

RIVO MULTITRADE OPTICAL SYSTEMS

Capacity of the primary distribution box



Overview

Distribution Box and Selection Guide: Internal Structure, Components. Learn how to choose a distribution box and understand its internal structure, inclu.

Key Takeaways

The total capacity of a primary distribution box depends on its rated amperage and the number of circuit slots, typically ranging from 5 to 15 devices for DC systems or 12-24 ways for residential AC panels. Understanding Distribution Box Capacity

A primary distribution box (also called a distribution board, consumer unit, or load center) is designed to safely distribute electrical power from the main supply to multiple circuits throughout a building . Its total capacity is determined by two main factors:

- **Amperage Rating:** This is the maximum current the main switch or main breaker can handle. For example, residential AC panels often range from 100A to 400A, while DC distribution boxes, like Ferroamp models, have main breakers rated at 63A 1000 VDC .



- **Number of Circuit Slots (Ways):** Each slot accommodates a circuit breaker or protective device. Residential AC panels commonly have 12, 18, or 24 slots, while DC distribution boxes may support 5, 8, or 15 devices depending on the model . Some slots are reserved for the main switch or surge protection devices, so the usable capacity is slightly lower than the total number of slots.

Practical Considerations

- **Spare Capacity:** Experts recommend adding 20–30% spare slots to allow for future expansion, such as additional lighting, appliances, EV chargers, or solar systems .
- **Load Matching:** The total capacity should match the expected electrical load of the building. Oversizing wastes space and money, while undersizing risks overloads and tripping .
- **Safety Devices:** The distribution box includes circuit breakers, RCCBs, and surge protection devices to prevent overloads, short circuits, and electrical hazards .

Example

A typical home distribution box might have 12 ways, with a main breaker rated at 100A. After accounting for the main switch and surge protection, it could safely accommodate 10 branch circuits for lighting, sockets, kitchen appliances, and HVAC systems . For DC systems, a Ferroamp Power Distribution 15 box can connect up to 15 devices to the DC grid, with a 63A main breaker . In summary, the total capacity of a primary distribution box is defined by its main breaker rating and the number of circuit slots, with practical planning including spare capacity for future expansion and safety considerations.

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