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XL-III 密集型母线槽系统

XL-III Sandwich Busbar Trunking System

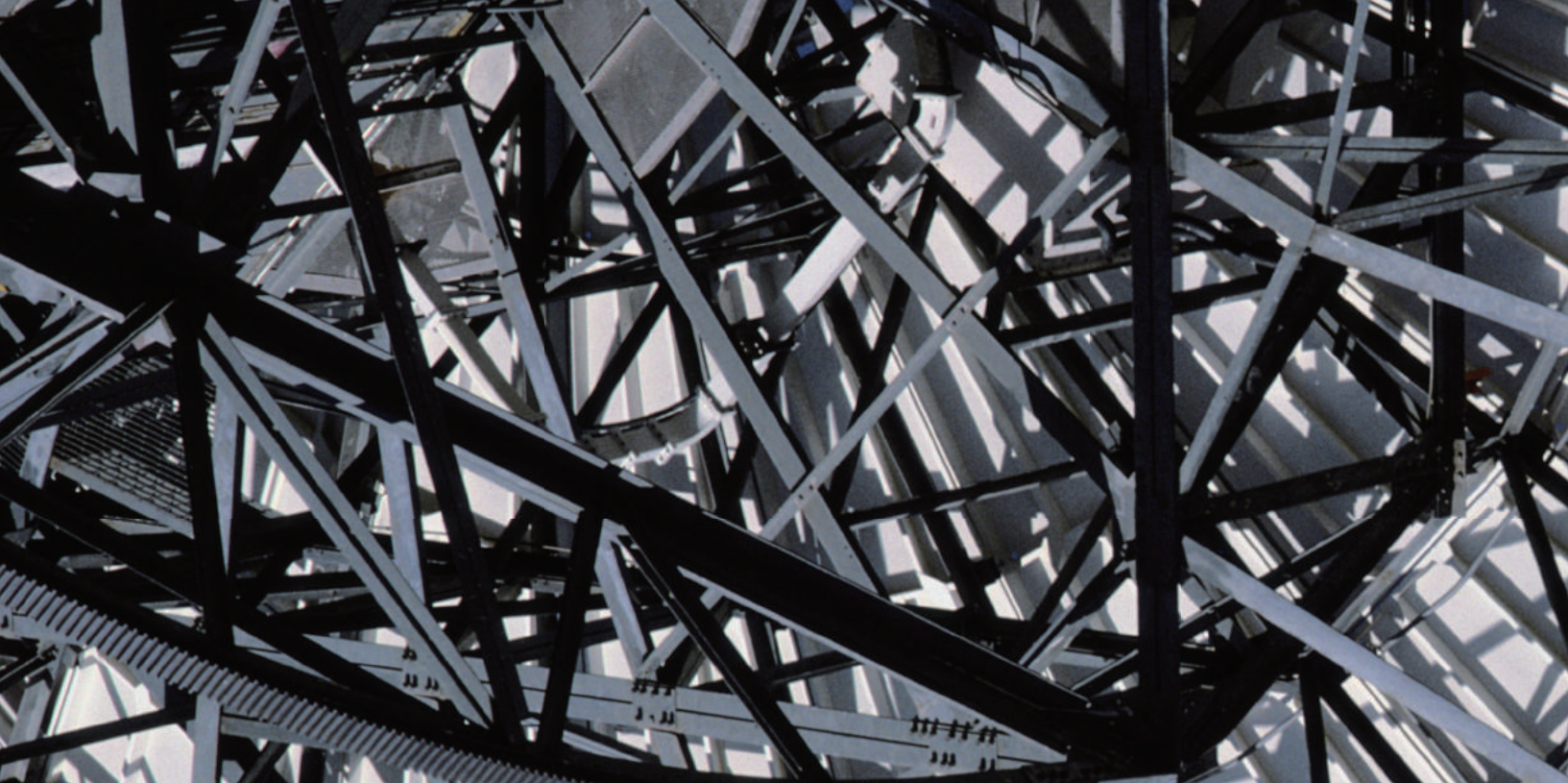
安全、可靠的输配电解决方案 Safe and reliable
power transmission and distribution solution

安全、灵活、经济
Safe, flexible, economic

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母线槽系统应用概述

电力供电系统的设计，不仅要符合行业标准和设计规范，而且还要考虑到经济、安全、更能满足技术要求。对于电气设备的选择应以整个系统是否达到最佳配置为依据，而不受限于各个设备所具有的特性，比如说对于配电柜和变压器的选择，就应该考虑到设备之间的配套，将其作为一个整体，而不是单个进行选择。

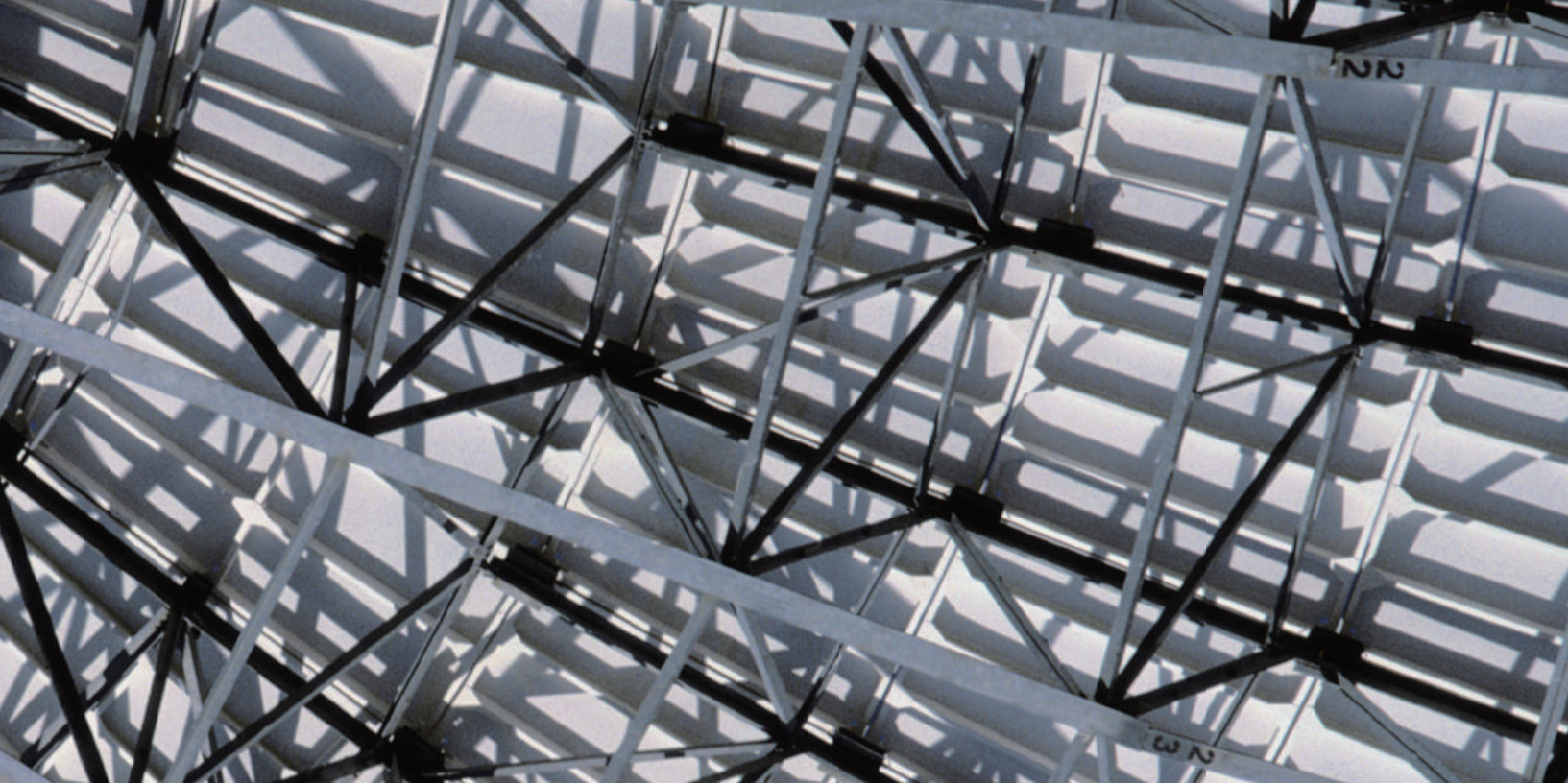
元器件性能稳定，具有较强的适应能力，不仅适用于额定的工作环境，而且在相对恶劣的环境中也能使用。作为一套全新的电力输电系统应充分考虑到以下几点：

- 建筑物的类型、用途和形式（例如：高层建筑、平房和工业厂房等）。
- 变压器和配电柜的位置。
- 建筑管理部门的规定和指导方针。
- 供电部门的指导方针。

一般情况下，都会尽可能多的做出好几种设计方案，通过对技术和商务的综合考虑，选择最适合用户需求的、最经济节省的方案供用户最终确认。在做预算方案的时候，会优先考虑以下几点：

- 设计简单清晰
- 使用寿命长
- 实用性强
- 防火性能
- 建筑物更改时，设备能经过重新组装后再次使用

以上问题在工程项目中会经常碰到，母线槽系统由于其自身的特点能充分满足上述要求。所以在实际应用中，母线槽系统已经逐步替代了电缆，而成为工程人员心目中的首选输配电产品。



Introduction of Busbar Trunking Systems

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. For electrical equipment selection should be based on whether the entire system can achieve the best configuration, but not limited to the integral features of equipments. For example, in choosing of connection between cabinets and transformers for the distribution, it should take into account the connections between devices as a whole rather individual choice.

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

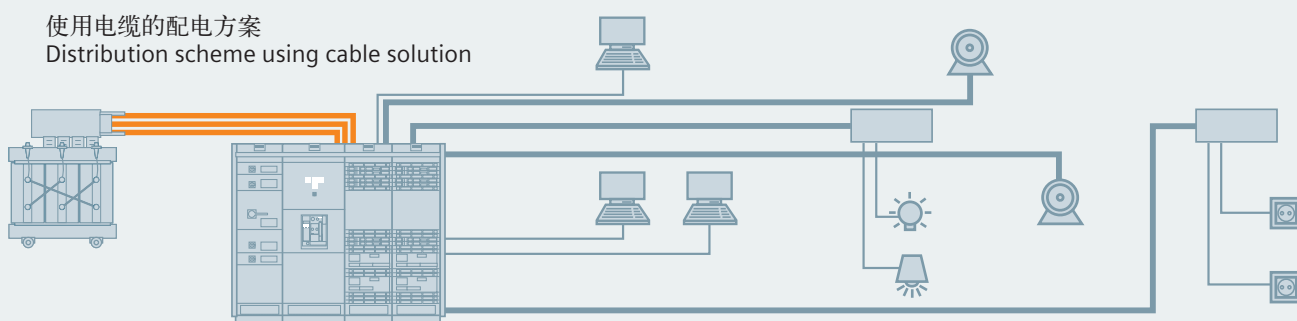
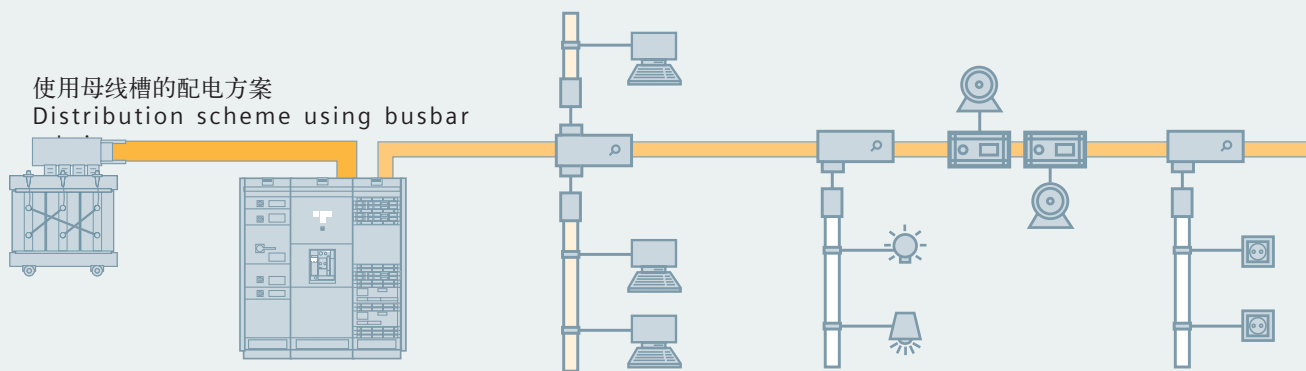
There will always be more than one possible solution which will have to be assessed in terms of its technical and economic advantages and disadvantages. In making this assessment, the following requirements should be a priority.

- 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 favor busbar trunking systems over cable installations for power transmission and distribution applications.

母线槽与电缆的对比优势

Advantages of busbar systems in comparison to cables



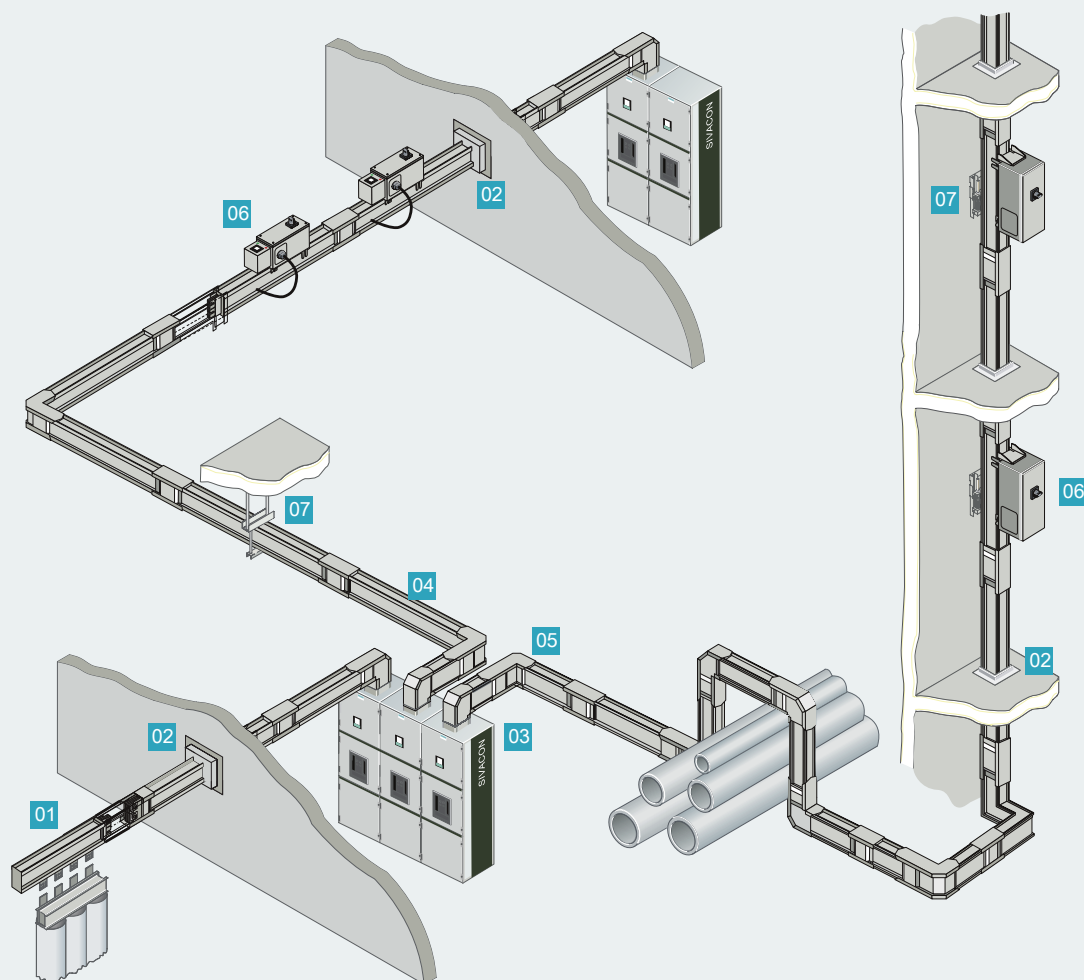
特点 Feature	母线槽 Busbar	电缆 Cable
可操作性 Operational reliability	可操作性高，短路电流依据 IEC 60439-1/-2 or IEC 61439-1/-6 Operational reliability High operational reliability and short-circuit rating tested according to IEC 60439-1/-2 or IEC61439-1/-6	操作性依据执行质量 The operational reliability depends on the quality of execution
火灾荷载 Fire load	极低；难以引起火灾 Very low	极高；容易引起火灾 Very high; depending on cable type
无卤素 PVC-/halogen-free	母线槽单元无卤素 Busbar trunking units are halogen-free	标准的电缆不是无卤素产品；而无卤素电缆成本高，货期长 Standard cables are not PVC-or halogen-free; Halogen-free cables are extremely expensive and have long delivery lead time
更改、增补或负载点重新布置方案灵活 Flexibility in the event of modification, expansion or the rearrangement of load points	通电的同时可以进行插接单元的变更、重置等操作，方案灵活，不必停工 Various changes, modifications or rearrangements can be realized flexibly under live operation. No power downtime	通常需要新安装或由于新的拼接点，夹位，同时布线等费用高；停工时间长 New installation usually required due to new splicing, clamping point. High costs on cable routing and long down time of power system
空间要求 Space requirement	通电的同时可以进行插接单元的变更、重置等操作，方案灵活，不必停工产品设计紧凑，空间要求低；载流量不受位置影响 Very low due to compact design along the contours of the building; Clear current carrying capacity downtime	由于弯曲的半径大，布线复杂，且布线方式影响载流量，对空间要求极其高 Enormously high due to cable bending radius, routing method, cable quantity and current carrying capacity requirements
低压主配电系统的空间要求 Space requirement for low-voltage main power distribution	由于插接单元中开关和保护设备的分散排布，空间要求低 Low space requirement due to evenly dispersed switchgears and protection devices in the tap off units	空间要求高 High space requirement
错误解决和消除 Troubleshooting and fault elimination	安装清楚，错误消除简单且开关装置靠近用户 Easy elimination of faults due to clearly installed system and closely located switching units	安装复杂，开关装置远离用户，错误解决耗时 Very time-consuming in fault elimination due to complicated installation and far located switching units
电磁化率 Electromagnetic susceptibility	有利的导体排布，低磁化率 Low susceptibility due to favorable conductor arrangement	排布要求高，高磁化率 High requirement of space arrangement, high susceptibility
调试时间 Commissioning time	调试时间短；同样人工成本高回报；高附加值 Short Commissioning time; High returns and EVA on same labor costs	调试时间长；高人工成本低回报；低附加值 Long commissioning times; High labor costs with low return and EVA

XL-III 密集型母线槽系统

XL-III Sandwich Busbar Trunking System

XL-III 密集型母线槽是镇江西门子综合中国市场的特点而研制的更贴近用户需求的新型密集型母线系统。该系统在原有基础上进行升级，自动化生产程度更高，能满足不同用户群的配电需求。

XL-III sandwich busbar trunking system is upgraded on the original compact busbar system in consideration of the customer demands and latest market trends. Better technology and higher automation of manufacturing will meet all kinds of power transmission and distribution requirements.



