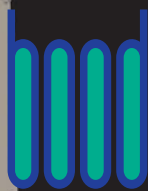




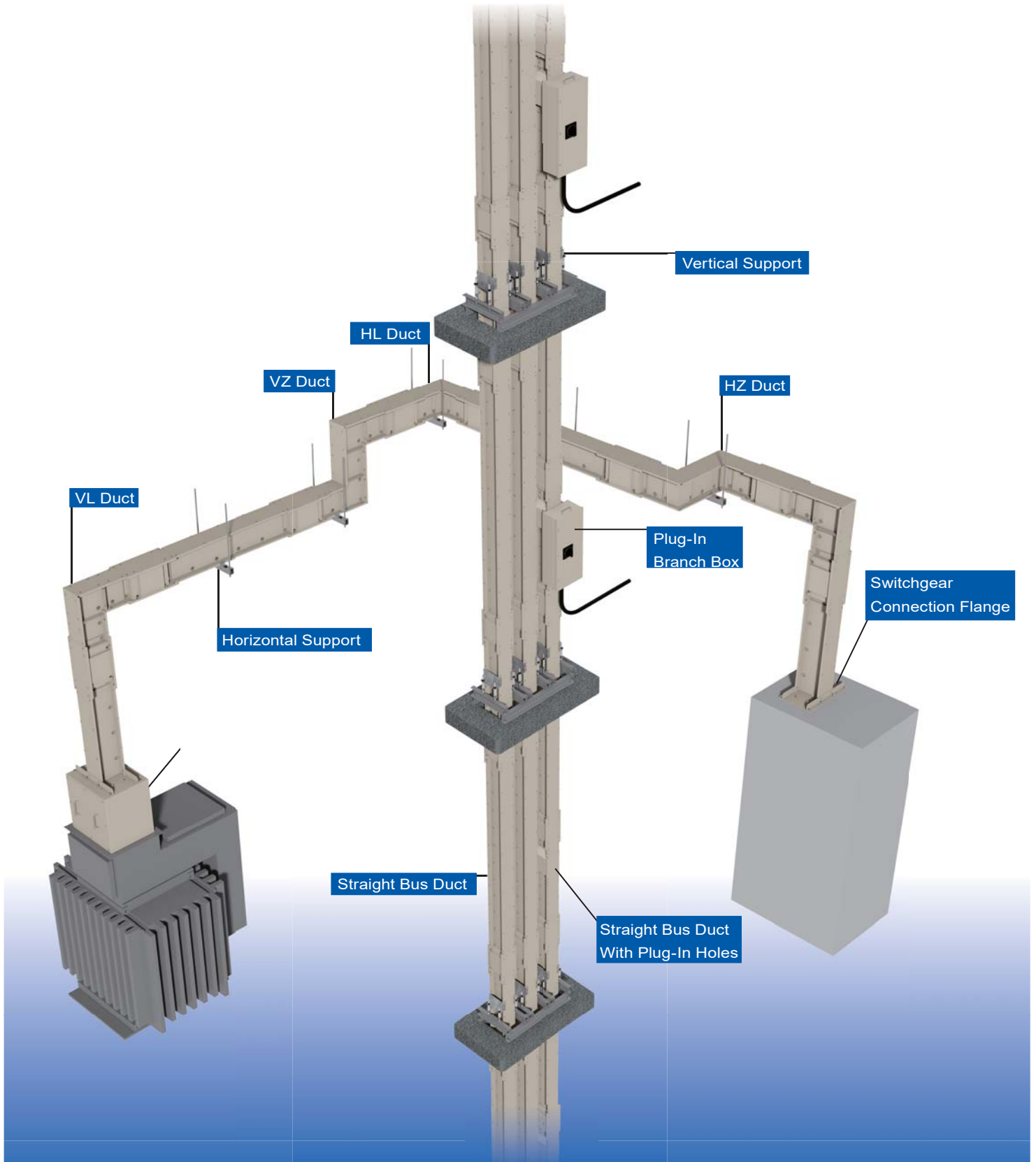
**KYODO KY-TEC CORP.**



**Busduct**

## ◀ Bus Duct Route Overview ▶

KYODO KY-TEC offers variable shapes of bus duct such as elbows and offsets. By combining such shapes with straight bus duct, any routing will be possible.



KYODO KY-TEC, the only Japanese manufacturer that specializes in manufacturing bus ducts, has been operating for more than 50 years. We supply safe and easy-to-use bus ducts, while always keeping in mind that safety is most important.

Bus duct trunking systems produce smaller amounts of electromagnetic waves than electrical cables, which means that bus ducts run cleaner. As a result, people, as well as computers, are protected from the adverse effects of electromagnetic waves.

As one of the first Japanese companies to focus on recycling, our product components, including housing, conductors, and insulation materials, are recyclable.

With past sales of more than 22,000 projects, KYODO KY-TEC's bus ducts have been used across the world, testifying to the safety and earth-friendliness of KYODO KY-TEC's products.



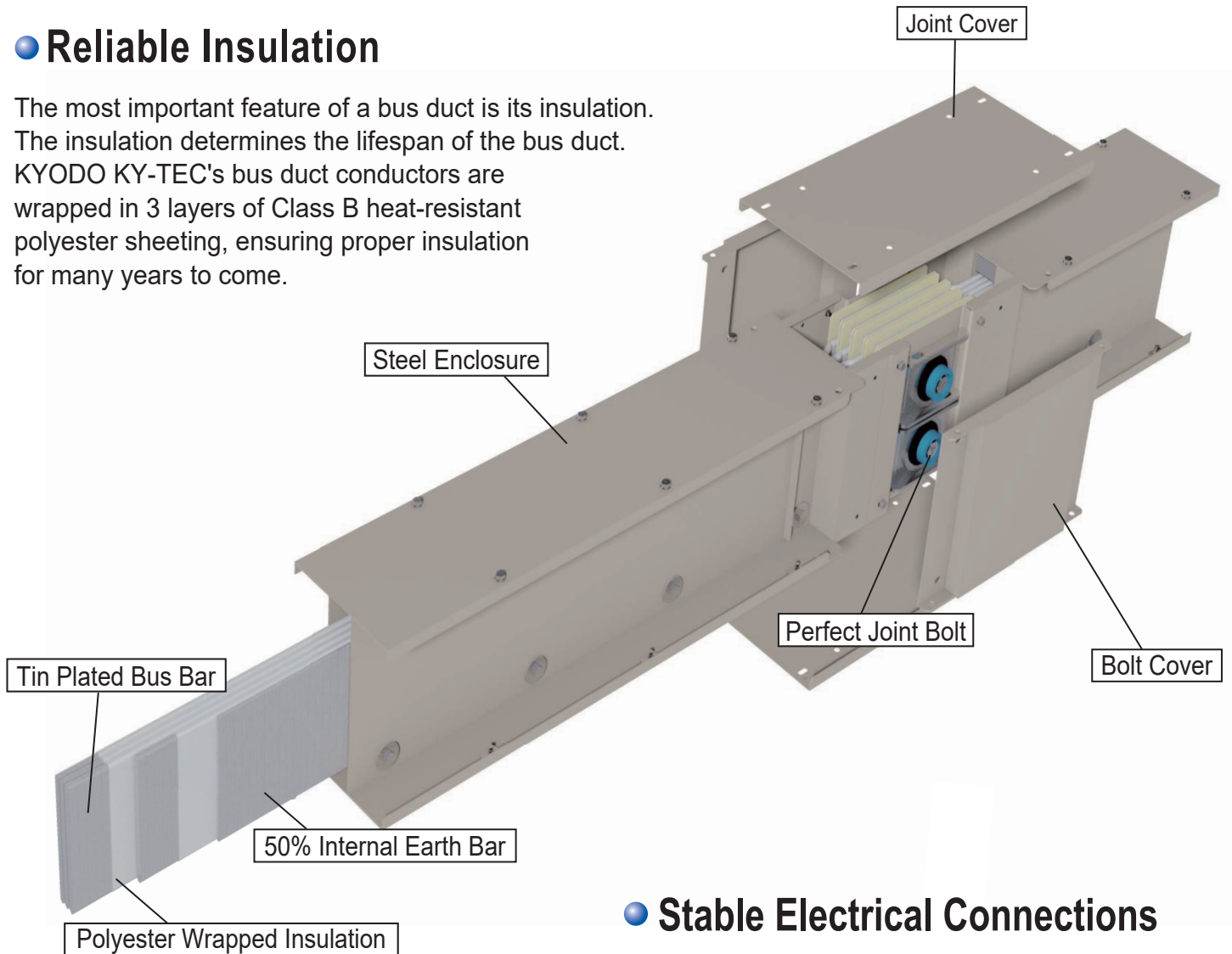
## ◀ Bus Duct Design and Features ▶

Q-BD bus duct is an entirely newly-developed 3-phase 4-wire electrical trunking system with a 50% internal earth bar. The reliable technology used to make it has been created with the technical know-how of the highly experienced professionals at KYODO KY-TEC.

This bus duct totally complies with the relevant IEC 61439 standards, and it is ASTA certified. It can be provided with a degree of protection of up to IP65.

### ● Reliable Insulation

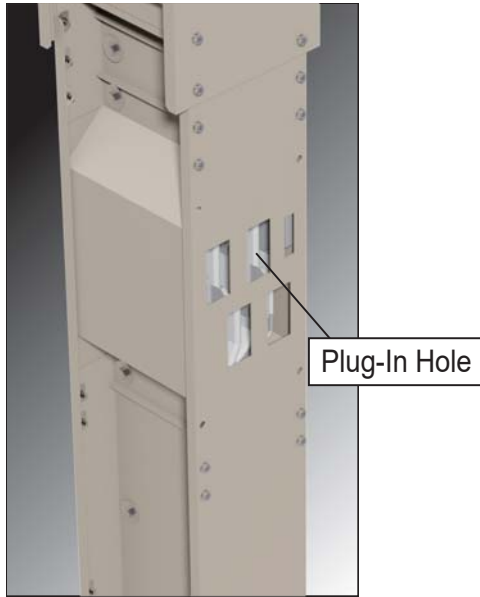
The most important feature of a bus duct is its insulation. The insulation determines the lifespan of the bus duct. KYODO KY-TEC's bus duct conductors are wrapped in 3 layers of Class B heat-resistant polyester sheeting, ensuring proper insulation for many years to come.



