Switchboard vs switchgear eaton

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Switchboards are used to safely distribute electricity throughout commercial and industrial facilities. A switchboard is a component of an electrical distribution system which divides an electrical power feed into branch circuits while providing a protective circuit breaker or fuse for each circuit in a common enclosure.

Switchboards typically have a maximum voltage rating of 600 Vac/Vdc and a maximum bus rating of 6000 A and are designed to meet UL891 and NEMA Standard PB2.

Switchboards and panelboards provide similar functionality in a power distribution system. Panelboards are typically limited to a maximum of 1200 A incoming current (main), either flush mounted within a wall or surface mounted to a wall. Switchboards are freestanding units that can be front connected and which would require only front access, similar to panelboards..

However, switchboards can allow for both front and rear access if desired. Switchboards can accommodate up to 6000 A bussing and overcurrent protective devices up to 5000 A. While panelboards are designed to UL 67, switchboards are governed by UL 891.

Cabling can enter directly into the main structure or through a dedicated pull structure. Pull structures are commonly used in service entrance switchboards. Cables can enter the structure from the floor (bottom entry) or from above (top entry.)

Distribution structures divide and send power to branch circuit protection devices and then to branch circuits to power downstream loads. Power flows from the main structure to the distribution structure via cross bus.

In most installations, switchboards are mounted close to a wall and are front accessible only. If required, the switchboard can be constructed to allow both front and rear access. Rear access switchboards provide easier access for installation and maintenance, but they are typically deeper than front access only switchboards.

The primary components of a switchboard structure are the frame, bus, overcurrent protective devices, instrumentation, enclosures and exterior covers. The switchboard frame is the metal skeleton that houses all the other components. The bus, which is either copper or aluminum, is mounted within this frame. The bus distributes power from the incoming cable conductors to the branch circuit devices. A horizontal bus distributes power to each switchboard section. In contrast, a vertical bus distributes power to the circuit protection devices within an individual section.

General purpose switchboards can include integrated insulated case circuit breakers, molded case circuit breakers, fused switches, metering and surge protection. The vast majority of switchboard applications can be served with a general purpose switchboard.

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Fusible switchboards are designed for commercial, industrial, and service entrance applications to protect and switch feeder and branch circuits. Each panelboard unit includes a switching contact structure with an instantaneous trip element.

Draw-out molded case switchboards provide the same basic capabilities as a general purpose switchboard, with the added functionality of offering draw-out capability for one or more feeder breakers. Draw-out molded case switchboards are often applied in critical applications like healthcare and data centers to reduce system downtime when replacing a breaker.

In recent years, draw-out capability in switchboards has been expanded to include molded case circuit breakers and power breakers typically found in low voltage switchgear assemblies. These switchboards provide higher density and a reduced footprint while accommodating higher current rated power breakers, and they require rear accessibility to barriered cable compartments. Eaton offers this capability in our Pow-R-Line XD switchboard.