- 01 变压器进线单元 Transformer feeding unit
- 02 防火栅 Fire barrier
- 03 低压柜馈电单元 Feeding unit to SIVACON
- 04 直线单元 Straight trunking units
- 05 换向单元 Junction units
- 06 插接单元 Tap off units
- 07 安装附件 Accessories for mounting

系统部件

System Components

系统部件基本描述

System Components Overview

XL-III 密集型母线槽系统既可应用在变压器与配电柜之间的连接，还可以为负载进行供电。系统的防护等级最高可达 IP65，能适应各种恶劣环境。插接箱输出电流最大可以达到 1250A，为用户提供了可靠的负载环境，高的防护等级也为维护人员的安全提供了保证。

XL-III system is an excellent choice for power transmission and distribution between transformer and switchgear as well as power supply for load equipments. High protection degree up to IP65 enables the applications under aggressive environment while ensuring maintenance personnel safety. Tap off units can generate output up to 1250A to provide reliable loading capacity.

01 变压器进线单元 Transformer feeder units

配置有专门的软连接装置
最大额定电流达到 6300A
Special flexible connection
device Rated current up to 6300A

02 防火栅 Fire barrier

通过 GA/T537-2005 规定
阻燃性能试验
Certified in accordance to
GA/T537-2005
Flame retarding performance
test

03 低压柜馈电单元 Feeding unit to SIVACON

从顶端进线
从底部进线
Top feeding
Bottom feeding

04 直线单元 Straight trunking units

根据需要可以加装穿墙套单元
馈电式和插接式
Wall-through cover unit is
available upon request
With or without tap off points

● 标准长度 Standard length

XLA-III : 4m/3m/2m/1m

XLC-III : 3m/2m/1m

● 可选长度 Optional length

XLA-III : 0.4-3.99m

XLC-III : 0.4-2.99m

● 可垂直安装也可水平安装

防护等级 IP54(最高可以达到
IP65)

Optional for vertical and
horizontal installation Protection
degree: IP54 (up to Ip65)

插接母线

Straight trunking unit with
tap off points

- 单面设插口
- Single side with tap off points
- 双面设插口
- Double sides with tap off points
- 插口提供的防护等级为 IP54
- Tap off point protection
degree is IP54
- 能有效防止错相安装
- Prevent effectively installation
mistake of wrong phase order

05 换向单元 Junction units

方便的更改一段母线的走线
角度为 70~175 度

Easily change the busbar
system routing direction

From 70° ~ 175°

L 型单元 L unit

T 型单元 T unit

Z 型单元 Z unit

06 插接单元 Tap off units

插接箱 (最大可至 1250A)
Tap off box (up to 1250A)

07 安装附件 Accessories for mounting

终端 End cap

连接器 Joint pack

安装附件 Fixing bracket

连接工具 Tools for connection

加工设备 Manufacturing Equipment



镇江西门子拥有全球第一台最先进的母线槽自动装配流水线。
The most advanced automatic riveting assembly line.

母线装配 Busbar trunking assembly

与传统密集型产品不同，XL-III 密集型母线系统引进英国亨罗布自冲铆接技术，外壳整体结构采用铆钉铆接，自动化生产程度高。利用液压传动可获得较大、均匀的压力，使得母线槽整体强度得到大幅度提升，并且具备良好的密封效果和防渗功能，防护等级高，电气连续性优，外型整洁美观。

Different with traditional compact busbar trunking system, XL-III system is assembled with enclosure structure automatically riveted by adopting the Henrob self-piercing riveting technology from UK. Hydraulic drive system provides strong but even pressure during riveting and enhances dramatically the overall mechanical strength of busbar system. Excellent sealing and seepage treatment ensures a high protection degree, excellent electrical continuity. The whole structure of busbar system is neat and well arranged.



技术参数

Technical Data

通用参数	
General Specifications	
Min./max./24 小时平均温度 Min. /max./Average Temperature within 24 hours	-5/+40/ 日均 35℃ -5/+40/Daily Average 35℃
防护等级 Protection Degree	IP54、IP65
连接器力矩 Joint Pack Torque	70Nm ± 6Nm
表面处理 Surface Treatment	喷塑 Plastic spraying
外壳材料 Enclosure Material	铝镁合金 Aluminum-magnesium alloy
外壳颜色 Enclosure Color	国际标准灰 (RAL7032), 具体颜色也可用户确定 RAL7032(light grey)
额定绝缘电压 Rated Insulation Voltage(Ui)	1000VAC
额定工作电压 Rated Working Voltage(Ue)	1000VAC (分接单元 690VAC)
额定频率 f Rated Frequency(f)	50/60Hz
额定电流 Ie Rated Current(Ie)	1)
额定短时耐受电流 Icw Rated Short Time Withstand Current	1)
额定峰值耐受电流 Ipk Rated Peak Withstand Current(Ipk)	1)
导体截面 Conductor Cross-section	1)
L1, L2, L3	1)
N	1)
PE	1)
单独一根导体作 PE Independent Bar as PE	1)
导体材料 Conductor Material	铜或铝 Cu or Al (TMY, 6063F)
每相铜排数 Copper Number of Each Phase	1)
最大安装间距 Maximum Installation Spacing	2m
污染等级 Pollution Class	3
外形尺寸 Dimension	1)
重量 Weight	1)

注：1) 选择不同的电流等级，相对应不同的数据。

Note:1) Data variable depending on different current selected.

技术数据

Technical Data

XLC-III 参数一览表 (铜母线系统)
XLC-III Data (Copper system)

环境温度: 20°C

电流 Current	短时耐受电流 (I _{cw}) kA Short-time withstand current	峰值耐受电流 (I _{pk}) kA Peak withstand current	电阻 (mΩ/m) Resistance/ meter	感抗 (mΩ/m) Reactance/ meter	阻抗 (mΩ/m) Impedance/ meter	压降 (V/m) Voltage Drop	外形尺寸 Dimension		重量 (Kg/m) Weight	
							宽度 (W) Width	高度 (H) Height	四线制 4 wire system	五线制 5 wire system
400	30	63	0.151	0.042	0.157	0.107	132	118	9.2	9.8
630			0.105	0.035	0.111	0.120	132	118	11.1	12.0
800			0.080	0.031	0.086	0.119	132	118	13.0	14.3
1000	50	105	0.061	0.027	0.067	0.115	132	126	15.9	17.5
1250			0.044	0.022	0.050	0.107	132	149	20.3	22.5
1600	65	143	0.033	0.018	0.037	0.103	132	179	26.3	29.3
2000			0.025	0.014	0.023	0.099	132	215	33.3	37.3
2500			0.018	0.009	0.020	0.087	132	274	44.8	50.3
3150	100	220	0.016	0.007	0.017	0.095	132	376	54.0	60.2
4000	120	264	0.012	0.003	0.013	0.085	132	448	68.0	76.2
5000			0.009	0.002	0.009	0.064	132	558	89.4	100.5
6300			0.007	0.001	0.008	0.053	132	638	130.7	145.4

备注: 3200A 为国际标准划分的电流等级, 3150A 母线各项技术规格和 3200A 是一致的, 因此我司执行的国标 3150A 即等同于 3200A

XLA-III 参数一览表 (铝合金母线系统)
XLA-III Data (Aluminum alloy system)

环境温度: 20°C

电流 Current	短时耐受电流 (I _{cw}) kA Short-time withstand current	峰值耐受电流 (I _{pk}) kA Peak withstand current	电阻 (mΩ/m) Resistance/ meter	感抗 (mΩ/m) Reactance/ meter	阻抗 (mΩ/m) Impedance/ meter	压降 (V/m) Voltage Drop	外形尺寸 Dimension		重量 (Kg/m) Weight	
							宽度 (W) Width	高度 (H) Height	四线制 4 wire system	五线制 5 wire system
400	30	63	0.139	0.029	0.142	0.096	132	118	7.8	8.2
630			0.139	0.029	0.142	0.151	132	118	7.8	8.2
800			0.100	0.024	0.103	0.139	132	139	9.3	9.9
1000	50	105	0.075	0.020	0.078	0.132	132	164	11.2	11.5
1250			0.058	0.016	0.060	0.128	132	194	13.5	14.5
1600	65	143	0.042	0.011	0.043	0.118	132	244	17.2	18.6
2000			0.033	0.008	0.034	0.116	132	289	20.2	22.0
2500			0.029	0.006	0.029	0.123	132	398	25.2	27.2
3150	100	220	0.020	0.001	0.020	0.101	132	508	33.3	36.3
4000			0.017	0.001	0.017	0.104	132	588	39.3	42.9

产品编号

Product Coding

XL-III 母线槽系统对一些基本的部件进行了编号，包括额定电流、导体配置、导体截面和导体材料等，右边的图示就反映了这一产品代码系统，用户可以根据此系统进行产品的订货选择。

A coding system is developed for XL-III busbar system basic units including rated current, conductor configuration, conductor cross-section and conductor material. Customer can select and order parts according to system codes as illustrated in the figure at right side.

选型案例：

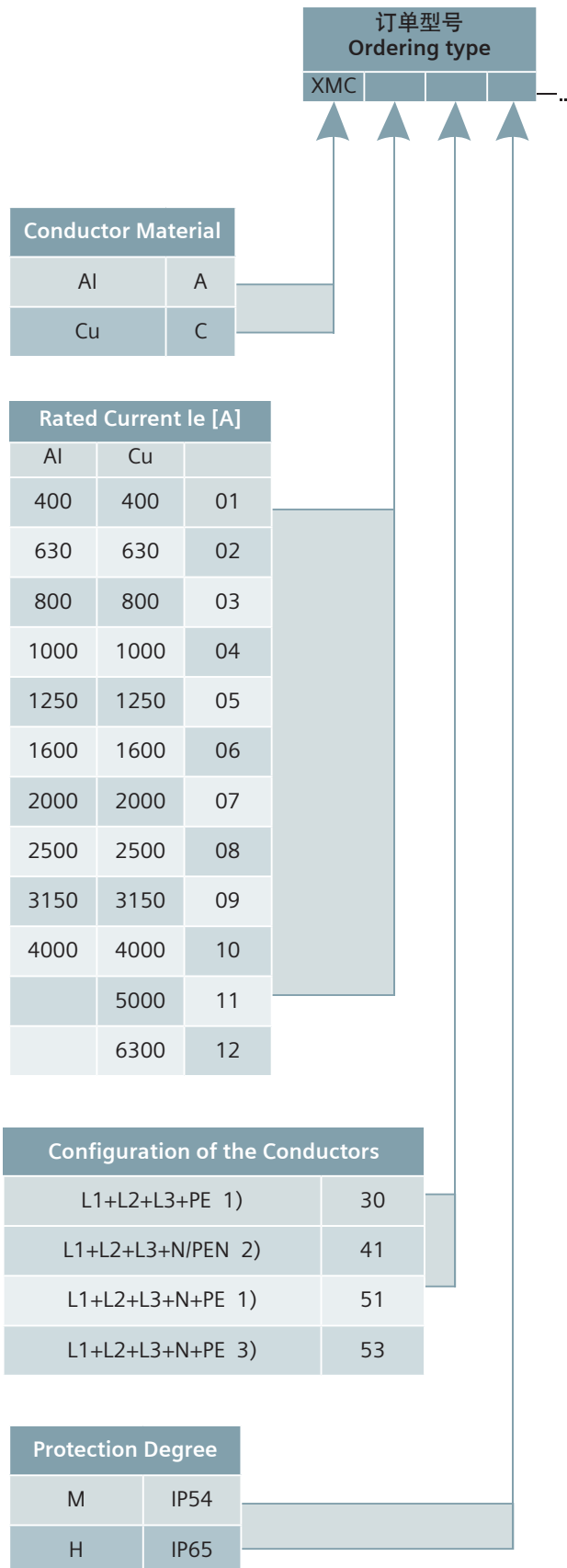
项目额定电流 2500A，应用铜母线系统，5 线制，
外壳作 PE，防护等级 IP 54。
系统代码为：XMC0851M—...

For example:

Rated current is 2500A, copper conductor, 5 wires, enclosure as PE, protection degree IP54.

The corresponding system code is XMC0851M—...

- 1) 外壳作 PE
- 1) Enclosure as PE
- 2) PEN 为保护中性线
- 2) PEN as neutral
- 3) 单独 PE 导体以及外壳共同接地
- 3) Independent PE bar and enclosure grounding



产品编号 Product Coding

插接箱编号

Tap off Box Coding

编号 Code	防护等级 Protection Degree
M	IP54

编号 Code	防护等级 Protection Degree
30	XM...30
41	XM...41
51	XM...51
53	XM...53

编号 Code	箱体规格 Switch Poles
1	1#
2	2#
3	3#
4	4#
5	5#
6	6#
7	7#
8	8#

编号 Code	开关操作方式 Operation Mode of Switch
LS	不带操作机构 Switch without Operating Mechanism
LSH	旋转操作手柄 Switch with Rotating Handle
LSM	电动操作机构 Switch with Electric Operating Handle

编号 Code	开关电流 Switch Current
63S	63A
80S	80A
100S	100A
125S	125A
160S	160A
200S	200A
250S	250A
315S	315A
400S	400A
630S	630A
800S	800A
1000S	1000A
1250S	1250A

编号 Code	开关极数 Switch Poles
3	三极 3 Pole
4	四极 4 Pole

XM- . AK .. . / ... - - . .

举例：XM-2AK51M/LSH-125S-3 表示箱体规格为 2#、母线系统为 51、防护等级为 IP54 的插接箱，采用断路器保护并带有旋转操作手柄，断路器为 3 极、额定电流为 125A。

For example: XM-2AK51M/LSH-125S-3 stands for tap-off box size 2#, busbar system 51, IP54, with breaker protection and rotary operating handle, breaker is 3 poles and rated current is 125A.

系统配置

System Configuration

外壳

Enclosure

XL-III 母线槽采用优质铝镁合金型材作为外壳，为无磁性环保材料，重量轻，散热快，母线槽运行时无磁滞涡流损耗，并且其足够大的截面能取代PE线作为100%整体式接地，相导体为铜材质时，为50%，表面静电粉末喷涂，通过1800h的耐盐雾实验，可长期应用于空气湿度大、盐分高、污染等级高的环境。

XL-III system uses premium Al-Mg alloy as enclosure material, non-magnetic and environment friendly, light weighted with fast heat dissipation. No hysteresis eddy current loss when busbar system in under operation. Cross section is large enough to replace PE as 100% grounding, 50% for copper phase conductor. Busbar surface is static power painted and passed the 1800h salt mist withstand test to ensure a long term operation under high air humidity, salty and high polluted environment.