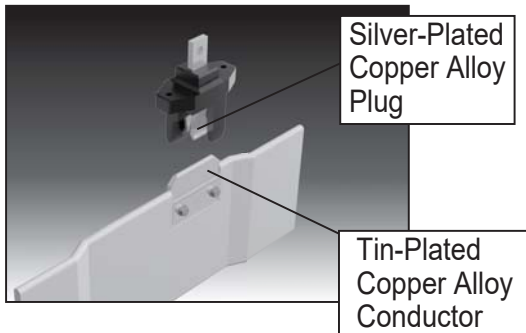
### ● Stable Electrical Connections

Copper conductors used in bus ducts are fully plated with tin to ensure stable electrical connections. Loosening bolts in jointing sections, the natural enemy of the bus duct, can also be fully prevented by using the Perfect Joint System.

## ◀ Load Branching on Plug-In Bus Ducts ▶

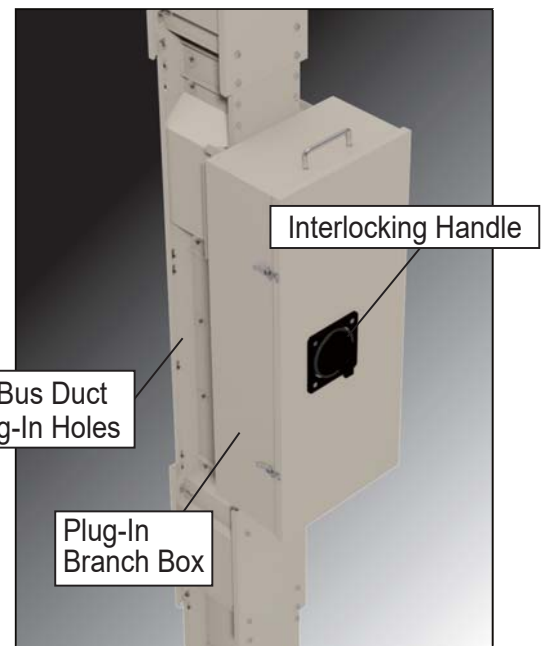


In places where it is necessary to branch load, bus ducts with plug-in holes can be used to make branching simple and easy. The maximum possible branch capacity for each plug-in hole is 630A. Each bus duct length has up to 2 plug-in holes.



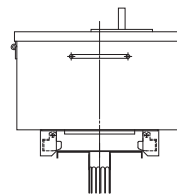
Branch boxes used for load branching include interlocking mechanisms to prevent them from being installed or removed while the breaker is in the ON position.

You can choose from a large variety of breakers for branching, with capacities from 125AF to 630AF.

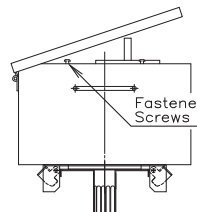


### ● Interlocking Mechanism

Interlocking mechanisms can be added onto any plug-in unit to keep workers (operators) safe. Interlocking with the bus duct case prevents installation and removal of the unit while the switch is ON. Cover interlocking prevents the cover from being opened while the switch is ON and also prevents accidental closing of the switch while the cover is open.



While the plug-in unit is ON, the cover cannot be opened and the fastener screws cannot be loosened, so the unit cannot be installed or removed from the bus duct.



While the plug-in unit is OFF, the cover can be opened and the fastener screws can be loosened, so the unit can be installed or removed from the bus duct.

## ◀ The Perfect Joint System ▶

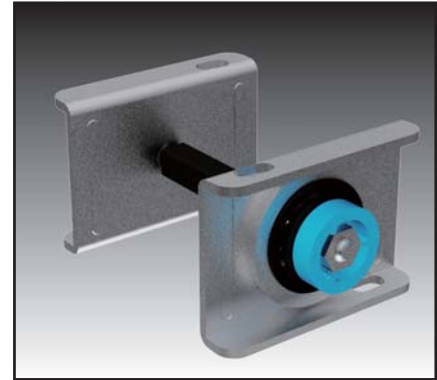
The most important thing during bus duct installation is making sure that joint bolts are tightened correctly. KYODO KY-TEC's bus ducts use the Perfect Joint System, in which joint bolts are tightened and installed correctly regardless of who installs jointing or how it is installed.

### ● Perfect Bolts



Before Tightening

When the specified torque is reached, the outer bolt head will twist off and the red ring will detach. Breaking the red plate will cause the self-locking mechanism to activate, after which the bolt can no longer be loosened.



After Tightening

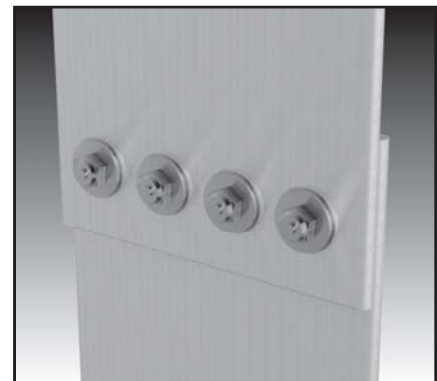
If installed correctly, the perfect bolt will only have the blue ring still attached. This bolt creates a secure connection, regardless of who installed it.

### ● PS Torque Bolts



Before Tightening

PS Torque Bolts are used in connections between bus ducts and equipment such as panels and transformers.

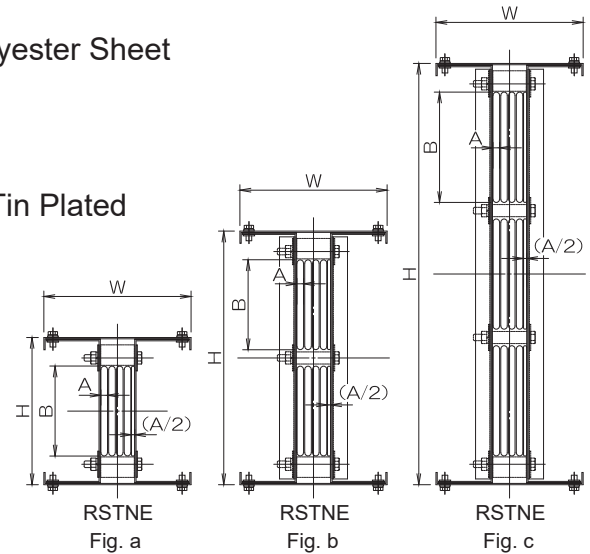


After Tightening

If the red outer head is tightened using an ordinary tool, the outer head of the bolt will twist off when the specified torque is reached. This revolutionary bolt allows users to confirm installation status and manage torque simply by looking at it.

## ◀ Ratings and Specifications ▶

- Bus Duct Type : Q-BD
- Applicable Standards : IEC 61439-1, IEC 61439-6
- Degree of Protection : IP65
- Wiring System : 3-Phase 4-Wire + 50% Internal Earth Bar
- Rated Voltage : 1000V(AC) or 1500V(DC)
- Rated Current : 800A to 6300A
- Rated Frequency : 50Hz / 60Hz
- Conductors : Copper Bars - Tin Plated
- Insulation Material : 130°C Heat-Resistant Polyester Sheet (Multi-Layered)
- Housing : Galvanized Sheet Steel
- Finishing Color : RAL7032
- Grounding : 50% Internal Earth Bar - Tin Plated



## ◀ Bus Duct Dimensions and Short-Circuit Capacity ▶

Rated Current (A)	Fig.	Bus Bars per Phase (mm) A × B × N	Bus Duct Dimensions			Short-Circuit Capacity (RMS) (kA-1sec)
			W (mm)	H (mm)	Weight (kg/m)	
800	a	8 × 40 × 1	180	110	25	40
1000	a	8 × 60 × 1	180	130	32	50
1250	a	8 × 75 × 1	180	145	37	50
1600	a	8 × 110 × 1	180	180	49	60
2000	a	8 × 150 × 1	180	220	62	80
2500	a	8 × 190 × 1	180	260	76	100
3200	b	8 × 110 × 2	180	310	90	120
4000	b	8 × 150 × 2	180	390	117	120
4500	b	8 × 170 × 2	180	430	131	150
5000	c	8 × 135 × 3	180	515	156	150
6300	c	8 × 170 × 3	180	620	192	150

## ◀ Impedance and Voltage Drop Data ▶

### Line to Line

Rated Current (A)	Bus Bars Per Phase (mm)	Cross-sectional area (mm <sup>2</sup> )	Impedance (μΩ/m)		Voltage Drop at Power Factor (V/100m)					
			Effective Resistance R	Reactance X	100	95	90	80	70	60
	A × B × N									
800	8 × 40 × 1	306	73.4	34.3	10.18	11.15	11.23	10.99	10.52	9.91
1000	8 × 60 × 1	466	49.4	25.3	8.56	9.50	9.62	9.48	9.12	8.64
1250	8 × 75 × 1	586	39.9	21.2	8.64	9.64	9.78	9.67	9.33	8.86
1600	8 × 110 × 1	866	28.0	15.3	7.76	8.70	8.84	8.76	8.46	8.05
2000	8 × 150 × 1	1186	21.1	11.7	7.31	8.21	8.35	8.28	8.02	7.63
2500	8 × 190 × 1	1506	17.3	9.4	7.50	8.39	8.52	8.44	8.16	7.76
3200	8 × 110 × 2	1732	15.3	7.6	8.49	9.38	9.47	9.32	8.95	8.46
4000	8 × 150 × 2	2372	11.5	5.8	7.97	8.83	8.93	8.79	8.45	8.00
4500	8 × 170 × 2	2692	10.4	5.2	8.11	8.97	9.07	8.92	8.57	8.11
5000	8 × 135 × 3	3198	9.1	4.2	7.89	8.63	8.68	8.49	8.12	7.64
6300	8 × 170 × 3	4038	7.3	3.5	7.97	8.76	8.84	8.67	8.31	7.84

### Line to Neutral

Rated Current (A)	Bus Bars Per Phase (mm)	Cross-sectional area (mm <sup>2</sup> )	Impedance (μΩ/m)		Voltage Drop at Power Factor (V/100m)					
			Effective Resistance R	Reactance X	100	95	90	80	70	60
	A × B × N									
800	8 × 40 × 1	306	73.4	34.3	5.88	6.44	6.49	6.35	6.08	5.72
1000	8 × 60 × 1	466	49.4	25.3	4.94	5.49	5.55	5.47	5.27	4.99
1250	8 × 75 × 1	586	39.9	21.2	4.99	5.57	5.65	5.58	5.39	5.12
1600	8 × 110 × 1	866	28.0	15.3	4.48	5.03	5.10	5.06	4.89	4.65
2000	8 × 150 × 1	1186	21.1	11.7	4.22	4.74	4.82	4.78	4.63	4.41
2500	8 × 190 × 1	1506	17.3	9.4	4.33	4.85	4.92	4.87	4.71	4.48
3200	8 × 110 × 2	1732	15.3	7.6	4.90	5.42	5.47	5.38	5.17	4.89
4000	8 × 150 × 2	2372	11.5	5.8	4.60	5.10	5.16	5.08	4.88	4.62
4500	8 × 170 × 2	2692	10.4	5.2	4.68	5.18	5.24	5.15	4.95	4.68
5000	8 × 135 × 3	3198	9.1	4.2	4.55	4.98	5.02	4.90	4.69	4.41
6300	8 × 170 × 3	4038	7.3	3.5	4.60	5.06	5.11	5.01	4.80	4.53

\*Conductor resistance calculated under ambient temperature of 40 °C with temperature rise value of 65K.

