

Distribution panels and main distribution boxes

Article Overview

Main panels serve as the central power intake, while distribution panels split and manage electricity to specific circuits or zones within a building.

Main Distribution Boxes (Main Panels)

A main panel, also called a main distribution box, is the primary point where electricity from the utility enters a building. It houses the main breaker, which controls the overall power supply and provides full-system protection against overloads and short circuits. Main panels handle higher voltages and currents, typically ranging from 100A to 4000A, and are usually installed near the utility source. They distribute power to branch circuits or downstream distribution panels, ensuring centralized control and safety for the entire electrical system. Key components of a main panel include:

- o Incoming terminals connecting to the utility supply
- o Main circuit breaker for overall system shutdown
- o Branch breakers for individual circuits
- o Optional surge protection and metering devices

Distribution Panels

A distribution panel (or distribution board) acts as an intermediary hub that receives power from the main panel and divides it into smaller circuits for specific areas, floors, or equipment. These panels are ideal for multi-zone or large buildings, providing localized control, load balancing, and energy monitoring. Distribution panels typically operate at lower capacities (50A-800A) and are installed inside buildings for convenient access. Key features of distribution panels include:

- o Busbars for efficient power distribution
- o Multiple outgoing breakers feeding downstream circuits or equipment
- o Optional integration of surge protection, metering, and monitoring systems
- o Modular enclosures with IP-rated sealing for harsh environments

Panelboards vs Distribution Panels

While the terms are sometimes used interchangeably, panelboards are generally compact assemblies designed to control and protect individual branch circuits, often in residential or light commercial settings. Distribution panels, on the other hand, serve as a central hub for routing power to multiple panelboards or large equipment, making them more common in industrial or multi-zone applications.

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Summary of Differences

Feature	Main Panel	Distribution Panel	Function
Central power intake and full-system protection	Splits power to specific circuits or zones		
Capacity	High (100A-4000A)	Lower (50A-800A)	
Location	Near utility source	Inside building, near load areas	
Components	Main breaker, branch breakers	Busbars, outgoing breakers, optional monitoring	
Application	Residential, commercial, industrial	Multi-zone buildings, industrial setups	

Understanding the roles of main panels and distribution panels is essential for designing safe, efficient, and maintainable electrical systems in any building type .

From residential 100-amp panels to massive 600 amp main distribution panels in

How do main electrical panels work. Learn the main parts of electrical panel, load center,

Distribution Panels vs. Switchgear: A Comprehensive Guide to Electrical Control and Distribution In our electrified

Distribution boxes, also known as electrical distribution boards or panels, are pivotal components in electrical systems, ensuring the

The power distribution boxes deliver electricity from the main electrical main to other circuits.

A load center (i.e., breaker box, fuse box) takes electricity from the utility source and distributes it

However, they are not nearly the same electrical panels, this article will bring you the differences between main and

Mains panels and distribution panels are usually used in a building's electrical system, and they are a complementary

The electrical panel--also called a circuit breaker box or service panel--is the central distribution point that connects

Discover how distribution panels ensure safe, efficient power distribution in homes, offices

Read this comprehensive buyer's guide on distribution boards, explaining what they are,

The electrical meter is mounted at the main electrical panel. From here, power is distributed to subpanels and circuits

Distribution panels and main distribution boxes

If you are providing power for a variety of different components at the same time, using a distribution panel is probably the best

Distribution boards might also be called panelboards, breaker panels, or simply electrical panels. A distribution board

Explore the difference between main and distribution panels in power systems. Learn usage, components, safety tips,

Christian Delbert / Shutterstock Here we look at the load centers--the distribution center or main panel and

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