



# Busway 101

Everything you need to know about today's most cost-effective technology for feeding power to electrical loads

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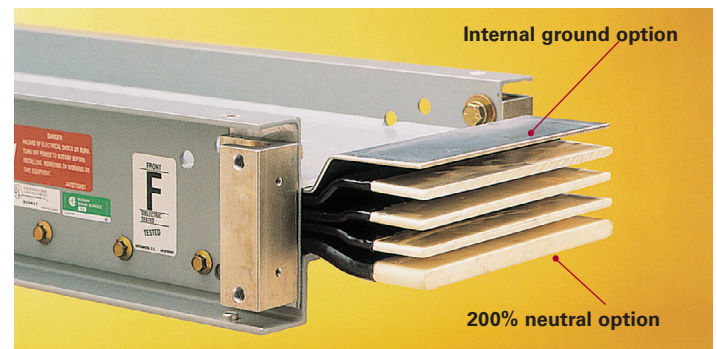
## Executive summary

From data centers and factories to high-rises and hospitals, today's commercial, residential and industrial facilities are perpetually short on capital, space and time. Using busway in place of cable and conduit to distribute electrical power can help building owners save all three commodities in significant amounts. This white paper provides an introductory overview of busway, describes its principal benefits and then explains some of the key attributes and capabilities to look for when evaluating busway product lines.

## What is busway?

Commercial, residential and industrial buildings have long distributed electrical power via cable and conduit. Busway is a more efficient alternative for accomplishing the same goal. Busway solutions include these core elements:

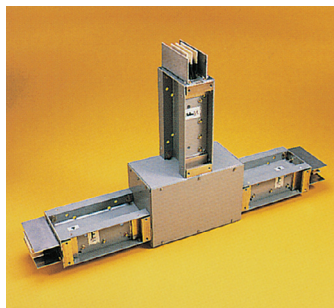
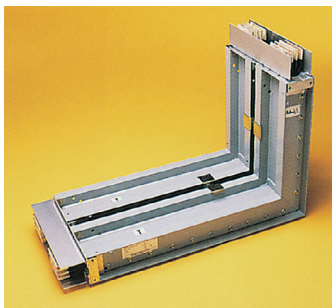
- **Conductors:** Also known as busbars, these are solid bars of either copper or aluminum that conduct electrical current
- **Housing:** This is a metal enclosure, typically made of aluminum, that contains the conductors
- **Insulation:** This key component prevents electrical faults by separating conductors from one another and from the unit's housing. Most busway products feature either air-insulated or epoxy-insulated designs



Busway consists of insulated conductors contained within a housing.

Busway comes in two basic styles:

- **Feeder busway:** Available in a wide variety of configurations and lengths, these are the main building blocks of a busway system
- **Plug-in busway:** Available in straight lengths only, these are busway pieces with the added ability to support one or more bus plugs at fixed positions. Bus plugs are the primary connection points for tapping in to the power supplied by the busway



Busway comes in a variety of configurations and sizes.

### Benefits of using busway

Busway offers several important advantages over cable and conduit. These include:

#### Ease of installation

Installing cable and conduit is complex, labor-intensive work that only highly specialized electricians can perform. Busway, by contrast, is a far simpler technology that most electricians with basic mechanical skills can assemble without expert help.



When compared to pipe and wire, busway is an easier to install solution that does not require specialized labor or tools.

#### Lower implementation cost

Paying specialized electricians for the many hours of effort required to bend and route conduit is a costly proposition. Companies that use busway instead can save that money and apply it to the bottom line.

#### Space savings

Space is almost always at a premium these days in data centers, office towers and most other buildings. Busway is a compact technology relative to cable and conduit that leaves more room for other, potentially revenue-generating uses.

#### Cost-effective adaptability

Once cable and conduit are in place, moving, expanding and reconfiguring it in response to growth or new requirements is generally both expensive and disruptive. With busway, facilities installing new equipment can simply add more bus plugs to their existing busway, while companies that need to move equipment can quickly and easily reconfigure their existing busway or even replace feeder busway with plug-in busway where required. Similarly, facilities with increased power requirements can quickly and easily swap out their existing bus plugs for new, higher-ampacity devices.

### Top busway applications

Almost any building that uses electrical power is a candidate for busway, but it's an especially good fit for facilities in these four categories:

#### Data centers

Most data centers add or replace server racks frequently as the workloads they support increase. Busway's flexibility and expandability enable IT facilities to accommodate such changes more swiftly, simply and cost-effectively. In addition, busway doesn't require remote power panels, so it lowers capital outlays and conserves expensive floor space. Finally, busway's size advantage over cable and conduit reduces congestion beneath raised floors, resulting in freer air flow, easier air management and lower cooling costs.