\*This table is for 50Hz frequency. Please inquire for information on 60Hz frequency.

Voltage Drop are calculated by following values.

$$\Delta V = K \times I \times (R \cos\theta + X \sin\theta) \times L$$

$\Delta V$  : Voltage drop value

I : Rated current(A)

L : Bus duct length (per 100m)

K : Line to Line =  $\sqrt{3}$  , Line to Neutral = 1

$\cos\theta$  : Power factor

$\sin\theta$  :  $\sqrt{(1 - \cos^2\theta)}$

#### 【 EXAMPLE 】

It is simulation of voltage drop calculation with following condition:

• Load current 4000A • Power factor 0.8 • Bus duct Length 100m

$$\Delta V = \sqrt{3} \times 4000 \times (11.5 \times 10^{-6} \times 0.8 + 5.8 \times 10^{-6} \times \sqrt{(1 - 0.8^2)}) \times 100 = 8.79(V)$$



# ASTA Certificate

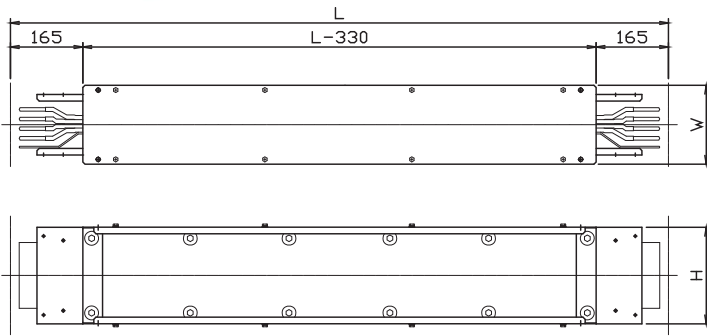
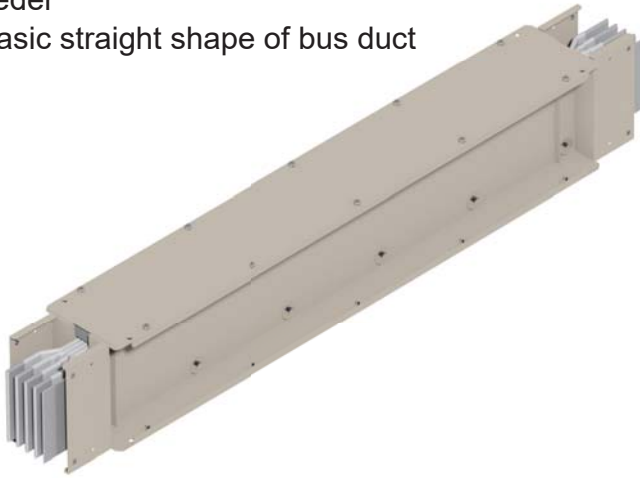
KYODO KY-TEC's bus duct has been type tested and certified by an independent testing authority Intertek and has ASTA Certification complying to latest IEC 61439-6 standard.



## ◀ Shape and Dimensions ▶

### ■ Feeder

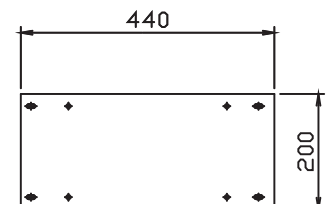
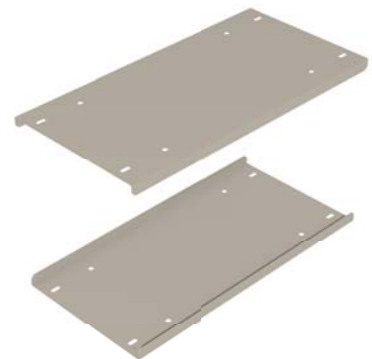
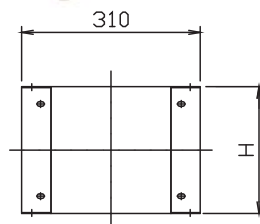
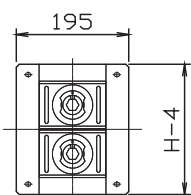
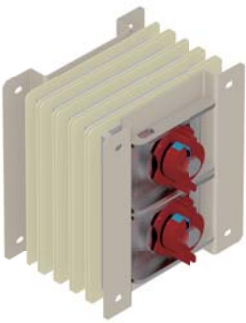
- Basic straight shape of bus duct



Rated Current (A)	W (mm)	H (mm)	Standard Length L (mm)
800	180	110	3000
1000	180	130	3000
1250	180	145	3000
1600	180	180	3000
2000	180	220	3000
2500	180	260	3000
3200	180	310	3000
4000	180	390	3000
4500	180	430	3000
5000	180	515	2500
6300	180	620	2500

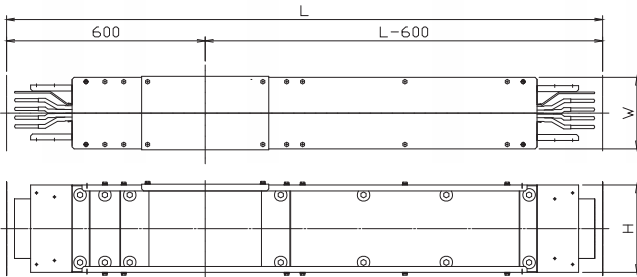
### ■ Joiner

- Jointing that connects each bus ducts



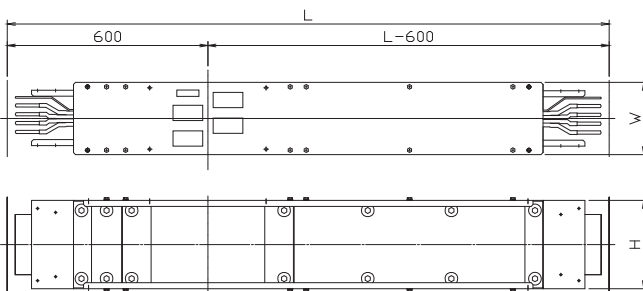
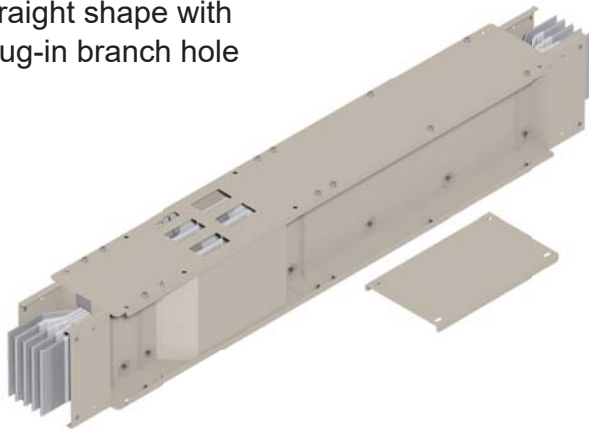
## ◀ Shape and Dimensions ▶

- Plug-in Feeder (cover closed)  
- Straight shape with plug-in branch hole



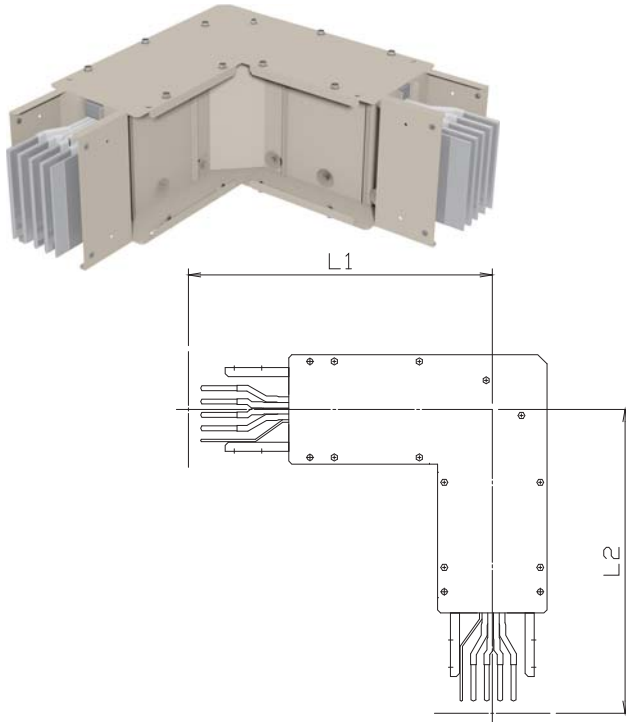
Rated Current (A)	W (mm)	H (mm)	Standard Length L (mm)
800	180	110	3000
1000	180	130	3000
1250	180	145	3000
1600	180	180	3000
2000	180	220	3000
2500	180	260	3000
3200	180	310	3000
4000	180	390	3000
4500	180	430	3000
5000	180	515	2500
6300	180	620	2500

- Plug-in Feeder (cover opened)  
- Straight shape with plug-in branch hole



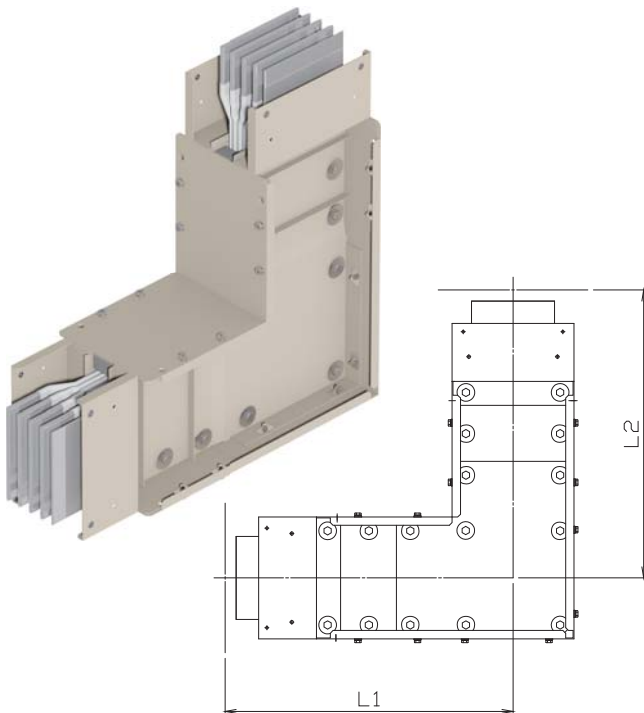
Rated Current (A)	W (mm)	H (mm)	Standard Length L (mm)
800	180	110	3000
1000	180	130	3000
1250	180	145	3000
1600	180	180	3000
2000	180	220	3000
2500	180	260	3000
3200	180	310	3000
4000	180	390	3000
4500	180	430	3000
5000	180	515	2500
6300	180	620	2500