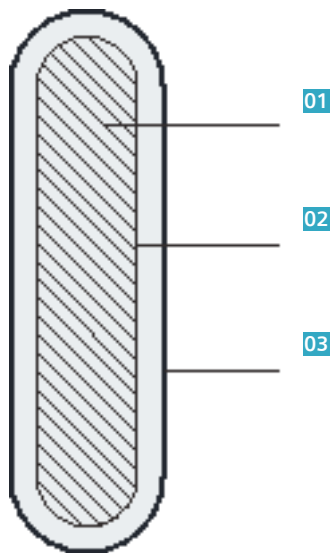
高性能绝缘材料
High Performance Insulation
Material

导体

Conductor XL-III 母线系统表面镀锡或者镀银，全长整体包裹高性能

绝缘材料聚酯薄膜。XLC-III 为铜导体系统表面镀锡或镀银，XLA-III 为铝合金导体系统，铝合金导体表面镀锡前做镀铜处理。

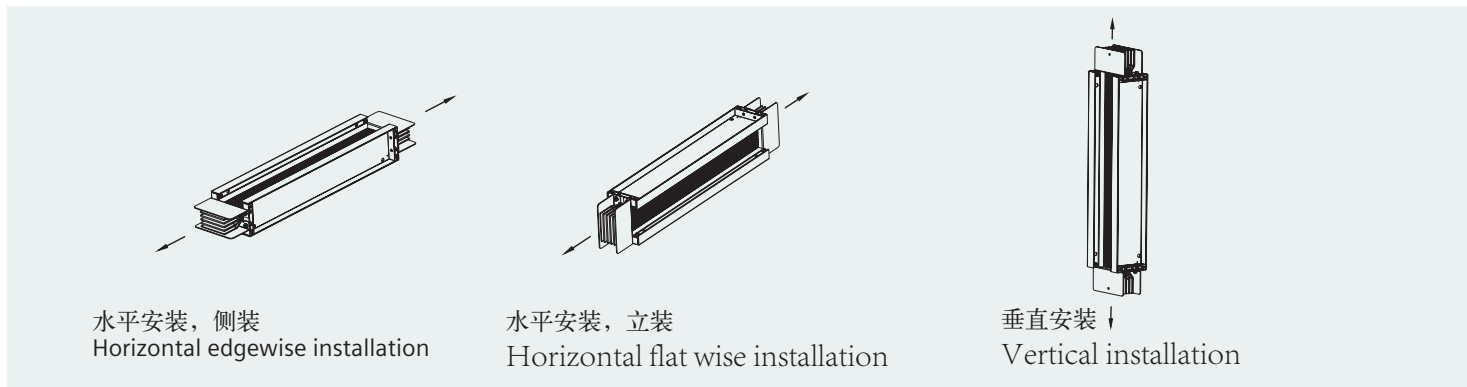
The conductors of the XL-III busbar system are normally tin-plated or silver plated on the surface, wrapped with high performance insulation material Mylar film; XLC-III is copper system with tin or silver plating, XLA-III is aluminum system with copper plating before tin plating.



- 01 导体，铜排（XLC-III）；铝合金排（XLA-III）
Conductor, copper bar(XLC-III); aluminum bar (XLA-III).
- 02 镀层，镀锡层（XLC-III）；镀铜层，镀锡层（XLA-III）
Coating, Tin coating (XLC-III); copper coating, tin coating (XLA- III)
- 03 高性能绝缘材料聚酯薄膜
High performance Insulation Material Mylar

XL-III 母线系统 XL-III Busbar system

系统配置 System Configuration



母线安装 Busbar Installation

XL-III 母线系统的内部为典型的三明治结构，而且保持全长密集，这种特殊的结构决定了 XL-III 母线系统的承载电流不会受安装位置及安装方式的影响，我们将会根据现场情况设计一个合适的走向。

The typical sandwich-type structure of XL-III busbar system maintains a compact structure over the whole length, that its current loading capacity will not be affected by the mounting position and location. A reasonable routing plan of busbar system can be engineered based on site conditions.

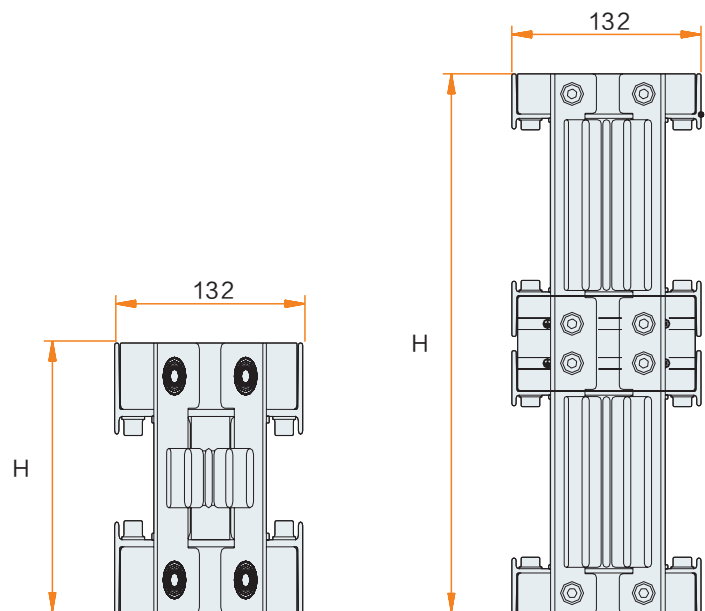
外形尺寸 Dimension

XL-III 母线系统表面镀锡或者镀银，全长整体包裹高性能绝缘材料聚酯薄膜。XLC-III 为铜导体系统表面镀锡或镀银，XLA-III 为铝导体系统，铝导体表面镀锡前做镀铜处理。

Dimensions of busbar system mainly depend on the rated current and conductor material. XL-III busbar system has in total 12 current ratings, among which current ratings of copper bar system ranged from 400A-2500A adopt single body structure and current ratings ranged from 3150A-6300A adopt double body structure, while aluminum bar system current ratings from 400A-2000A adopt single body structure and from 2500A-4000A adopt double body structure.

电流 A Code	高 H (mm) Height (mm)	
	XLC-III	XLA-III
400	118	118
630	118	118
800	118	139
1000	126	164
1250	149	194
1600	179	244
2000	215	289
2500	274	398
3150	376	508
4000	448	588
5000	558	/
6300	638	/

注：宽度均为 132mm
Note: Width is always 132mm



系统配置

System Configuration

导体配置

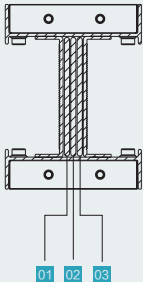
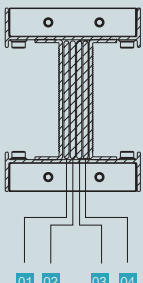
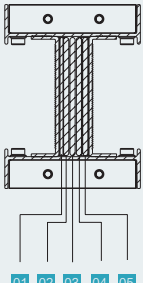
Enclosure

IEC364 标准规定配电设备的系统配置需根据整套系统配置进行选择，而且所选择的设备要充分保证整个系统的安全。XL-III 母线槽系统拥有多种导体配置系统，能适应不同工程对系统的要求。

IEC364 standard regulates that the power distribution equipment system configuration should be based on the entire system configuration and the selected equipment shall fully guarantee the security of the entire system. XL-III buabar system offers many different conductor configurations to meet different project requirements.

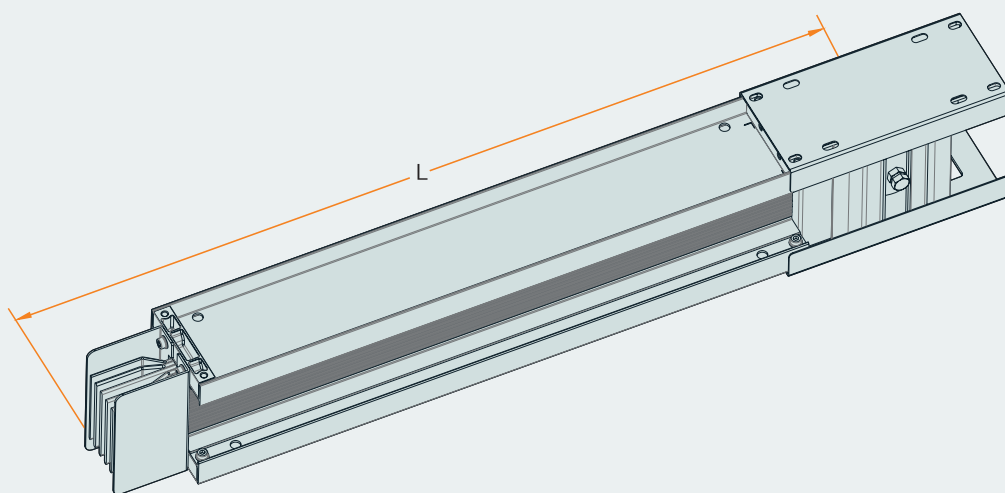
外壳做 PE：通过验证采用无磁性的铝镁合金外壳作为整体式接地导体，它的接地容量超过相线 50%。当系统出现高容量的接地故障时，使系统直接与大地相通，它具备最短的接地途径。

Enclosure as PE: Non-magnetic Al-Mg alloy enclosure is tested to be used as integral earthing conductor with a higher grounding capacity than a 50% phase conductor. When there is a high capacity earthing fault, The system is connected directly to ground with a shortest path.

	系统 System	导体配置 Conductor configurations						外壳 Enclosure
		01	02	03	04	05	06	
	XL-III...30	L1	L2	L3	-	-	-	外壳作 PE
	XL-III...41 XL-III...51	L1	L2	L3	N/PEN	-	-	PEN 为保护中性线 外壳作 PE Enclosure as PE PEN as neutral
	XL-III...53	PE	L1	L2	L3	N	-	单独 PE 导体以及 外壳共同接地 Independent PE conductor and Enclosure as grounding

功能单元

Functional Unit



直线段单元

Straight Trunking Units

XL-III 密集绝缘型母线槽壳体结构为完全密封型，最高防护等级可达 IP65，可在恶劣环境条件下使用。系统选择具有大于相线 50% 容量的整个外壳作为接地系统，保证足够的安全性，为接地故障提供可靠的接地路径，为地线短路提供最短的路径。当发生高容量的接地故障时，可有效的接地和保护整个系统。馈电式母线槽可以垂直安装也可以水平安装。

Enclosure of XL-III busbar system is a totally enclosed structure with a maximum protection degree of IP65, making the system applicable in aggressive environment. The enclosure can be used as grounding system with greater capacity than a 50% phase conductor, which provides reliable and shortest earthing path during an earthing fault and protect the whole system effectively. Busbar trunkings without tap-off units can be installed either vertically or horizontally..

标准长度 Standard Length	
XLC-III	1m XLC-III ...-1W*
	2m XLC-III ...-2W*
	3m XLC-III ...-3W*
可选长度 Optional Length	
XLC-III	0.4m-0.99 XLC-III ...-1W*
	1.01m-1.99 XLC-III ...-2W*
	2.01m-2.99 XLC-III ...-3W*

标准长度 Standard Length	
XLA-III	1m XLA-III ...-1W*
	2m XLA-III ...-2W*
	3m XLA-III ...-3W*
	4m XLA-III ...-4W*
可选长度 Optional Length	
XLA-III	0.4m-0.99 XLA-III ...-1W*
	1.01m-1.99 XLA-III ...-2W*
	2.01m-2.99 XLA-III ...-3W*
	3.01m-3.99 XLA-III ...-4W*

功能单元

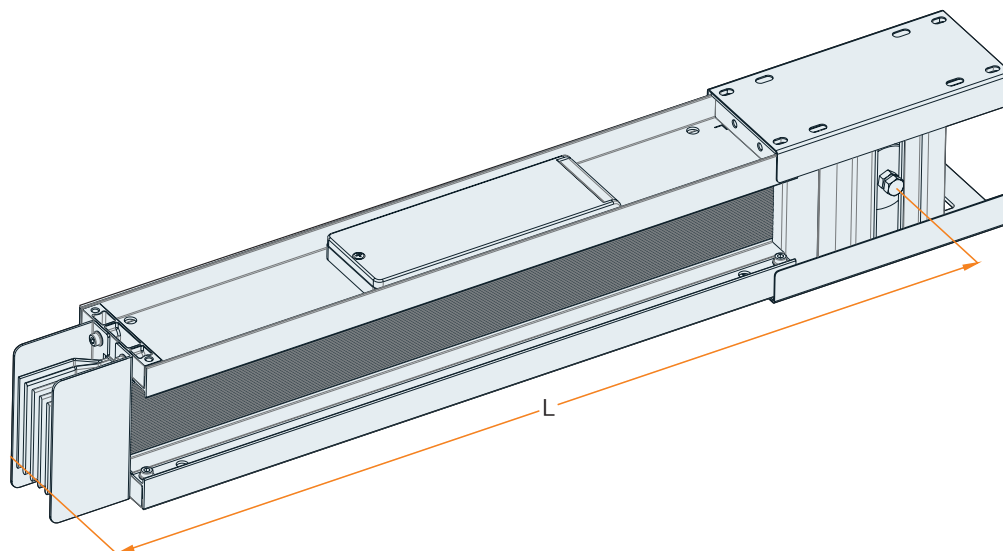
Functional Unit

直线段单元

Straight Trunking Units

插接式母线槽系统可以垂直安装也可以水平安装，插口的设置比较灵活，双面都可以设插接口，插口之间的最小间距为575mm,3米长标准段最多可以配置10个插口，用户可以根据具体情况预留插接口以便在设备负载更换位置或增加时，母线槽单元依然可以适应负载的要求，为用户提供安全可靠及便利的用电环境。

Straight trunking with tap-off points can also be installed vertically or horizontally. Tap off points can be arranged flexibly on both sides. The minimum distance between two tap off points is 575mm and up to 10 tap off points can be configured on a standard 3 meters long straight length. Tap off points can be reserved upon customer demands for possible relocation of load consuming equipment or increase of more equipment while busbar systems installed can still be used as a reliable and convenient solution.



标准长度 Standard Length	
XLC-III	L=1、2、3m
可选长度 Optional Length	
XLC-III	L=0.4~2.99m

标准长度 Standard Length	
XLA-III	L=1、2、3、4m
可选长度 Optional Length	
XLA-III	L=0.4~3.99m

功能单元

Functional Unit

换向单元

Junction Units

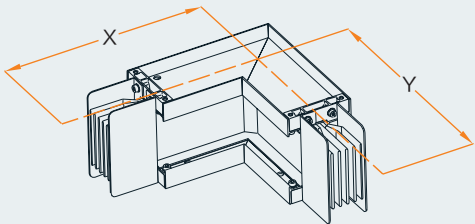
为了方便更改一段母线槽系统的走向，XL-III 系统设计有多种标准弯头，同时也可根据现场情况进行非标设计。

XL-III busbar system has multiple types of standard elbows for easy changing of busbar routing directions. Non standard elbows can also be designed according to site conditions.

L 型水平弯头 (ER/EL)

L type horizontal elbow (ER/EL)

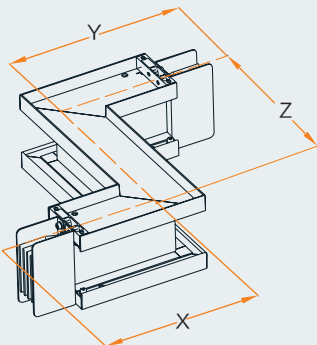
标准长度 Standard Length	
XLC-III	X/Y=0.35m
标准长度 Standard Length	
XLA-III	X/Y=0.35m



Z 型水平弯头 (RL/LR)

Z type horizontal elbow (RL/LR)

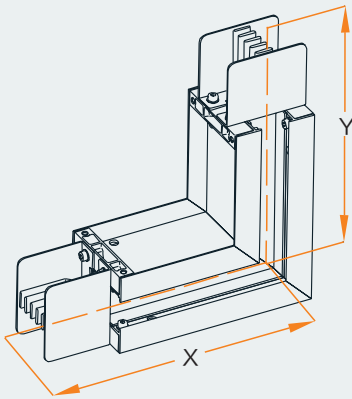
标准长度 Standard Length	
XLC-III	X=0.35m Y=0.35m Z=0.3m
标准长度 Standard Length	
XLA-III	X=0.50m Y=0.35m Z=0.3m



L 型垂直弯头 (FO/FI)

L type vertical elbow (FO/FI)

标准长度 Standard Length	
XLC-III...01-03	X/Y=0.35m
XLC-III...04-08	X/Y=0.5m
XLC-III...09-12	X/Y=0.7m
标准长度 Standard Length	
XLA-III...01-02	X/Y=0.35m
XLA-III...03-06	X/Y=0.5m
XLA-III...07-10	X/Y=0.7m



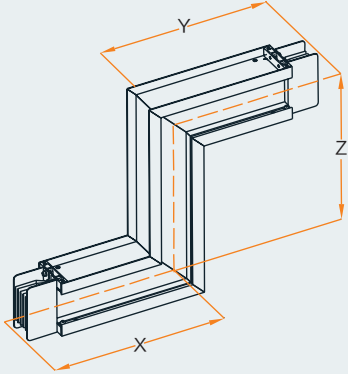
功能单元 Functional Unit

Z 型垂直弯头 (IO/OI)

Z type vertical elbow (IO/OI)

标准长度 Standard Length	
XLC-III...01-03	X/Y=0.35m Z=0.3m
XLC-III...04-08	X/Y=0.5m Z=0.3m
XLC-III...09-12	X/Y=0.8m Z=0.3m

标准长度 Standard Length	
XLA-III...01-02	X/Y=0.35m
XLA-III...03-06	X/Y=0.5m
XLA-III...07-10	X/Y=0.7m

