



HV/LV Busbar Trunking System

2014/2015

HV/LV Busbar Trunking System

Brief Introduction

About CHINT Electric

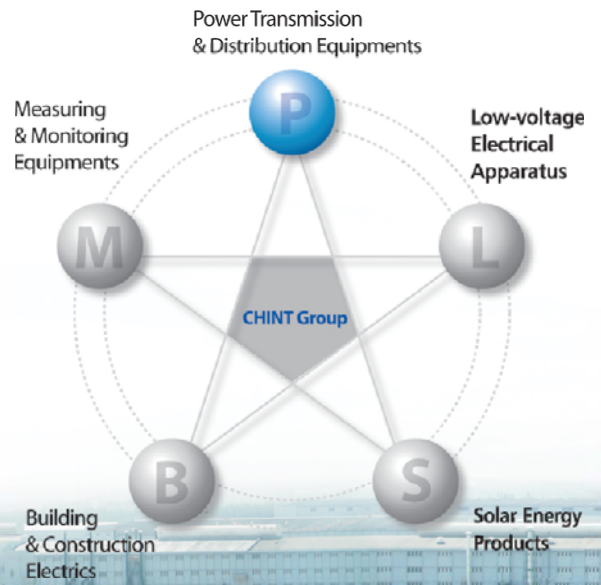
CHINT Electric is a subsidiary of CHINT Group Corporation. With an investment of 450 million USD, CHINT Electric possesses 4300 employees and 5 manufacturing business units with a factory area of 900,000m² located in Shanghai, which is one of the world's largest power transmission & distribution equipments manufacturing centers.

New Orders

Around 725 million USD in the year of 2012

Employee

4,300 employees





Product Range

- Power Transformer up to 750kV
- Distribution Transformer up to 35kV
- Dry-type Transformer up to 35kV
- Reactor up to 220kV
- GIS up to 252kV
- HV Circuit Breaker & Disconnecter up to 252kV
- VCB 12~40.5kV
- MV & LV Switchgear Panel, Prefabricated Substation up to 40.5kV
- LV Terminal Box, Bus Bar Duct
- Surge Arrester & Insulator up to 500kV, CT & PT up to 220kV
- Power Distribution Automation System
- Cable up to 36kV
- Capacitor
- Turn-key Solution

About CHINT Group

- CHINT is the leading player in the Power Transmission & Distribution industry and Low-voltage electrics industry in China. Founded in 1984 by a few local entrepreneurs and currently hiring 29,000 employees worldwide.
- National Employment Advanced Corporate (China State Council, 2012)
- Ranked in The 2011 BCG 100 New Global Challengers (The Boston Consulting Group, 2011)
- CHINT Low-voltage Electrics launched IPO at the Shanghai Stock Exchange of China (2010)
- No.2 in China Electricity Industry's Top 10 Most Competitive Enterprises (China Machinery Industry Information Institute, 2009)
- No.3 in China Electricity Industry (China Machinery Industry Information Institute, 2009)
- No.240 in Top 500 Chinese-Companies (China Enterprise Federation, 2009).
- No.1 in Power T&D and the controlling devices (China Machinery Summit, 2009)
- Ranked in Top 100 Best Employers in China (China Entrepreneurs Summit, 2008)
- No.15 in Top 100 Private & Public Companies in China (Forbes, 2006)
- National Quality Management Award(2004) (One of top honours for manufacturing companies in China)
- Worldwide business operation with 2,000 sales offices, agents, distributors, and local partners in domestic Chinese market and distributors & local partners in over 105 countries. International branches or regional offices set up in USA, UAE, Germany, Russia, Brazil, Ukraine, Hong Kong of China, UK and Nigeria.
- CHINT stretches its business to a new frontier of solar energy by setting up a branch company specialized in the solar energy products development.
- The R&D center of CHINT is recognized as the National Level R&D Center run by the companies, which means the R&D level of CHINT Group has reached the leading position in the industry of China.

Sales References

With a worldwide presence in over 125 countries such as, Italy, Germany, Estonia, USA, Russia, Japan, Australia, Saudi Arabia, Poland, Ukraine, Mongolia, Kazakhstan, Pakistan, Myanmar, Indonesia, Thailand, Egypt, Yemen, Algeria, Morocco, Congo, Tanzania, Mali, Zambia, Kenya, South Africa, Ghana, Nigeria, Colombia, etc, CHINT Electric provides reliable and high-qualified products and solutions to clients engaged in different businesses.



