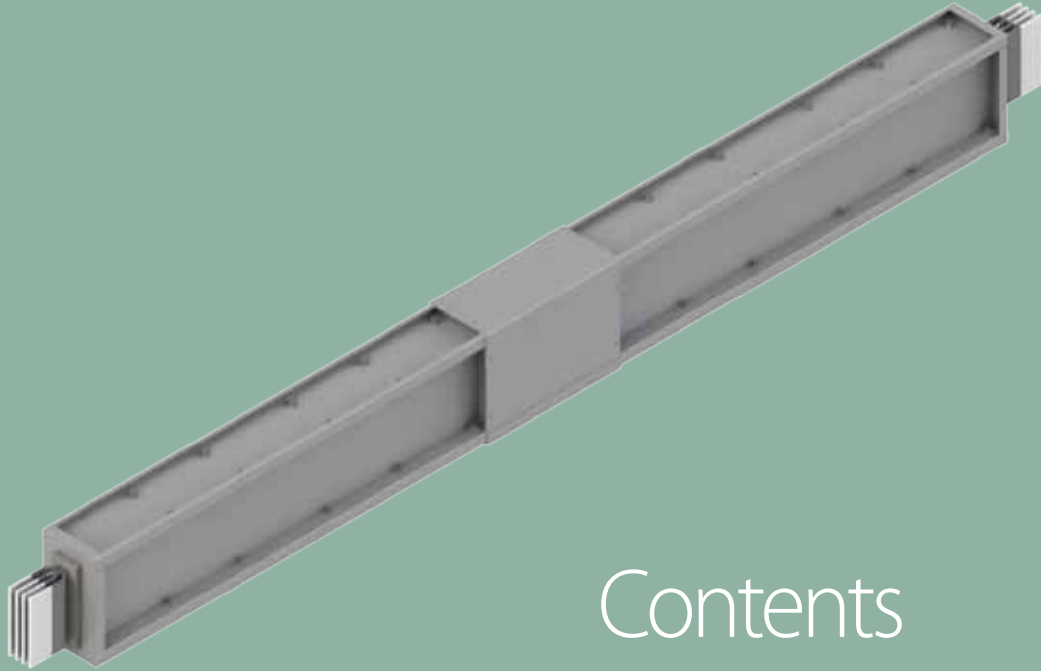


# CR-LV-II

LS C&S Busduct System Catalogue



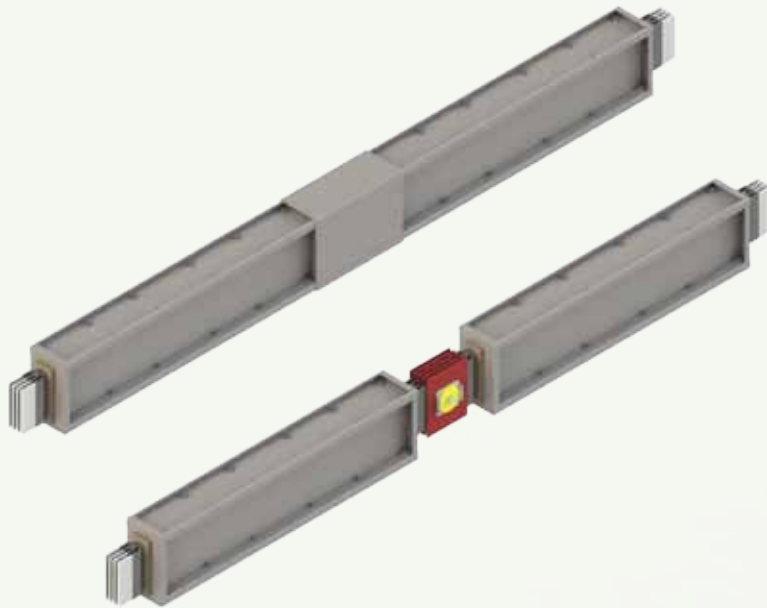
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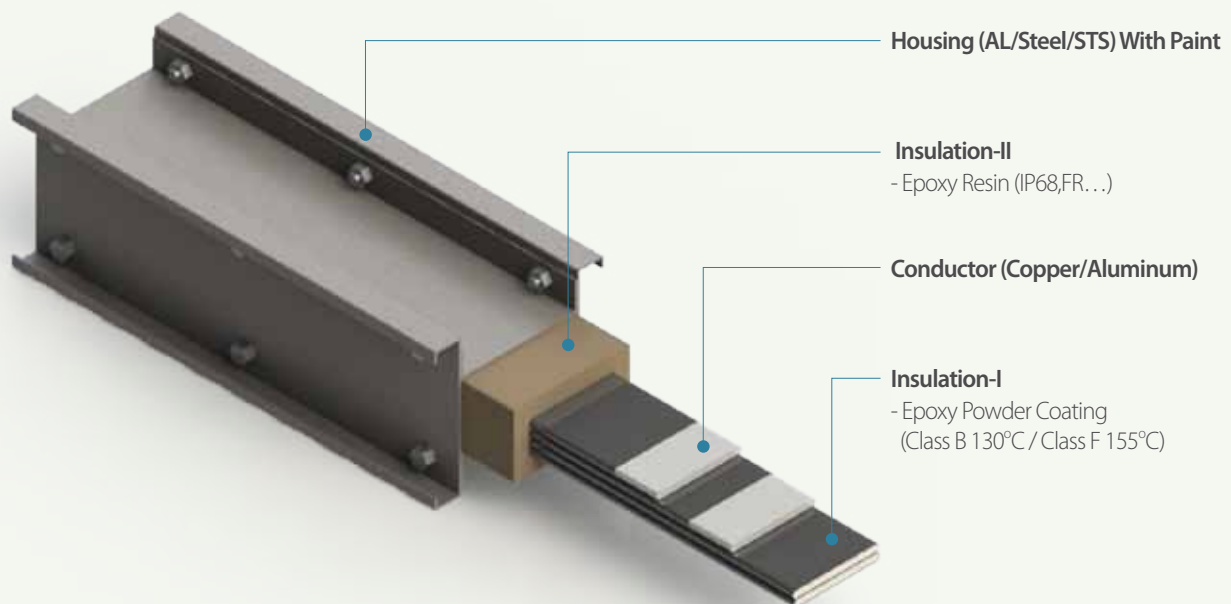
## Basic Structure