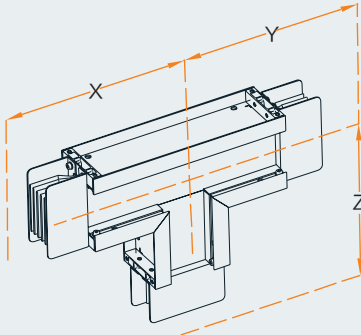


T 型垂直弯头 (TE)

T type vertical elbow (TE)

标准长度 Standard Length	
XLC-III...01-03	X/Y/Z=0.35m
XLC-III...04-08	X/Y/Z=0.5m
XLC-III...09-12	X/Y/Z=0.7m

标准长度 Standard Length	
XLA-III...01-02	X/Y/Z=0.35m
XLA-III...03-06	X/Y/Z=0.5m
XLA-III...07-10	X/Y/Z=0.7m

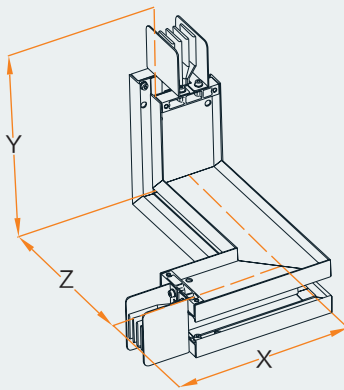
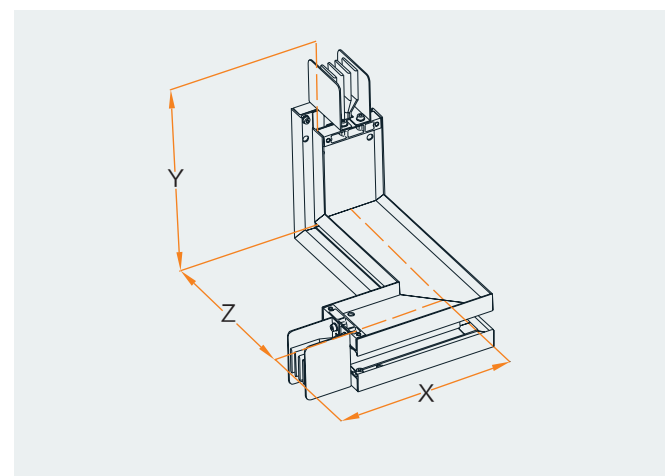


异型弯头 (OL/IL)

Special elbow (OL/IL)

标准长度 Standard Length	
XLC-III...01-03	X=0.35m Y=0.35m Z=0.3m
XLC-III...04-08	X=0.35m Y=0.5m Z=0.3m
XLC-III...09-12	X=0.35m Y=0.7m Z=0.3m

标准长度 Standard Length	
XLA-III...01-02	X=0.35m Y=0.35m Z=0.3m
XLA-III...03-06	X=0.35m Y=0.5m Z=0.3m
XLA-III...07-10	X=0.35m Y=0.7m Z=0.3m

功能单元

Functional Unit

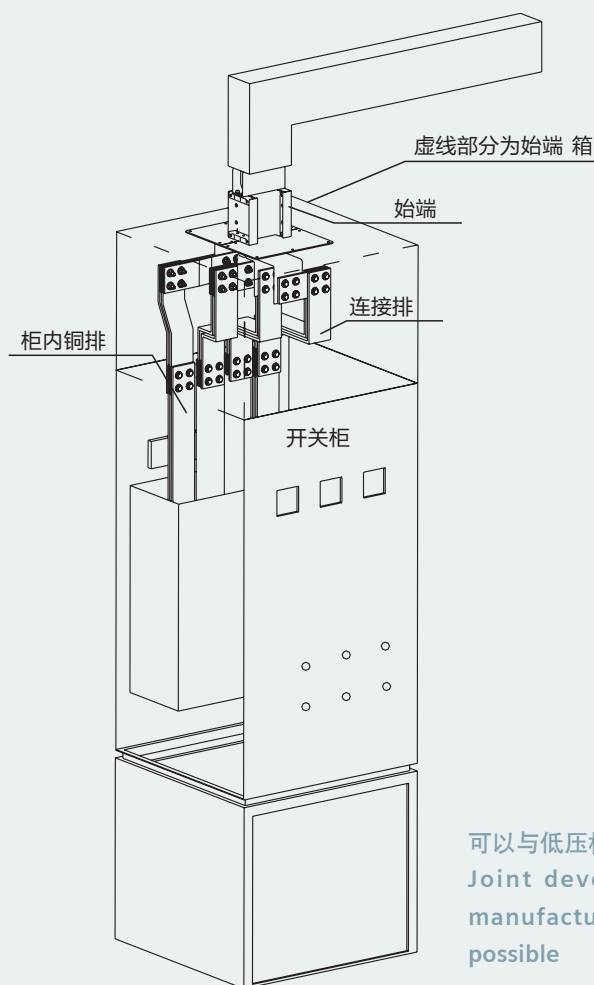
与低压柜直接连接的单元

Direct Connection with Low-voltage Switchgear

提供专门的始端进线单元和完整的连接单元实现 XL-III 母线槽系统与配电柜的连接，连接时根据用户低压柜的具体出线方式进行调整设计，既可顶端出线，也可底端出线，电流最高达 6300A，通常使用连接铜排进行转接。西门子负责提供原材料及现场的指导安装，安装时保持现场连接最短路径及时间，进线单元中的始端母线配置有连接法兰，与设备紧密结合，从而保证较高的防护等级

Special flange end feeding and connection unit can be offered to realize connection between busbar and switchgear with a maximum current up to 6300A. Design can be tailored to either top or bottom outlet based on customer switchgear design. Typically copper connection bar will be used for such connection and onsite supervision can be provided to optimize routing and fabrication time during installation. Connection flange is available inside the feeding unit to ensure a close and tight connection with switchgear with high protection degree.

我司母线可与默勒和西门子的配电柜直接联系。



可以与低压柜厂家合作设计母线
Joint development with switchgear
manufacturer for busbar connection is
possible

功能单元

Functional Unit

与变压器连接单元

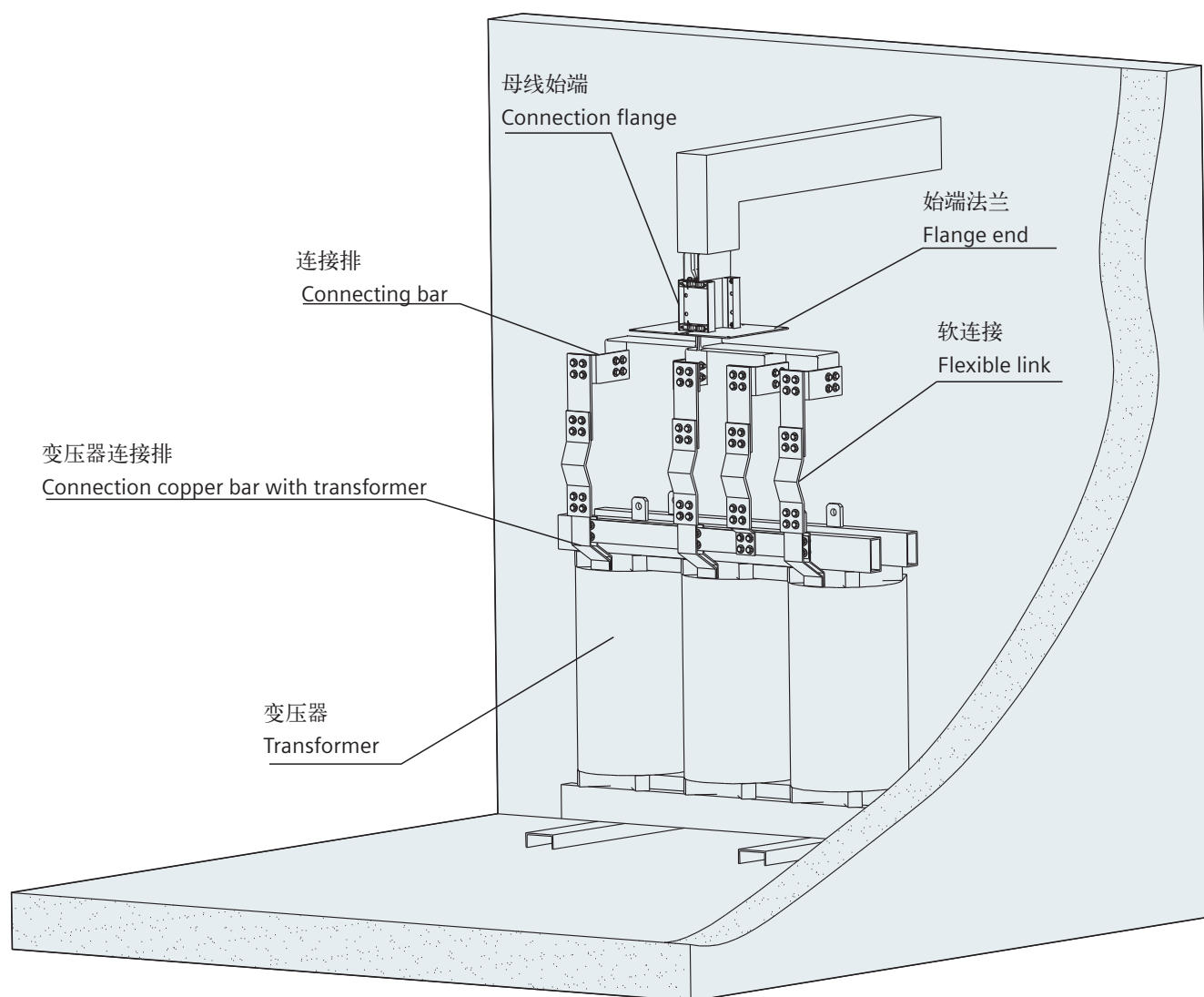
Transformer Connection Unit

连接方式

Connection Method

采用连接排和软连接连接始端与变压器。

Use copper bar and flexible link to connect flange end with transformer.



功能单元

Functional Unit

电缆进线单元

Cable Feeder Unit

我们也提供单独的电缆进线单元用于实现与一段母线之间的馈电或受电或者在无需过电流保护的情况下使用的装置。电缆进线单元最大电流为 6300A

The separate cable feeder unit up to 6300A can be offered to connect the power supply and busbar trunking systems or without over current protection device.

外形尺寸

Dimensions

最小尺寸：Min. dimension:

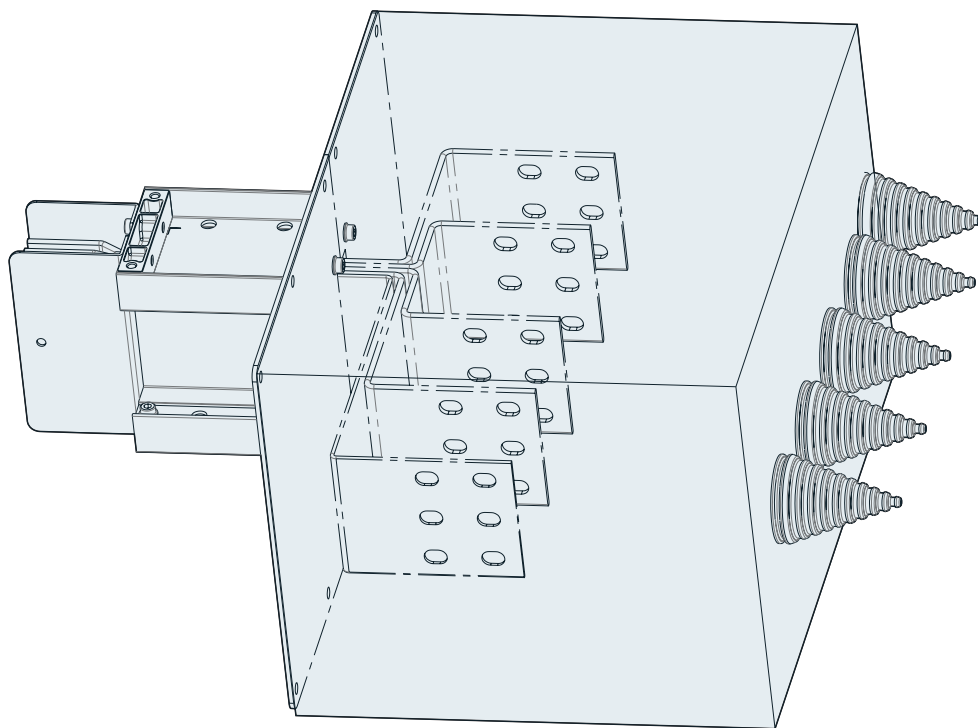
460mm x 640mm x 630mm (L x W x H)

最大尺寸：Max. dimension:

1020mm x 640mm x 1120mm (L x W x H)

多芯和单芯电缆都可以在电缆进线箱中使用，横截面不超过 300mm² 的电缆可直接安装使用。电缆进线单元配备法兰板和电缆护套。

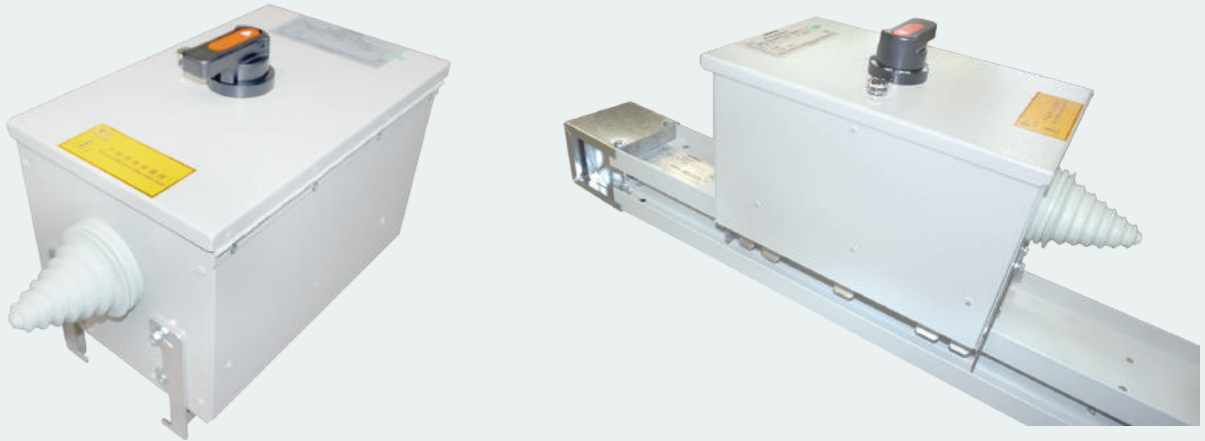
Both multi-core and single-core cables can be used in the cable feeder unit. Cables with cross section smaller than 300mm² can be installed inside directly.. Cable feeder unit is collocated with flange plate and cable protection sleeve.



功能单元 Functional Unit

插接箱单元

Tap off Unit



XL-III 插接箱单元获得多项专利技术，其设计结构紧凑、外形美观、性能可靠，额定电流为 16A~1250A。分 100A、160A、250A、400A、630A、630A（侧插式）、800A（双插口）、800A（侧插式）、1000A（侧插式）、1250A（侧插式）共 10 种标准箱体，同时可以根据客户要求满足更改箱体大小的非标设计。

The XL-III system offers a large range of tap off units from 16A to 1250A. Compact & neat design with high reliability have been multiple patents protected. 10 kinds of standard box are available with current ratings 100A, 160A, 250A, 400A, 630A, 630A (side plug in), 800A (double tap off points), 800A (side plug in), 1000A (side plug in) and 1250A (side plug in) respectively. Special sized tap off box can also be designed according to customer demands.

内部配置 Inner configuration

根据用户对插接箱的配置要求，可以在插接箱内安装 3 极或 4 极断路器对负载进行保护，断路器可配备西门子 3VT 或 3VA，也可由用户自行选择，包括保护开关的附件，比如操作手柄、分励脱扣、热磁脱扣、漏电保护模块等，公司将按照用户的要求提供标准配置。同时公司可以在现场测量后，参照现场具体情况对插接箱的外形尺寸进行非标设计，以满足现场的要求。

3 pole or 4 pole breaker can be installed according to user's requirements to protect equipment connected. SIEMENS 3VT MCCB or 3VA MCCB are available and other brands of MCCB are optional at customer's choice, including operating handle, shunt trip, TMF&RCD accessories etc. Special size tap off boxes can be developed based on site measurement data and conditions.

电缆馈线 Feeding cable

插接箱通过电缆引出电流给负载进行供电，出线方式灵活，在电缆出线口配置有专门的电缆保护套管，保护套管的直径可以根据电缆的直径进行配置。

Tap off unit will supply power to equipment via cable feeding unit. Special cable protection sleeve is equipped at cable feeder box outlet based on required diameter of cable.

功能单元 Functional Unit



插口装置 Tap off Unit

母排无间隙，真正实现了高密度，具有低阻抗、散热快等特点，且通用性强，适用于不同导体配置系统。母线系统的插口装置与导电桩头之间设有超声波塑料焊接固定的高弹性橡胶防护垫，防护等级高，确保插接时安全可靠。

Thanks to the compact sandwich design, the XL-III system is featured with low impedance, fast heat dissipation which is suitable for application of different conductor configuration.

High elastic rubber protective pad fixed by ultrasonic plastic welding is placed between tap off device and conductor terminal, ensuring high protection level, personnel and system safety and reliable plug in.

