

MLK Low Voltage Switchboard System



New Switchboard MLK – Wide Range of Applications

The MLK switchboard is designed mainly for electrical distribution in real estate and industrial buildings, and its nominal rating is sufficient even for demanding applications. MLK is a member of the ABB's MNS Switchgear Family. In addition to the modules designed specially for MLK, a wide range of fixed MNS units can also be used. To ensure reliability and safety in operation, MLK has passed extensive type tests in accordance with standards and has been granted the SGS FI Certificate.

Special attention has been paid to the following factors in the design of the MLK switchboard:

- **safety in use**
- **operational reliability**
- **overall economy**
- **user friendliness**
- **space utilization**
- **low life cycle costs**
- **environmental friendliness**

MLK is based on a fixed module system. In the development of the equipment user friendliness and serviceability have been emphasized. Special attention has been paid to the possibility of thermal monitoring and optimization of its maximum capacity. MLK is excellent when used as a main switchboard as its outgoing switch-fuses units and economic space utilization are designed for easy cabling.

The design of MLK is based on long-term experience and ABB's traditions in the manufacturing of switchgear.



Flexible, Versatile and Space Saving

The MLK Switchboard is the continuation of a long tradition of ABB as a leading switchgear manufacturer. Along with high performance characteristics and quality, great efforts have been made to ensure the versatility and serviceability of MLK. A wide scope of assembly solutions ensures a space saving product for all electrical distribution needs.



Wide scope of applications

The MLK Switchboard is perfect for use as a main or distribution board in real estate buildings, or as a motor control center in industry. Its fixed outgoing units modules are similar to MCS and MNS switchboards. Its flexibility and versatility ensure a reliable and space saving solution for all electrical distribution needs.



Reliability of electrical distribution

The foundation for disturbance free electrical distribution is reliable and safe equipment. The ABB components used in MLK guarantee a reliable solution for electrical networks. Its performance characteristics have been verified by extensive tests according to the IEC standards. With suitable maintenance its working life-time is long, and life cycle costs low.



Easy cabling

In designing MLK special attention has been paid to cabling and cable connections. Cable entry into the switchboard can be from the top or bottom. When using special cable compartments, even large power cables can be connected easily.



Safety in use

The feeder compartment provides space for auxiliary components such as relays and meters. From the point of view of operation and maintenance, this steel sheet compartment is an ideal location for even the most sensitive equipment.

Personnel Safety and Operational Reliability

Requirements for uninterrupted, high-quality electrical distribution are increasing everywhere. Operation and cabling must be implemented safely in all circumstances. The switchboard must function without causing major disturbances even in severe conditions, as long power failures may result in serious problems, and lead to high economic losses due to process interruptions in plants and buildings.



Clear and rigid design

The clear layout of the switchboard with control operations behind closed covers and protected compartments, are the basis for safe operation. The feeder compartments of the MLK switchboard are designed in a way that the transformer connection can be implemented either using power cables, or ABB's safe and reliable busduct system MDY.



Reliable ABB components

ABB's high performance air circuit breaker, with alternative protection relay possibilities, is a safe choice as the main supply device. An earthing cable or earthing switch can be used for earthing the transformer feeder or switchboard busbar. The use of an earthing switch makes earthing perfectly safe behind closed doors. Interlocking of the switching devices can be either electrical or mechanical.



Auxiliary equipment in their own areas

Auxiliary equipment such as meters and relays have their own enclosed area in the feeder compartments. Although the construction of MLK takes into account the possibility of arcing, safety can be increased by using modern ABB protection relays. As bus interfaces are used more often for the transmission of control commands and data to the control room, the use of the latest technologies is taken into account in the MLK switchboard.

Functional Economy

As MLK is used in a wide variety of applications the flexibility of assembly has been emphasized. Its assembly solutions save space, and an optimal solution can always be found for every customer.

The devices always have a fixed connection to the busbar system. The forms of internal separation of the outgoing units can be according to IEC 60439-1, either Form 2 (cabinet type) or Form 4 (functional unit type).