CR-LV-II consists of conductors insulated using Class B rated(130°C) epoxy powder coating(Fluidized bed epoxy; over 500um), metal housing and epoxy resin; thickness over 11mm, molded between the insulated bus bars and the housing.

- Improved waterproof, fireproof, and explosion-proof function, which allows electrical stability and durability than Sandwich type Busduct.
- Improved insulation performance, better impact-resistant, and lightweight which provides easier installation and better performance compared to other typical cast resin Busduct without metal housing.



## Configuration



# Joint Kit

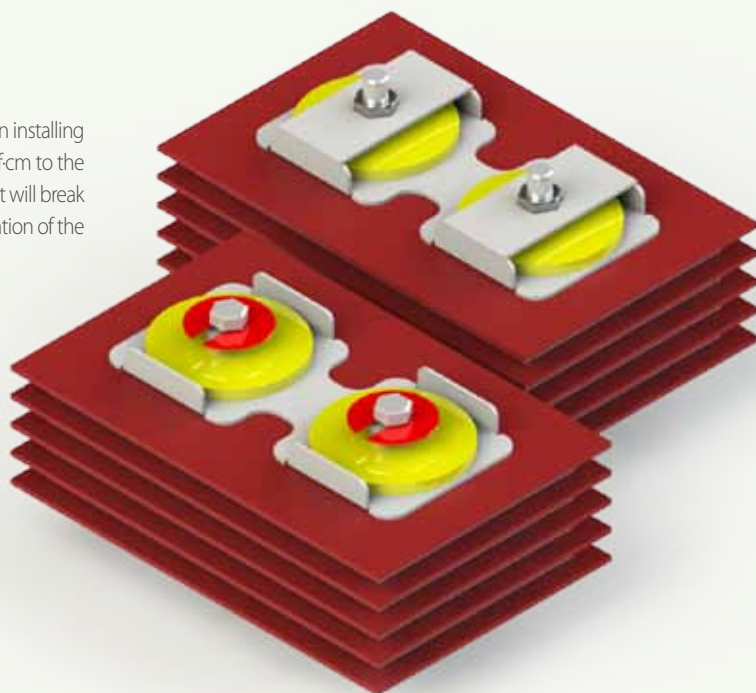
The CR-way uses a joint kit method.

## Feature

Both joint plates of the joint kit and the conductors are tin plated. (A silver plated option is available.) It prevents discoloration and corrosion of the joint plates. 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 an even connection of the contact surface.

## Double Head 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 break off on its own. Thus, it allows visual inspection for the proper application of the bolts at the connection.



## The number of double-headed bolts required for each joint kit specifics

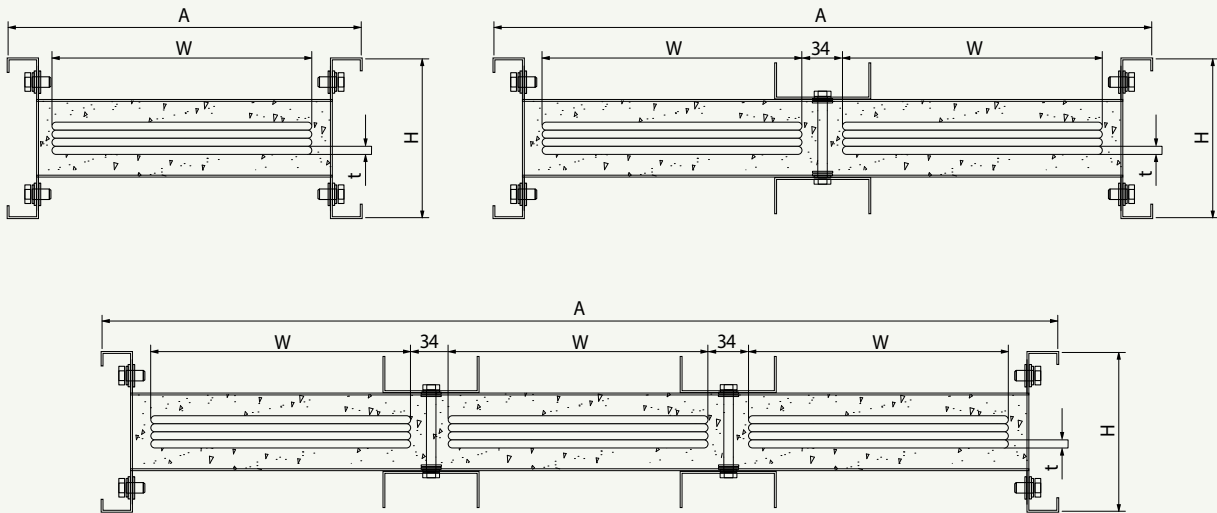
Number of DH bolts		1	2	3	4	6
Ampere (A)	CU	630, 800, 1000, 1250, 1600, 2000	2500, 3200, 3600, 4000	5000	6300	7500
	AL	630, 800, 1000, 1250	1600, 2000, 2500	-	3200, 3600, 4000	5000, 6300

## ! 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 red tags are cut off. If a proper torque is not applied at the connection, it may cause heat during operation.