插接方式 Plug in Method

国际专利支持的“T”型插脚稳定、可靠，载流能力更强。16-630A（铜母线）为单插口分接，630-1250A（铜母线）采用连接器式分接（侧插式），其中800A可设计为双插口分接方式。

T shaped plug pins with patent protection is stable, reliable with enhanced current carrying capacity.

16A to 630A(copper trunking) is single point tapping; 630A to 1250A(copper trunking) is using joint pack tapping (side plug in), and 800A can be designed to double tap off points tapping.

操作安全 Safe Operation

防错相安装

提供 IP54 的防护等级

插脚均做镀银处理以保证系统可靠的电气连续性。插接箱内部多重联锁，防止在通电情况下插接箱门被打开

Prevent wrong phase order installation;

Protection degree of IP54 available;

All plug in pins are silvered plated to ensure reliable system electrical continuity. Multiple interlocking devices inside tap off unit will prevent door from being opened during live operation to ensure maximum personnel safety.



功能单元

Functional Unit

连接器单元 Joint Pack Unit

“QWIKMAKE”™ 连接器 国际专利支持

“QWIKMAKE”™ joint pack supported with international patent protection

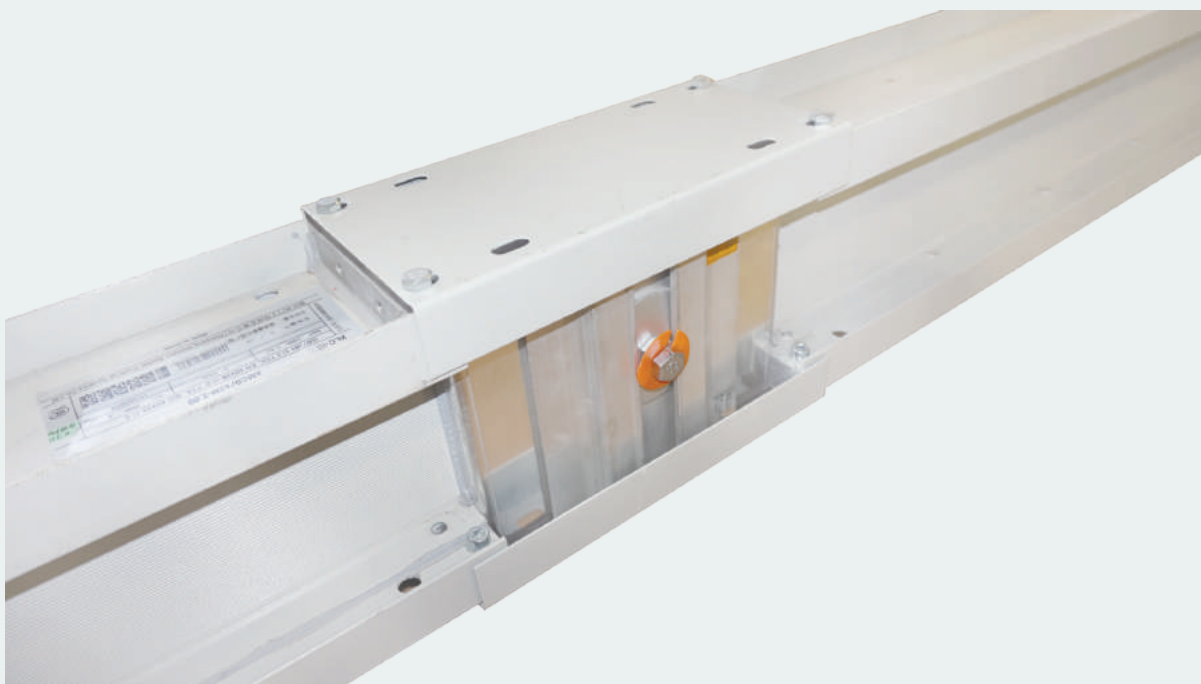
摒弃了传统的设计，使得安装速度较普通连接器快一倍。而且由于它不可翻转，两段母线在连接时不会发生错相，简化安装程序，更有助于安全快速的安装。

Different from the traditional design, the innovative new design of joint pack greatly shortens the installation time and prevents wrong phase order installation due to non turnable feature. Simpler installation process but more rapid and safe.

双头力距螺栓 Double Heads Torque Bolt

该通用件从英国原装进口，双头螺钉能保证在安装时，只需用 19mm 普通扳手旋紧螺钉直至上面的螺栓头自动断裂，且螺钉上的黄色指示牌脱落，说明该接头力矩已达到最佳状态，可节约 75% 安装时间。安装完毕后剩余的螺栓头可在维修、拆装时二次利用。

Double heads torque bolt imported from UK can save up to 75% of installation time. Use only a 19mm ordinary wrench to tighten the bolt until the outer bolt head and the yellow label fall off, which indicates the bolt is tightened to required torque already. Falling off bolt head can be recycled for further maintenance and mounting.



功能单元 Functional Unit

高压力均衡垫 High Pressure Balance Pad

螺栓锁紧时产生的压力通过特殊设计的碟形垫圈传递至与铜排等截面的高压力均衡垫，确保整个母线连接处表面压力均匀、松紧适度，电气连接安全可靠。

The pressure caused by bolt tightening passes to the high pressure balance pad at the same cross section of the conductor via the dish gasket to ensure pressure on the busbar connection are evenly and properly distributed and reliable electrical connection is guaranteed.

膨胀补偿 Compensation for Expansion

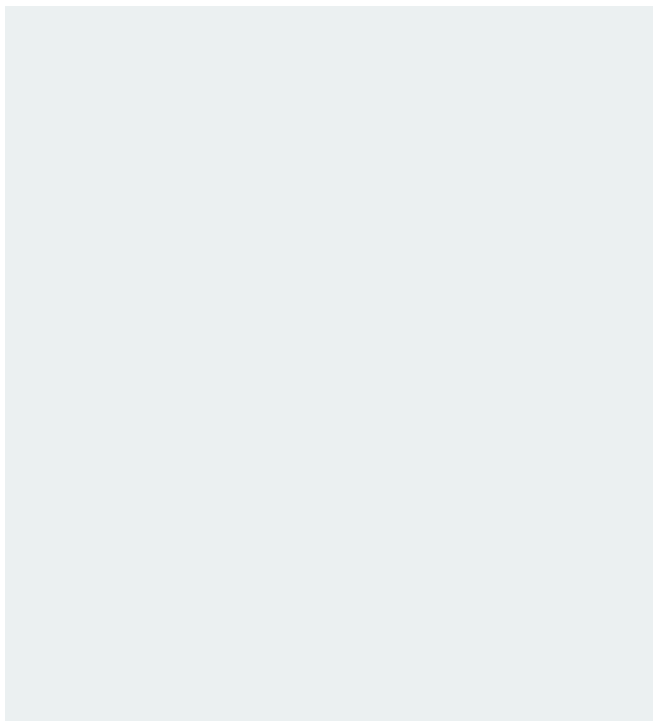
接头的设计（对接式）满足由于热膨胀而引起母线槽的线性伸缩，在不降低母线的机械强度、电气连续性、载流容量及短路流量的前提下，每个连接器提供 7mm 的膨胀补偿，使得 XL-III 铜母线槽系统在实际应用中可以吸收一定的膨胀量。水平方向直线段长度如果铜母线连续长度超过 80 米，铝合金母线超过 50 米，其中无任何换向单元，需要安装膨胀单元。

Joint pack (buted type) of XL-III busbar system meets linear expansion requirements due to thermal expansion. Each joint pack can compensate 7mm expansion while without comprising busbar mechanical strength, electrical continuity, load carrying capacity and short circuit capacity. In horizontal direction, the compensation for expansion unit will be applied in the length of straight trunking units continuously without any junction unit, every 80 meters and above of the copper busbar or every 50 meters above for the aluminum alloy busbar.

防护等级高 High Protection Degree

连接器各部件之间均设计有防水措施，同时加有绝缘垫的连接盖板使得在母线连接处也能保证较高的防护等级。

Each part and component of joint pack is designed with waterproofing measures. Meanwhile joint pack cover plate with insulation pads also guarantees a higher level of protection.

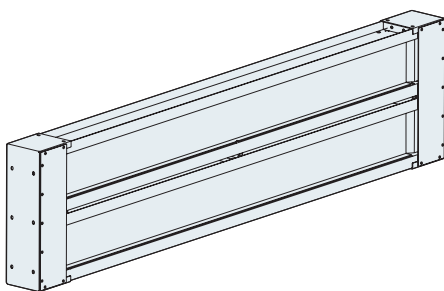


功能单元 Functional Unit

系统附件 System Accessories

终端单元 End cap

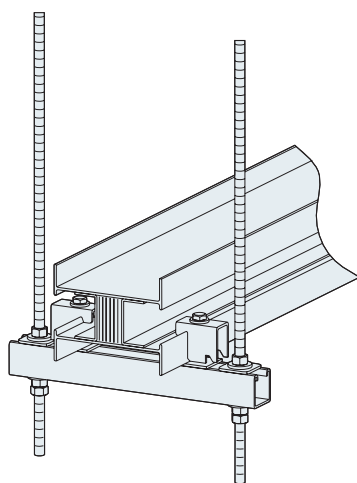
母线终端安装在母线槽系统的末端,用以防止导电部件的裸露。
End cap is mounted at the end of busbar system to avoid exposure of electrical conducting parts.



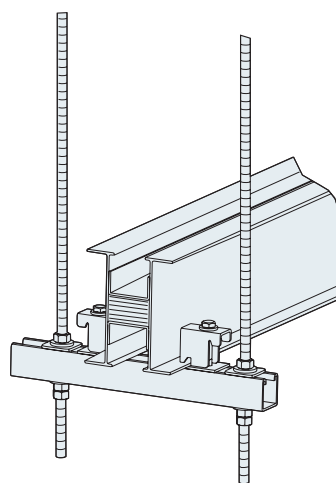
安装支架上自带的定位装置能固定母线槽系统,使得安装好的系统更加稳固,同时这种定位装置是跟安装支架一起提供的。
Positioning device supplied along with installation supports can fix busbar system and make the installed system more secure.

水平安装支架 Horizontal Installation Supports

提供两种不同的安装支架:水平立装使用和水平侧装使用。
Two different mounting devices are available for horizontal flat wise and horizontal edge wise installation respectively.



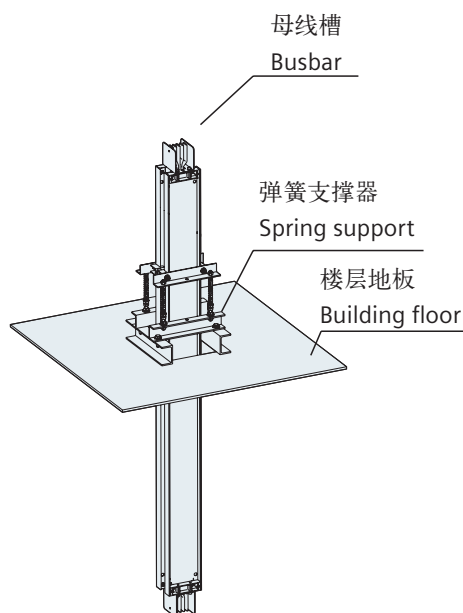
水平立装使用
Horizontal Flat wise



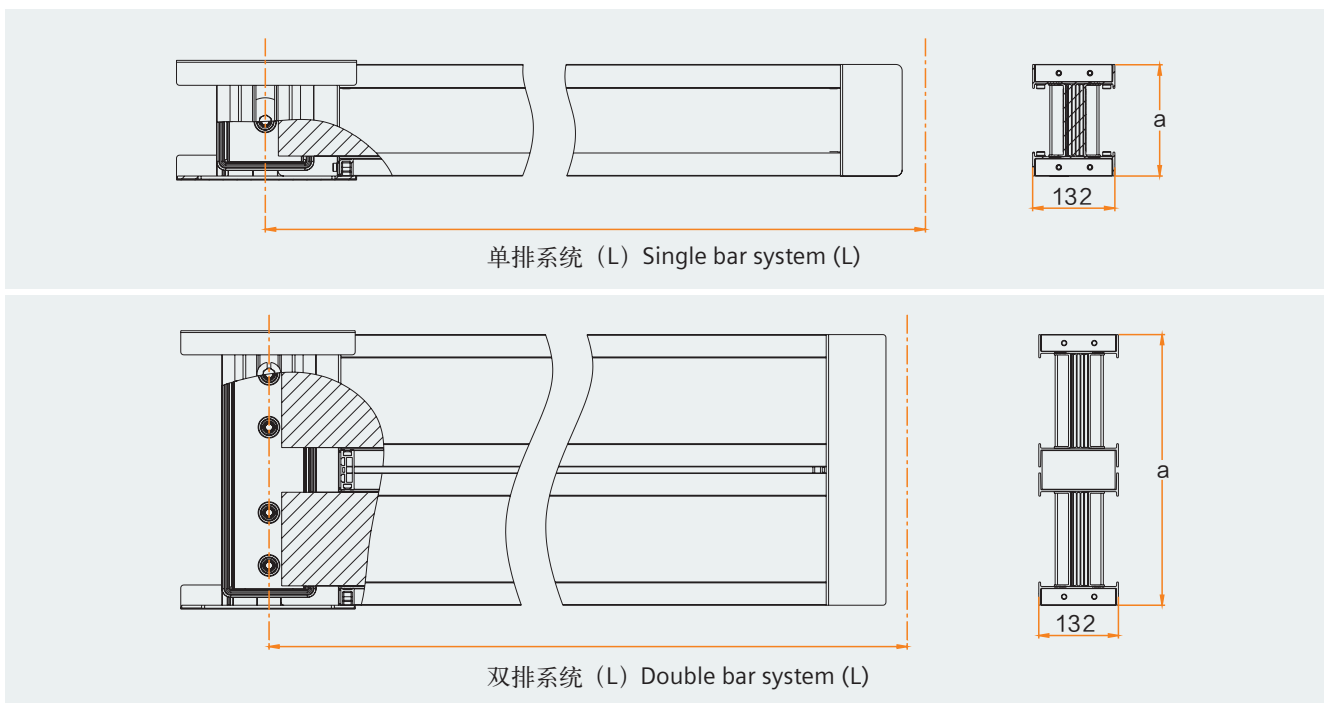
水平侧装使用
Horizontal Edge wise

垂直安装支架 Vertical Installation Supports

母线槽垂直安装时提供特殊的弹簧支撑件作为安装附件,每个弹簧支撑架都能承受母线及插接箱所带来的额外载重负荷。
Special spring supports are used as installation accessory during vertical installation, which can withstand additional weights of busbar system and tap off unit.



物理数据 Physical Data



直线段单元 Straight Trunking Units

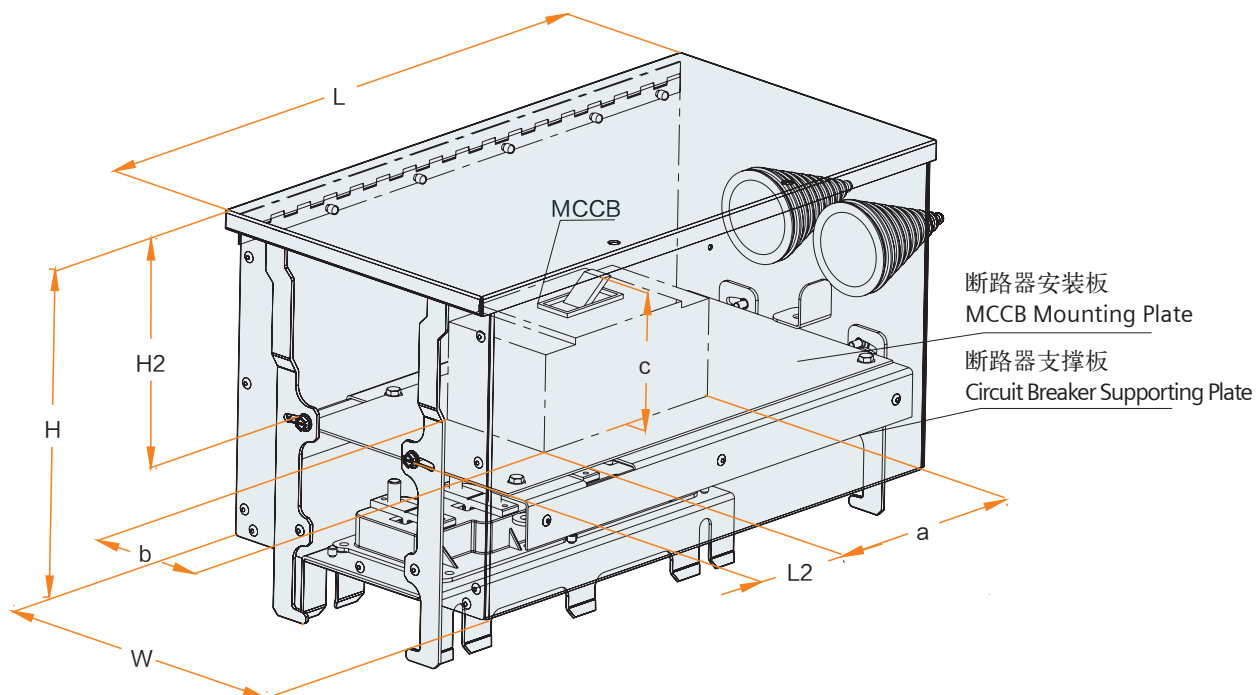
电流 (A) Current(A)	a/mm	
	XLC-III 铜母线 XLC- III (copper busbar)	XLA-III 铝母线 XLA- III (aluminum busbar)
400	118	118
630	118	118
800	118	139
1000	126	164
1250	149	194
1600	179	244
2000	215	289
2500	274	398
3150	376	508
4000	448	588
5000	558	/
6300	638	/