Utility User

Application: cooperation with National Electricity Companies in over 50 countries for power generation, transmission and distribution.

Europe

- EAC-Cyprus
Products: Cable.
- Eesti Energia-Estonia
Products: Power transformer.
- EMS-Serbia
Products: Power transformer.
- ENEL-Italy
Products: Distribution transformer, cable.
- Fingrid-Finland
Products: Distribution transformer.
- HS ORKA HF-Iceland
Products: Power transformer.
- PPC-Greece
Products: Power transformer, cable.
- NEC-Bulgaria
Products: VCB.

Latin America

- BPC-Bhutan
Products: Surge arrester.
- CELEC S.P.-Ecuador
Products: Power transformer.
- CNEL-Ecuador
Products: Power transformer.
- ELCOSA-Honduras
Products: Power transformer.
- Enersis-Chile
Products: Power transformer, surge arrester, insulator, SF₆ circuit breaker.
- ENDESA-Chile
Products: Power transformer, surge arrester, insulator, SF₆ circuit breaker.
- ICE-Costa Rica
Products: Power transformer.
- PREPA-Puerto Rico
Products: Surge Arrester.

Asia-pacific

- EVN-Vietnam
Products: Switch disconnector, power transformer, etc.
- Kamoki-Pakistan
Products: Substation turn-key project.
- MEPE-Myanmar
Products: Reactor, Power transformer.
- NEA-Nepal
Products: Substation turn-key project.
- NTDC-Pakistan
Products: Substation turn-key project.
- QESCO-Pakistan
Products: Surge arrester.
- TEPCO-Japan
Products: Power transformer, circuit breaker, disconnector and CT&PT.

Africa

- EEPKO-Ethiopia
Products: HV Circuit breaker, disconnector, earthing switch, surge arrester, insulator, CT.
- ENE-Angola
Products: GIS.
- JIRAMA-Madagascar
Products: Reactor.
- KENGEN-Kenya
Products: Surge arrester.
- KPLC-Kenya
Products: Cut-out fuse, surge arrester, insulator.
- PHCN-Nigeria
Products: Transformer protection & control panel.
- RECO-Rwanda
Products: Distribution transformer, etc.
- REGIDESO-Burundi
Products: Power transformer, distribution transformer.
- SBEE-Benin
Products: Power transformer.
- SNEL-D.R. Congo
Products: Power transformer.
- SONABEL-Burkina Faso
Products: Power transformer, reactor.
- TANESCO-Tanzania
Products: Substation turn-key project.
- VRA-Ghana
Products: MV switchgear, DC panel, disconnector.
- ZESCO-Zambia
Products: CT-VT metering unit.

Middle-east

- NEC-Sudan
Products: Power transformer.
- NEPCO-Jordan
Products: Power transformer, earthing transformer.
- ONEC-Oman
Products: Power transformer.
- PEC-Yemen
Products: Substation turn-key project.
- PEDEEE-Syria
Products: Insulator, surge arrester, substation turn-key project.
- PEEGT-Syria
Products: Insulator.
- TEIAS-Turkey
Products: Surge arrester, insulator.
- WARD-Lebanon
Products: SF₆ circuit breaker, disconnector, surge arrester, insulator.

CIS

- ENA-Armenia
Products: HV circuit breaker, switch disconnector, etc.

More >>>

Global Operation in Over **125** Countries

Industrial End User

Application: widely applicable for mining, iron-steel, cement, metallurgy, chemical, railway, petroleum, paper, power generation industries, etc.

Mining Industry

- BHP Billiton-Australia
Products: CT& PT, distribution transformer, etc.
- Rio Tinto-Australia
Products: Distribution transformer, CT.
- FMG-Australia
Products: Power transformer.

Iron-steel Industry

- JFE Steel-Japan
Products: Disconnecter.
- Bao Steel-China
Products: Power transformer, MV switchgear panel.

Cement Industry

- Serebryabskiy Cement Plant-Russia
Products: HV capacity compensation device, HV capacitor.
- Viet Quang Cement Plant-Vietnam
Products: Power transformer, HV circuit breaker, disconnecter, MV&LV switchgear panel.

Petroleum & Gas Industry

- Chevron-USA
Products: Switchgear panel, distribution transformer.
- PDVSA-Venezuela
Products: Power transformer, distribution transformer.
- CNPC-China
Products: Power transformer, GIS, MV switchgear panel.

