

XLA/XLC LV Busbar Trunking System
Rated Current: 400A~5000A

XLA/XLC LV Busbar Trunking System Brochure



sivacon

8PS



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Zhenjiang Siemens Busbar Trunking Systems Co., Ltd.



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Welcome to Zhenjiang Siemens Busbar Trunking Systems Co., Ltd.

Zhenjiang Siemens Busbar Trunking Systems Co., Ltd. (ZSB) is a joint venture between Siemens Ltd., China (Automation & Drives Group) and Daqo Group. Having initially started in 1998 as a joint venture between Klockner-Moeller and Daqo Group, it was formerly known as Zhenjiang Klockner-Moeller Busbar Trunking Co., Ltd. with a proven track record in the Asian Pacific Market.

The company's main operation is the manufacturing of busbar trunking system for power transmission and distribution.

Quality policy: Supply high quality products and perfect service to our customer.



Low-voltage Switchgear and Controlgear-the Basis for Progressive Solution

Competence and innovation in switching and electrical installation technology are prerequisites so that power can be used without danger and user-friendly in industrial facilities and buildings.

Low-voltage switchgear from Siemens offers a comprehensive and innovation range of products covering switching devices for load feeders or the distribution of power, control and signaling device as well as complete cabinet systems.

All in all, we can provide you with innovative components for switching and electrical installation technology which utilize state-of-the-art features such as integration and communication as the basis for advanced and uniform solutions which provide you with many benefits.



SIVACON 8PS- Busbar Trunking Systems in Action

Busbar trunking systems in the low-voltage range perform the safe and reliable transmission and distribution of electrical power from transformer via main distribution board and sub-distribution board right to the load. ZSB busbar trunking systems are the complete and efficient answer in this area:

Performance characteristics:

- Clear network structure
- Unproblematic retrofitting in the event of load changes
- Low operating costs
- Simple planning and installation

All these systems are 'type-tested LV switch-gear assemblies' to IEC 60 439-1 and -2. This ensures that they offer a standard of safety and reliability that meets the particularly high performance expectation of automated production and for building services provision.

Room-covering system for lighting installations and small loads

The CD-K system (up to 40A) allows you to supply lighting installations covering the whole expanse of, say, furniture showroom, supermarkets and greenhouses with power, and also provides the means to easily fix them in position. Due to its pleasing appearance, the equipment is well suited for use in sales rooms visited by the public. On the other hand, its high degree of protection, to IP54, allows the CD-K system to be used even in harsh environments.

Small and middle power distribution

BD1 system is ideally suited for the power supply (up to 700A) in workshop, high building and trade premise, with four different current rating, easy installation and minimum stock holding.



BD1 system is quick to install and ideally suited for use in workshops and trade premise, as here, at a photographer



The ideal system for production lines needing a great deal of power is the LD system up to 5000A



In the petrochemical industry, ZSB busbar applies widely



Siemens offers modular component cabinets for indication, control and monitoring of the flow of power through busbar trunking system

Safe and reliable power transmission

The louvred LD busbar trunking system, up to 5000A, is the system for transporting current in production lines with a large energy requirement, such as in the automotive industry. A separate PE busbar ensures that the protective device in such a system responds reliably even if the current paths are relatively long. The high short circuit rating allows medium-voltage switches to be used as protective elements for the transmission of power between transformer and main circuit-breaker.

Flexible power distribution in multi-storey buildings

The XL sandwich-style system, up to 5000A, is used where large quantities of power need to be transported, uninfluenced by the mounting position of the system.

Conductor configuration with the PE conductor insulated along its entire length, and a double-size neutral can ensure the interference-free distribution of power in places such as radio stations, computer centres or at internet providers. The system is protected to IP54 as standard, even IP65 can be reached.



The XL busbar trunking system is the perfect equipment for multi-storey buildings where large quantities of power need to be transported, uninfluenced by the mounting position of the system

- CD-K system Rated Current: 25A~40A
- BD1 system Rated Current: 140A~700A
- LD system Rated Current: 1000A~5000A
- XL system Rated Current: 400A~5000A
- KFM system Rated Current: 250A~5000A

System Overview

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- 2/5 System Application
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System Description

Developing a power distribution concept, including system and component configurations, involves finding an effective solution based on customer requirements and supplier technology. This design information brochure for the XL busbar system for rated currents ranging from 400A to 5000A, is designed to help with this task.