功能单元 Functional Unit

3VL/3VT 始端外形数据表 3VL and 3VT TOB Dimensions

注意：请确保足够的空间为其他附件安装并且注意一些安装误差元素

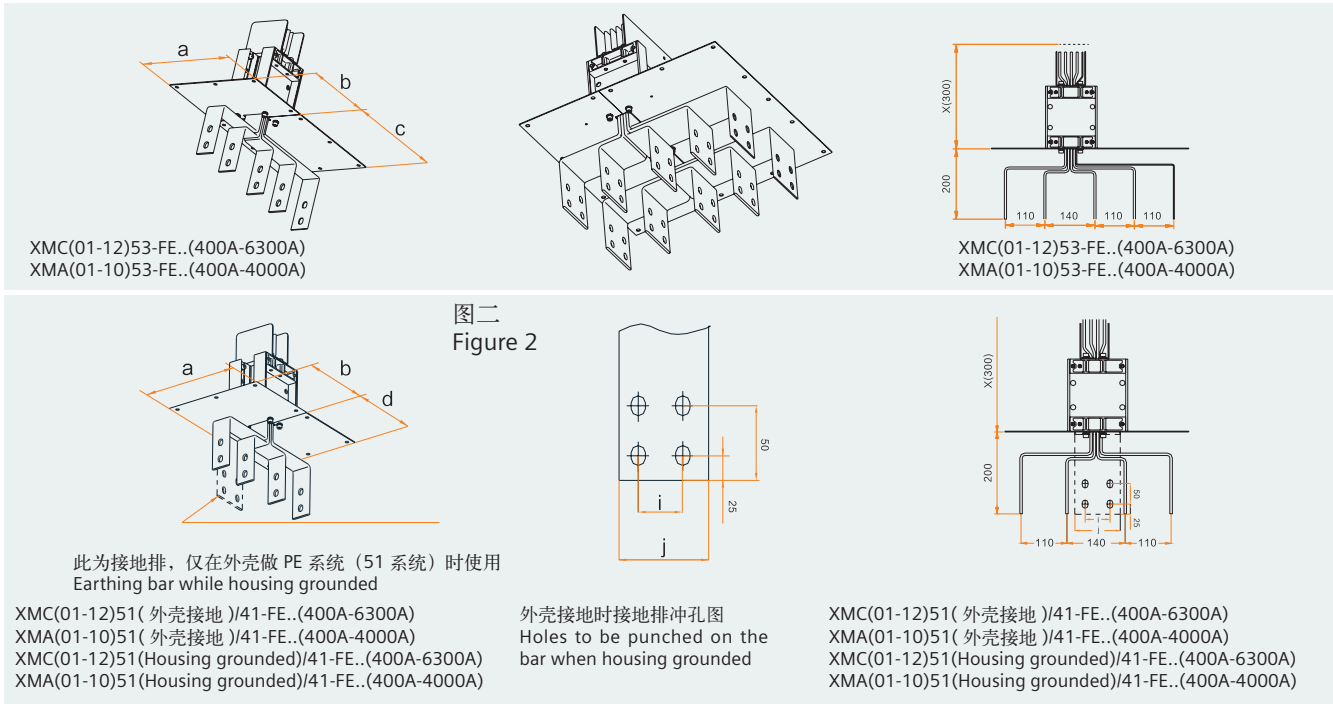
Note: Please ensure enough space for other accessories installation and also pay attention to installation tolerances requirement.



电流	箱体宽 (W) (Box Width)	箱体长 (L) (Box Length)	箱体高 (H) (Box Height)	断路器安装板和 箱体顶端的高度 (H2) (between MCCB mounting plate to top of box)	断路器至 箱体 前端的长度 (L2) (between MCCB to front of box)	3VA MCCB(参考尺寸) 3VA MCCB (Reference size)			3VT MCCB(参考尺寸) 3VT MCCB (Reference size)		
						a	b	c	d	e	f
63A-100A	227mm	354mm	225mm	133mm	100mm	130mm	76.2mm	88mm	120mm	78mm	91mm
160A	247mm	394mm	255mm	165mm	110mm	130mm	76.2mm	88mm	120mm	90mm	93mm
250A	267mm	494mm	275mm	178.5mm	135mm	158mm	105mm	88mm	170mm	105mm	135mm
315A	307mm	644mm	315mm	220mm	200mm	248mm	138mm	137mm	254mm	140mm	135mm
400A											
500A	337mm	844mm	345mm	285mm	250mm	248mm	138mm	137mm	268mm	210mm	137.5mm
630A											

物理数据 Physical Data

以下数据仅供参考，不可作为生产的依据，实际数据以测量及工艺图纸为准
The following data is only for reference purpose and shall not be used production.
Actual data shall be based on measurement and engineering drawings.

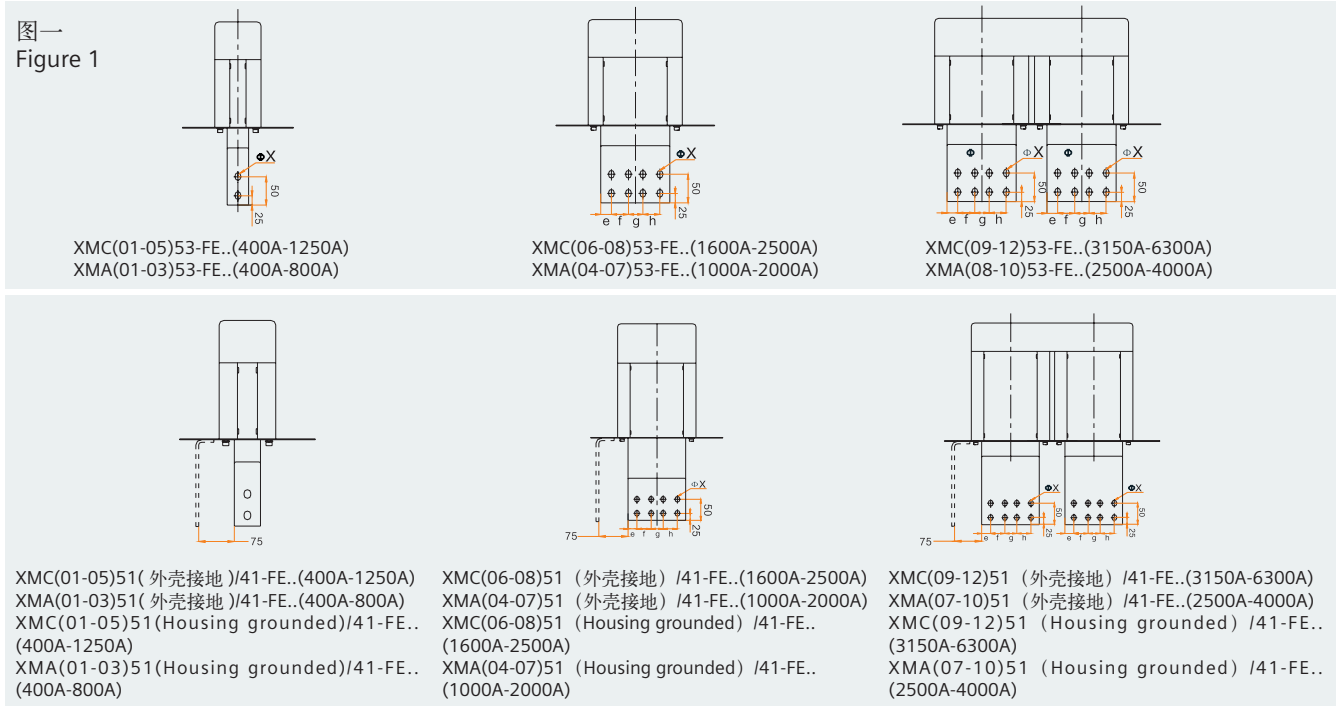


电流等级 (XLC-III) Current Level (XLC-III)	a	b	c	d	e	f
400A	280	130	130	130	见“图一” Refer to Figure 1	见“图一” Refer to Figure 1
630A	280				见“图一” Refer to Figure 1	见“图一” Refer to Figure 1
800A	280				见“图一” Refer to Figure 1	见“图一” Refer to Figure 1
1000A	290				见“图一” Refer to Figure 1	见“图一” Refer to Figure 1
1250A	310				见“图一” Refer to Figure 1	见“图一” Refer to Figure 1
1600A	340				27.5	60
2000A	380	45.5	60			
2500A	440	45	60			
3150A	540	29.5	60			
4000A	610	47.5	60			
5000A	720	45	60			
6300A	820	200	200	200	35	60

电流等级 (XLA-III) Current Level (XLA-III)	a	b	c	d	e	f
400A	280	130	130	130	见“图一” Refer to Figure 1	见“图一” Refer to Figure 1
630A	280				见“图一” Refer to Figure 1	见“图一” Refer to Figure 1
800A	305				见“图一” Refer to Figure 1	见“图一” Refer to Figure 1
1000A	330				20	60
1250A	360				35	60
1600A	410				30	60
2000A	455	22.5	60			
2500A	560	35	60			
3150A	670	32.5	60			
4000A	750	22.5	60			

物理数据 Physical Data

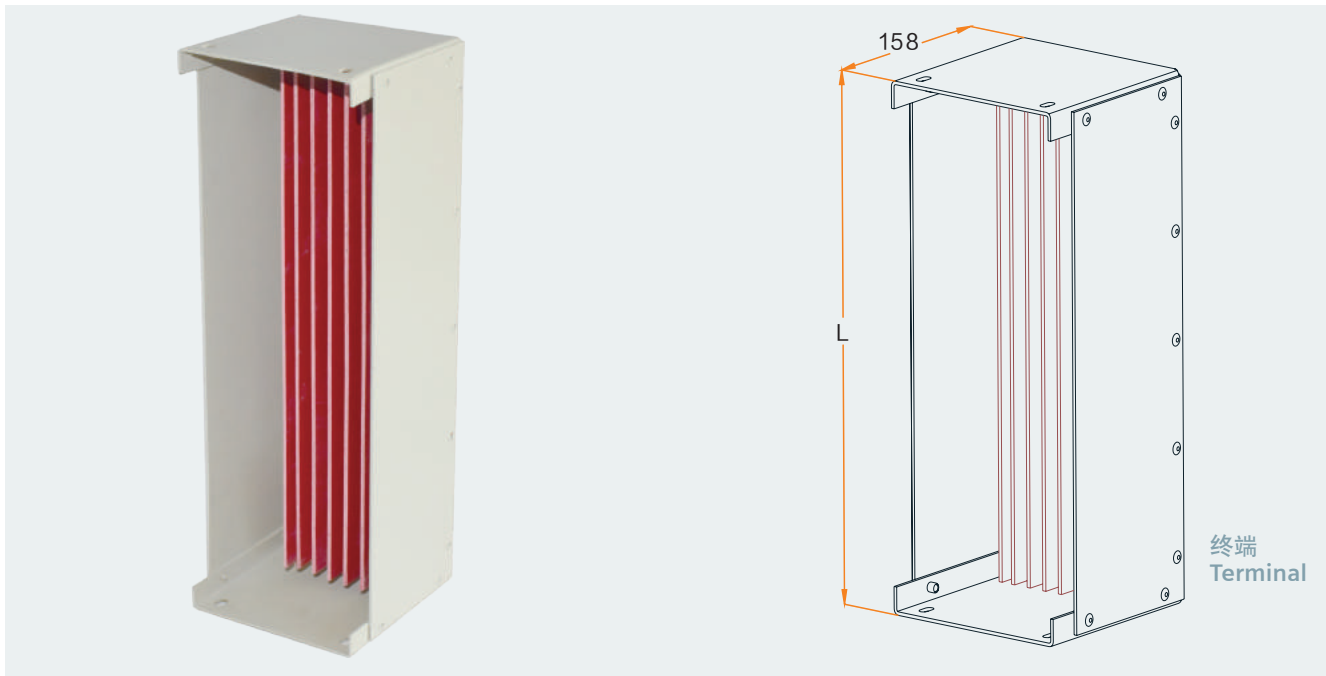
以下数据仅供参考，不可作为生产的依据，实际数据以测量及工艺图纸为准
The following data is only for reference purpose and shall not be used production.
Actual data shall be based on measurement and engineering drawings.



g	h	外壳接地时接地排 Grounding bar when housing grounded		φ X	图示冲孔个数 Holes to be punched
		i (图二) (Figure 2)	j (图二) (Figure 2)		
		见“图一” Refer to Figure 1	见“图一” Refer to Figure 1		
见“图一” Refer to Figure 1	见“图一” Refer to Figure 1	0	62	φ 12	2
见“图一” Refer to Figure 1	见“图一” Refer to Figure 1	0	62	14 × 20	2
见“图一” Refer to Figure 1	见“图一” Refer to Figure 1	0	62	14 × 20	2
见“图一” Refer to Figure 1	见“图一” Refer to Figure 1	0	62	14 × 20	2
0	0	0	62	14 × 20	4
0	0	0	62	14 × 20	4
0	60	0	62	14 × 20	6
0	0	0	62	14 × 20	2 × 4
0	0	0	115	14 × 20	2 × 4
0	60	60	115	14 × 20	2 × 6
60	60	60	125	14 × 20	2 × 8

g	h	外壳接地时接地排 Grounding bar when housing grounded		φ X	图示冲孔个数 Holes to be punched
		i (图二) (Figure 2)	j (图二) (Figure 2)		
		见“图一” Refer to Figure 1	见“图一” Refer to Figure 1		
见“图一” Refer to Figure 1	见“图一” Refer to Figure 1	0	60	14 × 20	2
见“图一” Refer to Figure 1	见“图一” Refer to Figure 1	0	60	14 × 20	2
0	0	0	60	14 × 20	4
0	0	0	60	14 × 20	4
0	60	0	60	14 × 20	6
60	60	0	75	14 × 20	8
0	0	60	75	14 × 20	2 × 4
0	60	60	130	14 × 20	2 × 6
60	60	60	130	14 × 20	2 × 8

物理数据 Physical Data



电流 (A) Current(A)	L(mm)	
	XLC-III 铜母线 XLC-III (copper buabar)	XLA-III 铝母线 XLA-III (aluminum busbar)
400	130	130
630	130	130
800	130	151
1000	138	176
1250	161	206
1600	191	256
2000	227	301
2500	286	410
3150	388	520
4000	460	600
5000	570	/
6300	650	/

其他

计算及选型

额定电流的计算

在安排母线槽系统布局时须注意以下几点:

- 负载或配电系统的场所、数量和连接方式
- 分散系数
- 设定的短路等级

与配电柜连接须提供

- 配电柜的型号
- 进线方式（顶端、底端或背面）

安装的地理位置和条件

- 空间尺寸
- 建筑物构造（针对悬挂和安装）
- 母线槽走向
- 环境条件（温度、湿度、空气质量等）
- 系统穿过的墙面

与其他系统配套 - 比如与母线槽系统安装配套的部分为:

- 供电线路的平面图
- 通风管道走向的位置
- 照明系统的平面图
- 需提供插接单元的数量和具体位置
- 母线槽系统严格按照上面提到的几点进行测量，第一步是计算额定电流。

Others

Calculation and Type Selection

Calculation of Rated Current

The following information is important for planning busbar system layout:

Information to be provided for connection with distribution system

- Distribution system model and type
- Feeding mode (top, bottom or rear)

Installation Location and Condition

- Space dimensions
- Building structure (for hanging and installation)
- Busbar routing
- Ambient conditions (temperature, humidity and air quality etc.)
- Wall cut-outs for busbar

● Location, quantity and connection types of load consuming equipment or power distribution system

- Dispersal Coefficient
- Short-circuit level defined

Coordination with Other Systems-(for example, required coordination for busbar system installation)

- Power system line arrangement plan
- Location and routing of ventilation ducts
- Lighting system line arrangement plan
- Positions and quantities of required tap off units
- Busbar system will be measured and designed according to above information, starting from rated current calculation

其他 Others

$$I_B = \frac{P_{inst} \cdot \alpha \cdot b}{\sqrt{3} \cdot U_e \cdot \cos \phi} \cdot 10^3$$

I_B = 额定电流 (A)

U_e = 额定工作电压 (V)

$\cos \phi$ = 功率因数

P_{inst} = 安装功率 (KW)

α = 分散系数

b = 馈电系数

$b = 1$ 单面馈电

$b = 0.5$ 双面馈电和中间馈电单元

$$I_B = \frac{P_{inst} \cdot \alpha \cdot b}{\sqrt{3} \cdot U_e \cdot \cos \phi} \cdot 10^3$$

I_B = Rated current (A)

U_e = Rated operational voltage (V)

$\cos \phi$ = Power factor

P_{inst} = Installed power (KW)

α = Dispersal coefficient

b = Feeding factor

$b = 1$ with single side feeding

$b = 0.5$ with double sides feeding and intermediate feeding unit

主电路数 Numbers of Main Circuits	α
2 与 3	0.9
4 与 5	0.8
6 至 9	0.7
10 及以上	0.6

除非特殊规定，一般情况下 α 都表示分散因数，这点可以参照 IEC/EN 60439-1 标准载荷容量与环境温度的关系。

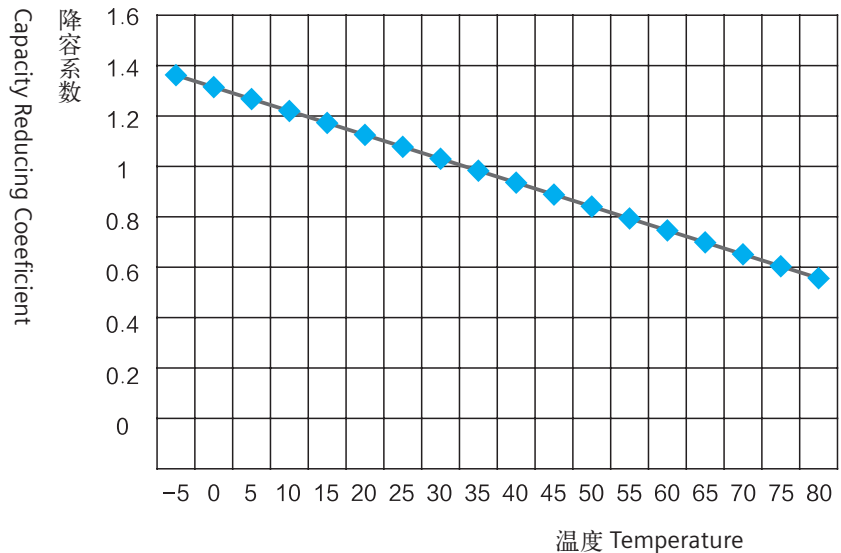
Unless otherwise specified, α in general refers to dispersal coefficient, which can be referred in IEC/EN 60 439-1 about the correlation between standard load capacity and ambient temperature.

