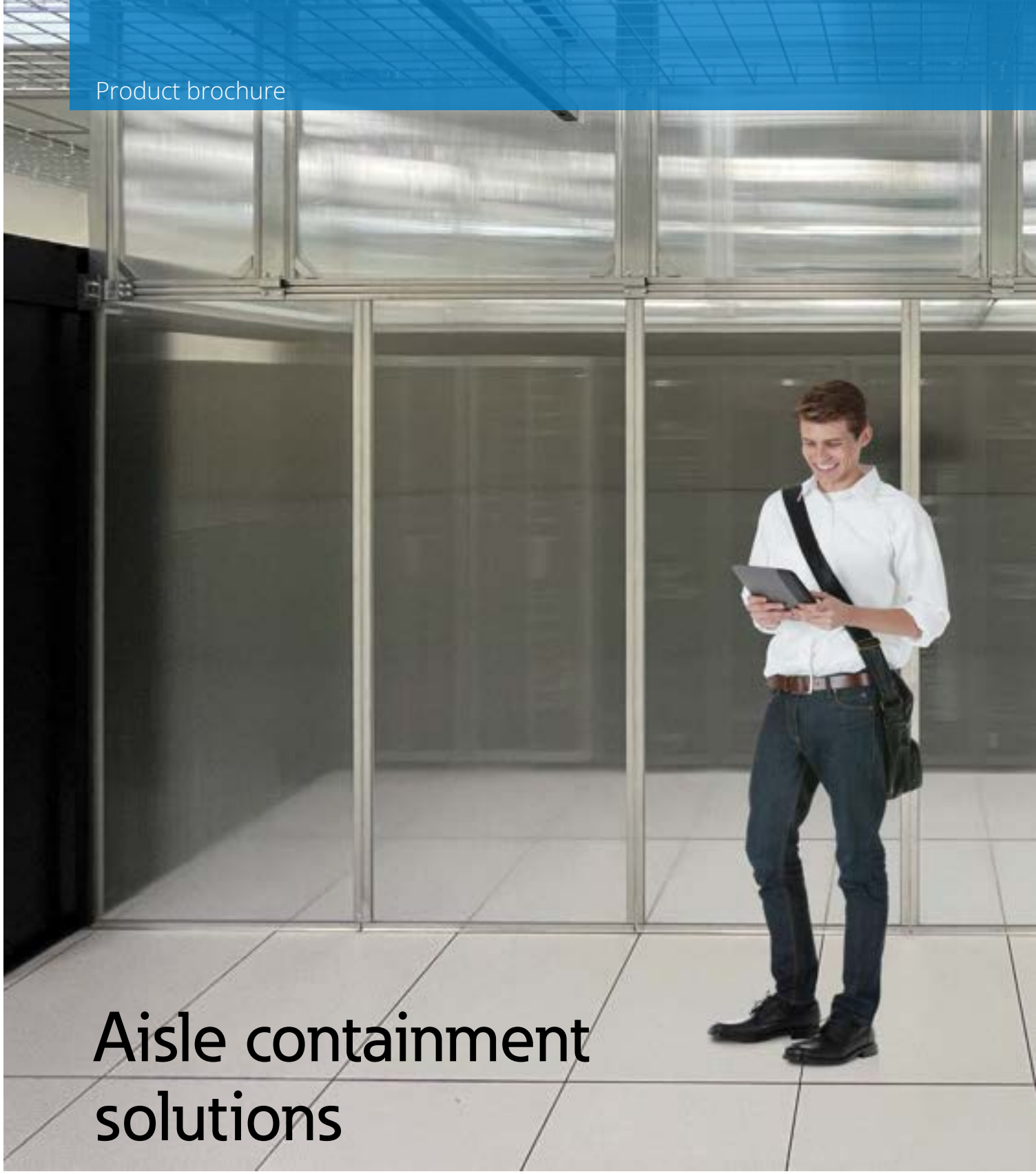
Product brochure



# Aisle containment solutions

Powering Business Worldwide

# The new standard in IT airflow management

Eaton's wide selection of data center aisle and rack containment solutions is designed to optimize your data center's efficiency, security and cost-effectiveness.