Description of the different systems, their technical features and areas of application are provided, as well as drawing of the individual busbar trunking system elements.

"Further Information" suggests approaches for creating effective planning solutions. Individual engineering principles are introduced and detailed information on subjects such as fire barriers and functional endurance is provided.

ZSB offers services and engineering tools for preparing tender specifications.

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General

Creating a design concept for a power supply system, not only involves observing applicable standards and regulations, but also examining and clarifying economic and technical requirements.

Components should not only be appropriate for rated operation, but should also be suitably dimensioned to withstand faults situations. A power distribution concept should also take the following points into consideration.

- Building type, use and form (for example, high-rise building, flat buildings and number of floors).
- Load centers and possible supply paths and location for transformers and main distribution boards
- Regulations and guidelines of building authorities
- Power supply company guidelines.

There will always be more than one possible solution which will have to be assessed in terms of its technical and economic advantages and disadvantages. In making this assessment, the following requirements should be a priority

- Simple and transparent design
- Long service life
- High availability
- Low fire load
- Flexible adaptation to building modifications.

These requirements are generally easy to meet with appropriate busbar trunking systems. For this reason, engineers increasingly favour busbar trunking systems over cable installations for power transmission and distribution applications. ZSB offers busbar trunking systems for rated current from 25 to 5000A.

- CD-K system for 25-40A is ideal for supplying lights and small consumers.
- BD1 system for 140-700A is designed for supplying workshops with tap-offs up to 350A
- LD system is designed for supplying consumers with a high power consumption in industrial application.
- XL system is designed for supplying large power requirement in buildings.