**Horizontal Elbow (HL) Duct**  
 - Horizontal jointing used to connect bus ducts at a right angle



Rated Current (A)	Standard Length L1×L2 (mm)
800	500×500
1000	500×500
1250	500×500
1600	500×500
2000	500×500
2500	500×500
3200	500×500
4000	500×500
4500	500×500
5000	500×500
6300	500×500

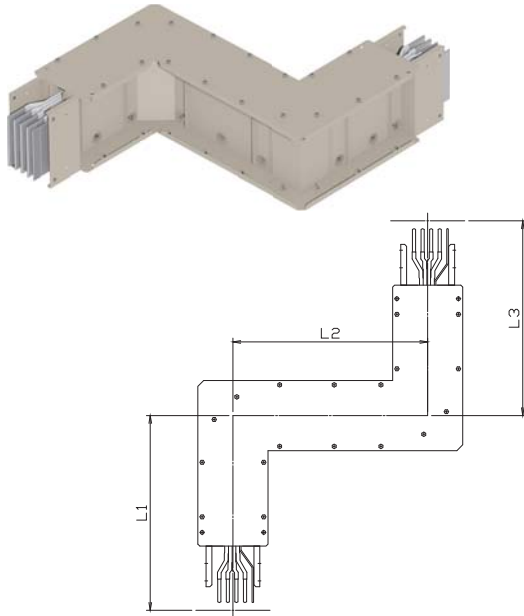
**Vertical Elbow (VL) Duct**  
 - Vertical jointing used to connect bus ducts at a right angle



Rated Current (A)	Standard Length L1×L2 (mm)
800	500×500
1000	500×500
1250	500×500
1600	500×500
2000	500×500
2500	500×500
3200	600×600
4000	600×600
4500	600×600
5000	700×700
6300	700×700

### Horizontal Offset (HZ) Duct

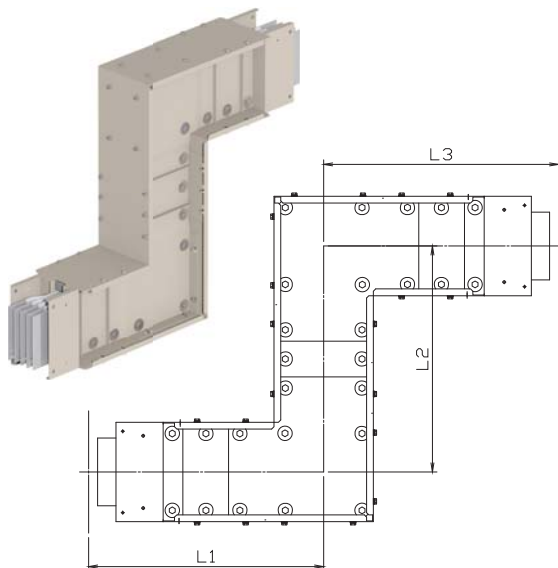
- Jointing unit used to adjust route position horizontally by the smallest amount possible



Rated Current (A)	Standard Length L1×L2×L3 (mm)
800	500×500×500
1000	500×500×500
1250	500×500×500
1600	500×500×500
2000	500×500×500
2500	500×500×500
3200	500×500×500
4000	500×500×500
4500	500×500×500
5000	500×500×500
6300	500×500×500

### Vertical Offset (VZ) Duct

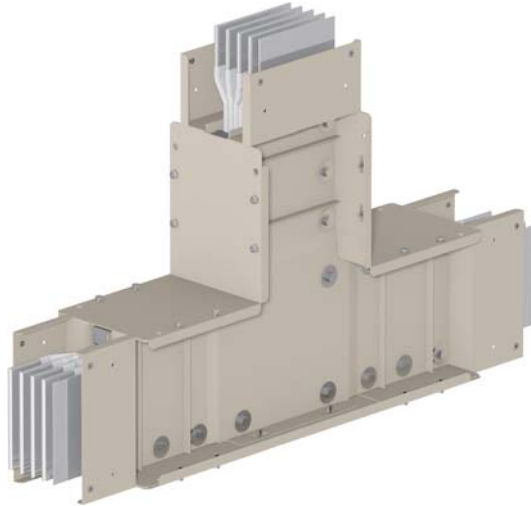
- Jointing unit used to adjust route position vertically by the smallest amount possible



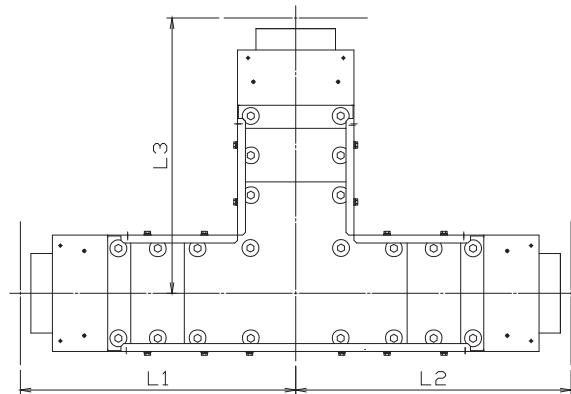
Rated Current (A)	Standard Length L1×L2×L3 (mm)
800	500×500×500
1000	500×500×500
1250	500×500×500
1600	500×500×500
2000	500×500×500
2500	500×500×500
3200	600×600×600
4000	600×600×600
4500	600×600×600
5000	700×700×700
6300	700×700×700

## Vertical Tee (VT) Duct

-Vertical jointing unit used to branch bus duct in three directions



Rated Current (A)	Standard Length L1×L2×L3 (mm)
800	500×500×500
1000	500×500×500
1250	500×500×500
1600	500×500×500
2000	500×500×500
2500	500×500×500
3200	600×600×600
4000	600×600×600
4500	600×600×600
5000	700×700×700
6300	700×700×700



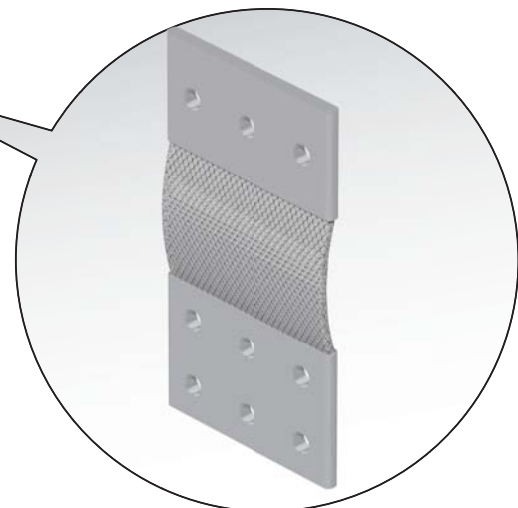
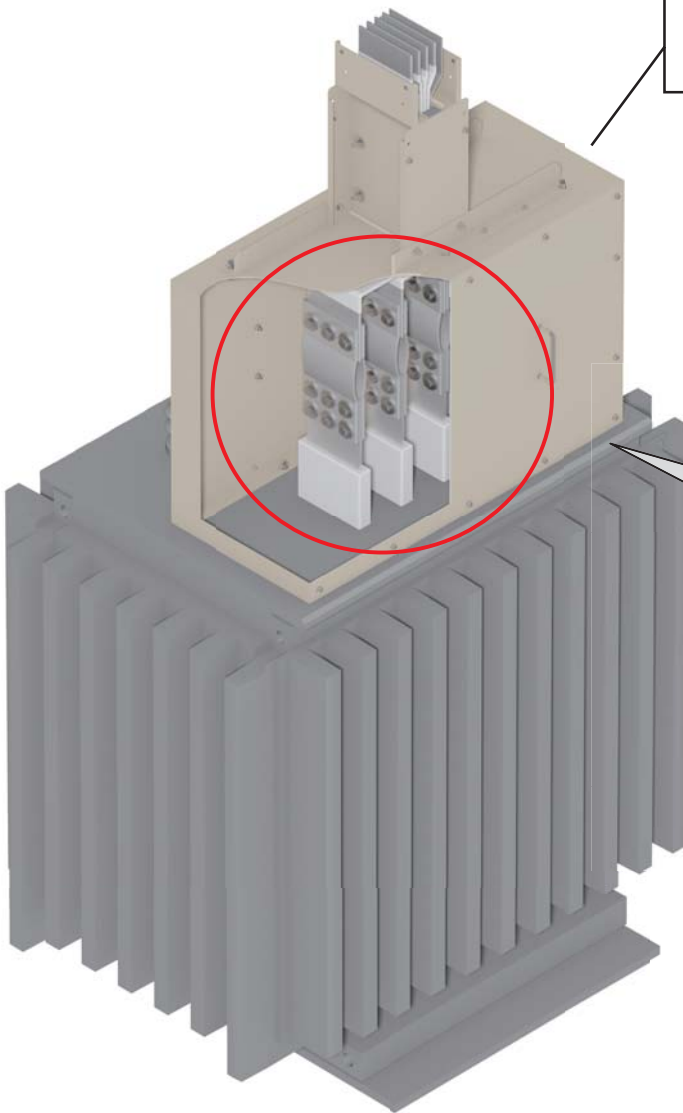
\* Horizontal Tee (HT) Duct also available.

Horizontal jointing unit used to branch bus duct in three directions.