Power Rental Industry

- Aggreko-UK
Products: Power transformer.
- APR Energy-USA
Products: Power transformer, HV circuit breaker, disconnecter, CT, PT.

Paper Industry

- VISY-Australia
Products: Switchgear panel
- UPM-Finland
Products: MV switchgear panel.

Chemical Industry

- Saint Gobain-France
Products: Power transformer, MV switchgear panel, cable, busduct.
- INVISTA-USA
Products: Distribution transformer, switchgear panel, DC panel.

Power Generation

- TATA Power-India
Products: Power transformer.
- SIBAYAK Geothermal Power Plant-Indonesia
Products: MV&LV switchgear panel, surge arrester, insulator, CT, VCB.

Commercial & Civil Construction

- Shangri-la Hotel-Philippine
Products: Distribution transformer.
- Kiev Boryspil International Airport-Ukraine
Products: GIS.

Shipbuilding Industry

- Fincantieri-Italy
Products: Power transformer.

More >>>

Engineering & Contracting

- EIFFAGE-France
Products: Power transformer, reactor.
- FLUOR-USA
Products: Power transformer.

More >>>

Turn-key Project

- Kamoki-Pakistan
Projects: 230kV substation EPC.
- Saint Gobain-France
Projects: 35kV substation EPC.
- PEC-Yemen
Projects: 132kV and 33kV substation EPC.
- NEA-Nepal
Projects: 132kV and 33kV substation EPC.
- SMCO-D.R. Congo
Projects: 220kV substation EPC.
- TANESCO-Tanzania
Projects: 35kV and 66kV substation EPC.
- NTDC-Pakistan
Projects: 220kV substation EPC.

More >>>





Table of Contents

HV/LV Busbar Trunking System

Busbar Trunking System (Busway)

- NCK1—Air-insulated Busway
- NCM1—Dense Insulated Busway
- NCK2—Air Fire-resistant Busway
- NCM2—Dense Fire-resistant Busway
- NCK3—Air Insulated Busway
- NCM3—Dense Insulated Busway

1~7

Common Enclosure Busbar

- GFM-12 Common Enclosure Busbar

8~10

Busbar Trunking System

Busbar Trunking System (Busway)