Engineered to maximize energy efficiency and reduce cooling costs, our aisle and rack containment systems contain and guide cool air within the racks to where it's needed most. By preventing hot and cool air from mixing, they create a controlled environment that maximizes the performance and lifespan of your IT equipment.

Eaton's RapidPod aisle containment system provides a modular, quick-to-deploy containment system for smaller spaces or edge environments. For larger facilities, Eaton's standing hot aisle containment (HAC) system offers a scalable, floor-mounted containment structure. The easy-to-assemble SmartRack aisle containment system creates a room within the aisle.

From rapid deployment in a compact server room to robust containment across multiple aisles in a large-scale operation, Eaton offers flexible, customizable options for aisle containment.

# Aisle containment solutions

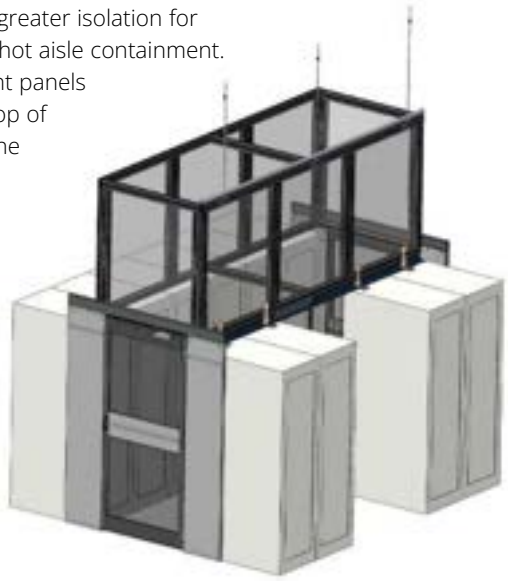
Industry studies by the Uptime Institute estimate that up to 60% of the cool air supplied to traditional data centers is wasted because it bypasses the intended IT equipment and returns directly to the hot air intake of the CRAC. Adopting a cold or hot aisle containment strategy increases air efficiencies, allowing a significant reduction of cold air supply, which translates to longer hardware life and valuable energy savings.

Eaton's solutions can be equally effective for both hot and cold aisles in the data center:

- Containment structures can be rack-, ceiling- or floor-mounted, allowing for easy rack changes within the row.
- Horizontal or vertical panels mount easily to the top of Eaton's Paramount or SmartRack enclosures or any other enclosures.
- Containment panels are comprised of clear materials that have safety ratings, such as UL 94 V-0, ASTM E 84, FM4910 or antistatic.

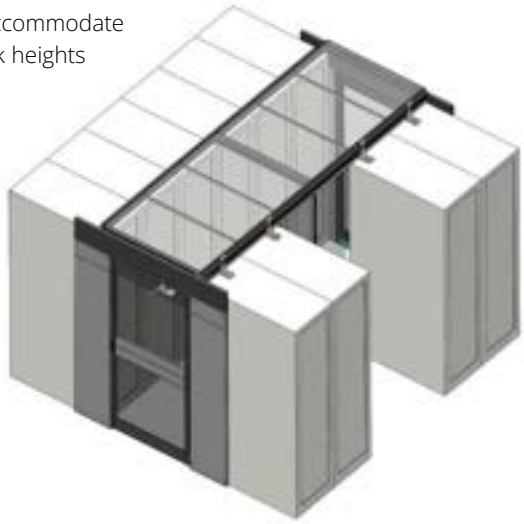
## Vertical aisle containment

This system allows greater isolation for either cold aisle or hot aisle containment. Vertical containment panels connect from the top of the enclosures to the data center ceiling.



## Horizontal aisle containment

Eaton's ceiling system is modular and scalable to accommodate differences in rack heights and row spacing.