#### Industrial and manufacturing facilities

Most factories are packed with heavy-duty machinery and other electrical equipment. Using a bus plug to feed those devices directly from overhead busway is both simpler and cheaper than running cables from those machines to switchboards. Plus, industrial and manufacturing facilities that use cable and conduit often embed it in concrete beneath the shop floor, making moves, additions and changes more expensive and time-consuming. With busway, however, supporting new or re-arranged assembly lines is as easy as adding more pieces, relocating bus plugs or replacing feeder segments with plug-in sections.

#### Hospitals

Like data centers and factories, hospitals are constantly installing and repositioning equipment. Busway simplifies and reduces the cost of those processes at a time when budgets in healthcare are tighter than ever. It also empowers hospitals to dedicate space they would otherwise use for distributing power to delivering care instead.

#### Commercial and residential structures

In an office building or apartment tower, every square foot devoted to power distribution leaves one less square foot available for rent. With its trimmer profile, busway maximizes leasable floor space, resulting in greater revenue and richer profits.



## Key features to look for when buying busway

Companies eager to capitalize on busway's considerable benefits should look for products with these attributes:

- **Certified safety:** At a bare minimum, any busway product worth using must be certified by UL®, the Canadian Standards Association (CSA®) or the International Electrotechnical Commission (IEC)
  - **Indoor and outdoor options:** Reputable busway manufacturers typically offer products for both indoor and outdoor applications
  - **A wide variety of current ratings:** Varying applications impose varying current needs, which can shift over time as well. The best busway solutions support any current rating a customer might need, both now and in the future
  - **High fault current ratings:** To protect sensitive electrical equipment, busway must be capable of handling the available fault current that a given power distribution system is capable of throwing at it
  - **A broad range of plug options:** Look for product families whose bus plugs offer breaker, fusible switch, contactor and starter options for every requirement, as well as multiple surge protection and metering alternatives
  - **Flexible configuration options:** Variety is equally important when it comes to power distribution options, so be sure to choose busway products capable of handling both single-phase and three-phase power, with or without a neutral bar, or even with a 200 percent neutral. Selecting products that support integral, internal and isolated grounding options is critical as well
  - **Ease of installation:** All busway products are easier to install than cable and conduit, but best-in-class offerings further simplify deployment by providing thoughtful extras like alignment pins that prevent you from installing bus plugs out of rotation and clearly labeled stickers that help you quickly see where segments connect
- **Alternative options for connecting directly to other electrical equipment:** Most busway manufacturers require facilities and installing contractors to connect other products like group metering and panelboards via cable runs between bus plugs and distribution equipment. The most sophisticated busway solutions, however, save money and floor space while shortening installation times by allowing companies to connect group metering and panelboards directly into a nearby busway segment instead
  - **ENERGY STAR® and LEED® certification:** Buildings certified under the Leadership in Energy & Environmental Design (LEED) standard for environmentally sustainable construction are often eligible for tax breaks and other financial incentives, so look for busway products that qualify for LEED credits. Using busway bearing a SMaRT® certification can qualify facilities for additional utility rebates, and will also reduce operating expenses by lowering power bills
  - **Comprehensive services and support:** Busway is an intuitive, largely do-it-yourself technology, but users sometimes require planning and implementation assistance just the same. Make certain, therefore, to purchase busway only from vendors with the experience and resources to provide expert services and support when necessary

## Conclusion

Though cable and conduit has been the default option for distributing power to electrical equipment for many years, busway offers an extensive list of practical and financial advantages. Businesses looking to simplify power distribution and increase agility while saving money and conserving space should take a close look at carefully designed and equipped busway solutions from proven vendors with the products, people and expertise to meet all of their needs.

## About Eaton

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*We power businesses with reliable, efficient and safe electrical power management solutions. Combined with our personal service, support and bold thinking, we are answering tomorrow's needs today. Follow the charge with Eaton. Visit us at [Eaton.com/busway](http://Eaton.com/busway).*



Well-made busway solutions come with thoughtful installation aids like the alignment pin on this bus plug, which prevents technicians from installing the device 180 degrees out of rotation.

For more information, visit  
**[Eaton.com/busway](http://Eaton.com/busway)**