# Feeder

Although the standard length of the LS C&S CR-LV Busduct feeder is 3 meters, it can be adjusted to the installation environment, or on request.

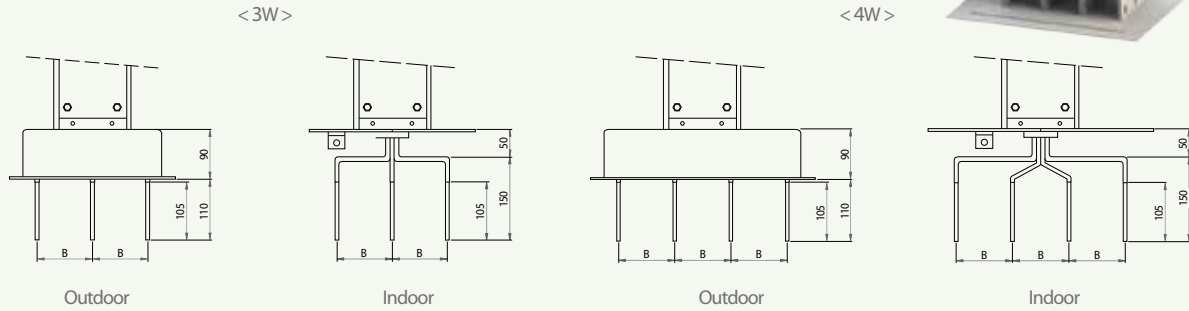


		3W						4W			
Material	Ampere(A)	t	Dimension(mm)			Material	Ampere(A)	t	Dimension(mm)		
			W	A	WGT				W	A	WGT
AL	630	6.35	41	121	10.2	AL	630	6.35	41	121	11.1
	800		62	142	13.3		800		62	142	14.5
	1,000		86	166	16.9		1,000		86	166	18.5
	1,250		108	188	20.2		1,250		108	188	22.1
	1,600		164	244	28.6		1,600		164	244	31.3
	2,000		210	290	35.5		2,000		210	290	38.9
	2,500		126	386	34.9		2,500		(2)126	386	37.0
	3,200		164	442	43.2		3,200		(2)164	442	45.8
	3,600		184	482	47.5		3,600		(2)184	482	50.4
	4,000		210	534	53.2		4,000		(2)210	534	56.3
	5,000		184	700	63.4		5,000		(3)184	700	66.1
6,300	210	778	70.8	6,300	(3)210	778	73.8				
CU	630/800	6.35	41	121	15.0	CU	630/800	6.35	41	121	17.5
	1,000		57	137	19.3		1,000		57	137	22.7
	1,250		73	153	23.6		1,250		73	153	27.8
	1,600		108	188	33.0		1,600		108	188	39.1
	2,000		145	225	42.9		2,000		145	225	51.0
	2,500		195	275	56.3		2,500		195	275	67.1
	3,200		108	330	43.8		3,200		(2)108	330	49.9
	3,600		126	366	49.8		3,600		(2)126	366	56.9
	4,000		145	404	56.2		4,000		(2)145	404	64.2
	5,000		195	504	73.0		5,000		(2)195	504	83.6
	6,300		164	640	77.1		6,300		(3)164	640	86.1
7,500	195	733	89.6	7,500	(3)195	733	100.1				

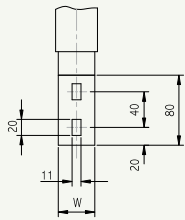
\*H: 3W, 4W = 140mm

# Flanged End

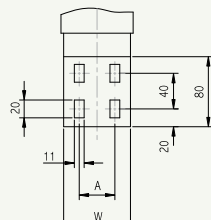
The flanged end is connected to either a transformer or a panel. Dimension details are shown below.



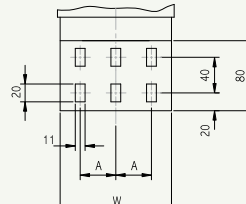
[Fig. CL2-1]



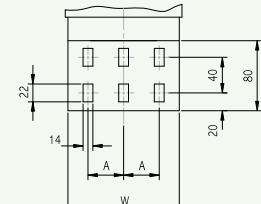
[Fig. CL2-2]



[Fig. CL2-3]



[Fig. CL2-4]



[Fig. CL2-5]

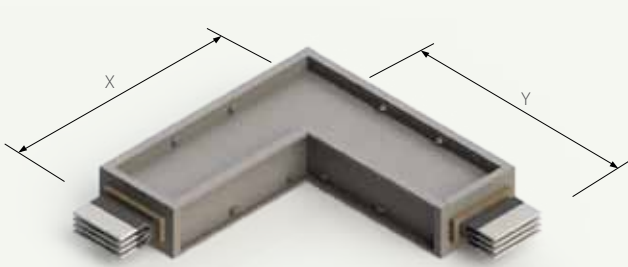
Ampere(A)	Dimension(mm)				Fig.	
	t	W	A	B		
AL	6.35	41	~	100	CL2-2	
		62	~			
		86	40			
		1,250	108	50	130	CL2-5
		1,600	164	60		
		2,000	210	70		
		2,500	(2)126	40		
		3,200	(2)164	60		
		3,600	(2)184	60		
		4,000	(2)210	70	130	CL2-4
		5,000	(3)184	60		
		6,300	(3)210	70		
CU	6.35	41	~	100	CL2-2	
		41	~			
		57	~			
		1,250	73	40	130	CL2-3
		1,600	108	50		
		2,000	145	50		
		2,500	195	70		
		3,200	(2)108	50		
		3,600	(2)126	40		
		4,000	(2)145	50	130	CL2-4
		5,000	(2)195	70		
		6,300	(3)164	60		
		7,500	(3)195	70		