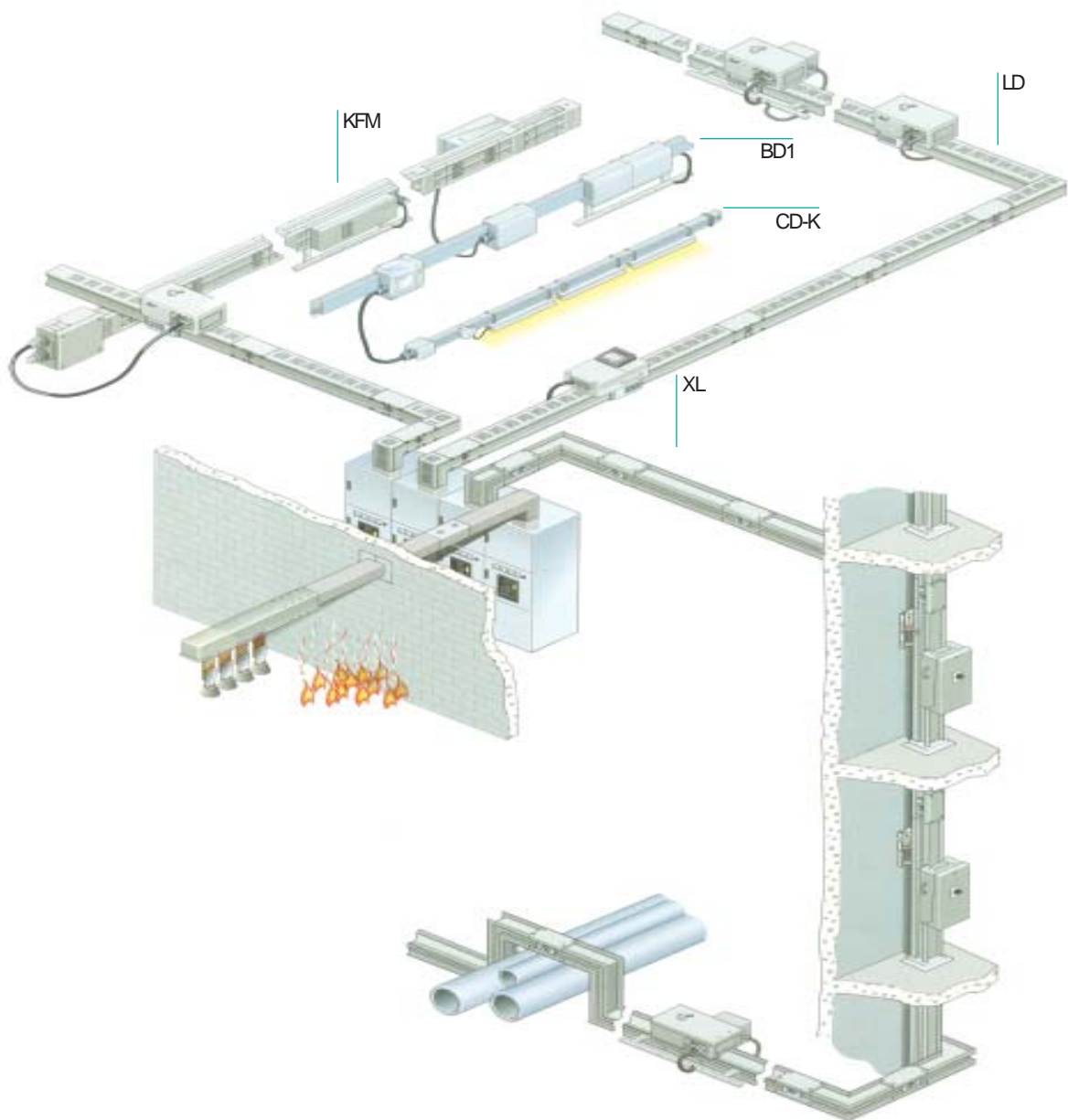


Figure 1: Busbar trunking system

Purpose and types of busbar trunking systems

The complexity of today's buildings makes power distribution with a high level of transparency and flexibility an indispensable requirement. The uninterrupted provision of power is also absolutely essential for production plants with multiple shifts.

Busbar trunking systems meet these demands for an economical power distribution system with simple design, fast installation, optimum flexibility and safety by offering:

- Straightforward network structures
- Minimum space requirement
- Easy retrofitting with sudden changes in location and consumer ratings.
- High short-circuit current rating and low fire load

The XL busbar trunking system is a type-tested low-voltage assembly (TTA) in accordance with IEC/EN 60 439-1 and 2 in the form of an aluminium enclosed sandwich system. The XL sandwich system consists of busbars, insulation, the aluminium enclosure and the fastening and connection elements.



Figure 2: XL trunking unit

Power distribution

The main application of busbar trunking system is power distribution. The advantage of such systems over cable installation is that the locations of power tap-off point are not permanent, but can be moved to any position within the entire system. To tap power at any given point simply requires positioning a tap-off unit at that location on the busbar.

The result is flexible distribution system for decentralized power supply to particular line or area. Tap-off points can be mounted on one or both sides of straight trunking units.

The XL busbar trunking system provides tap-off units from 16A to 800A for power tap-offs and for connecting consumers. Tap-off units can be fitted with either fuse switches or circuit-breakers.



Figure 3: Tap-off units for flexible power tapping

With all busbar trunking systems, pluggable tap-off units have a high safety standard, the following requirements will be fulfilled by all tap-off units

- Early-make PE contact for mounting and late-break contact for removing
- With the cover open, no live part can be accessed

Applicable for Buildings



Both XL and LD systems can be applied for large buildings. As heavy current transmission and distribution system, they should satisfy the requirements below:

- Flexible supply in high-rise buildings
- Safety of supply facilities

In order to satisfy customer's requirements, XL busbar system has a lot features in design. It enhances capability of current-carrying of neutral conductor up to 200% neutral system, therefore enhances stability of system and can apply to network company, electronic workshop and telecommunication building where there are higher requirements for electric power.

LD busbar system mainly applies to projects where have horizontal runs and degree of protection IP54/31.

Applicable for Industry



Industrial projects have high requirements to busbar system, especially on short-circuit withstanding current, for example, welding line in a workshop. LD busbar system is a perfect power transmission and distribution system for industry. It has become the ideal products of customers because of its high fire-proof and degree of protection up to IP54.

Conductor configuration

IEC364 stipulates that electrical equipment must be selected according to the type of system at hand in order to determine the protective measures required.

Neutral conductor

The rise in new electronic consumers that are sensitive to interference, particularly near the power supply in the building, is presenting busbar trunking systems with new challenges. Interference from electromagnetic fields and harmonics in the mains supply impair the correct functioning of computers, servers and many other state-of-the-art electronic devices. Particularly, the large number of AC consumers in a mains supply place a high load on the neutral conductor on account of the resulting harmonics. Double neutral conductor cross-sections (200%) reduce the susceptibility of the system in networks subject to harmonics.

PE Conductor

A large PE conductor cross-section also provides optimum safety for the power supply since the reduced loop impedance ensures rapid interruption of short-circuit currents. This consequently reduces the risk of possible downtimes thanks to the rapid disconnection of upstream protective devices.