■ Flanged End Box

- Busduct with connection flange and box to connect Transformers

Connection Box and connecting busbar details are designed by KYODO KY-TEC according to Transformer detail drawings



◀ Flexible Link ▶

Use between transformer bushing and bus duct connection to absorb electrical micro vibration

## Flanged End

- Busduct with connection flange to connect panels or switchboards

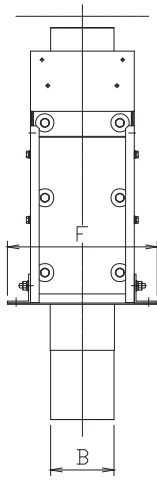
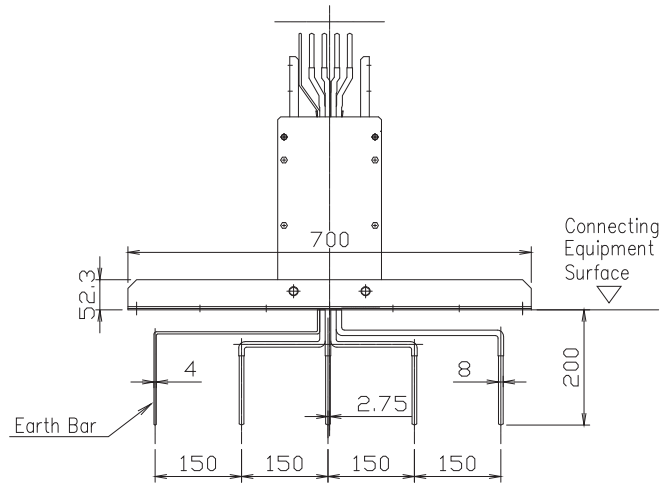
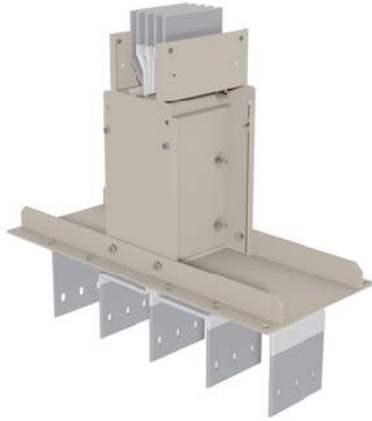


Figure.1

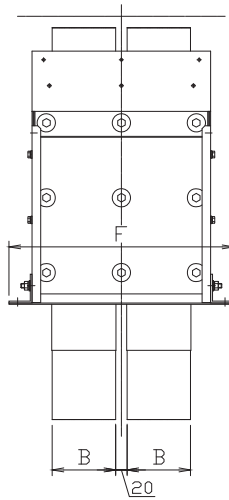


Figure.2

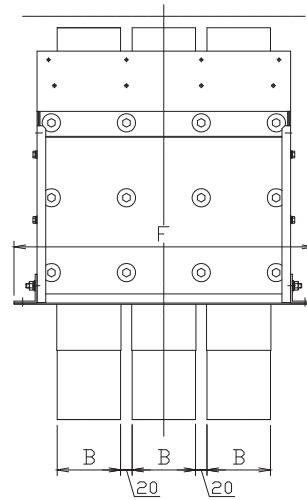


Figure.3

Connecting hole pitch dimension

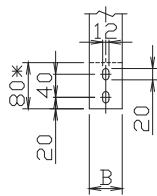


Figure.a

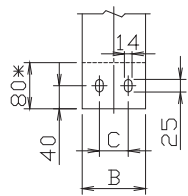


Figure.b

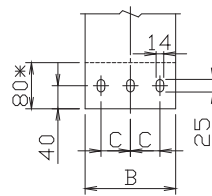


Figure.c

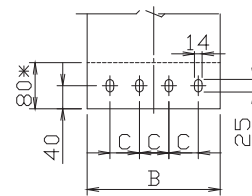


Figure.d

\* "80mm" means contact length of conductor Bus Duct and Equipment.



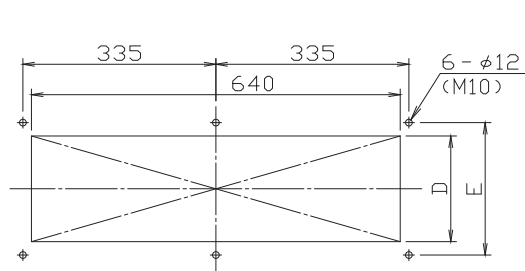


Figure. I

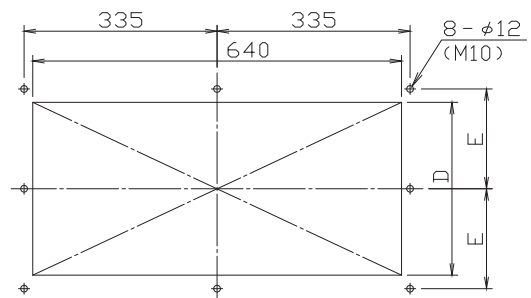


Figure. II

Dimension of switchboard plate openings : 640 x D

## Dimensions

Rated Current (A)		B (mm)	C (mm)		D (mm)	E (mm)	F (mm)	
800	Figure.1	40	Figure. a	-	Figure. I	80	160	190
1000	Figure.1	60	Figure. a	-	Figure. I	100	180	210
1250	Figure.1	75	Figure. a	-	Figure. I	115	195	225
1600	Figure.1	110	Figure. b	50	Figure. I	150	230	260
2000	Figure.1	150	Figure. c	50	Figure. I	190	270	300
2500	Figure.1	190	Figure. d	42	Figure. I	230	310	340
3200	Figure.2	110	Figure. b	50	Figure. II	280	180	390
4000	Figure.2	150	Figure. c	50	Figure. II	360	220	470
4500	Figure.2	170	Figure. d	42	Figure. II	400	240	510
5000	Figure.3	135	Figure. c	42	Figure. II	485	282.5	595
6300	Figure.3	170	Figure. d	42	Figure. II	590	335	700

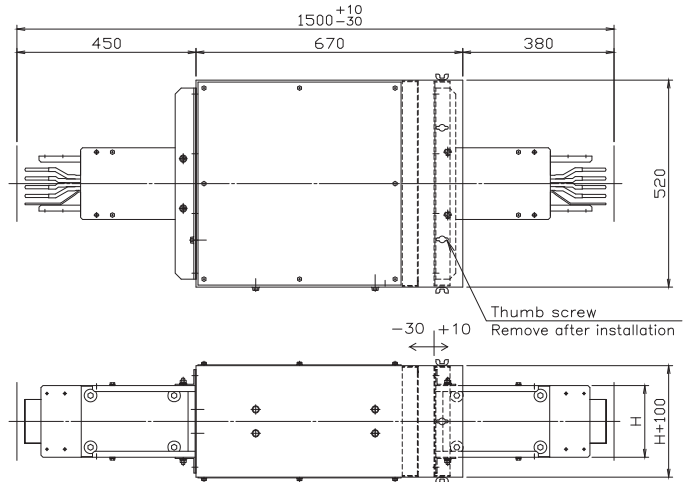
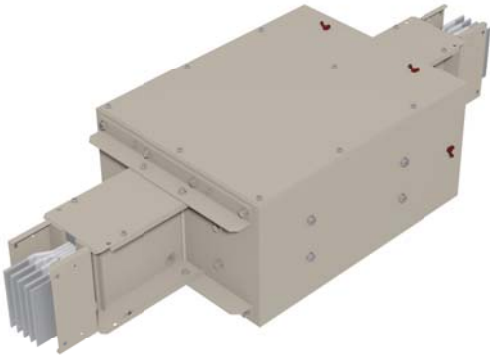
## ● PS Torque Bolts



PS Torque Bolts are used in connections between bus ducts and equipment such as panels and transformers.

## Expansion Duct

- Duct used to absorb thermal expansion and contraction of bus ducts
- Used in routes with long straight sections



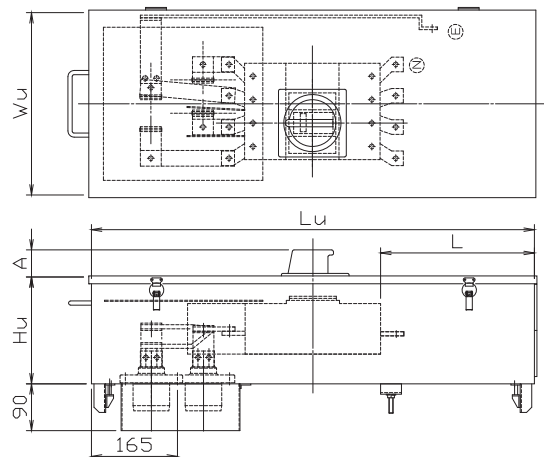
※For dimensions H, refer to the chart on page 10.

## Plug-In Units

- Plug-in branch boxes used to branch load from bus ducts



Frame	Wu (mm)	Hu (mm)	Lu (mm)	A (mm)	L (mm)	Weight (kg)
125	280	175	650	53	185	18
250	280	175	650	53	185	18
400	350	205	850	52	295	34
630	350	205	950	52	395	46

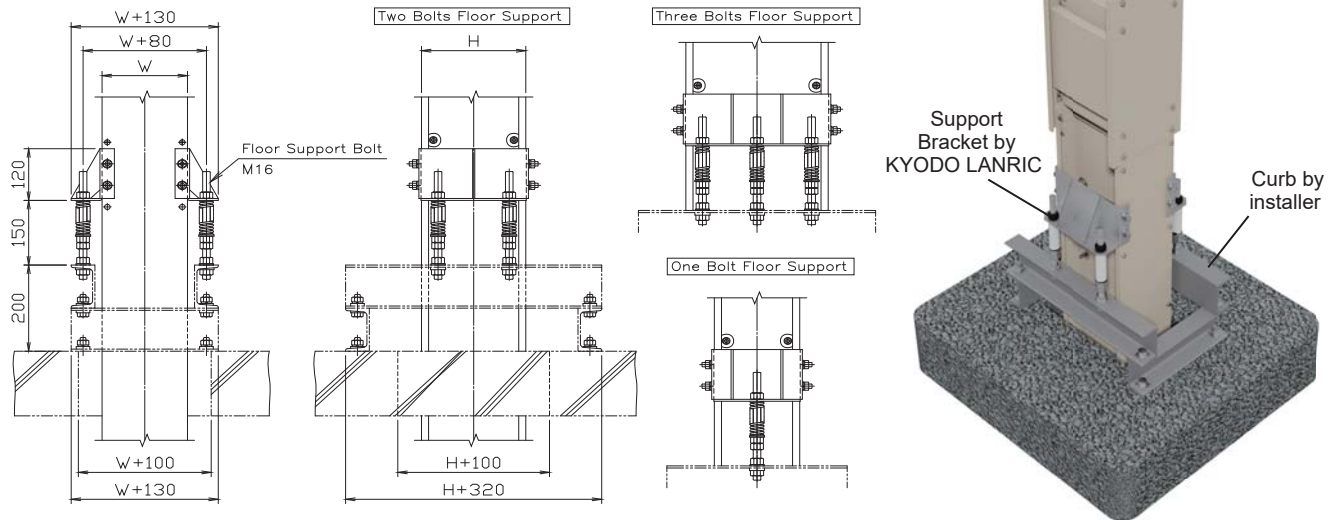


## Vertical Supports

### Distance between Vertical Supports

The distance between vertical supports is permitted to be up to 6m according to electrical equipment regulations in Japan (check and conform with the regulations in your country), but we recommend providing floor support on each floor. In cases where floor height is 4m or higher, we recommend installing intermediary sway-bracing systems.

