearl Residence	HCMC, 2013
Riverside Residence	HCMC, 2010	Pegasus Plaza	Dongnai, 2013
Thinh Vuong Apartment	HCMC, 2010	Pho Dong – Hoa Sen	HCMC, 2013
Xi Riverview Palace	HCMC, 2010	New Pearl	HCMC, 2013
Lotus Garden	HCMC, 2011	The Eastern	HCMC, 2013
IJC Aroma	Binhduong, 2011	Tropic Garden	HCMC, 2013
Petroland Apartment	HCMC, 2011	The Everrich 2	HCMC, 2014
Terra Rosa	HCMC, 2011	HMTC Do Thanh	HCMC, 2014
Vung Tau Plaza	Vungtau, 2011	Central Plaza	HCMC, 2014
Charm Plaza	HCMC, 2012	Hung Phat Apartment	HCMC, 2014
City Center D1	Dongnai, 2012	ICON D3	HCMC, 2015
Sunrise city North	HCMC, 2015	Lexington	HCMC, 2015
Galaxy 9	HCMC, 2015	Everrich Infinity	HCMC, 2016
Vista Verde	HCMC, 2016	Phu Cuong apt	HCMC, 2015
The Ascent	HCMC, 2015		

Other projects

Shopping Mall

Lotte Mart 2	HCMC, 2010
Vinh Trung Plaza	Danang, 2010
Vincom Center Danang	Danang, 2015
Vincom Bien Hoa	Bienhoa, 2015
Lotte Mart Phan Thiet	Phanthiet, 2013
Lotte Mart Vung Tau	Vungtau, 2014
Vincom Thao Dien	HCMC, 2015

Hotel

Caravelle Hotel	HCMC, 1997
Grand Hotel	HCMC, 2011
Le Meridien Hotel	HCMC, 2012
Metropole Wedding Center	HCMC, 2012
Liberty Riverside Hotel	HCMC, 2013
Duc Viet Resort	Phuquoc, 2015
Oceanviews Apartment Hotel	Danang, 2013
Culture Hotel	HCMC, 2014
Sai Gon Hotel	HCMC, 2014
The Beach Hotel	Vungtau, 2014
IBIS Nha Trang	Nhatrang, 2015
Silverland Hotel	HCMC, 2016

Factory

Groz-Beckert Factory	Danang, 2009
Takigawa Factory	Binhduong, 2011
Fujitsu Factory	Dongnai, 2012
Saigon Stec	HCMC, 2016
Flexcom Vina 2nd	Bacninh, 2013
Shin-Etsu Factory	Binhduong, 2014
Nippon	Binhduong, 2016
Castec	Binhduong, 2016

Public Building

Hoan My Hospital	HCMC, 2011
Hangar A76 Noi Bai	Hanoi, 2012
Hoa Sen University	HCMC, 2012
My Phuoc Hospital	Binhduong, 2014
T2 Noi Bai	Hanoi, 2014
Duc Giang hospital	Hanoi, 2016

Certification & Specification

KEMA KEUR (I-Series AL-AL)

KEMA KEUR (I-Series CU-AL)

CB Certificate (I-Series AL-AL)

CB Certificate (I-Series CU-AL)

