

Safe and Reliable Power Distribution in LV Networks

A safe and reliable power distribution is always a challenge whether it is in construction sites or Industry or Building segments. The most important criteria which are to be taken into consideration in these areas where one can expect non-technical people may be working around. For example a feeder panel which is feeding street lighting is normally located in a public area.

With this critical requirement, International electro-technical commission has introduced IEC61439-5 as specific standards for manufacturing power distribution solutions in public areas. The standards clearly define power distribution panel requirements in public areas.

The following features are considered to be very important in designing power distribution in every application

- All parts have a high degree of protection and are safe.
- System shall be such that it should be easy to add new switching devices to existing distribution boards.
- The design of the System such that the Switching devices shall get mounted and connected to the bus bar system.
- Design should allow switching devices to be connected when the system is live.
- The Power distribution should be voltage-free during change of fuses
- The system should be modular in nature for easy planning
- The system should flexible in such a way that it shall be possible to switch fuse units or circuit breakers depending on customer choice.
- To provide flexibility to the user, it should be possible to rearrange outgoing feeders.
- The bus bars should be screen protected which provides utmost safety to the operator.

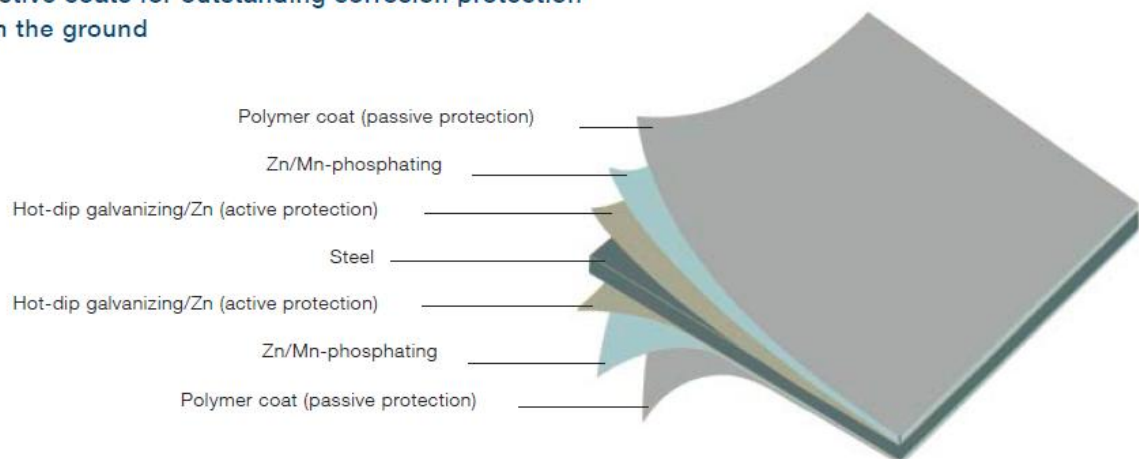
Power distribution solution which is required to comply with IEC61439-5 is required to undergo stringent testing procedure which is laid down by the standards. One need to ensure the Distribution boards installed in their premises complies with IEC61439-5.

When distribution boards are considered with moulded case circuit breakers, it is recommended to consider plug-in design which provides excellent flexibility to the user and provides good operational safety.

The bus bars system used in these types of power distribution boards should be normally touch proof with a continuous layer of polyamid insulation. This feature enable maintenance personnel to replace module when bus is live and reduces system down time.

When these power distribution boards are used for in outdoor application, very elaborate treatment is to be done on sheet steel to protect against corrosion. As user it is recommended to incorporate sheet steel treatment to comply with ISO 1461. In case some portion of the enclosure is buried underground, it is advised that underground area of enclosure system is polymer coated. Typical requirement of coating is as shown below.

Six protective coats for outstanding corrosion protection of steel in the ground



As a user it becomes very much essential to clearly define the tender specification about the treatment to ensure right products are delivered for the project.

For safe voltage testing, it is mandatory to provide right apertures in power distribution boards so that operation and maintenance team will be in position to test when system is live. This is a mandatory requirement in accordance IEC 61243-3.

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One of the analysis has proved that most vulnerable to failure in electrical system is termination. A power cable network in electrical distribution is required to withstand harsh environment like humidity, vibration, higher ambient conditions without causing any malfunctions. One need to ensure that the connectors supplied along with power distribution board complies with IEC 61238-1.

ABB offers comprehensive solution for these types of power distribution system " KABELDON" series. The solution offers the best safe and reliable power distribution solutions.



The above power distribution panels provide clear understanding about safety against electrical hazards. The system provides excellent flexibility to user in positioning the incomer anywhere with in the power distribution boards. Due to touch proof design of bus bars, online replacement is very simple.

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With Kabeldon solutions, user can select choice of protection either fuses or circuit breakers. One of biggest advantage of the system is ease of replacement and less downtime. The below images provides an overview on possible options with Kabeldon.

Fuse Rail option



Switch fuse option



Circuit Breaker option



The bus bar system is fully insulated and available up to 2500A. The system is fully tested for IEC 61439-1 and IEC61439-5 standards. The bus bars is designed in such way that the operating personnel fully protected against accidental contact.



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Kabeldon as solution is suitable for outdoor applications. Many times the incoming cable is laid from overhead lines (pole mounted transformers). In this scenario protection against surges is mandatory. ABB offers surge arresting devices which can be incorporated in to Kabeldon solutions.



KABELDON Application

- LV networks in Street lighting, Traffic Lighting
- LV Distribution solution for Hospitals, Hotels and Malls
- Electric supply to Aircrafts on ground
- Electric supply for Boats and Ships
- Temporary Electric supply for construction sites
- Compact substations – With use of Kabeldon solutions overall size compact substations can be reduced. In addition due to compact design of CSS, troubleshooting/Replacement will be very easy.
- Diesel Generating sets – Overall size of acoustic enclosure can be reduced (cost optimization) due to compact foot print of Kabeldon solutions.

Where safety against electrical hazards is primary requirement(Safety is required everywhere), [Kabeldon](#) is the right solutions.

In case of further information, please contact

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