#### Vertical Support Brackets



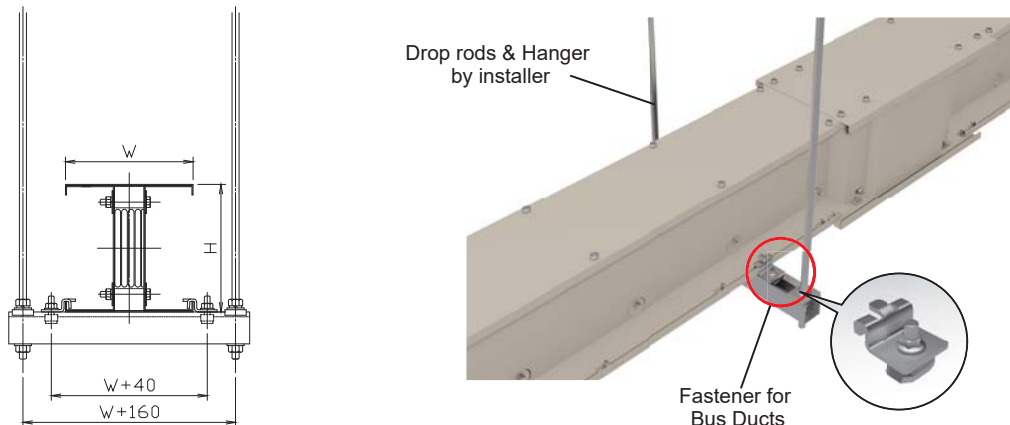
※Number of support bolts will vary depending on the capacity of the bus duct.

## Horizontal Supports

### Distance between Horizontal Supports

The distance between horizontal supports must be not less than 2m. Additionally, be sure to install earthquake-proofing supports at appropriate intervals according to your construction guidelines and planning for facility earthquake proofing.

#### Horizontal Fastener

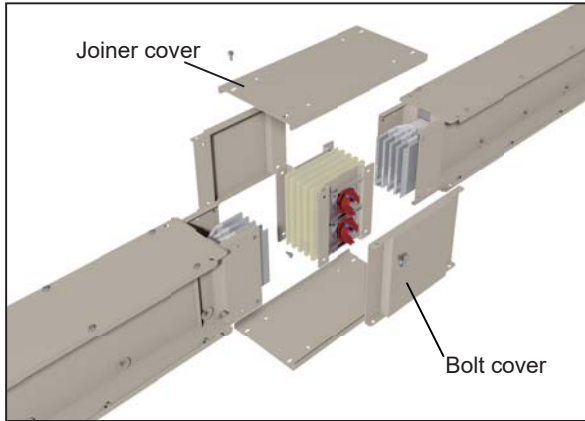


※For dimensions W and H, refer to the chart on page 10.

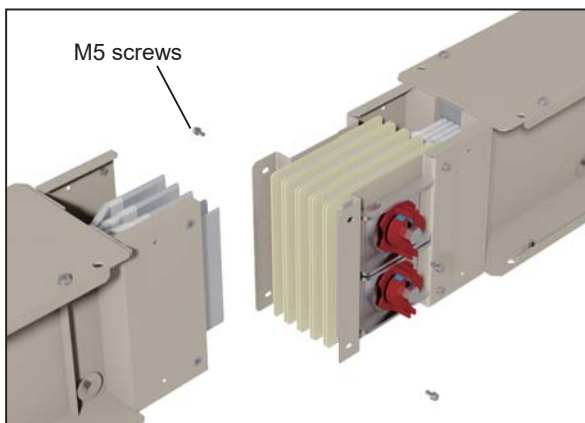
## ◀ How to Install Joiner ▶

- Bus duct routes are made by connecting various types of bus ducts with joiners.

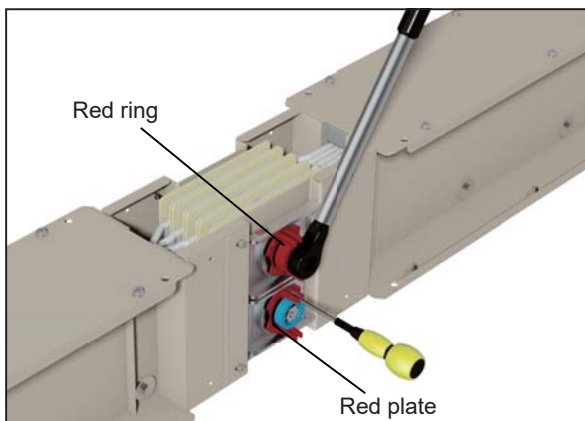
※Before installing, please read the details in the user's manual .



1. Prepare installation components: bus ducts, joiner, and joiner covers, bolt covers and screws.



2. Before raising the bus duct, use M5 screws to secure one side of the joiner onto one of the bus ducts.
3. Insert the other bus duct into the joiner and secure it with M5 screws .

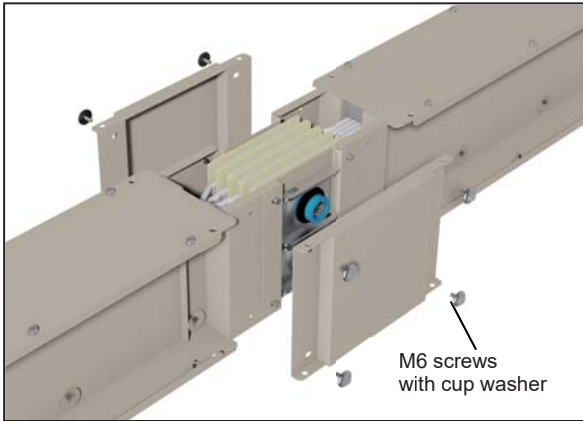


4. Confirm that the components of the joint are aligned properly, then use the specialized wrench to tighten the perfect bolts. When the specified torque is reached, the outer head will twist off, and the red ring will detach.
5. After tightening the perfect bolts, break and remove the red plates. Then, their self-locking mechanisms will activate.

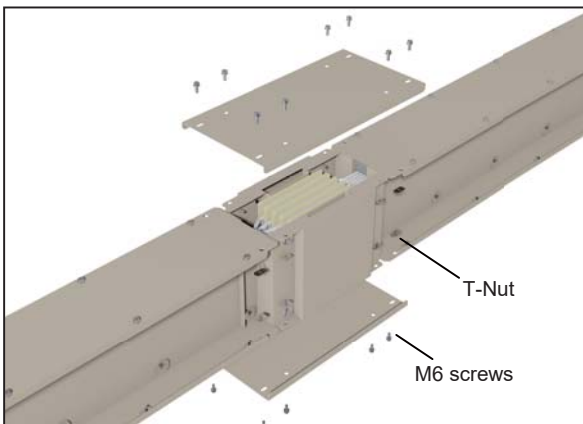
## ◀ How to Install Joiner ▶

- Bus duct routes are made by connecting various types of bus ducts with joiners.

※Before installing, please read the details in the user's manual .



6. Confirm that only the blue rings will remain on the perfect bolts, then install the bolt cover by using M6 screws with cup washer.



7. Install the joiner cover by using M6 screws.

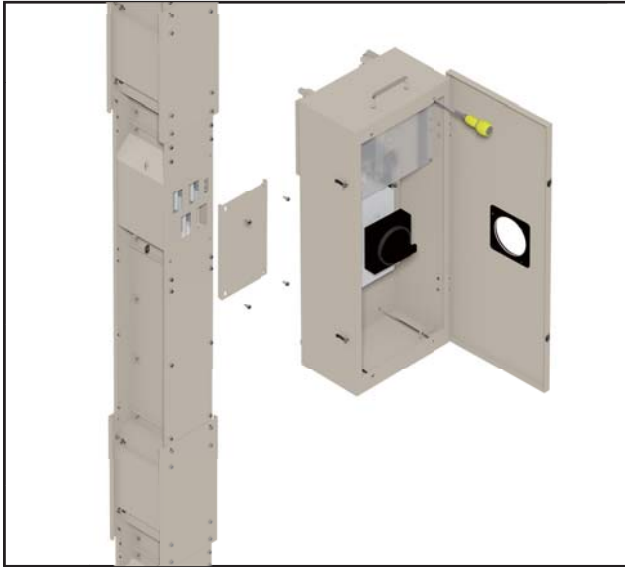


8. Installation is complete.

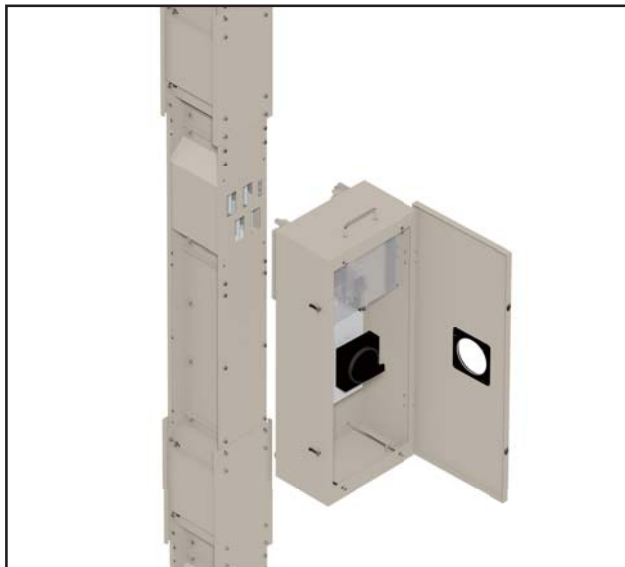
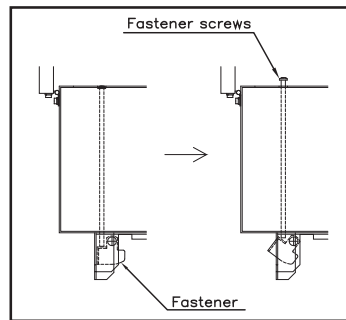
## ◀ How to Install Plug-In Branch Box ▶

- By inserting MCCB Branch Box, easily branch loads at necessary points.

※Before installing, please read the details in the user's manual.