# Fittings

Fittings including the elbow and tee are designed to adapt to any change made to the direction of the busduct installation. The same features have been applied to the fittings of the CR-way, and the size specifications are shown below. (The standard dimension of each fitting is the same as the dimension shown in the table below. Please contact our design team for information about the minimum dimension.)

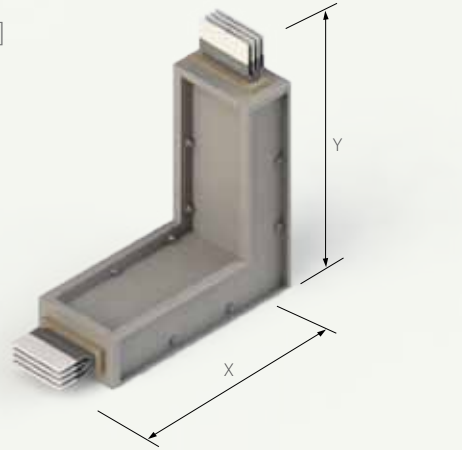
## Elbow

[Vertical]



Ampere(A)	Dimension(mm)	
	X	Y
1 table	500	500
2 tables	600	600
3 tables	700	700

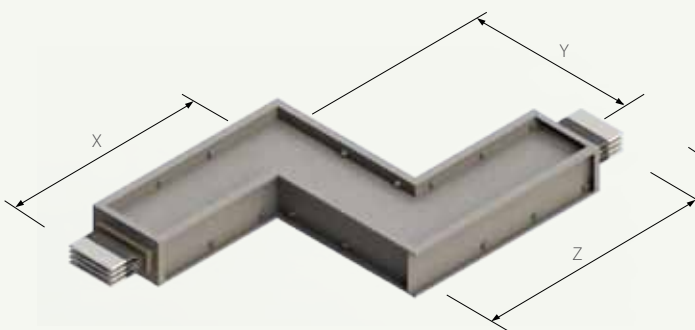
[Horizontal]



Ampere(A)	Dimension(mm)	
	X	Y
1 table	500	500
2 tables	500	500
3 tables	500	500

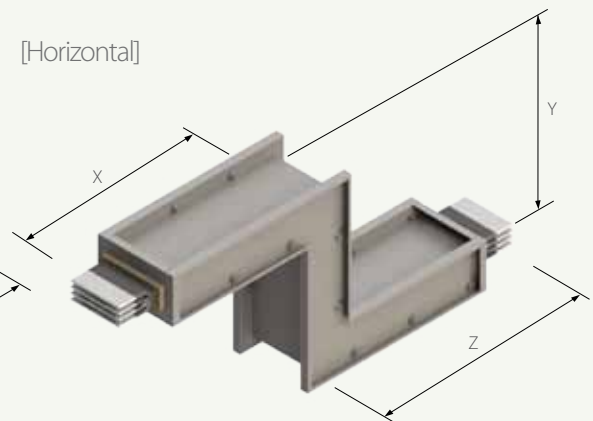
## Offset

[Vertical]



Ampere(A)	Dimension(mm)		
	X	Y	Z
1 table	500	500	500
2 tables	600	500	600
3 tables	700	500	700

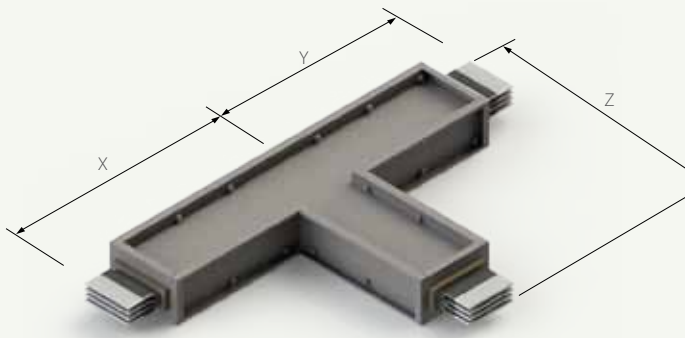
[Horizontal]



Ampere(A)	Dimension(mm)		
	X	Y	Z
1 table	500	500	500
2 tables	500	500	500
3 tables	500	500	500

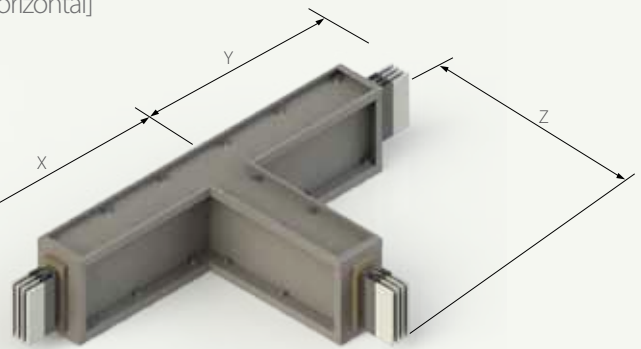
## Tee

[Vertical]