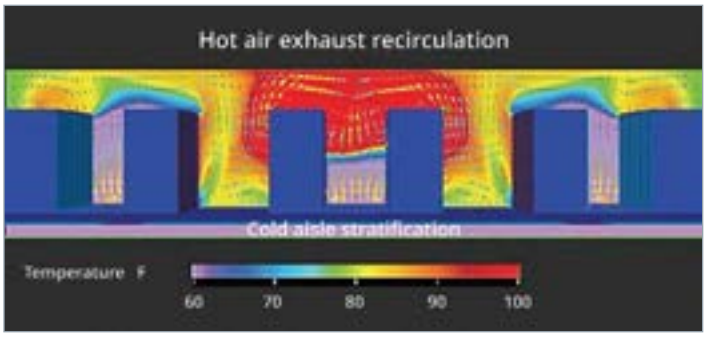


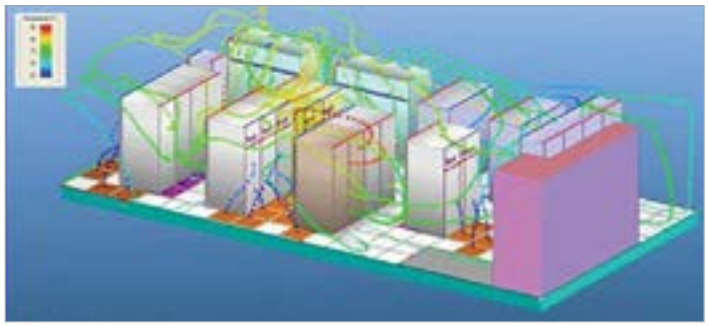
## Why airflow management?

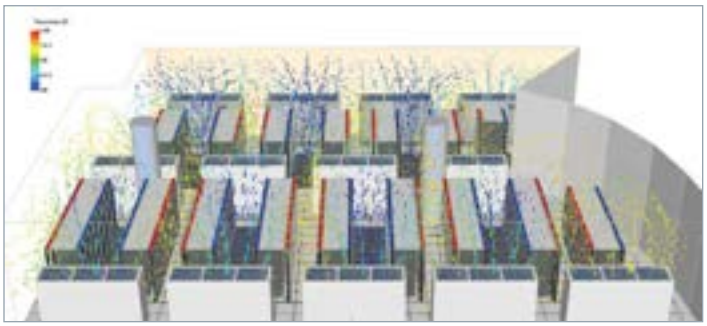
Airflow in legacy data centers can be unpredictable and have numerous inefficiencies that may worsen as power densities increase.

**Inefficiencies include:**

- Bypass airflow
- Recirculation
- Air stratification
- Hot and cold air mixing





# RapidPod aisle containment system

## Modular, scalable, field-configurable airflow management

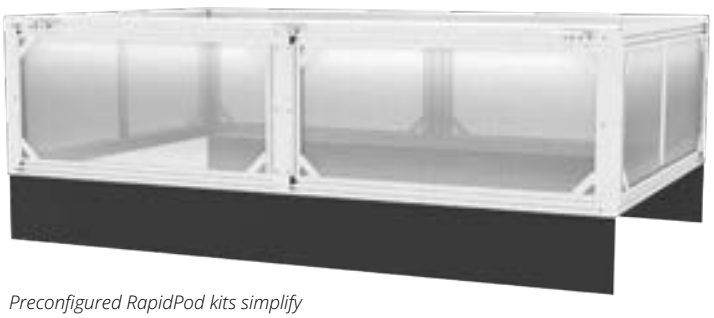
Prevent hot and cool air from mixing in IT environments with the RapidPod aisle containment system. With 60 preconfigured kits available, the RapidPod system simplifies ordering and deployment. The components are modular, allowing the system to be adjusted, extended or customized to fit almost any hot aisle/cold aisle rack configuration to maximize thermal efficiency and reduce cooling costs.

**Cooling optimization**

- Hot and cool air are separated for more efficient cooling, better temperature control and improved equipment performance.
- Better efficiency saves energy and lowers air conditioning costs.

**Strong and durable construction**

- Frame is made of high-strength aluminum extrusions with five-point secure attachment interfaces, providing stability and long-term durability.
- Modular panels, available in transparent or semi-transparent polycarbonate, allow light in to facilitate visual inspection while maintaining thermal isolation.