1. Open the cover of plug-in branch box in the OFF position.  
While the plug-in branch box is in the ON position, the cover cannot be opened.  
Loosen the fastener screws (4 screws) with a screwdriver.  
Remove the plug-in hole cover and mounting screws (M6×18)

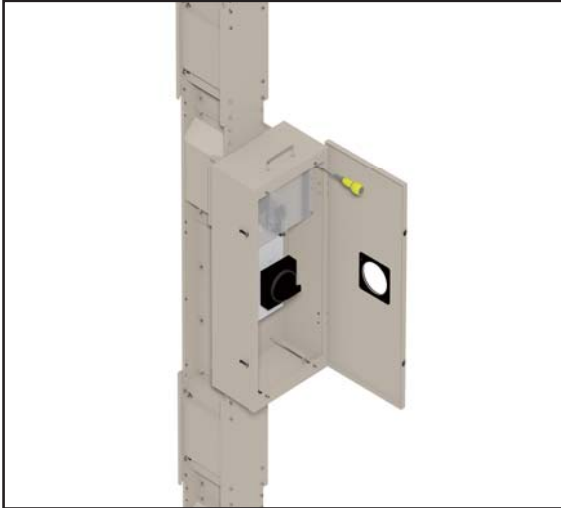


2. Confirm the phase position  
whether the clip can insert into the plug-in hole.  
To install the plug-in branch box, insert the clip into the plug-in hole until the clip guide  
contact the bus duct.

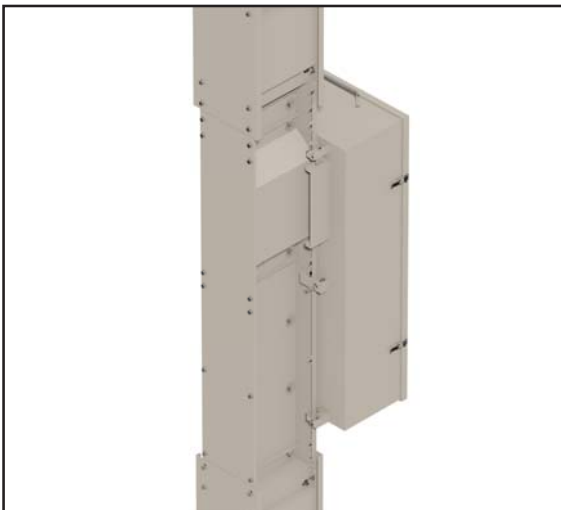
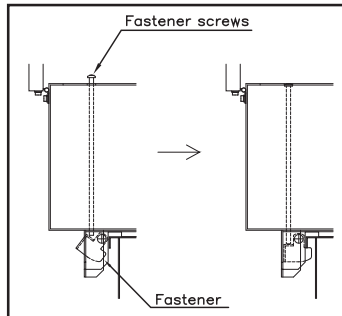
## ◀ How to Install Plug-In Branch Box ▶

- By inserting MCCB Branch Box, easily branch loads at necessary points.

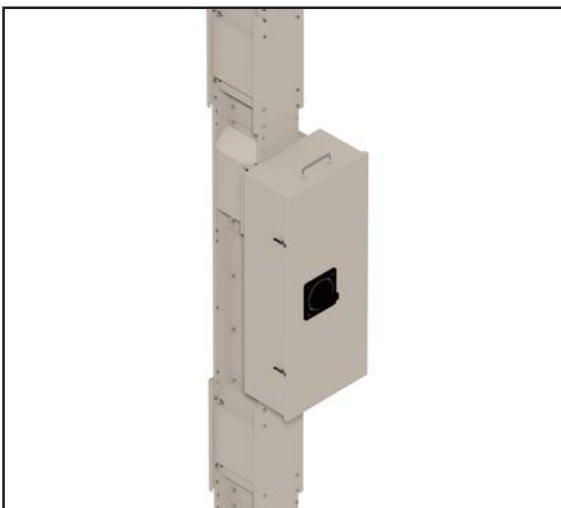
※Before installing, please read the details in the user's manual .



3. Tighten the fastener screws (4 screws) with a screwdriver to secure the plug-in branch box onto the bus duct.



4. Loosen the intermediate fastener and rotate it by 90 degrees. Then, catch it onto the bus duct and tighten the M8 bolt.



5. Installation of the plug-in branch box is complete.

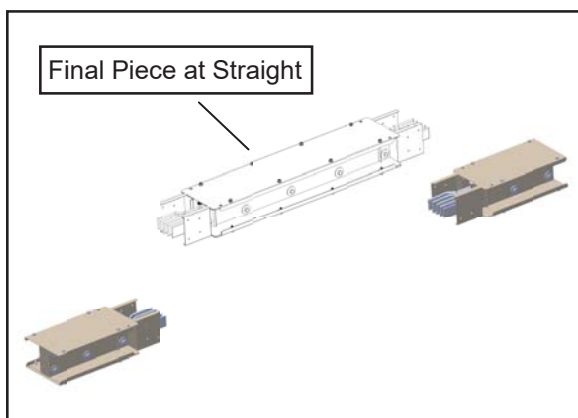
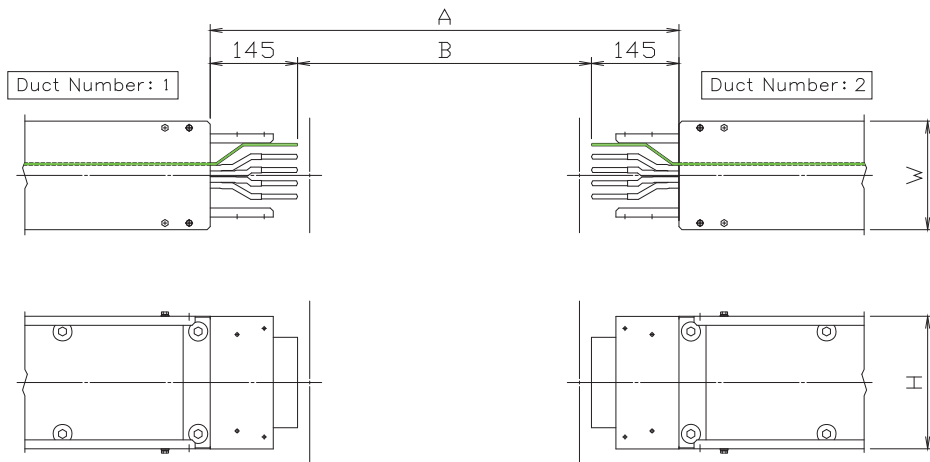
## ◀ Site Measurement ▶

It is possible to remain final piece as “measuring point” to determine and fine-tune dimensional error during installation.

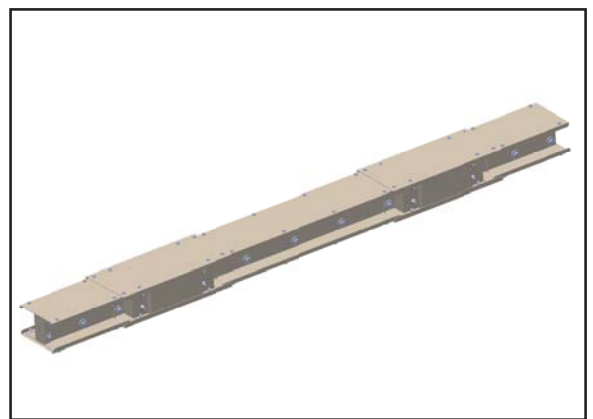
Please send to our engineer the dimensions of A and B or A, B, C and D as describe in each drawing.

It important to indicate which sides is the earth bar running, please send to us the photos of measuring point to confirm the earth bar direction of bus bar running

### ● Straight



Final Piece Measurement

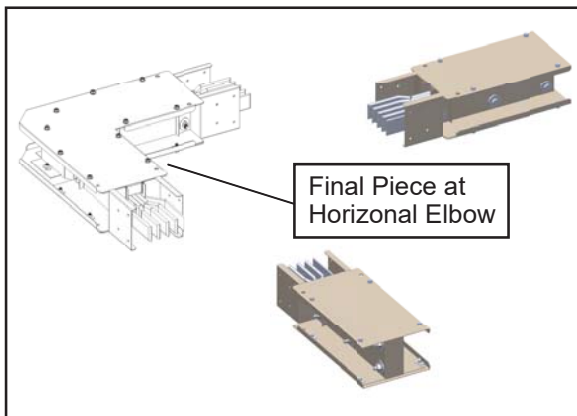
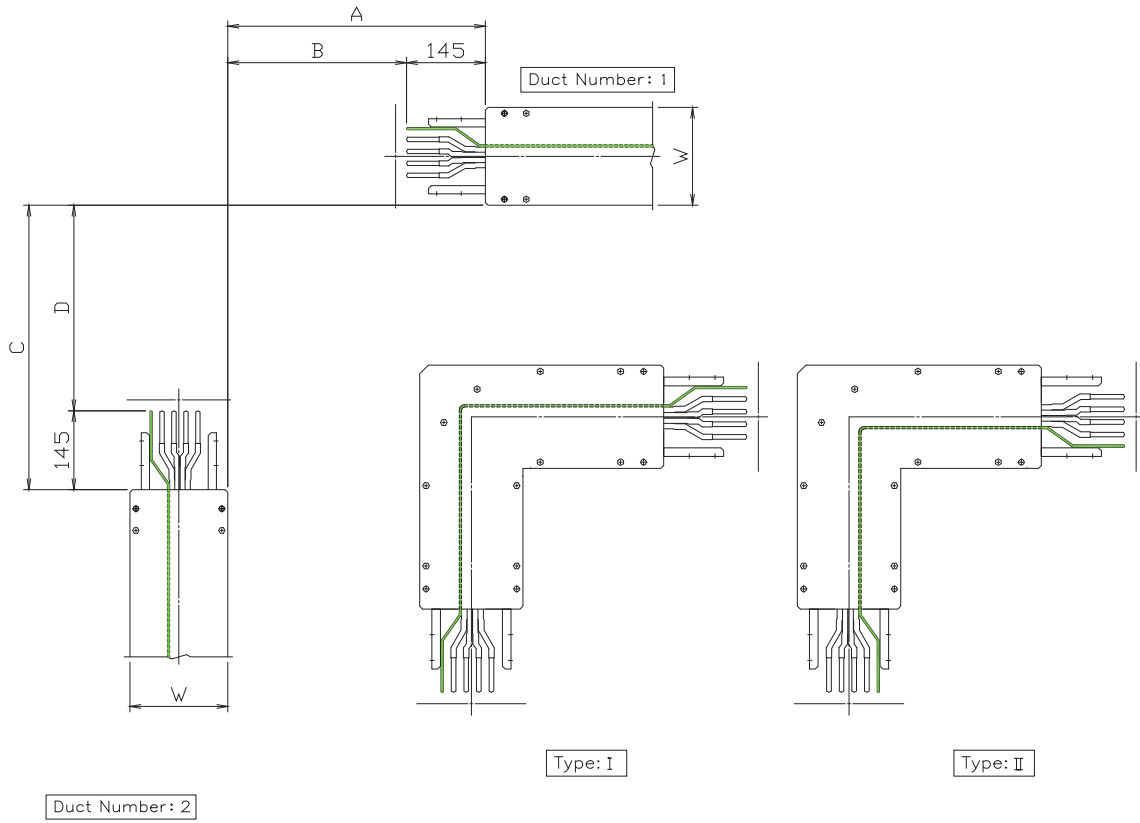