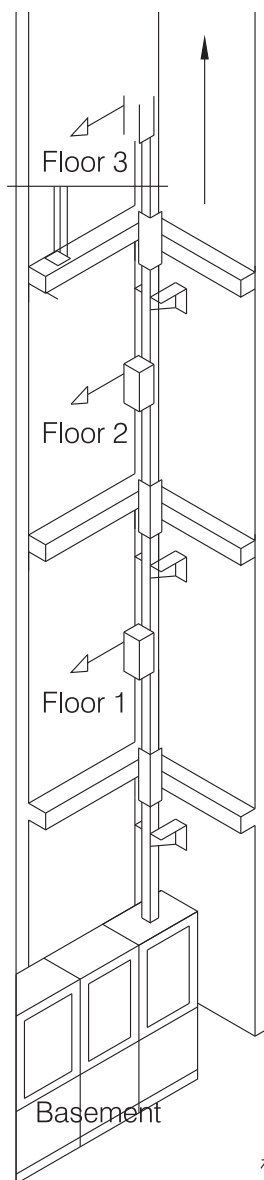
1. General

1.1 Application

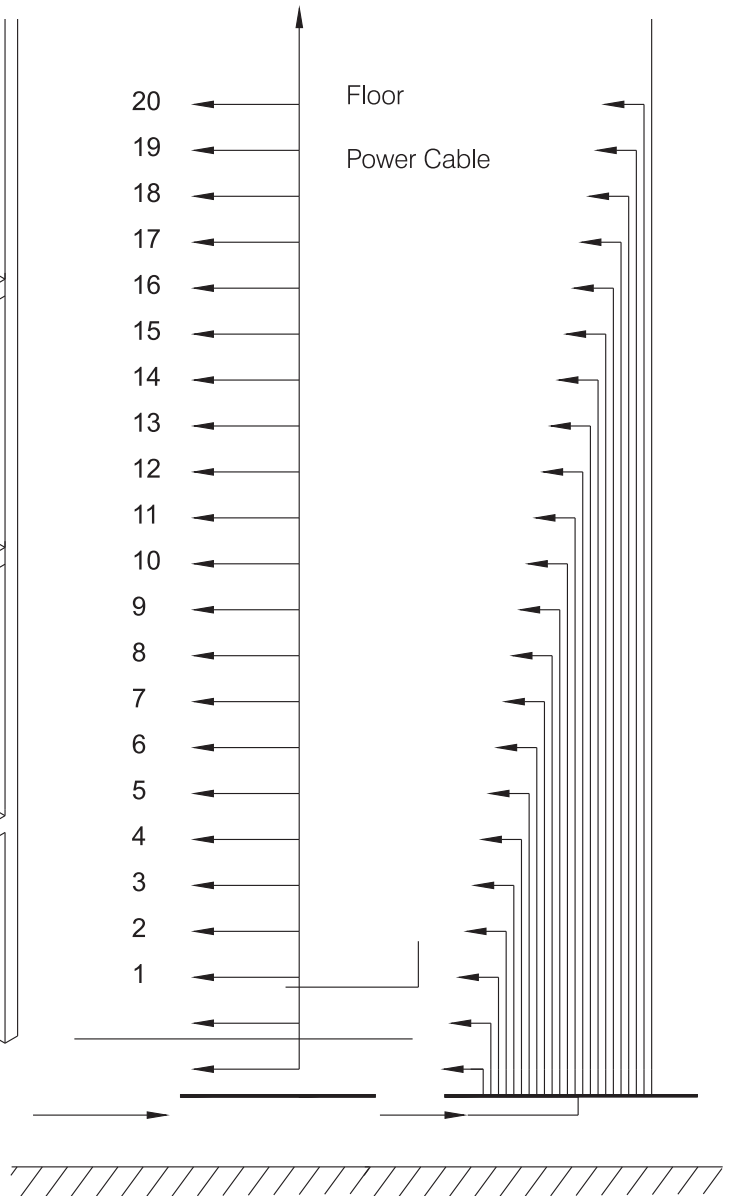
Applicable in three-phase three-wire, three-phase four-wire and three-phase five-wire power supply and distribution system of rated current up to 5000A, voltage up to 660V, 50/60Hz. It is widely applied in industrial workshop with huge span steel structure, high-rise buildings, substation, power station, and airport for power transmission and distribution.

1.2 Standard: IEC 60439-2:2000

In the high-rise buildings



Busbar Trunking System

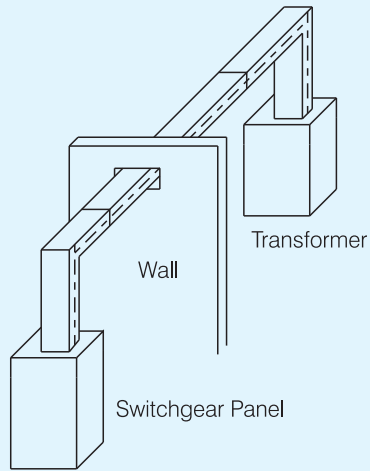


Busbar Trunking System

2. Main Application

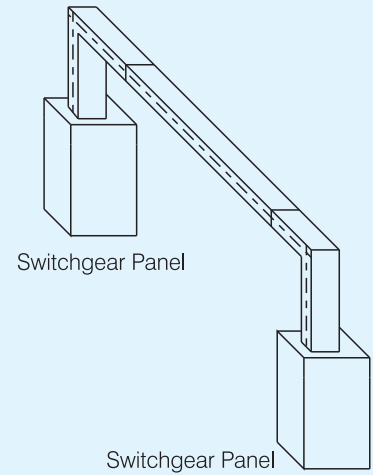
Feeder busway for incoming

Transmit power from transformer to the incoming terminal of the switchgear panel.



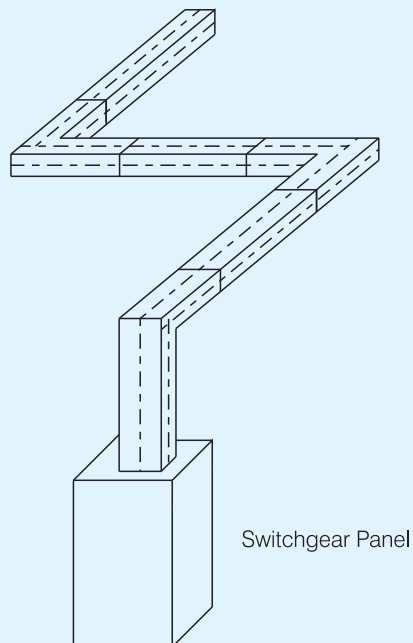
Feeder busway for coupling

Transmit power from switchgear to busbar coupler panel.