*Preconfigured RapidPod kits simplify ordering and support easy customization.*

**Fully customizable**

- The RapidPod system can be adapted to fit a wide range of gap sizes, irregular layouts or any future changes in the rack row.
- The system supports vertical (hot aisle) or horizontal (cold aisle) configurations.
- Choose rack-mount or ceiling-mount brackets to support the frame.
- End-of-row doors are available in café, swing and sliding door styles.

**Convenient setup**

- Modular panels are pre-assembled for fast, hassle-free installation with standard hand tools.
- Extension options are designed to integrate seamlessly with RapidPod kits.

# RapidPod configurations

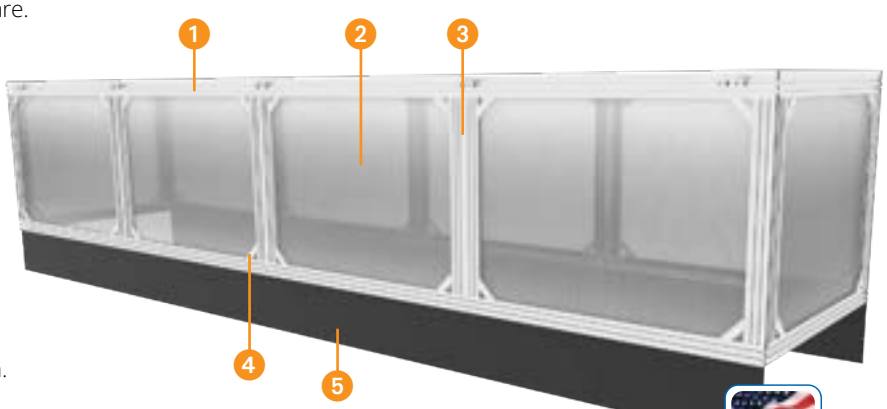
Get the main components of the RapidPod system with preconfigured kits in common aisle configurations. Next, add rack or ceiling mounting brackets. Finally, add any expansion panels or other customization needed for your specific design. The system can be built to accommodate almost any layout.

## Preconfigured RapidPod kits

Available in 60 configurations, RapidPod kits include an extruded aluminum frame, polycarbonate panels, flap seals and necessary hardware.

- Height: 18, 24, 36, 42 or 48 in.
- Width: 42, 54 or 60 in.
- Length: 8, 16, 24 or 32 ft.

1. **Extruded aluminum frame**
   Five-point secure attachment interfaces provide stability and long-term durability.
2. **Polycarbonate panels**
   Available in transparent or semi-transparent polycarbonate, the panels permit visual inspection.
3. **Splice brackets**
   Securely connect panels.
4. **Gusset brackets**
   Add diagonal reinforcement to distribute load and minimize sway.
5. **Flap seals**
   Flexible sponge rubber compresses to create a seal against moisture and contaminants.




*Model: RPODPNL3654192*
*Size is 36 in. H x 54 in. W x 192 in. L (16 ft. L)*

TAA COMPLIANT

## Mounting options

Choose the mounting brackets appropriate for your installation.

- Rack-mount brackets secure the RapidPod system to the top of server racks.
- Ceiling-mount brackets secure the RapidPod system to an overhead structure.

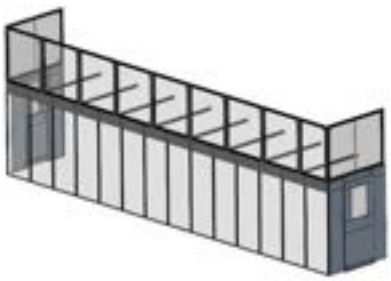
## Extension options

Additional components expand and customize the RapidPod kits to fit almost any hot aisle/cold aisle rack configuration. Choose from 42 different extension kits, compatible brackets and flap seals.