Clean earth

Insulated PE conductors offer optimum reliability and safety in the power supply of electronic consumer in buildings on account of their complete insulation from the busbar enclosure. In the event of a short-circuit between the phase and the consumer enclosure this PE conductor (clean earth) is not affected by this fault and is therefore potential-free during a short-circuit to an exposed conductive part. Even leakage currents in the enclosure due to magnetic fields do not affect the clean earth. The clean earth is therefore ideal as the PE connection for susceptible electronic loads.

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Cross-sections for PEN, N, PE conductors compared to the conductor cross-section

The following tables compare the conductor cross-sections L1, L2, L3, PEN, N, PE and clean earth of different conductor configuration.

System	Cross-section L1, L2, L3	PEN	N	PE	Clean earth
XLC...3	100%	-	-	Housing	-
XLC...4	100%	-	100%	Housing	-
XLA...41	100%	100%	-	Housing	-
XLC...5	100%	-	200%	Housing	-
XLC...7	100%	-	-	100%+Housing	-
XLC...8	100%	-	100%	100%+Housing	-
XLA...51	100%	-	100%	Housing	-
XLC...C	100%	-	-	Housing	100%
XLC...D	100%	-	100%	Housing	100%
XLA...53	100%	-	100%	100%+Housing	-

Rated currents and short-circuit currents of standard transformers

Rated voltage U_n	400/220V			690/400V		
	Relative short-circuit voltage U_k			Relative short-circuit voltage U_k		
Rated power kVA	Rated current A	Short-circuit current I''_k , A		Rated current A	Short-circuit current I''_k A	
50	72	1805	-	42	1042	-
100	144	3610	2406	84	2084	1392
160	230	5776	3850	133	3325	2230
200	288	7220	4812	168	4168	2784
250	360	9025	6015	210	5220	3560
315	455	11375	7583	263	6650	4380
400	578	14450	9630	336	8336	5568
500	722	18050	12030	420	10440	7120
630	909	22750	15166	526	13300	8760
800	1156	28900	19260	672	16672	11136
1000	1444	36100	24060	840	20840	13920
1250	1805	45125	30080	1050	26060	17480
1600	2312	57800	38530	1330	33300	22300
2000	2888	72200	48120	1680	41680	27840
2500	3612	90300	60200	2094	52350	34900
3150	4546	113650	75780	2636	65893	43933

Formula

Rated current of transformer

$$I_N[A] = k \times S_{NT}[kVA]$$

Short-circuit current of transformer

$$I''_k = I_N / U_k \times 100$$

400V: $k=1.45$

690V: $k=0.84$

Housing cross-section compared to conductor cross-section(Cu equivalent)

Rated current, A	Housing cross-section
400	320%
630	274%
800	240%
1000	305%
1250	235%
1600	187%
2000	157%
2500	121%
3150	221%
4000	197%
5000	171%

Example:

1) XB40

L1、L2、L3、N:100%

PE(Housing): 305% copper conductor cross-section

2) XB56

L1、L2、L3:100%

N:200%

PE(housing): 121% copper conductor cross-section

XL selection depending on transformer rated values

Transformer rated values

XL System

Rated Current I, A	Rel. short-circuit voltage $U_k, \%$	Uninterrupted short-circuit current I''_k, kA_{eff}	Peak short-circuit current I_{pk}, kA	Type	Rated Current I_e, A	Rated short-time withstand current I_{cw}, kA_{eff}	Rated impulse withstand current I_{pk}, kA
910	6	15.15	38.58	XLA/XLC	1000/1000	50 / 30	105/ 63
1155	6	19.25	49.00	XLA/XLC	1250/1250	50/ 50	105/108
1444	6	24.06	61.24	XLA/XLC	1600/1600	65/ 65	144/144
1805	6	30.07	76.57	XLA/XLC	2000/2000	65/ 65	144/144
2310	6	38.50	98.00	XLA/XLC	2500/2500	90/ 65	198/144
2887	6	48.11	122.50	XLA/XLC	3150/3150	110/120	242/264
3609	6	60.11	153.10	XLA/XLC	4000/4000	150/120	330/264
4546	6	75.78	192.90	XLA/XLC	- /5000	- /120	- /264