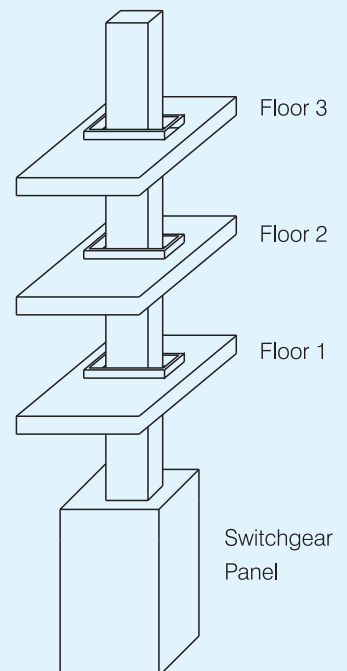
Horizontal installation and plug-in type busway

Transmit power for switchgear panel to different loads in buildings.



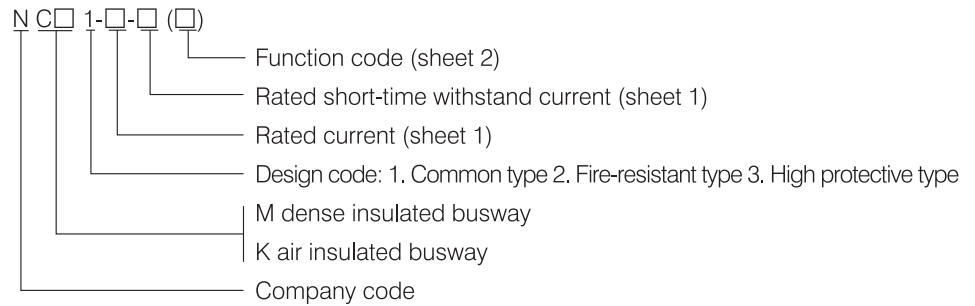
Vertical installation and plug-in type busway

mainly used in high-rise buildings, and transmit power to different floors through plug-in boxes.



Busbar Trunking System

3. Type Designation



Sheet 1

Rated current (A)	Rated short-time withstand current (1s,kA)	Rated withstand current (peak, kA)
200, 315, 400, 500, 630	20	40
630, 800, 1000, 1250	31.5	66
1600, 2000, 2500, 3150	50	105
3150, 4000, 5000	80	176

Sheet 2

No.	Item	No.	Item
A	Linear type busbar trunking unit (straight sector)	LC	L shaped vertical joint
B	Incoming feeder section	LS	L shaped horizontal joint
C	Incoming feeder box	TS	T shaped horizontal joint
CK	Plug-in box	ZC	Z shaped vertical joint
TH	Spring bracket	ZS	Z shaped horizontal joint
TB	Corbel	TC	T shaped vertical joint
DG	Suspender	DJ	Suspender

4. Structure Feature

4.1 Structure

4.1.1 Busbar ABC

4.1.1.1 T2 copper complying with IEC standard adopted. Copper covering aluminum conductor customized, which is made of L1 pure industrial aluminum with a good performance equal to pure copper.

4.1.1.2 The joint part surface of busbar is plated with silver, and the surplus surface is processed by advanced CPWP copper lightning technology, which is of great anti-oxidation and anti-corruption capability.

4.1.1.3 The insulation of the busbar is epoxy insulation coating processed. The puncture voltage of the coating can reach to 22Kv/mm 1min, and the aging resistance imitated duration test is 50 years. The product has features of reliability, fire-resistant, withstand to high temperature and wet, anti-dust and so on, etc.

Busbar Trunking System

5. Technical Parameter

- 5.1 Rated operating voltage: ~380V, ~660V, DC800V.
- 5.2 Rated tapping operating voltage: ~380V, ~660V.
- 5.3 Rated insulation voltage: AC690V, DC800V.
- 5.4 Rated current (A): 200, 315, 400, 500, 630, 800, 1000, 1250, 1600, 2000, 2500, 3150, 4000, 5000.
- 5.5 Rated current of incoming feeder box: 250~5000A.
- 5.6 Rated current of plug switch box: 63~800A.
- 5.7 Frequency: 50/60Hz.
- 5.8 Protection level: IP40, IP54.
- 5.9 Wiring: three-phase three-wire, three-phase four-wire and three-phase five-wire.
- 5.10 Temperature rise: (sheet 3)