## RapidPod special configuration options

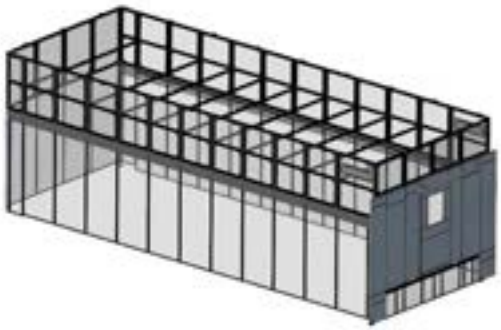
**Three-sided pod**

- Room wall serves as fourth side
- Side-mounted swing doors
- Standard blanking panels close ends of row
- Flexible part-ordering options available



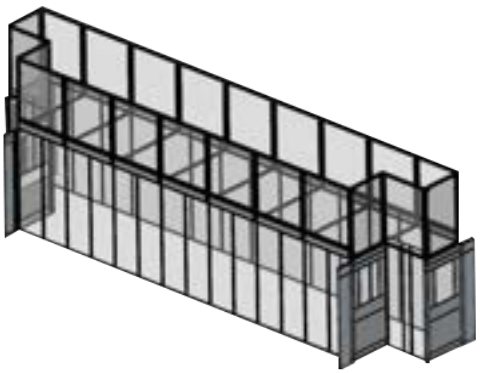
**Special designs**

- Can be configured to meet specific customer requirements
- Accommodates complex room features



**Split-length pod**

- "Inside" corners



# Hyperscale standing hot air containment (HAC)

## Fully customizable containment for hyperscale data centers

Eaton's standing hot aisle containment (HAC) system is a freestanding structural enclosure engineered to deliver maximum cooling efficiency and robust support for critical infrastructure. Designed for greenfield data center deployments, the standing HAC ensures reliable performance while offering unmatched flexibility and compatibility with advanced cooling technologies.

TAA COMPLIANT

**Fully customizable**

- The standing HAC can be tailored to meet the unique requirements of each facility.

**High weight capacity**

- Arms and structural framework are engineered to support heavy loads, including electrical busways, telecom equipment, fire suppression systems, lighting and liquid cooling manifolds.

**Liquid cooling ready**

- Fully compatible with liquid cooling systems, the standing HAC enables seamless integration with next-generation cooling strategies.

**Freestanding design**

- The standing HAC provides independent structural support without reliance on racks, simplifying installation and scalability.

**Optimized airflow management**

- Rack arrangement pressurizes cooled air from the raised floor within a contained area, ensuring efficient delivery to IT equipment.

**Effective heat removal**

- Perimeter cooling units draw hot air from the hot aisle or surrounding room through the top to maintain stable operating temperatures.

*The HAC supports the integration of liquid cooling manifolds to cool high-density server racks.*

*The HAC is compatible with cable management solutions, including cable tray and fiber routing systems, to organize, route and protect cables in high-density installations.*

# SmartRack aisle containment

## Easy-to-assemble aisle containment

The SmartRack aisle containment system is a simple way to improve cooling efficiency in hot aisle/cold aisle rack configurations. Essentially creating a room within the aisle, the system helps keep hot air and cold air separated to make existing air conditioning systems more effective.

The system is designed to be installed without the assistance of contractors or HVAC specialists. Components are organized into modular kits and come with assembly hardware and instructions for easy step-by-step installation.

*A fully assembled SmartRack aisle containment system improves cooling efficiency while keeping equipment accessible.*

**Cooling optimization**

- Aisle containment keeps hot air and cold air separated for more efficient cooling, better temperature control and improved equipment performance.
- Increased cooling efficiency saves energy and lowers air conditioning costs.

**Convenient setup**

- Installation does not require a contractor or HVAC specialist, saving time and expenses.
- Kits have a manageable number of parts and include assembly hardware and instructions to streamline installation.
- Frame mounts to floor with included brackets and user-supplied hardware.

**Security**

- Sliding double doors have a key lock for controlled aisle access.
- Roof panels and sliding double doors have clear acrylic panels, allowing room light into the aisle for security and monitoring.