额定电流 I_e 是基于一定的环境温度而言的（24 小时平均温度为 35°C ，不超过 40°C ，下面的图表就表明了载荷容量是随着环境温度的变化而变化的。

The rated current I_e is based on certain ambient temperature (average temperature is 35°C , not higher than 40°C . The table below illustrates that the load capacity is changing along with the changes of ambient temperatures.

降容曲线

Capacity Reducing Curve



设计实例

Design Example

电压降的计算

如果母线槽系统长距离输配电，就必须考虑到电压降对系统的影响，下面是电压降的具体计算公式：

$$\Delta U = a \cdot \sqrt{3} \cdot I_B \cdot l \cdot (R' \cdot \cos \phi + X' \cdot \sin \phi) \cdot 10^{-3}$$

ΔU = 电压降 (V)

I_B = 额定电流 (A)

l = 系统总长度 (m)

a = 载荷分配系数

R' = 电阻 (mΩ/m)

X' = 电抗 (mΩ/m)

$\cos \phi$ = 功率因数

载荷分配系数根据载荷分配的类型而定，下面的图表反应了在额定电流一定的情况下载荷分配的不同方式。

最小单极接地故障电流的安全断开回线阻抗决定了一极短路的电流的大小，需要计算：

相线导体和保护导体

相线导体和 PEN 导体之间的回线阻抗

阻抗值主要取决于：

检测结果

计算结果

模拟系统

技术参数表中已经详细列明了 XL-III 母线槽系统的阻抗值，因此可以根据阻抗值计算母线槽系统的回线阻抗，从而得到系统的总回线阻抗值。通过整个母线槽系统的回线阻抗，很容易估算系统的 1 极最小短路电流，或通过计算得到。

Voltage Drop Calculation

Voltage drop impact on the system shall be considered in case busbar system is used for long distance power transmission and distribution. The calculation formula of voltage drop is as follows:

$$\Delta U = a \cdot \sqrt{3} \cdot I_B \cdot l \cdot (R' \cdot \cos \phi + X' \cdot \sin \phi) \cdot 10^{-3}$$

ΔU = Voltage drop (V)

I_B = Rated current (A)

l = Total length of the system (m)

a = Load distribution coefficient

R' = Resistance (mΩ/m)

X' = Reactance (mΩ/m)

$\cos \phi$ = Power factor

Load distribution coefficient is depending on the load distribution types where the following table shows different load distribution under fixed rated current.

The loop impedance of the minimum single pole grounding fault current safe tripping determines 1-pole short-circuit current rate. Calculation of loop impedance is required between the phase conductor and protective conductor, and the phase conductor and PEN conductor

Impedance values are mainly determined by:

Measuring results

Calculating results

Simulating system

Impedance values of XL-III busbar system have been listed in details in the Technical Parameters Table, wherer the loop impedance can be calculated according to these impedance values and lead to the total loop impedance values of the system. The minimum short circuit current can be estimated or calculated easily based on the whole busbar system loop impedance value.

载荷分布 Load Distribution		系数 A Factor A
A → B ↓	从 A 供电 B 点插接配电 Power Supply From A Plug in Distribution From B	1
A → B ↓ C ↓ D ↓ B ↓ E ↓	A 点供电 B、C、D、E 插接配电 Power Supply From A Plug in Distribution From B、C、D、E	0.5
B ↓ A ↑ C ↓	从 A 供电 B、C 点插接配电 Power Supply From A Plug in Distribution From B、C	0.25
B ↓ D ↓ A ↑ E ↓ C ↓	A 点供电 B、C、D、E 插接配电 Power Supply From A Plug in Distribution From B、C、D、E	0.125

$$I_{k/min} = \frac{c \cdot U_n}{\sqrt{3} \cdot Z_k}$$

c = 电压系数 0.95

U_n = 相间电压

Z_k = 阻抗

c = voltage factor 0.95

U_n = voltage between phases

Z_k = impedance

设计实例

Design Example

过载及短路保护 Overload and Short-circuit Protection

母线槽系统在运行时必须进行过载及短路保护，通常情况下熔断器或断路器都是作为保护装置而在系统中广泛使用。选择时，需考虑短路电流的强度、系统的运行功能等因素。

Busbar trunking systems must be protected against overload and short-circuits during operation. Typically fuses or circuit breakers are widely used as protection devices. Short circuit current strength, system operating function etc need to be considered during application configuration.

在实际应用中由于熔断器的灵敏度非常高，而且当电流稍微超过额定电流时，熔断器就开始熔化，但熔化的时间比较长，所以熔断器不是很适合作为过载保护装置在系统中使用。

Fuses are in general less suitable as overload protection device due to its high sensibility that fuses will start to melt when the current is only slightly over the rated value but however take a long time of melting.

若母线槽系统的过载保护装置使用熔断器，为了保证保护装置对母线槽系统提供合适的保护，熔断器的额定电流必须要比母线槽系统的额定电流低一个等级。

In case fuses are used as protection device for busbar system, the rated current of fuses must be lower one level than the rated current of busbar system in order to ensure proper protection against busbar system.

如果使用断路器进行保护，其保护单元可以根据母线槽系统的额定电流进行调整，也就是说母线槽系统可以达到100%的载流量。If circuit-breakers are used for protection, the protection unit can be adjusted according to the rated current of the busbar system, which means the busbar system can operate at 100% load carrying capacity.

若决定采用熔断器和断路器作为保护装置对母线槽系统进行短路保护时，所选型号的电流不要超过母线槽系统指定的保护电流，还需考虑短路电流的强度、是否需要带限流保护装置及所选保护装置短路开关容量是多少等因素。

If decided to take fuses and circuit-breakers to protect busbar system against short circuit, currents of the selected models shall not be higher than defined busbar rated protection current. Meanwhile other factors such as short circuit strength, whether current limiting protection device shall be included and the breaking capacity of short circuit breakers etc should also be considered.

如下：

$$I''k \leq I_{cc} \leq I_{cu}$$

$I''k$ = 估计的安装位置的短路电流

I_{cc} = 系统运行时的额定电流

I_{cu} = 断路器的额定短路容量

The following applies:

$$I''k \leq I_{cc} \leq I_{cu}$$

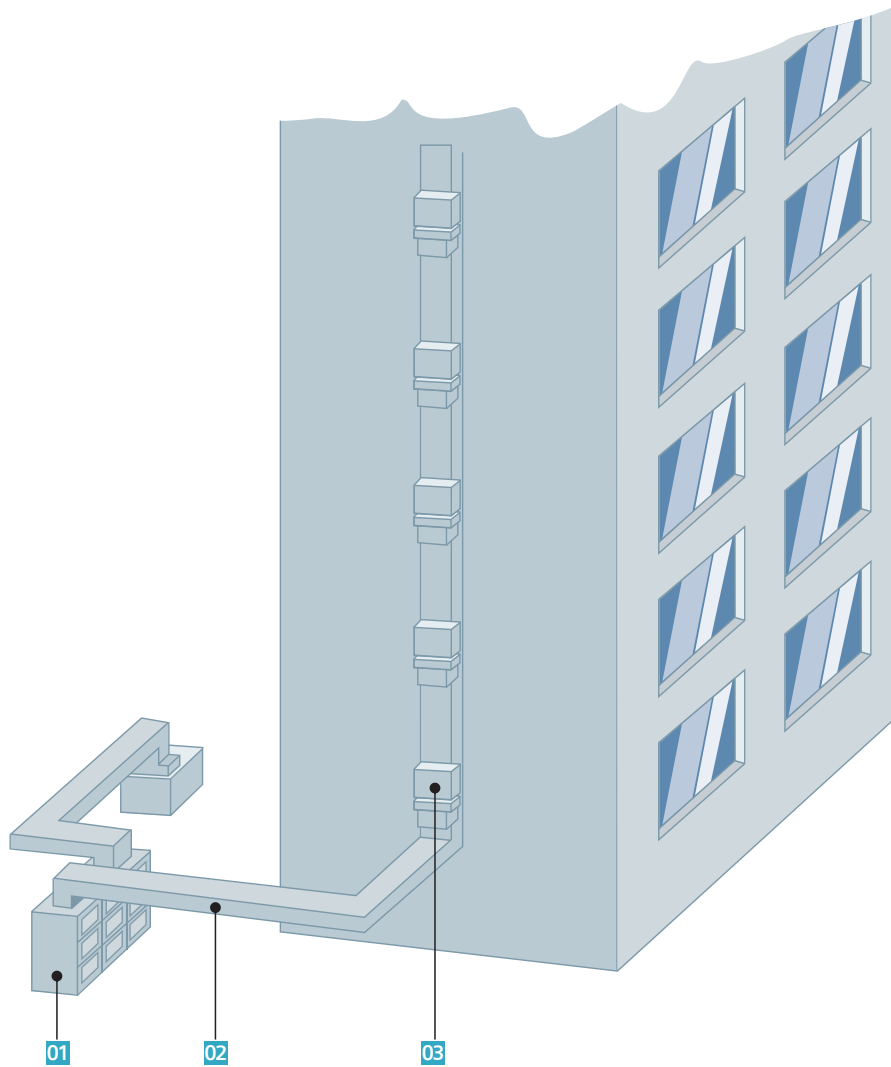
$I''k$ = the short-circuit current expected at the place of installation

I_{cc} = rated current of system operation

I_{cu} = rated short-circuit breaking capacity of the circuit breaker

设计实例

Design Example



		楼层数 Floor Number	10层 (每层 8 个房间) 10 floors (8 rooms each floor)
		每个房间的额定功率 Power of each floor	26KW
		额定工作电压 Ue Rated working voltage (Ue)	400V
01	配电柜	功率因数 $\cos \phi$ Power factor	0.9
02	母线槽系统	分散因数 α Dispersion factor	0.6
03	插接箱	利用因数 β Utility factor	0.5
		变压器供电 Transformer supply	1 × 1250KVA, UK=6%
		防护等级 Protection degree	IP54
		系统型式 System pattern	TN-S

设计实例

Design Example

每层楼额定电流的计算

Rated Current Calculation of Each Floor

$$I_{BS} = \frac{P_{inst} \cdot \alpha}{\sqrt{3} \cdot U_e \cdot \cos \phi} \cdot 10^3$$

I_{BS} = 每层楼的额定电流 (A)

U_e = 额定工作电压 (V)

$\cos \phi$ = 功率因数

P_{inst} = 安装功率 (KW)

α = 分散系数

$$I_{BS} = \frac{8 \cdot 26 \cdot 0.6}{\sqrt{3} \cdot 400 \cdot 0.9} \cdot 10^3 = 200A$$

用户类型 User type	β
电炉室或蒸汽炉室 Electric stove room or steam boiler room	0.1-0.2
商业性的办公场所和建筑的照明 Lighting of business offices and buildings	0.7-0.9
电梯和服务设施 Lifts and service facilities	0.6-0.8
会议室 Meeting room	0.6-0.8
小型办公场所 Small office place	0.5-0.7
大型办公场所 Large office place	0.4-0.8

直线段额定电流的计算

Rated Current Calculation of Straight Trunking Unit

$$I_B = (I_{NS} \cdot \beta)$$

$$I_B = 10 \cdot 200 \cdot 0.5 = 1000A$$

换算系数是总负载数的利用和分散系数，如果不知道具体的换算系数，可以咨询当地的供电公司，供电公司有详细的不同场合下的换算系数值。上面的图表列出了换算系统的平均值。

Conversion factor is the utility and dispersion factors. In case the exact conversion factor is unknown, the local power supplying bureau shall be consulted for different conversion factors to be used under different occasions. The values shown in above table are the average figures of the conversion system.

从上面提到的几点，我们可以很容易就进行 XL-III 母线槽系统的选择，例如：需三相五线制系统，100% 中性线，所承载的电流为 1250A，而相应的短时耐受电流为 50KA。

From the above mentioned key points, the selection of XL-III busbar system is much easier, for example: 3 phases and 5 wires system, 100% N conductor, current load 1250A with a short time current endurance capacity 50KA system are requested.

母线槽系统为：XLC-III 0551 插接箱单元：箱体规格为 2#，母线系统为 51、防护等级为 IP54 的插接箱，采用断路器保护并带有旋转操作手柄，断路器为 3 极、额定电流为 250A。

Busbar System: XLC-III 0551; Tap off box size 2#. Busbar system is 51, tap off box with IP54, with breaker protection and rotary operating handle, breaker is 3 poles with rated current 250A.

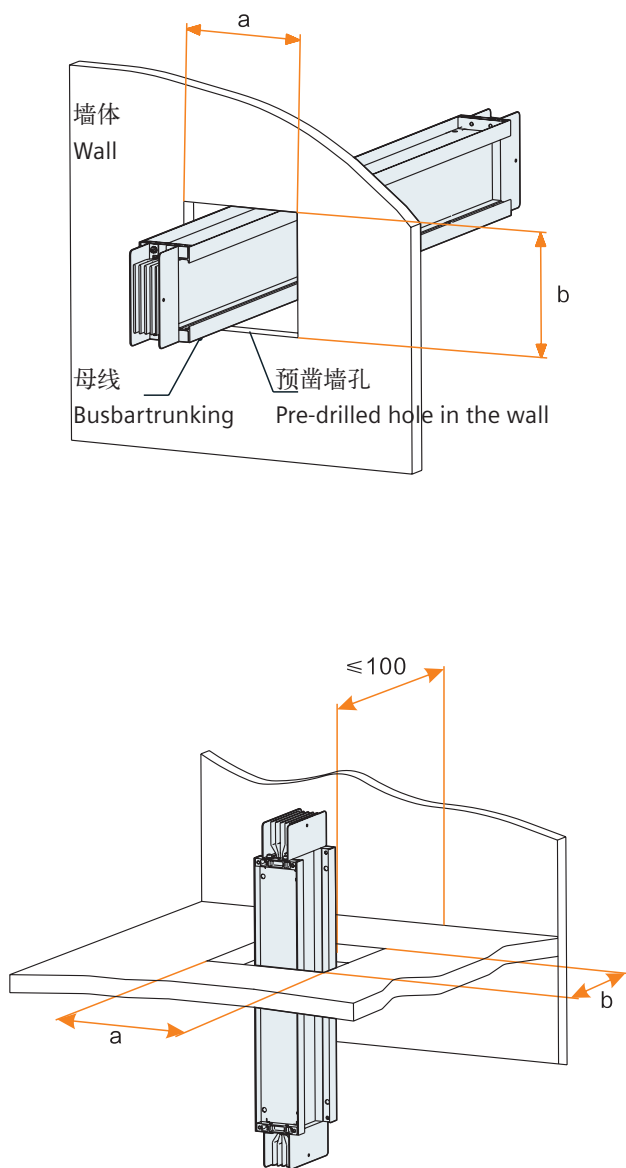
插接箱单元代码为：XL-2AK51M/LSH-250S-3

Tap-off unit code: XL-2AK51M/LSH-250S-3

母线槽系统的安装

Busbar System Installation

下列图示表明了母线槽单元穿墙安装时的标准尺寸
The following figure shows the standard dimensions requested for busbar system installation through the walls.



a- 表示母线宽度方向
a- direction of busbar width
b- 表示母线高度方向
b- direction of busbar height

穿墙 Through the wall

电流 (A) Current (A)	a/mm	b/mm
XLC-III 400A XLA-III 400A	340	324
XLC-III 630A XLA-III 630A	340	324
XLC-III 800A XLA-III 800A	340	345
XLC-III 1000A XLA-III 1000A	340	370
XLC-III 1250A XLA-III 1250A	340	400
XLC-III 1600A XLA-III 1600A	340	450
XLC-III 2000A XLA-III 2000A	340	495
XLC-III 2500A XLA-III 2500A	340	604
XLC-III 3150A XLA-III 3150A	340	714
XLC-III 4000A XLA-III 4000A	340	794
XLC-III 5000A XLC-III 6300A	340	847

母线槽系统的安装

Busbar System Installation

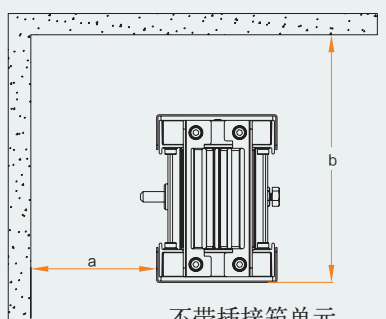
水平安装尺寸要求

Dimensions Requirement for Horizontal Installation

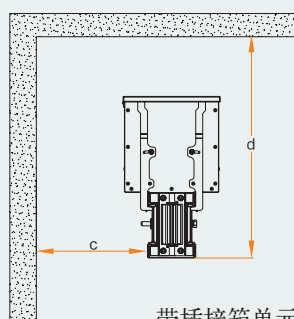
为了使母线槽系统和插接箱单元的安装更加简单方便，在进行设计时必须考虑到系统安装的最小尺寸。
Minimum installation space required shall be considered during engineering phase to ensure convenient and fast installation of busbar trunking systems and tap off units.

