

Difference between switchgear and panelboards

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In the design of power distribution systems, there is ambiguity regarding the use of switchgear vs switchboard vs panelboard. The application of each of them requires the deployment of a common node to supply power for onward distribution to other parts of a facility, while offering protection to the circuits downstream.

Despite these similarities, each of them has unique characteristics that make one more suitable for an application than others. In this article, we review the attributes of switchgear, switchboards, and panelboard, as well as compare them vs. each other.

As per Article 48 of NEC, switchgear is an assembly completely enclosed on all sides and top with sheet metal (except for ventilating openings and inspection windows) and containing primary power circuit switching, interrupting devices, or both, with buses and connections.

Typically, doors, removable covers, or a combination of both, provide access to the interior of the assembly. In comparison to switchboards and panelboards, switchgear has a larger capacity – with a voltage rating of up to 38 kV and a current rating of up to 6,000A. Generally, their design follows ANSI C37.20.1, UL 1558, and NEMA SG-5.

A switchboard is an assembly of components that reroute electricity from one or more sources to several smaller regions of usage. Because it is an assembly, it is easily modified and usually has overcurrent protection. Voltages handled by switchboard systems are 600 V or less, with currents of 1,600 A or higher. Thus, operates at power levels less than switchgear. Switchboards adhere to NEMA PB-2 and UL 891, and are accessible from the front and the rear.

The NEC defines a panelboard as: "A single panel or group of panel units designed for assembly in the form of a single panel, including buses and automatic overcurrent devices, and equipped with or without switches for the control of light, heat, or power circuits; designed to be placed in a cabinet or cutout box placed in or against a wall, partition, or other support; and accessible only from the front".

They are ideal for residential, commercial, and small industrial facilities operating between 120 and 600V or higher, depending on the location. Also, they can be designed to accommodate single-phase or three-phase power. Components on a panelboard include the main breaker, respective circuit breakers, and bus bars. Various types of panelboards include:

A switchgear can refer to different assemblies and parts used to help control and supply power to connected electronics. A switchboard is like a switchgear, but it is usually smaller and less complex with lower electrical ratings.

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Keep reading to learn more about the differences between these two electrical terms. By the end of this post, you'll gain additional insights into switchgears and switchboards.

To define switch gear, it is a range of devices or systems that function to regulate electricity delivery. The assemblies and components included in switchgears can also help in securing and isolating other systems.

Take note that switchgears also have differences among their types. For example, a medium-voltage model often works to distribute and manage power between 1KV to 75KV. On the other hand, a low-voltage variant may only control systems up to 1KV.

Like an electrical switch gear, a switchboard works to distribute electricity through connected power systems safely. It can also aid in controlling electrical flow to prevent issues.

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