**Compatibility**

- The system works with any combination of 42U, 45U and 48U rack cabinets from most manufacturers.
- Racks can be standard width (600 mm) or wide (750 mm).
- The system is compatible with new installations and retrofits to existing aisles.

**Flexibility**

- Modular kits make it easy to adjust the system if aisle configurations change.
- Telescopic beams adjust to accommodate four to six standard-width racks per side or four to five wide-width racks per side.
- Multiple kits may be connected for longer aisles.

# Aisle containment solutions

## End-of-row doors

Eaton's upgraded end-of-row doors bring a modern look to aisle containment strategies. Made of sturdy, lightweight aluminum instead of steel, these doors are easier to handle, install and integrate into installations without sacrificing durability and performance.

End-of-row doors block obvious escape routes for air and eliminate air recirculation and air mixing to enhance the overall efficiency of cold aisle containment. Choose from café, swinging and sliding door styles and over 20 side panel extensions.

**Durable aluminum frame**

- Lighter in weight than steel doors, aluminum doors are easier to install, handle and maintain.

**Convenient visibility**

- Windows are fully transparent and resist impact. They are rated UL 94 V-0 for flame resistance.

**Flexible installation**

- Choose from field-ready, rack-integrated and ceiling-mount options.

TAA COMPLIANT

**Universal compatibility**

- Doors are adaptable to almost all enclosures, regardless of manufacturer.

**Improved airflow efficiency**

- Within the cold aisle, doors maximize cold air delivery from the bottom of the enclosure to the top.

**Cost-effective containment**

- Doors reduce hot/cold air mixing, extending uniform cold air supply to servers.
- An integrated edge grip seal at the bottom of the doors seals air gaps to maintain blockage.

## Door styles

**Café**

- Height: 90 or 96 in.
- Width: 42 in.
- 90° hold-open feature for convenient equipment adjustments and maintenance
- Optional stainless steel crash plates

**Single swing**

- Height: 90 or 96 in.
- Width: 33 or 36 in.
- Field-reversible design supports left-hand and right-hand swinging
- Grabber latch to hold the door open or closed

**Dual swing**

- Height: 90 or 96 in.
- Width: 48 in.
- Field-reversible design supports left-hand and right-hand swinging
- Grabber latch to hold the doors open or closed

**Single sliding**

- Height: 90 or 96 in.
- Width: 36 in.
- Field-reversible design supports left-hand and right-hand sliding
- Automatic-close/ hold-open feature for smooth, reliable operation

**Dual sliding**

- Height: 90 or 96 in.
- Width: 48 in.
- Field-reversible design supports left-hand and right-hand sliding
- Automatic-close/ hold-open feature for smooth, reliable operation

# Rack containment solutions

## Heat containment system (HCS)

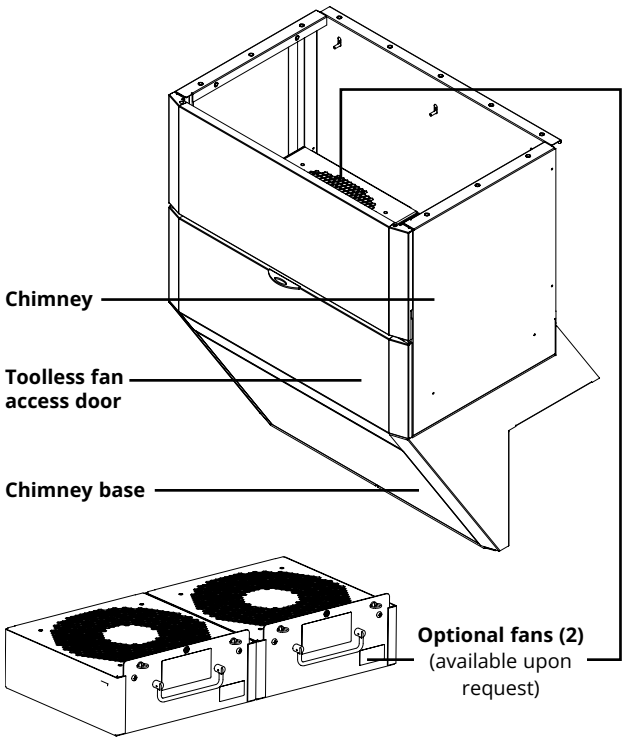
Eaton's HCS is a simple, scalable and low-cost solution to cool up to 25 kW or more per enclosure without the expense of adding supplemental CRAC units to your data center.