XL-III 母线槽系统（不带插接箱）
XL-III 馈电式母线槽系统的最小尺寸
XL-III Busbar Trunking System(without tap off box)

XL-III 母线槽系统（带插接箱）
XL-III 馈电式母线槽系统的最小尺寸
XL-III Busbar Trunking System(with tap off box)



不带插接箱单元
without tap off units



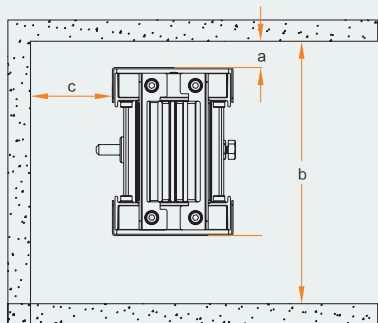
带插接箱单元
with tap off units

垂直安装尺寸要求

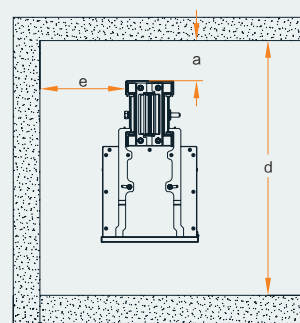
Dimensions Requirement for Vertical Installation

XL-III 母线槽系统（不带插接箱）
下面的图示表明了母线槽系统安装时的最小尺寸，并没有反映安装附件的尺寸，在工程项目中安装时要充分考虑到。
XL-III busbar trunking (without tap off units)
Charts below shows the minimum dimensions required for installation of XL-III busbar trunking system excluding space required for installation accessories which need to be considered during installation.

XL-III 母线槽系统（带插接箱）
下面的图示表明了母线槽系统安装时的最小尺寸，并没有反映安装附件的尺寸，在工程项目中安装时要充分考虑到。
XL-III busbar trunking (with tap off units)
Charts below shows the minimum dimensions required for installation of XL-III busbar trunking system excluding space required for installation accessories which need to be considered during installation.



不带插接箱单元
without tap off units



带插接箱单元
with tap off units

母线槽系统的安装

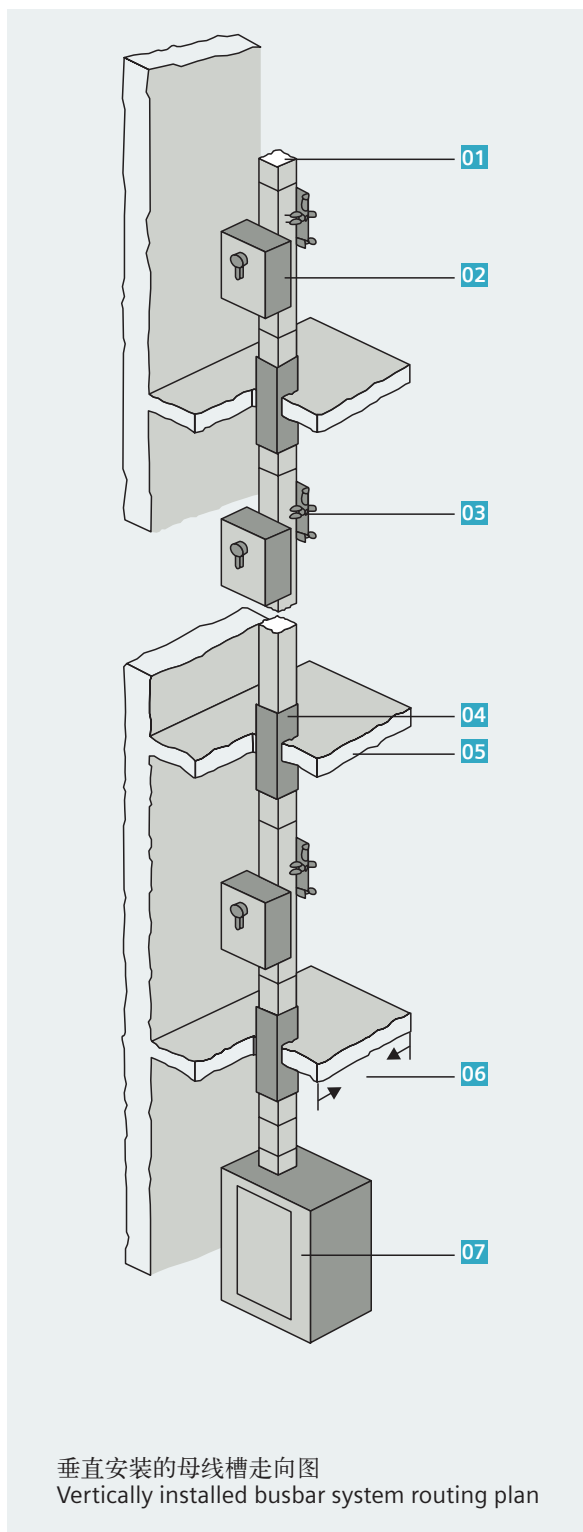
Busbar System Installation

水平安装 Horizontal installation		XLC-III 铜母线 XLC-III copper busbar	XLA-III 铝母线 XLA-III aluminum busbar		XLC-III 铜母线 XLC-III copper busbar	XLA-III 铝母线 XLA-III aluminum busbar
电流等级 Current Rating(C)	a	b		c	d	
400A	100	218	218	350	1018	918
630A	100	218	218	350	1018	918
800A	100	218	239	350	1018	939
1000A	100	226	264	350	1026	964
1250A	100	249	294	350	1049	994
1600A	100	279	344	350	1079	1044
2000A	100	315	389	350	1115	1089
2500A	100	374	498	350	1174	1198
3150A	100	476	608	350	1276	1308
4000A	100	548	688	350	1348	1388
5000A	100	658	/	350	1458	/
6300A	100	738	/	350	1538	/

垂直安装 Horizontal installation		XLC-III 铜母线 XLC-III copper busbar	XLA-III 铝母线 XLA-III aluminum busbar		XLC-III 铜母线 XLC-III copper busbar	XLA-III 铝母线 XLA-III aluminum busbar	
电流等级 Current Rating(C)	a	b		c	d		e
400A	100	318	318	100	1018	1018	400
630A	100	318	318	100	1018	1018	400
800A	100	318	339	100	1018	1039	400
1000A	100	326	364	100	1026	1064	400
1250A	100	349	394	100	1049	1094	400
1600A	100	379	444	100	1079	1144	400
2000A	100	415	489	100	1115	1189	400
2500A	100	474	598	100	1174	1298	400
3150A	100	576	708	100	1276	1408	400
4000A	100	648	788	100	1348	1488	400
5000A	100	758	/	100	1458	/	400
6300A	100	838	/	100	1538	/	400

母线槽系统的安装

Busbar System Installation



垂直安装的母线槽走向图
Vertically installed busbar system routing plan

- 01 终端
End cap
- 02 插接箱单元
Tap off unit
- 03 弹簧支架
Spring support
- 04 防火栅
Fire barrier
- 05 天花板厚度
Ceiling thickness
- 06 安装支架距离墙面需 10cm
10cm distance is required from mounting support to wall
- 07 配电柜
Power distribution board

安装方式

Mounting method

母线槽系统垂直安装时，对于插接箱的安装方式有着明确的规定，需采用底出线的方式，当 L1 导体在左手侧的时候，插接箱也要采用底出线的安装方式。

The mounting of tap off unit is prescribed clearly in vertical installation of busbar trunking system. Bottom outlet line is requested. When L1 conductor is at left hand side, it means the tap off unit needs to be installed with bottom outlet line.

垂直安装

Vertical Installation

当 XL-III 母线槽垂直安装时需要特殊的安装附件（弹簧支架），而且如果是单套系统，每层楼则至少需加装一套弹簧支架装置；如果是双套系统，则至少需要加装两套弹簧支架装置。弹簧支架的作用主要是为了承载母线槽自身的重量及运行时产生的线性膨胀，有两种不同的规格型号可供选择。在选择时要考虑到插接箱所带来的额外重量，同时对于输电母线和配电母线要有区别，针对不同的母线槽型号进行不同的选择。

Special spring brackets are required for installing XL- III busbar system vertically. If a single line system is installed, at least one set of spring brackets needs to be added at each floor. In case of a dual lines system installed, two sets of spring brackets need to be added. The main function of spring bracket is to undertake the weight of busbar itself as well as the linear expansion during operation. Two different types are available for choice. Meanwhile the extra weight of tap off unit also needs to be considered. There are also differences for power transmission and distribution busbar systems, therefore brackets need to match with different types of busbar systems.

	电流 (A) Current (A)	数量 Quantity
输电 Power Transmission	400~2500	1
	3150~6300	2
配电 Power Distribution	400~2500	1
	3150~6300	2

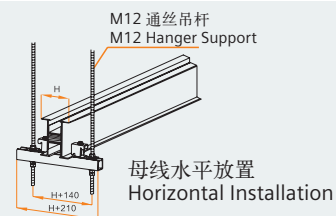
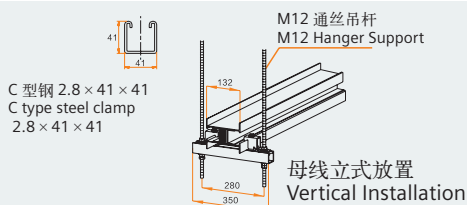
Note: At least one tap off unit on each floor.

母线槽系统的安装

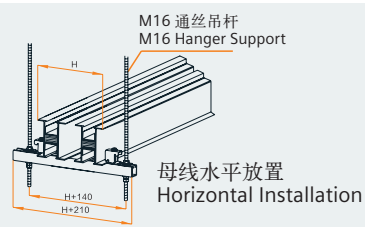
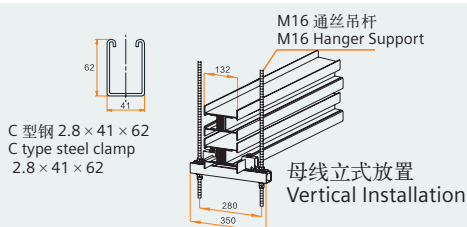
Busbar System Installation

通丝吊架 Hanger Support

适用于轻载且
震动小的场合
Applicable to light
loading with slight
shock occasion

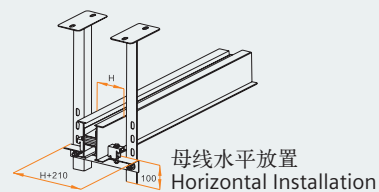
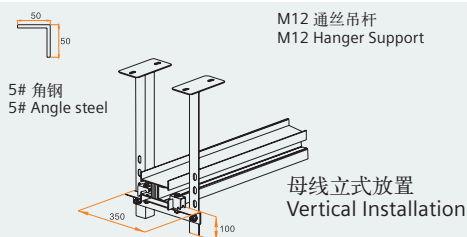


适用于重载且
震动小的场合
Applicable to heavy
loading with slight
shock occasion



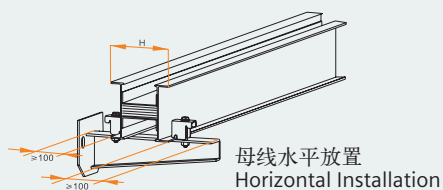
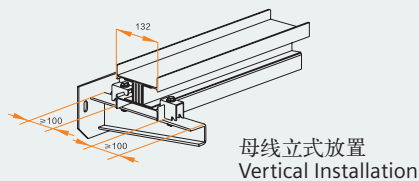
角钢吊架 Angle Steel Support

适用于轻载且
震动小的场合
Applicable to light &
heavyloading with
slight shock occasion

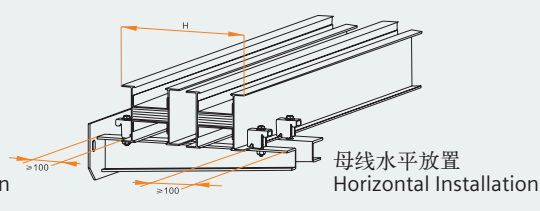
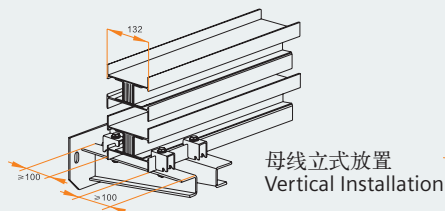


支架托臂 Support Bracket Arm

轻载
(单托臂)
light loading
(Single arm)



重载
(双托臂)
light loading
(Double arms)



注：上示图片为示意图，具体形式请以测量或工程师与客户确认的图纸为准。

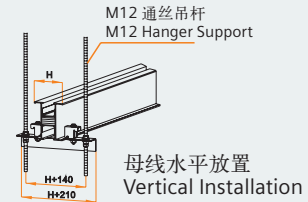
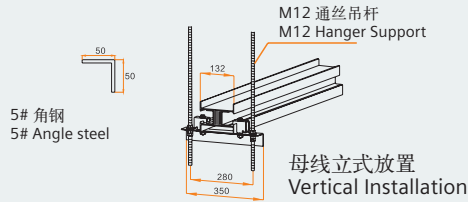
Remarks: Figures above are for lustration purpose only. Actual installation ways shall be aligned with site measurement engineer and based on the confirmed engineering drawing from the client.

母线槽系统的安装

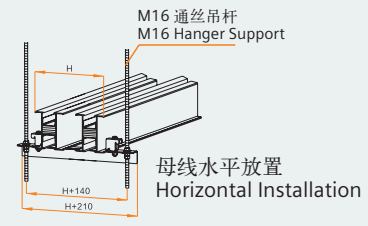
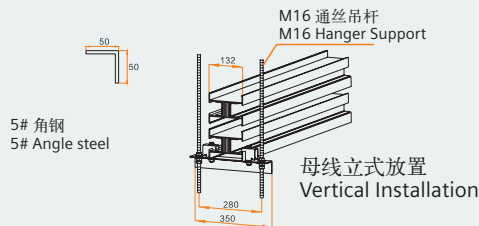
Busbar System Installation

通丝吊架 Hanger Support

适用于轻载且
震动小的场合
Applicable to light
loading with slight
shock occasion

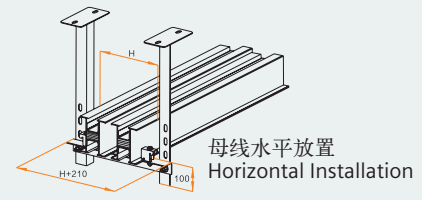
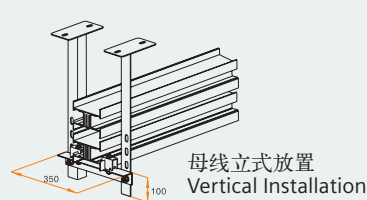


适用于重载且
震动小的场合
Applicable to heavy
loading with slight
shock occasion



角钢吊架 Angle Steel Support

适用于重载或轻载且
震动小的场合
Applicable to light &
heavy loading with
slight shock occasion



注：上示图片为示意图，具体形式请以测量或工程师与客户确认的图纸为准。

Remarks: Figures above are for lustration purpose only. Actual installation ways shall be aligned with site measurement engineer and based on the confirmed engineering drawing from the client.

垂直安装尺寸要求

Dimensions Requirement for Vertical Installation

Current Rating	400A	630A	800A	1000A	1250A	1600A	2000A	2500A	3150A	4000A	5000A	6300A
XLC-III	118	118	118	126	149	179	215	274	376	448	558	638
XLA-III	118	118	139	164	194	244	289	398	508	588	/	/

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