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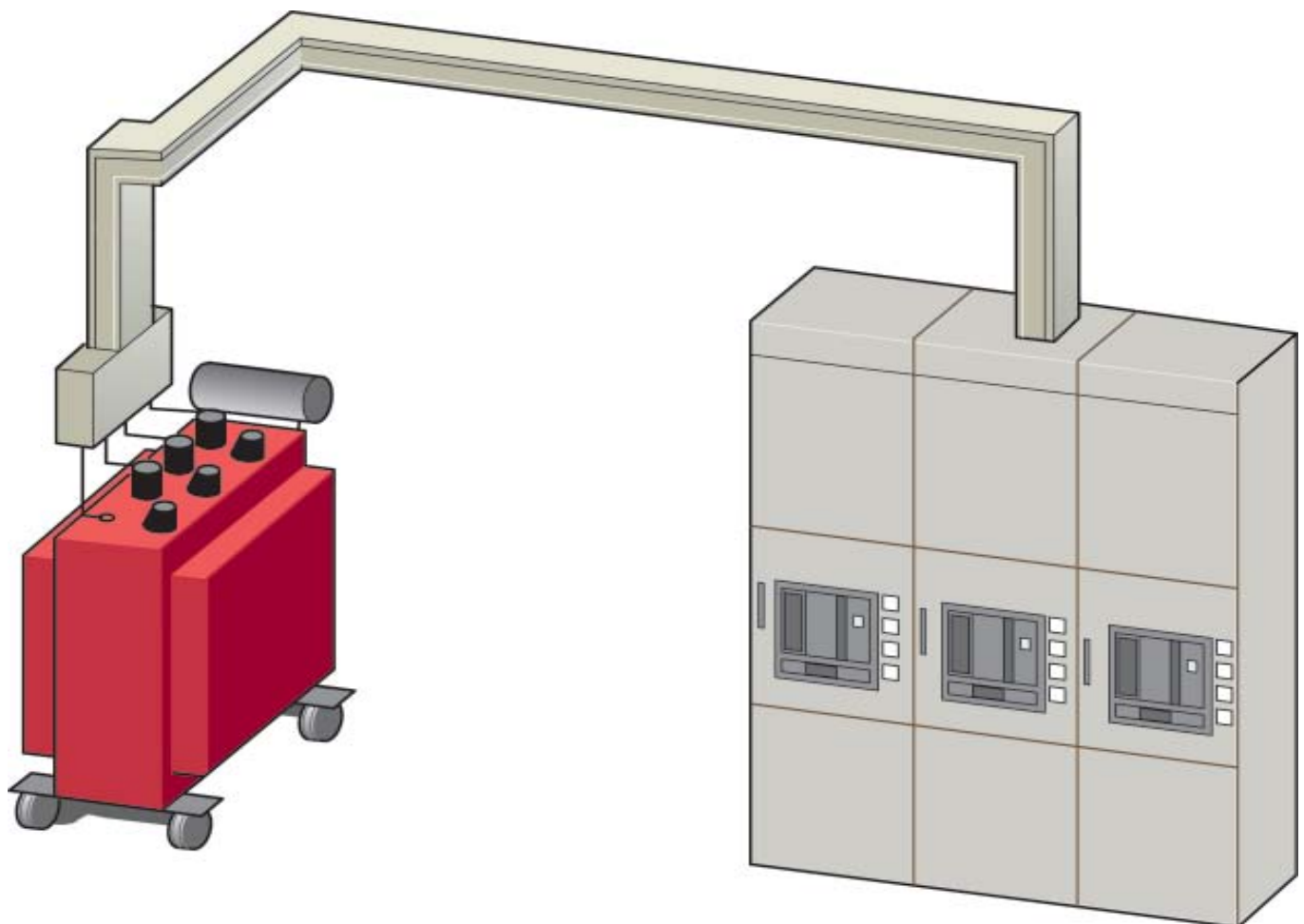