Enough space for cabling

In the Form 4 unit the degree of protection between the apparatus compartment and other compartments is IP XXB. In bigger outgoing units the connection to the busbar is made with prefabricated bars. Thermal monitoring can be carried out for all connections, or they can be tightened to a fixed torque. Current carrying connections can be re-tightened, if required, from the front side of the switchboard.



Form of internal separation 4

Starter units can be implemented also using Form 4 unit internal separation. The starter units are the same as used in MNS motor control centers. The outgoing unit is provided with a main device for disconnecting the unit before the doors can be opened.



Form of internal separation 2

The compartment construction is a space and cost saving solution without compromising safety. All devices and components used meet the requirements for protection from accidental contact. Switchboards with a high level of protection can be operated by trained personnel and do not require professional skilled staff.

By using a compartmental type construction, assembly can be implemented with modules which save space and make the switchboard clear and easy to access.



Several busbar options

The busbar material can be either aluminium or copper. The busbar has been extensively tested and designed to withstand even high short-circuit stresses. In addition, by using a divided busbar, harmful disturbances caused by magnetic fields can be decreased.

MDY Busduct – Maximal Distribution Security

When the reliability of electrical distribution is important and high economical interests are involved, it is essential to use a solution which has been verified by tests to be suitable for all working conditions.

The MDY phase-insulated busduct from ABB is a reliable and safe solution for the connection from the transformer to the main distribution board or motor control center. Using busducts, very high short-circuit withstand currents can be achieved (I_{cw}/I_{pk} up to 100/235 kA).



Important part of electrical distribution

The current carrying conductor from the transformer to the switchboard is one of the most important parts of the distribution system and its operational reliability requires special consideration. The ABB MDY busduct is the result of long experience and product development. It is made up of aluminium supporting elements and insulated phase bars. Busbar extension joints can be made on site, and are suitably enclosed to meet the ambient conditions.



Busbars with phase-insulation

The phase-insulation of busbars is made of halogen free material which is extruded onto the bars. The insulation fastens tightly onto the busbar surface and due to its black colour transfers heat well thus providing effective cooling. Depending on the load, busbars can be made of aluminium or copper.



Pre-fabricated busduct elements

Busbars are manufactured as elements which enable quick connection and easy installation on site. Fire insulation between compartments is implemented using pre-fabricated bushings with fire separation class EI-M 60 or EI-M 120. If required, the fire-insulation bushing can also be made gas-proof. The degree of protection by enclosure of the busbar cover is IP 30 or IP 54.

MLK – Technical Data

Standards and tests	IEC 60439-1; EN 60439-1 SFS 60439-1: 2000 SFS 60529: 2000 SFS 5601: 2000 FI-Certificate 20710		
Rated insulation voltage	U_i	1000 VAC	Depends on the apparatus
Rated operation voltage	U_e	690 VAC	
Rated impulse withstand voltage	U_{imp}	8 kV	Option 10 kV Option IV
Overvoltage category		III	
Degree of pollution		3	Option 63-80 kA
Rated current	I_n		
- main busbar		max. 3200 A	
- distribution bars		max. 2000 A	
Rated short-time withstand current	I_{cw}		Option 132-176 kA
- main busbar		max. 50 kA	
- distribution bars		max. 50 kA	
Rated peak withstand current	I_{pk}		Option 63-80 kA
- main busbar		max. 125 kA	
- distribution bars		max. 125 kA	
Arcing withstand		50 kA, 300 ms, 760 V	SFS-EN 60439-1
EMC Environment		1 and 2	
Insulation resistance		>10 MΩ	(IEC 60529)
Test voltage		1 min 2500 V	
Degree of protection		IP 21...IP 44	
Dimensions:			Electrostatic polyester powder
-height	2200 mm (2000 mm)		
-cubicle widths	400, 500, 600, 800 mm		
-depths	400, 600, 800, 1000 mm		
-module size	E=25 mm		
-Surface treatment:			
-housing	hot galvanized sheet steel		
-inside parts	hot galvanized sheet steel		
-roof, rear and end plates	hot galvanized sheet steel		
-doors	painted RAL 7035, light grey		
Assembly	fixed		
Internal compartments	Form 2/4 (form 2 or 4)		

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MNS

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