Installation Complete

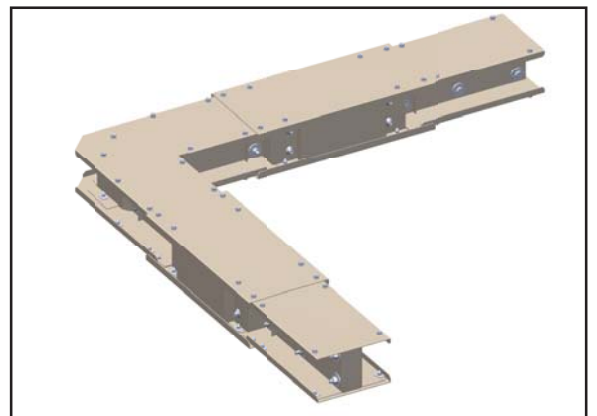


## ◀ Site Measurement ▶

### ● Horizontal Elbow



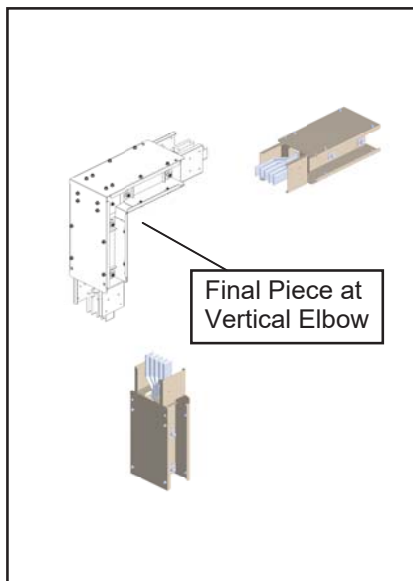
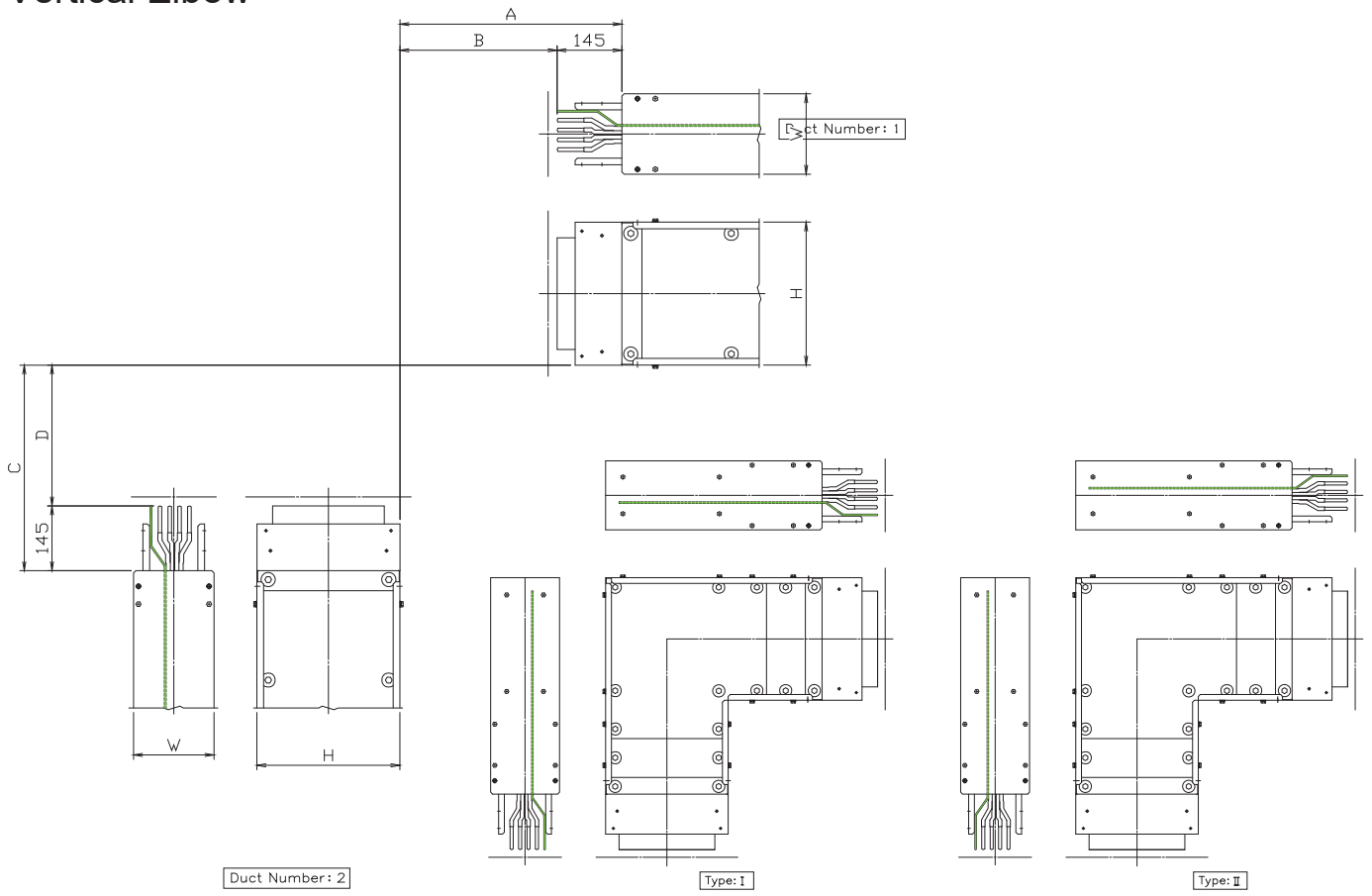
Final Piece Measurement



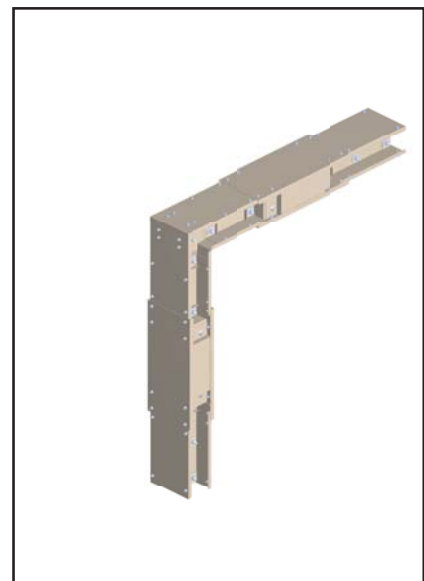
Installation Complete

# ◀ Site Measurement ▶

## ● Vertical Elbow



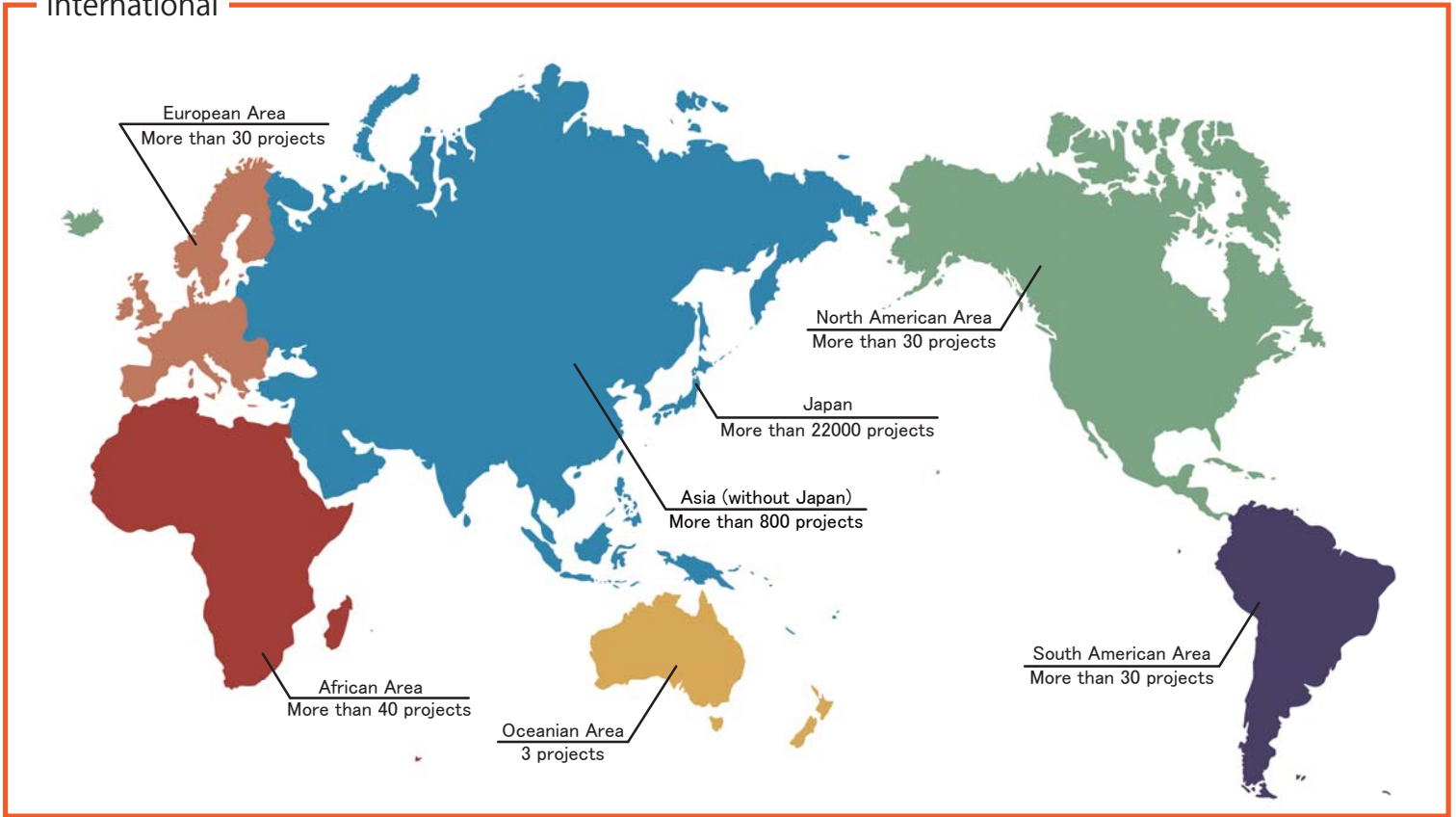
Final Piece Measurement



Installation Complete

# Project References

## International



## Representative Projects in Japan





※Please note that for improvement the specifications of this bus duct are subject to change without notice.