Figure 1: Connecting a transformer to a distribution board

XL Busbar Trunking System

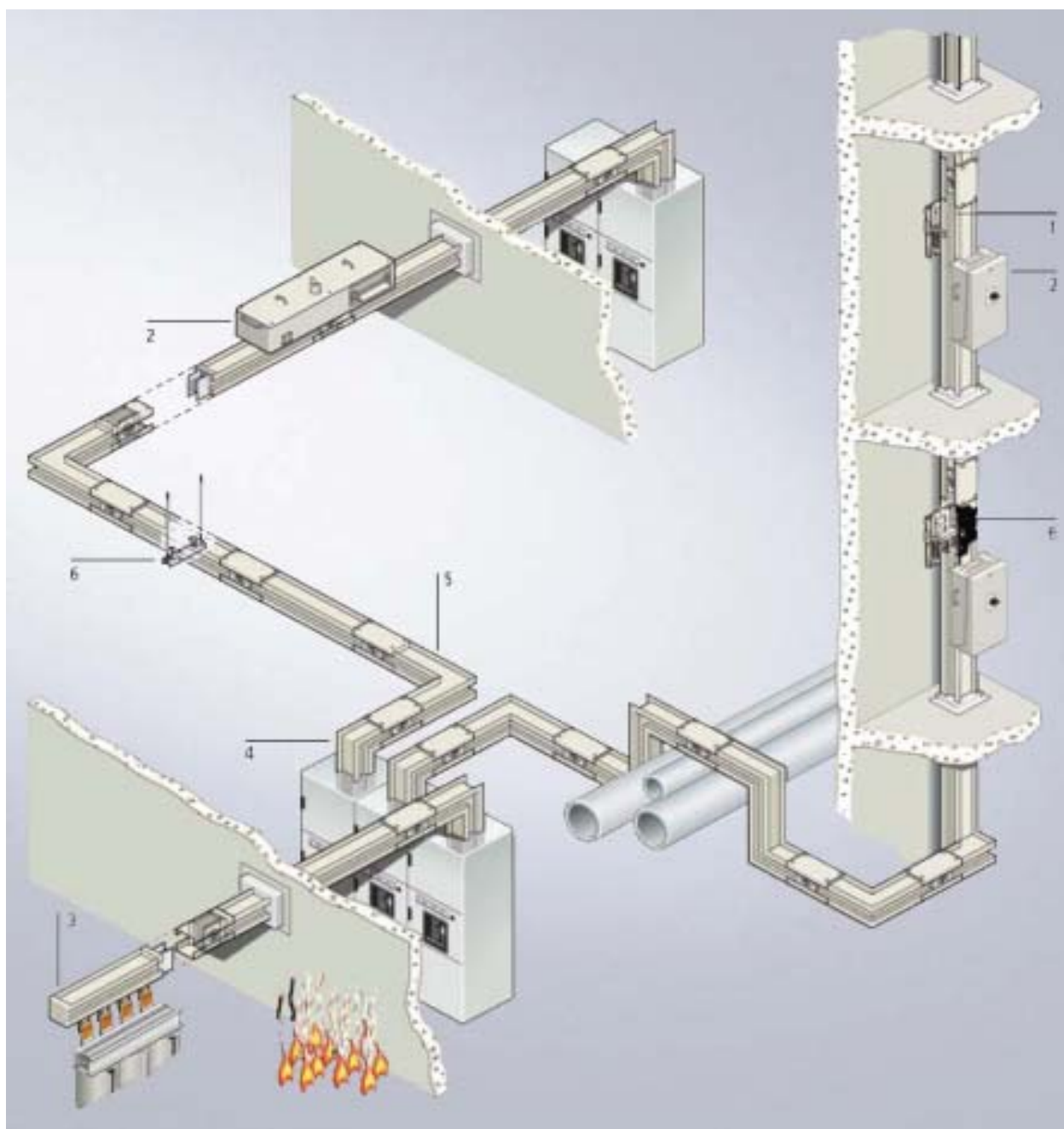
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3/17	Dimension

XL Busbar Trunking System

System Description



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XL busbar trunking system is used for both power transmission and distribution. The system offers an outstanding level of flexibility in term of location requirements and is particularly suitable for power distribution in multi-storey buildings. The high degree of protection to IP65 as well as tap-off units up to 800A also guarantee safe power distribution for high energy requirements of industrial applications.