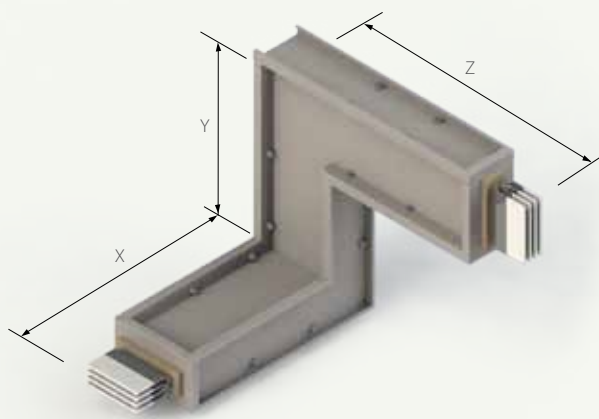
Ampere(A)	Dimension(mm)		
	X	Y	Z
1 table	500	500	500

[Horizontal]



Ampere(A)	Dimension(mm)		
	X	Y	Z
1 table	500	500	500
2 tables	500	500	500
3 tables	500	500	500

## Combination



Ampere(A)	Dimension(mm)		
	X	Y	Z
1 table	500	500	500
2 tables	500	600	600
3 tables	500	700	700

## Flanged End Box

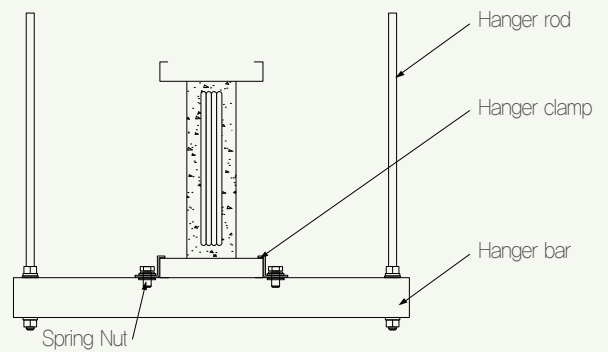


# Hangers

Both horizontal and vertical hangers are available for the CR-LV-II depending on the installation environment.

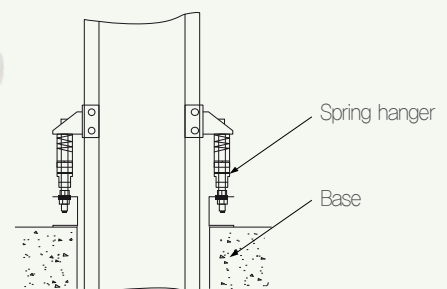
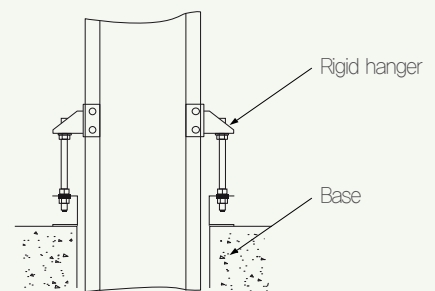
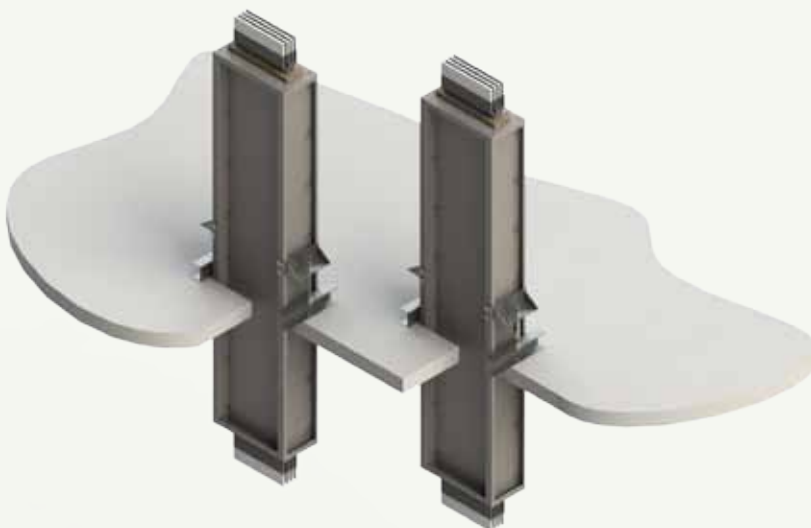
## Horizontal Hangers

The standard horizontal installation method of the CR-LV-II requires two supports for each product. The standard 3 meter busducts are designed to be installed at 1.5-meter intervals, and the space between the hangers should not surpass 2 meters at the most. (Please contact the design team for further information.)



## Vertical Hangers

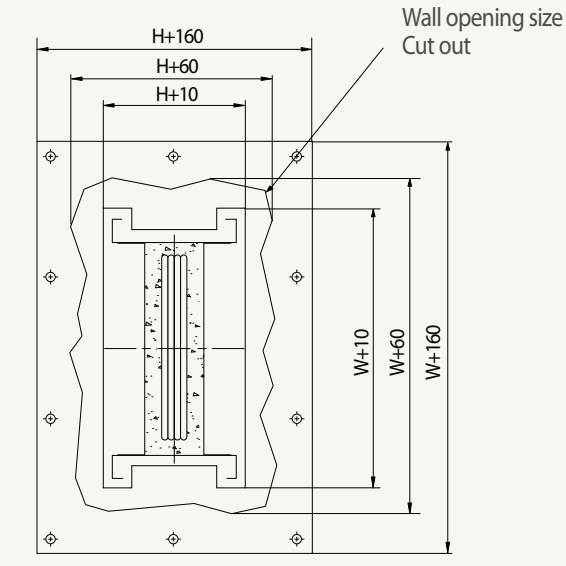
For vertical installation of The CR-LV-II, install the vertical hangers first, and fix the Busducts on the hangers for better support.