- Patented technology is available on Eaton's Paramount and Vantage S2 enclosure systems and can also be field-retrofitted to Eaton's SmartRack enclosures and most enclosures by other manufacturers.
- HCS contains and directs the heat exhaust of your IT equipment through the chimney that is attached to the top rear of the enclosure.
- Hot air is then ducted to your existing CRAC units through a plenum ceiling or high air returns.


Photo courtesy of Humana

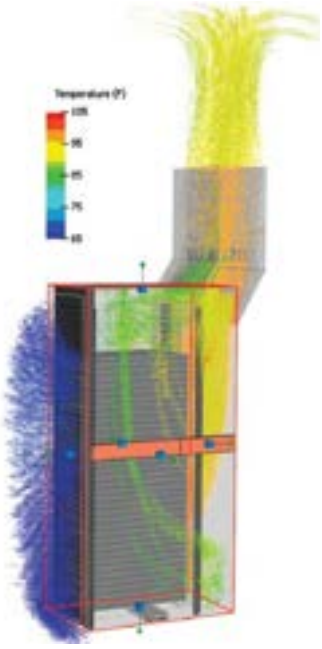
*The HCS allows for your existing cable management without the interruption of rerouting or disconnecting cables and power. Shown here on Eaton's Paramount enclosure system.*

**HCS can be an active and/or passive chimney solution that effectively manages the ever-increasing heat loads in today's data center.**




**Eaton's HCS is:**

- **Scalable**—can be adapted to existing infrastructures to increase rack utilization as your capacity demands grow
- **Predictable**—separates hot exhaust air and cold supply air, dramatically increasing the reliability of the data center
- **Efficient**—allows hotter air to return directly to the CRACs, increasing their efficiency by operating at a higher Delta T (ΔT)
- **Reliable**—extends existing cooling capacity throughout the data center, freeing up stranded assets and lowering operational costs
- **Flexible**—does not require you to alter existing enclosure locations and is also field-installable on third-party enclosures



**Computational fluid dynamics (CFD) model showing airflow through an active HCS system.**

# Rack containment solutions

## HCS flexible return duct

For data centers unable to accommodate steel chimneys, an alternative solution for controlling chaos cooling is Eaton's flexible return duct. A simple interface easily connects to the top of the HCS chimney.

- Flexible 10 in. ducts are clamped to the interface and a 2 ft. x 2 ft. ceiling tile, which is mounted to the plenum ceiling to create a closed-loop system.
- Ducting is V-0 rated and self-extinguishing.
- Ceiling tile is available in NuGrey to match existing tiles.
- Ducting can be cut in the field for custom fits.
- Each duct comes with four clamps.
- Ducts are positioned directly over the fan for maximum airflow.


**The HCS flexible return duct is an ideal solution for enclosures that are off-grid from drop ceilings, where obstacles preclude the use of sheet metal chimneys, or where there are uneven ceilings throughout a data center.**

## Telescopic chimney

The Eaton telescopic chimney (TC) is a passive straight duct that channels the hot exhaust from the rear of a high-density enclosure to the return plenum. By preventing the hot exhaust air from mixing with the cool air in the data center ambient space, the TC maximizes cooling efficiencies and reduces energy costs.

**Features**

- **Multiple height options:** The TC extensions range from 12 in. high to 76 in. high to accommodate most data center ceiling heights and offer infinite adjustability within the selected height ranges.
- **Compatible with Paramount:** The TC is compatible with all of Eaton's standard Paramount enclosures for existing and new data center build-outs.
- **Data center upgrades:** The TC and its Paramount components can be retrofitted on existing Paramount enclosures. The top panel can be replaced with a Paramount enclosure TC top panel with chimney cut-out. The rear door can be replaced with a solid door.