ISO 9001

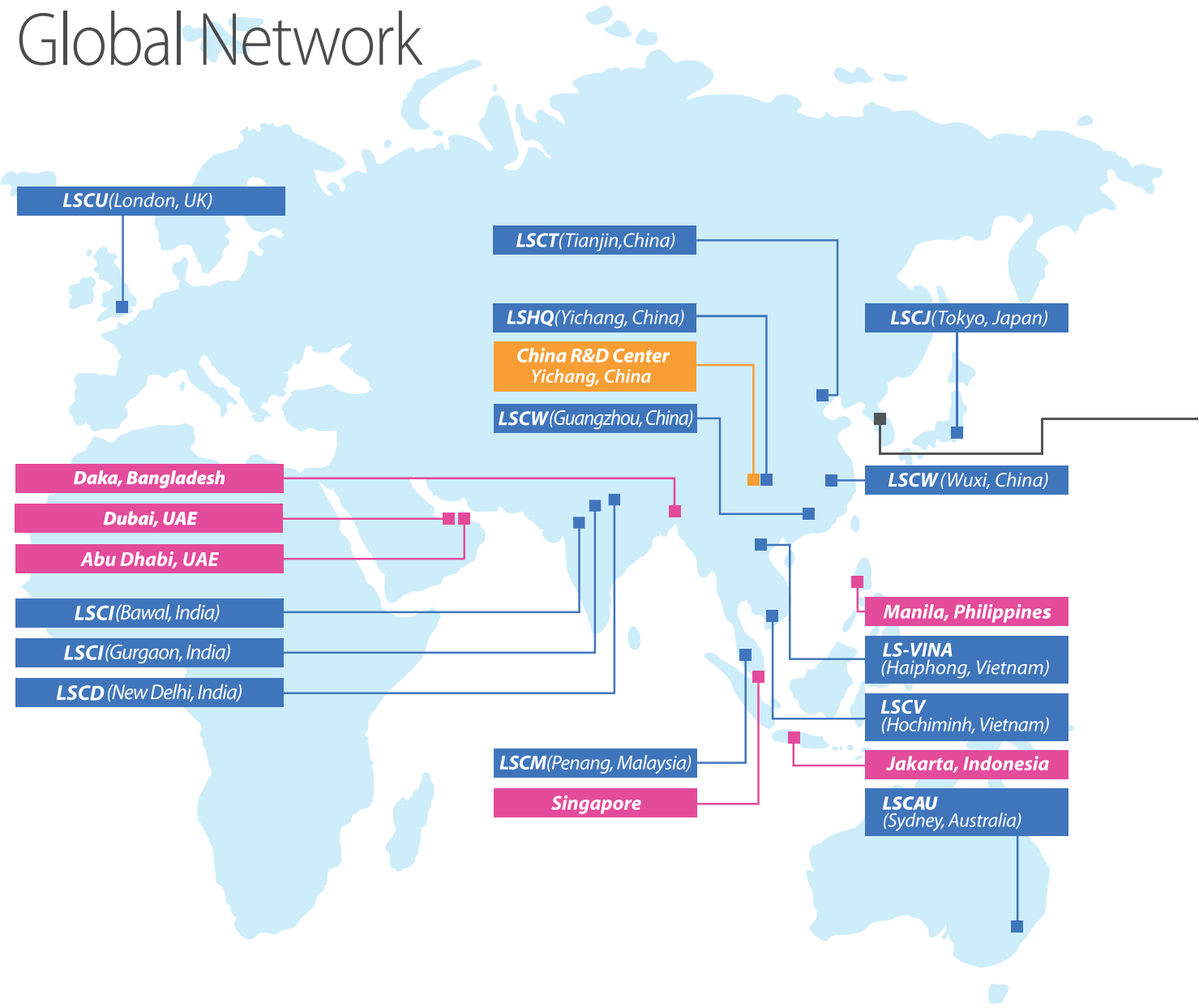
ISO 14001

OHSAS 18001

Memo

Memo

Global Network



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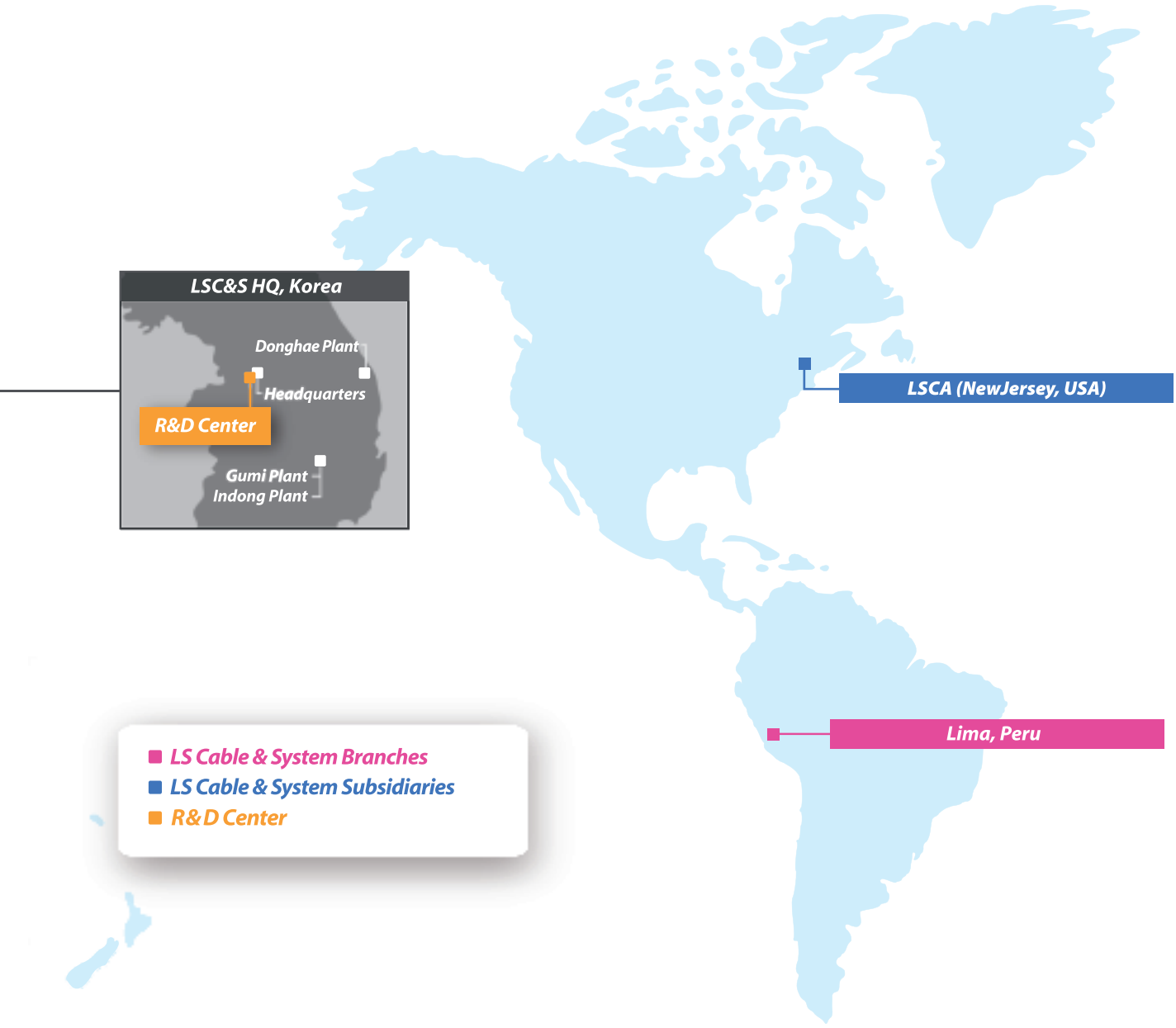

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