1 Straight trunking Unit

With or without fire barrier
Degree of protection IP42,IP54,
(IP65 on request)

Conductor configuration

- Standard length
 - XLA: 4 m/3 m/2 m/1 m
 - XLC: 3 m/2 m/1 m
- Optional lengths of
 - XLA: 0.44 - 3.99 m
 - XLC: 0.50 - 2.99 m

- For horizontal and vertical installation

Straight trunking units with tap-off points

- Tap-off points on one side
- Tap-off points on two sides
- Correct orientation feature: protection against incorrect installation

2 Tap-off units

With either fuse breaker or circuit-breaker
Steel enclosure of protection IP54
Early-make PE(N)connection contact during fitting
Standard colour: RAL7035
Mechanical interlock device & Auto. device to orientation
Effective avoid to incorrect mounting
Plug pin with silver coating

3 Feeder Units

Transformer feeder units

- Special flexible connection
- Rated current up to 5000A

Distribution board feeder units

- Special copper bar connection
- Rated current up to 5000A

Or cable feeder unit

4 Connection to Siemens power distribution systems

For distribution connection to from

- Above
- Below

5 Junction units

Change of busbar run conveniently within 70~175°

- L unit
- T unit
- Z unit

6 Accessories

End cap
Joint pack
Fixing bracket
Tools for connection

System brief

General

- Rated Current: 400~5000A
- Compact construction for whole system, Sandwich Type busbar
- The enclosure is made from aluminium with light weight, high rigidity and the surface is static spray painting which enjoys good anti-corrosion and anti-oxidation.
- Degree of protection is up to IP65, can apply in outdoor
- The conductor is made from 2# electrolysed copper (purity up to 99.95%), tin-plated or silver-plated, and isolated along their entire length with Mylar polyester film made by Dupont in US, with insulating grade B(130°C)
- State-of-the-art Joint pack with single bolt ensures more safe and quick installation.
Minimum distance between two tap-off point is 575mm, up to 10 tap-off points can be equipped every 3m standard length.

Busbar trunking system consists of the following units:

- Straight length and straight length with tap-off point
- Transformer entry unit, Distribution cabinet entry unit and cable entry unit
- Junction unit: L elbow, T elbow, Z elbow
- Tap-off unit

All units have standard designing, non-standard designing is also available based on measurement on site.

Conformity and test certificate

- ISO9001 quality certificate awarded —quality management is complied strictly.
- Comply with the standards IEC439-1 & 2 GB7251-1 & 2 BS5486 DIN VDE0660
- National type test & China Compulsory product Certification (CCC) test passed

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Technical data for XL busbar system

Ambient temperature	
min./max./24-hours average	-5/+40/35 °C
Degree of protection	IP42, IP54, IP65
Torque setting for joint pack	min. 50Nm
Busbar surface treatment	paint finish aluminium housing
Enclosure material	
Color of trunking unit	RAL 7035 (light grey). Optional color available
Rated insulation voltage Ui	1000 V AC, 1200 V DC
Rated operational voltage Ue	1000 V AC(690 V AC with tap-off point)
Rated frequency f	50/60 Hz
Rated current Ie	_____ 1)
Rated short-time withstand current	_____ 1)
Rated peak withstand current Ipk	_____ 1)
Conductor material	AL / CU
Number of busbars	_____ 1)
Conductor cross-section	_____ 1)
- L1, L2, L3	_____ 1)
- N	_____ 1)
- PE (Equivalent copper cross-section)	_____ 1)
- Insulated PE conductor (clean earth)	_____ 1)
Max. fixing intervals	
- Horizontal edgewise	
- Horizontal, flatwise	2m
Enclosure dimensions	_____ 1)
Weight	_____ 1)

Note: 1) Enter the values from the technical data for the system you select. For values see technical data.

2) Cross out information which does not apply.

Coding of products

XL busbar system has a set of coding for basic units, including rated currents, conductor configurations, conductor cross-section and conductor material. Our customer can chose according to system coding below while booking.

Coding of System for Copper Bar:

No.	System
3	TPE
4	TPNE
5	TPDNE
7	TP+PE
8	TPN+PE
C	TP+CE
D	TPN+CE

No.	Current, A
I	400
II	630
III	800
0	1000
1	1250
3	1600
4	2000
6	2500
7	3150
8	4000
IV	5000

Copper bar
B-IP54 feeder unit
C-IP65 feeder unit
E-IP54 tap-off in one side
G-IP54 tap-off in both sides



- 1) Housing as PE
- 2) or an independent bar as PE
- 3) Double neutral system(200% neutral)

Example:

If you select XL feeder busbar with copper conductor, IP54, TPN, conductor size 6X65, code of the product will be XB41.