Sheet 3

Postion	Temperature rise (k)	Postion	Temperature rise (k)
Terminals to connect outside insulation wire	70	Silver coated copper Silver coated copper	80
Contact position of plug connector on the channel and fixed joint position between busbars		Touchable enclosure and cover board	
Copper copper	50	Metal surface	30 ¹⁾
Stannum coated copper Tin coated copper	70	The surface of insulation material	40 ¹⁾
Stannum coated aluminum Stannum coated aluminum	55		

※ Note: ¹⁾ Except that other regulations exist, the temperature rise of the enclosure of the busway, which people can get close to them, but have no necessary to touch can be raised, metal surface up to 25K, and insulation surface can up to 15K.

5.11 Short-time withstand current and peak withstand current (sheet 4)

Sheet 4

Rated current Ie (A)	Short time withstand current Icw (1sec, kA)	Rated peak withstand current (kA)
200~630	20	40
630~1250	31.5	66
1600~3150	50	105
3150~5000	80	176

Busbar Trunking System

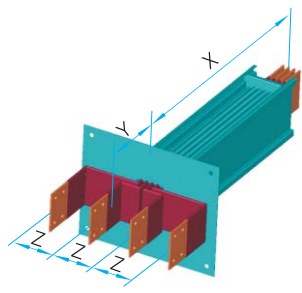
6. Function Unit

Every busbar system are constituted with many independent functional units. The following are the specifications of various kinds of functional units, type choosing and the means to order non-standard products of N series of bus way. (Normal specifications are with *)

6.1 Start terminal (or Incoming feeder section)

The start terminal and origin box comprise the power incoming unit of the bus way, which can also be applied to the connection between the transformer and the switchgear panel.

Sheet 5

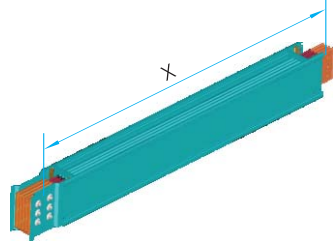
X	Y	Z	Functional code	Diagram
500	250	100	(B-1) *	
500	250	150	(B-2)	
500	250	200	(B-3)	
Non-standard size	Non-standard size	Non-standard size	(B-X+Y+Z)	

6.2 Straight sector

The straight sector is defined as feed type and plug-in type. The feed type has no jack, used as power transmission. The plug-in type has jacks on both sides of the straight sector, and can distribute the power through installing the plug-in box.

The gap between the plugs should be larger than 600mm, less than 6m.

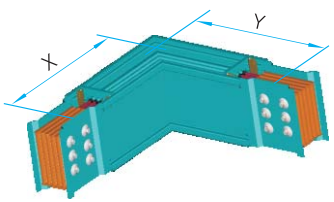
Sheet 6

X	Quantity of jacks (n)	Function code	Diagram
1000	4	(A-1)	
2000	8	(A-2)	
3000	12	(A-3) *	
Non-standard size	Non-standard No.	(A-X+n)	

6.3 L shaped horizontal elbow

L shaped horizontal elbow works as the connection unit when bus way bends in horizontal direction.

Sheet 7

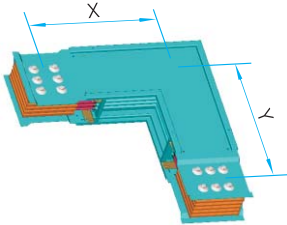
X	Y	Function code	Diagram
400	400	(LS-1)	
500	500	(LS-2) *	
600	600	(LS-3)	
Non-standard size	Non-standard size	(LS-X+Y)	

Busbar Trunking System

6.4 L shaped vertical elbow

L shaped vertical elbow works as the connection unit when bus way bends in vertical direction. And the bending angle is 90° .

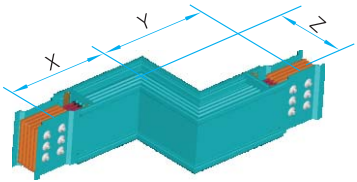
Sheet 8

Rated current (A)	X	Y	Function code	Diagram
250~2000	500	500	(LC-1) *	
2500~3150	600	600	(LC-2) *	
4000~5000	700	700	(LC-3) *	
	Non-standard size	Non-standard size	(LC-X+Y)	

6.5 Z shaped vertical elbow

Z shaped vertical elbow works as the connection unit when bus way bends in horizontal direction. Z is the departure dimension.