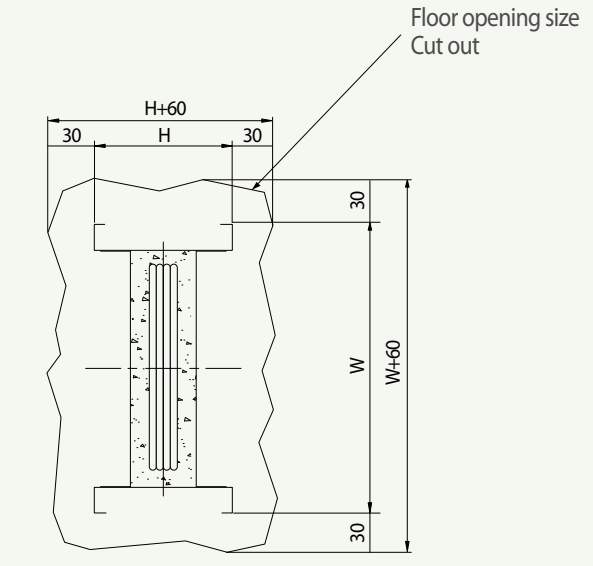


# Etc.

## Wall Flange



## Floor Opening

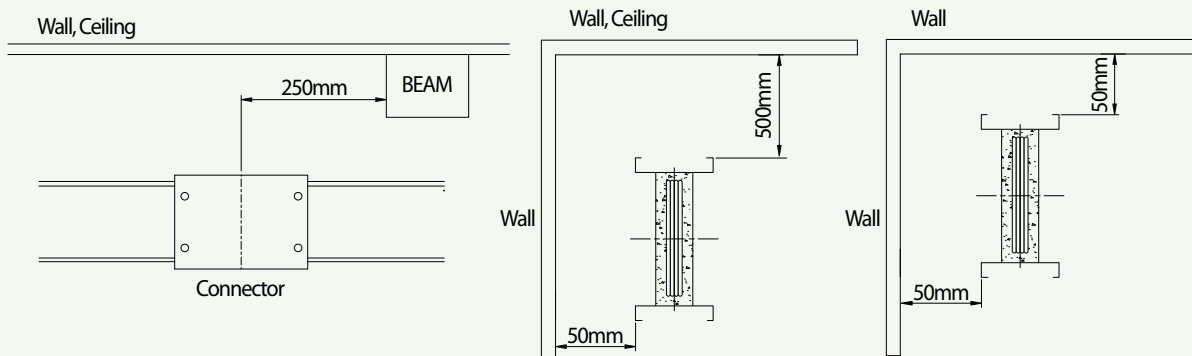


A wall flange is used to seal the gaps produced during installation of busducts at the walls, ceilings and floors. The company does not provide glass wool or fire forms.

- W : The width of the product
- H : The height of the product

- W : The width of the product
- H : The height of the product

## The required minimum distances from a wall for heat dissipation and maintenance



# 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 60Hz. For a 50Hz installation, multiply the reactance (X) by 0.83.

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

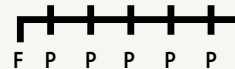
$\bullet V_d =$  voltage drop[V] ·  $I =$  rated load amperes[A] ·  $R =$  resistance[Ω] ·  $X =$  reactance[Ω] /  $\cos =$  power factor /  $\sin =$  reactive factor

$$\bullet \text{Real Voltage Descend} = \alpha \times V_d \times \frac{\text{Actual load current}}{\text{Rated load current}} \times \frac{\text{Actual length of the line (m)}}{100m}$$

•  $\alpha$ (load constant)  $\alpha = 1$ , concentrated load  
(a place such as an electrical room)