**Benefits**

- **Increased efficiency:** The TC is capable of channeling up to 30 kW of heat exhaust to the return plenum. This prevents hotspots, recirculation and remixing and thus maximizes cooling efficiencies.
- **Low maintenance:** The TC has no moving or electrical parts to monitor or maintain.
- **Ease of installation:** The TC attaches to the enclosure top panel with eight fasteners and can be installed in less than 30 minutes. The TC is secured to its desired height with only four fasteners.

**Rear view of the Telescopic Chimney mounted on a Paramount enclosure with solid rear doors. Model JDDS8430 shown here.**

**Chimney extensions range from 12 in. high to 76 in. high to accommodate varying data center ceiling heights. Model EXTTC4376 shown here.**

**Top panel includes two brush strips for cable entry. Brush cable openings can accommodate 1,000 (40 in. deep panel) to 1,600 (45 in. deep panel) Cat6 cables. Model JTPTC3045 shown here.**

# Airflow management accessories

## Blanking panels

In today's dynamic data center environment, IT equipment is refreshed on a frequent basis. These changes often leave open U-space in the enclosure which can allow recirculation of hot exhaust air back to the equipment inlet. This can cause overheating of the equipment and subsequent shutdown of servers when the maximum temperature threshold is reached.

Blanking panels provide a quick, easy and cost-effective solution to optimize air circulation within an enclosure while maintaining aesthetics.

- Blanking panels significantly reduce recirculation of hot exhaust air to the equipment inlet.
- Available in toolless, mechanically fastened and cable pass-through styles with plastic and steel options.
- Width meets EIA-310-D standards for 19-inch rack equipment.
- Available in 1U, 2U, 3U, 4U, 5U, 6U, 7U, 8U and 20U heights (depending on style).
- Most panels are bulk-packed in quantities of 10 and 100.

**Toolless plastic blanking panels are a low cost and necessary solution for preventing recirculation and optimizing airflow in your rack (Model: ETN-PBP1U10).**

**Brush strips allow routing of cables through the panel (Model: ETN-CMBPBRSH1U).**

**Vertical blanking panels seal open spaces and prevent bypass airflow in areas that are traditionally difficult to seal. They can also be adapted for cable management.**

**Adjustable blanking panels, offered in two sizes (7-12U, 12-22U), easily adapt to your hardware requirements (Models: SBP712USQ, SBP1222USQ).**

# Airflow management accessories

## Paramount high-flow doors

Eaton's high-flow doors offer exceptional airflow with 75% perforation, a 19% increase over the industry standard.

- Unique perforation pattern results in a reduction of raw material consumption by over 60%, which means less waste in the manufacturing process—a great "green" benefit.
- Doors are available as left- or right-hinged and are also field-reversible.
- High-flow perforation is also available for the rear door and can be ordered as full or split. The doors feature toolless door removal, a brushed aluminum door pull and a variety of locks.

SmartRack heavy-duty enclosures
Eaton's SmartRack heavy-duty enclosures have optimized hexagonal door ventilation (~80% open pattern) to provide enhanced airflow.

## Raised floor grommets

By installing Eaton's raised floor grommets, you can optimize the effectiveness of existing cooling equipment and manage increasing heat loads. The raised floor sealing system specifically addresses bypass airflow and its detrimental effect on data center cooling.

**Features and benefits**

- **Increased energy efficiency and predictability**—eliminates bypass airflow while maintaining a consistent subfloor plenum pressure.
- **Flexible, thoughtful design**—overlapping serrated fingers and optional elastomer ties adapt to any size or shape cable bundle. Ties ensure a complete and lasting seal by providing tension against the cabling.
- **Superior performance**—helps deliver faster, greater return on investment.

**Non-permeable material allows maximum pressure to be maintained in the sub-floor plenum when cables are installed, minimizing bypass airflow (Models: FG118, FG76).**

To contact an Eaton salesperson or local distributor, visit **Eaton.com/AisleContainment** or call **800.225.7348**

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