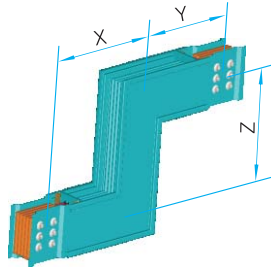
Sheet 9

X	Y	Z	Function code	Diagram
500	500	200	(ZS-1)	
500	500	300	(ZS-2) *	
500	500	500	(ZS-3)	
Non-standard size	Non-standard size	Non-standard size	(ZS-X+Y+Z)	

6.6 Z shaped vertical elbow

Z shaped vertical elbow works as the connection unit when bus way bends in vertical direction, Z is the departure dimension.

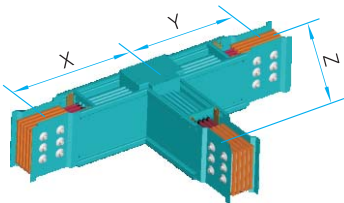
Sheet 10

Rated current (A)	X	Y	Z	Function code	Diagram
250~2000	500	500	200	(ZS-1)	
2500~3150	500	500	300	(ZS-2) *	
4000~5000	500	500	500	(ZS-3)	
	Non-standard size	Non-standard size	Non-standard size	(ZS-X+Y+Z)	

6.7 T shaped horizon elbow

T shaped horizontal elbow works as the connection unit when bus way bends in horizontal direction.

Sheet 11

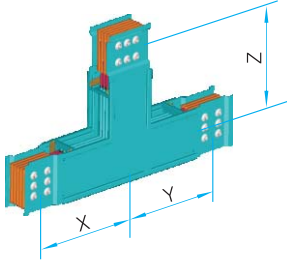
X	Y	Z	Function code	Diagram
400	400	400	(TS-1)	
500	500	500	(TS-2) *	
600	600	600	(TS-3)	
Non-standard size	Non-standard size	Non-standard size	(TS-X+Y+Z)	

Busbar Trunking System

6.8 T shaped vertical elbow

T shaped vertical elbow works as the connection unit when bus way bends in vertical direction.

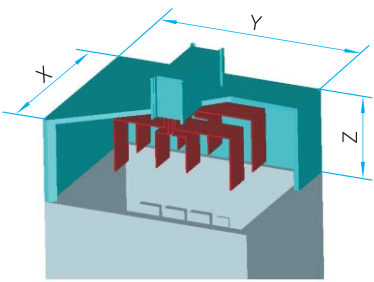
Sheet 12

Rated current (A)	X	Y	Z	Function code	Diagram
250~2000	500	500	500	(TC-1) *	
2500~3150	600	600	600	(TC-2) *	
4000~5000	700	700	700	(TC-3) *	
	Non-standard size	Non-standard size	Non-standard size	(TC-X+Y+Z)	

6.9 Origin box

Origin box is providing the connecting space and sealed protection for letting the electrical cable go through the bus way or inlet on the top of transformers and switchgear panel.

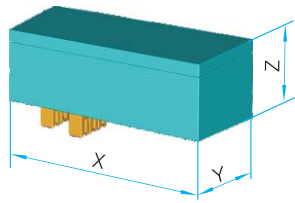
Sheet 13

X	Y	Z	Function code	Diagram
300	400	300	(C-1)	
400	400	300	(C-2)	
500	400	300	(C-3)	
600	600	400	(C-4)	
600	800	400	(C-5)	
600	1000	400	(C-6)	
800	800	400	(C-7)	
800	1000	400	(C-8)	
1000	1000	400	(C-9)	
Non-standard size	Non-standard size	Non-standard size	(C-X+Y+Z)	

6.10 Jack box

Jack box is a output and distribute electric unit, it can also be used as low current inlet box. It should be used along with plug line portion. When ordering, the switch type should be marked following jack box type.

Sheet 14

Current (A)	Quantity of poles	X	Y	Z	Function code	Diagram
10~225	3P	500	220	140	(CK-1—type)	
250~400	3P	650	260	170	(CK-2—type)	
630~800	3P	800	300	170	(CK-3—type)	
10~225	4P	500	220	140	(CK-4—type)	
250~400	4P	650	260	170	(CK-5—type)	
630~800	4P	800	340	170	(CK-6—type)	

Busbar Trunking System

GFM-12 Common Enclosure Busbar



1. General

1.1 Application: applicable in transmission and distribution system of rated current up to 5000A, rated voltage 12KV, AC 50/60Hz. It is mainly used as the electrical connection of main transformer and generator, transformer and the high voltage switchgear and between the loop of high voltage instruments in power station, industrial and mining organizations.