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

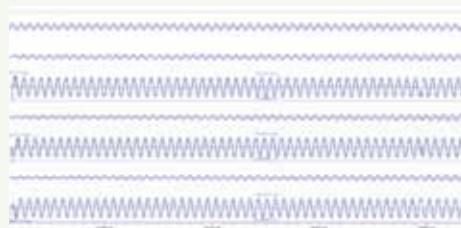


• **F** : Flanged End (panel connections) • **P** : Plug-in Unit

Ampere(A)	Impedance $\times 10^{-3} \Omega$ ( $\mu\Omega/100m, 60Hz$ )			Voltage Drop(V/100m)				
	R	X	Z	0.7	0.8	0.9	1	
AL	630	14.72	7.11	16.34	16.78	17.50	17.83	16.06
	800	9.78	5.44	11.19	14.87	15.37	15.49	13.55
	1000	7.14	4.30	8.34	13.98	14.37	14.38	12.37
	1250	5.76	3.61	6.80	14.32	14.67	14.64	12.47
	1600	3.92	2.57	4.69	12.70	12.98	12.89	10.87
	2000	3.14	2.09	3.77	12.78	13.04	12.95	10.89
	2500	2.68	1.78	3.21	13.60	13.88	13.78	11.58
	3200	2.13	1.40	2.55	13.81	14.10	14.00	11.79
	3600	1.58	1.26	2.03	12.54	12.63	12.32	9.88
	4000	1.39	1.12	1.78	12.26	12.34	12.03	9.62
CU	5000	1.06	0.87	1.36	11.75	11.81	11.49	9.14
	6300	0.92	0.76	1.20	13.00	13.06	12.70	10.08
	630	8.57	7.11	11.14	12.09	12.14	11.80	9.35
	800	8.57	7.11	11.14	15.35	15.41	14.98	11.87
	1000	6.42	5.77	8.63	14.91	14.88	14.36	11.11
	1250	5.09	4.85	7.03	15.21	15.12	14.50	11.02
	1600	3.56	3.61	5.07	14.06	13.90	13.25	9.87
	2000	2.74	2.85	3.96	13.71	13.53	12.86	9.50
	2500	2.12	2.22	3.07	13.30	13.12	12.46	9.18
	3200	1.94	2.03	2.81	15.59	15.38	14.60	10.76
CU	3600	1.70	1.78	2.46	15.34	15.14	14.38	10.61
	4000	1.51	1.57	2.18	15.08	14.89	14.15	10.46
	5000	0.88	1.20	1.48	12.72	12.30	11.35	7.60
	6300	0.79	1.08	1.34	14.44	13.95	12.87	8.58
	7500	0.58	0.82	1.01	12.91	12.45	11.47	7.59

## Short Circuit Strength

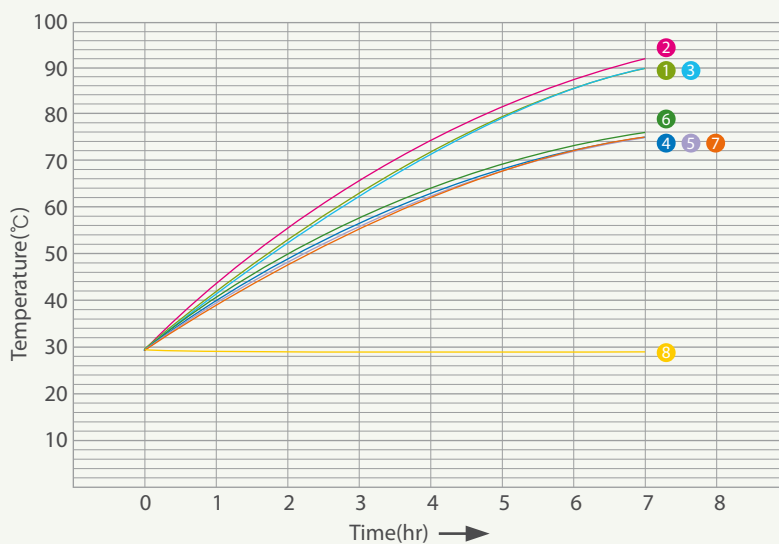
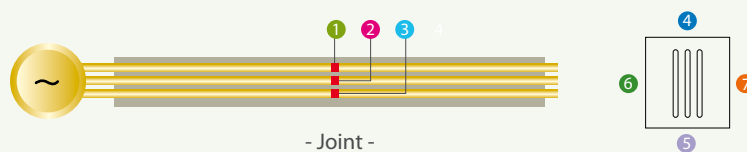
The short circuit strength of the CL-LV-II has been tested as specified in IEC 61439-1, 6 [(previous standard) IEC 60439-1, 2], and certified by KEMA.



Ampere(A)		630	800	1000	1250	1600	2000	2500	3200	3600	4000	5000	6300	7500
AL	1sec	24	40	50	50	50	80	80	80	100	100	100	100	-
	3sec	14	23	29	29	29	46	46	46	58	58	58	58	-
CU	1sec	40	40	50	50	50	80	80	80	100	100	100	100	100
	3sec	23	23	29	29	29	46	46	46	58	58	58	58	58

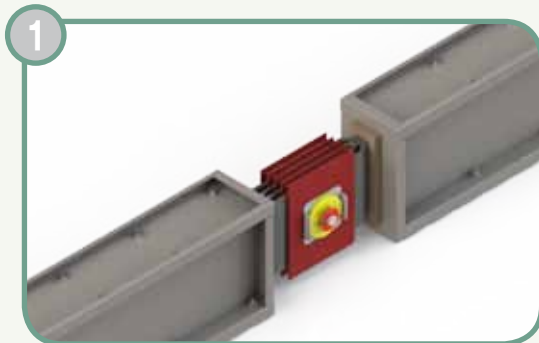
## Temperature Rise

The temperature rise limit is an important property which determines the performance of busducts. The temperature rise limit of the busduct is designed so 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].



Classification	1	2	3	4	5	6	7	8
Censer Location	Joint Conductor			Exterior of Epoxy			Ambient Temperature	
Temperature Rise Value	61K	63K	61K	46K	46K	47K	46K	29.4°C

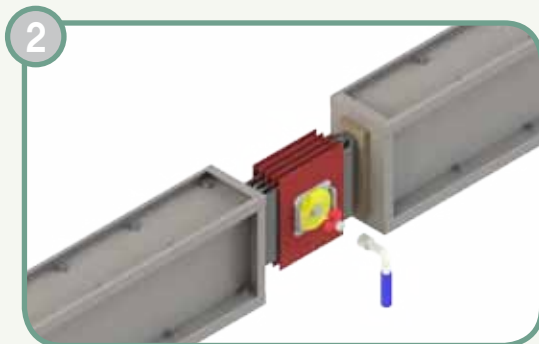
# CR – LV (Joint Kit)



Before connecting the busducts, be sure to align them at the top and the bottom and the left and the right as well as horizontally and vertically. (This applies for joint connection of the horizontal and vertical ducts.) Make sure that the joint kit is not tilted. Be sure that the surface is clear of particles before connecting them.