XL Busbar Trunking System

System Components

Coding of System for Aluminium Bar:

No.	Current, A
01	400
02	630
03	800
04	1000
05	1250
06	1600
07	2000
08	2500
09	3150
10	4000

No.	System Configuration
41	L1+L2+L3+PEN
51	L1+L2+L3+N+PE(housing)
53	L1+L2+L3+N+PE

Material of Conductor	
Aluminium	A
Copper	C

XL 

1) Housing as PE

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Busbars

The busbars of the XL busbar system are normally tin-plated and covered with highly resistance insulating material. The conductor material is copper (or Aluminium.)

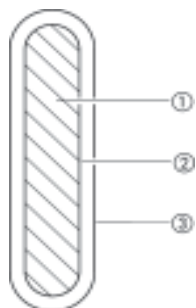
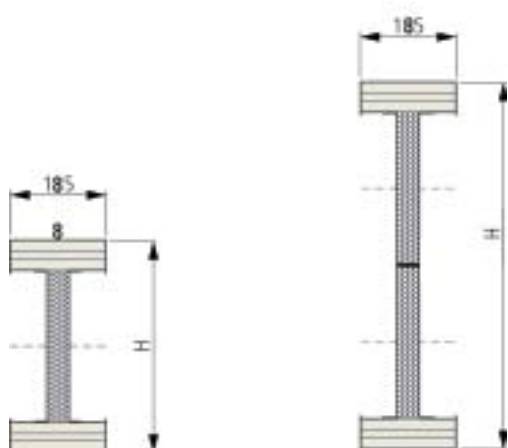


Figure 1: XL busbar system

1. Copper or aluminium bar
2. Tin plated. Silver plated is available if requested.
3. High-temperature resistant insulation coating

Dimensions

Dimensions depend on rated currents and material of conductor. XL busbar system contains 12 current ratings, in which system of 8 lighter ratings is of single bar, the rest of double bar.



Mounting position and rated current

The sandwich-type construction of the XL busbar system means that its current carrying capacity is not affected by the mounting position, thus offering optimum flexibility in the design of busbar runs.

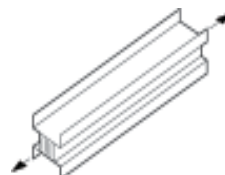


Figure 2: Busbar run horizontal, busbar position edgewise

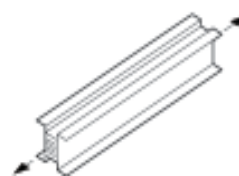


Figure 3: Busbar run horizontal, busbar position flatwise

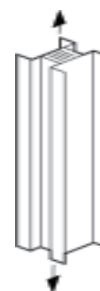


Figure 4: Busbar run vertical

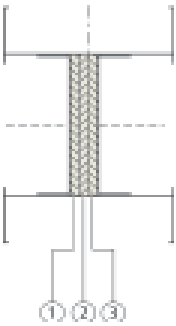
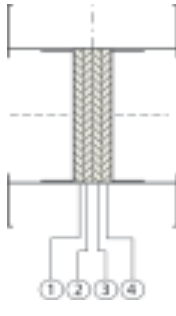
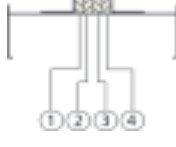
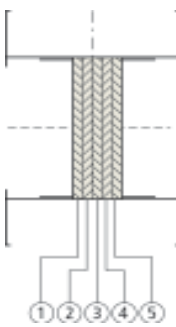
H, mm		Current, A	H, mm		Current, A
XLA	XLC		XLA	XLC	
105	102	400	255	180	2000
120	102	630	310	255	2500
135	102	800	460	310	3150
150	105	1000	560	380	4000
180	120	1250		510	5000
215	150	1600			

XL Busbar Trunking System

System Components

Conductor Configurations

Seven different conductor configurations are available as per actual situation requirement.

	System	Conductor configuration					Housing
		1	2	3	4	5	
	XLC...3	L1	L2	L3	-	-	Housing as ground
	XLC...4	L1	L2	L3	N	-	Housing as ground
	XLA...41	L1	L2	L3	PEN	-	Electrical connection between housing and PEN
	XLC...7	L1	L2	L3	PE	-	Electrical connection between housing and PE
	XLC...C	L1	L2	L3	Clean earth	-	No electrical connection between clean earth and PE
	XLA...51	L1	L2	L3	N	PE	Housing as PE conductor
	XLC...5	L1	L2	L3	N	N	Housing as ground
	XLC...8	L1	L2	L3	N	PE	Electrical connection between housing and PE
	XLC...D	L1	L2	L3	N	Clean earth	No electrical connection between clean earth and PE

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