1.2 Standard: IEC 60694

2. Working Condition

2.1.1 Ambient air temperature $40^{\circ}\text{C} \sim +40^{\circ}\text{C}$ 。

2.1.2 Altitude: $\leq 1000\text{m}$.

2.1.3 Relative humidity: daily value $\leq 95\%$, monthly value $\leq 90\%$.

2.1.4 Earthquake degree: 8 (basic acceleration designed is less than 0.2g).

2.1.5 Wind pressure: $\leq 700\text{Pa}$ (Equal to wind speed 34m/s).

2.1.6 Raining, snowing, suddenly change in temperature and sunlight should be considered.

2.1.7 Ice thickness: $\leq 20\text{mm}$.

3. Technical Parameter

3.1 Ratings

3.1.1 Rated voltage: 12kV.

3.1.2 Rated current: 630A~5000A.

3.1.3 Rated frequency: 50Hz (or 60Hz) .

3.1.4 Insulation level:

Rated 1min power frequency withstand voltage (wet test effective value): 30kV.

Rated 1min power frequency withstand voltage (dry test effective value): 42kV.

Rated lighting impulse withstand voltage (peak value): 75kV.

3.1.5 Rated short-time withstand current and rated peak value withstand current

Sheet 1

Rated current (effective value) A	Rated peak withstand current (peak value, 0.3S) kA	Rated short-time withstand Voltage (effective value, 2s)
630~1000	63	25
1250~2500	80	31.5
3150~5000	100	40



Busbar Trunking System

3.1.6 Allowable temperature & temperature rise of each part

When working under normal condition, temperature and temperature rise should correspond with the sheet 2 below.

Sheet 2

Parts		Allowable temperature, °C	Allowable temperature rise, K
Conductor		105	65
Conductor of Bolt	Silver coated	105	65
Contact surface of enclosure	No coating	90	50
Enclosure		70	30
Supporting construction for the enclosure		80	40
Insulation parts		130	90

4. Construction

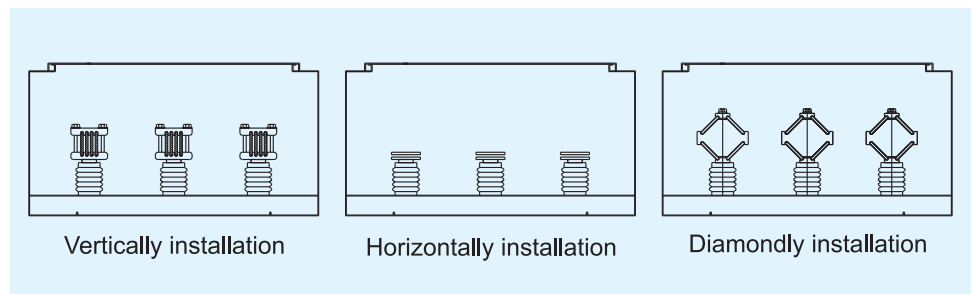
4.1 Outline dimension

Width: 800, 900, 1000, 1100, 1200

Height: 300, 400, 500, 600, 800

Length: every single length is no more the 2.5m

4.2 Structural drawing



Busbar Trunking System



5. Accompanying Document

- 5.1 Product certificate
- 5.2 Operation instruction manual
- 5.3 Packing list, shipping list
- 5.4 List of accessories , easily damaged parts , spare parts , special parts.
 - a) Accessories includes : installation material , bolts , earthing wire
 - b) Easily damaged parts include: Insulator, heat shrinkable tubings, bus clamps, etc.
- 5.5 Delivery inspection report
- 5.6 Other technical document required by the contract.

6. Ordering Information

Please specify the following information when ordering:

- 6.1 Environment condition. Two sides could solve it by consulting for special environment condition.
- 6.2 Ratings
- 6.3 Installation requirements or drawings on site.
- 6.4 We could send engineers to measure on site if needed.

International Business:

Attributed to our reliable quality and perfect after-sales service, CHINT Electric has been relied on and entrusted with by many of our clients around the world. We will continue to supply best products and try hard to win more compliments through our best service.

For inquiries, further interests for products cooperation, partnership, international alliance, investment discussion with us, please contact the following representatives.

Area	Representative	Tel	E-mail
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