#### Check List

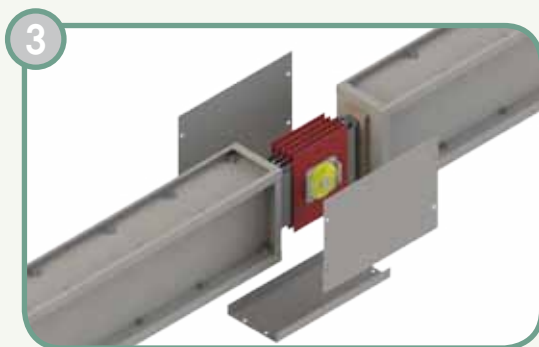
- The alignment of the busducts.
- The surface of the joint must be clear of dust or particles.



Using a torque wrench, slowly tighten the exposed bolt head of a double head bolt. Connect the busducts temporarily first, and check the function of the insulation (100MΩ or higher) by checking the insulation resistance. Make sure the insulation is working normally before breaking off the double-head bolt head. The double-head bolt head is designed to break off at 800~1000Kgf·cm, therefore tighten the exposed head until it breaks off. Once the exposed head and the red tag attached to it have been cut off, the state of the joint connection should be visible, which means they are properly connected.

#### Check List

- Check the connection of the joint: The head of the double-head bolt and the red tag should be cut off.

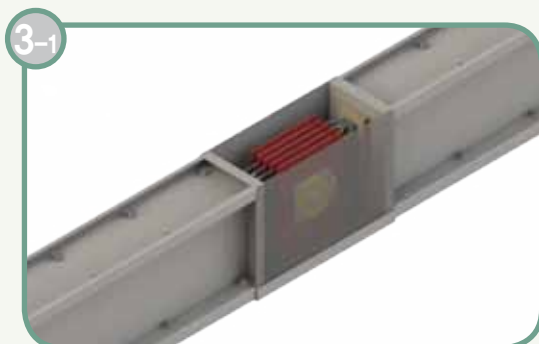


Assemble joint cover plates using M6 bolt.

Top side should be open along with the direction where epoxy mixture is poured as the picture.

#### Check List

- Assorting the edgewise, flatwise, and riser type cover while installation because the shapes of each joint covers are different.



## ! Precaution

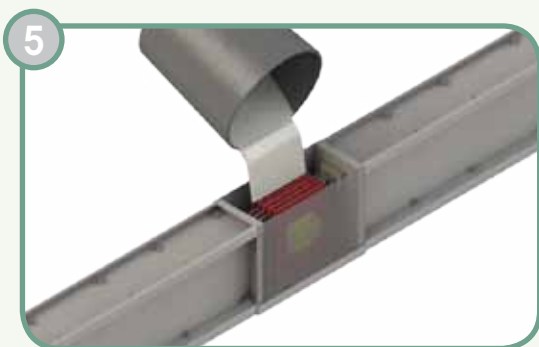
Make sure to remove all the dirt or moisture inside the joint cover as it can be a cause of deterioration of insulation or accident.



Be sure to keep the ambient temperature at 25°C or higher before mixing the epoxy resin and filler. When mixing the epoxy resin in a cool environment, be sure to cover the mixing container to keep warm. It is to maintain the temperature of the container at 25°C or higher. In order of filler, epoxy resin and hardener, add them into the mixing container, and mix it for 15 minutes using a hand drill. (Please contact our design team for information about how to maintain the temperature of the container when mixing the epoxy resin in a cool environment.)

**Check List**

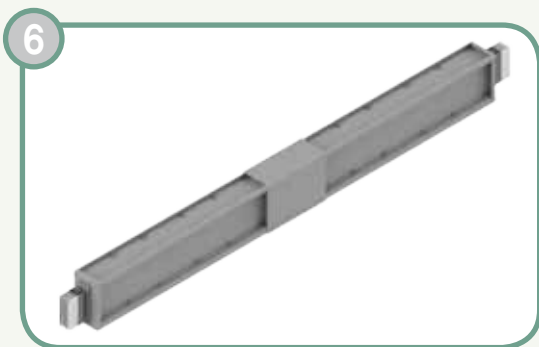
- The ambient temperature: 25° C or higher
- Mix filler, epoxy resin and hardener for 15 minutes



Pour the mixture into the molding flask. Maintain the ambient temperature at 25° C. When molding in a cool environment, cover the molding flask to keep warm to maintain the temperature at the molding flask. Remove foams on the surface of the mixture for about 1 hour. Mold only three joints out of a total of four, and continue molding the entire line following the same procedure. Wait for 8 hours, and check the function of the insulation by checking the insulation resistance. When it is normal, finish molding the remaining joint. (Please contact our design team for information about covering the container when molding the epoxy resin in a cool environment.)

**Check List**

- Ambient temperature: 25°C or higher
- Removing foams on the surface of the mixture for 1 hour



Perform the final inspection to check the performance of the joint.

**Check List**

- Final inspection of the joint

**!** As it is not possible to make any change caused by route change, mechanical shock or insulation defectiveness after pouring epoxy mixture, make sure to conduct a electrical and mechanical inspection to every piece beforehand.