



Vertiv™ SmartAisle™
Containment

Energy-efficient Data Center Cooling



Vertiv™

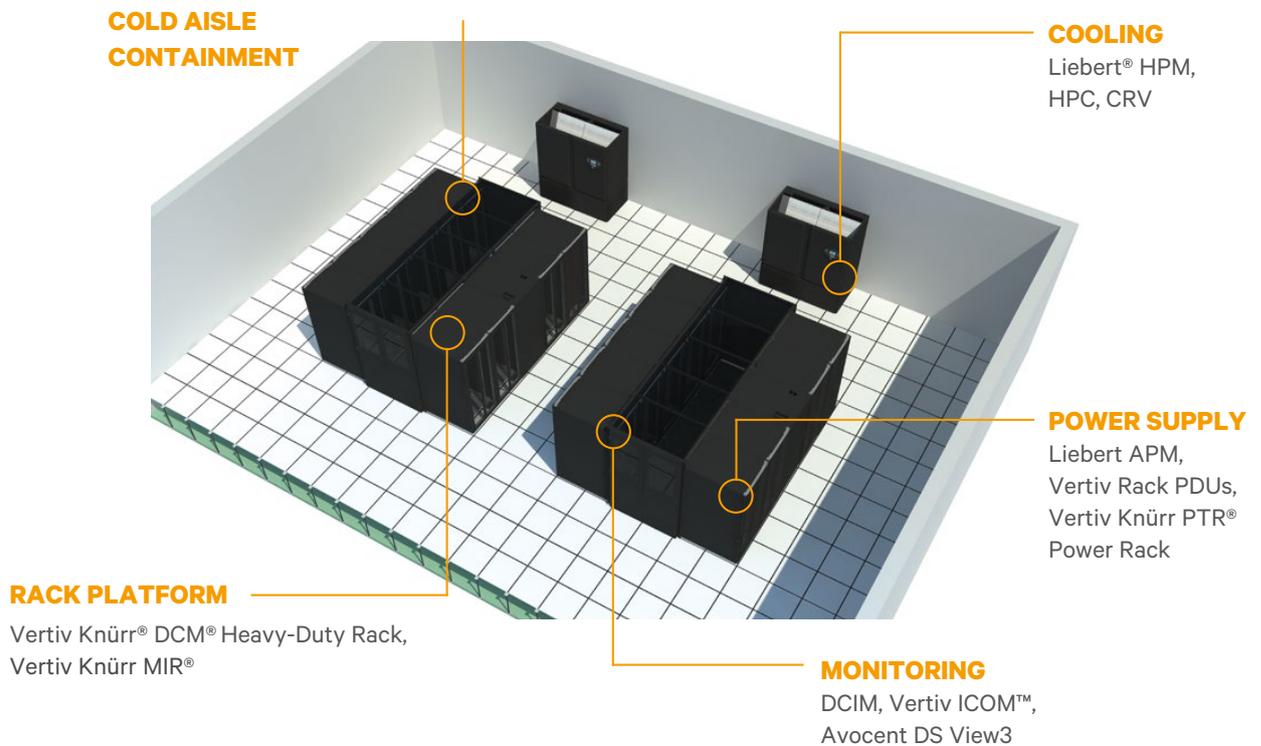
Vertiv designs, builds and services mission critical technologies that enable the vital applications for data centers, communication networks, and commercial and industrial environments. We support today's growing mobile and cloud computing markets with our portfolio of power, thermal, infrastructure management products, software and solutions, all complemented by our global service network. Bringing together global reach and local knowledge, and our decades-long heritage including brands like ASCO®, Chloride®, Liebert®, NetSure™ and *Trellis*™, our team of experts is ready to take on your most complex challenges, creating solutions that keep your systems running—and your business moving. Together, we're building the future of a world where critical technologies always work.

YOUR VISION, OUR PASSION.

VertivCo.com



Vertiv™ SmartAisle™ – the comprehensive data-center solution



ITs most important response is the increasing independence of applications from within the IT infrastructure. Virtualization and cloud computing are today's buzzwords. Energy-efficient IT components and their dynamic control according to the applications' current needs form the hardware basis for this.

In terms of physical infrastructure the answer lies in the Vertiv SmartAisle from Vertiv. In the data-center, the SmartAisle forms the room, the power supply and the cooling system for servers, storage and the network. Choosing a comprehensive range of components that are tailored to one another in every respect enables the physical infrastructure to be adapted to any need imaginable, since no data-center is like any other and no data-center remains unchanged for long.

The Vertiv SmartAisle solution ensures optimal availability, efficiency and future-proofing.

Features

- Best failsafe capacity
- Ideal temperature for IT; no hot spots
- Minimum power consumption
- Easy to plan and run.

Complete solution

- Racks
- Rack PDUs
- Power distribution
- UPS
- Cooling with Vertiv ICOM control
- Enclosure
- Cable management
- Monitoring: cabinet and aisle
- Data Center Infrastructure Management (DCIM)
- Commissioning and maintenance
- Other services.

All active components have interfaces to a top-level infrastructure management system (Vertiv *Trellis*™) which facilitates integrated monitoring, management and automation of the physical infrastructure.

Achieved energy savings through patented, controlled cold aisle containment in many projects (banks, insurance companies, industry etc.).



the green grid™

Green IT

- Reduction in CO₂ emissions through optimum energy efficiency.
- Very good PUE values are achieved, often better than 1.35
- Compliance with the EU Code of Conduct.

Vertiv™ SmartAisle™ – A form of containment proven to lead to substantial savings in energy costs

Vertiv™ SmartAisle™ – the comprehensive data-center solution

Control from Vertiv

Due to rising power costs and increased environmental awareness, almost every operator's current objective is to operate their data-center as energy efficiently as possible.

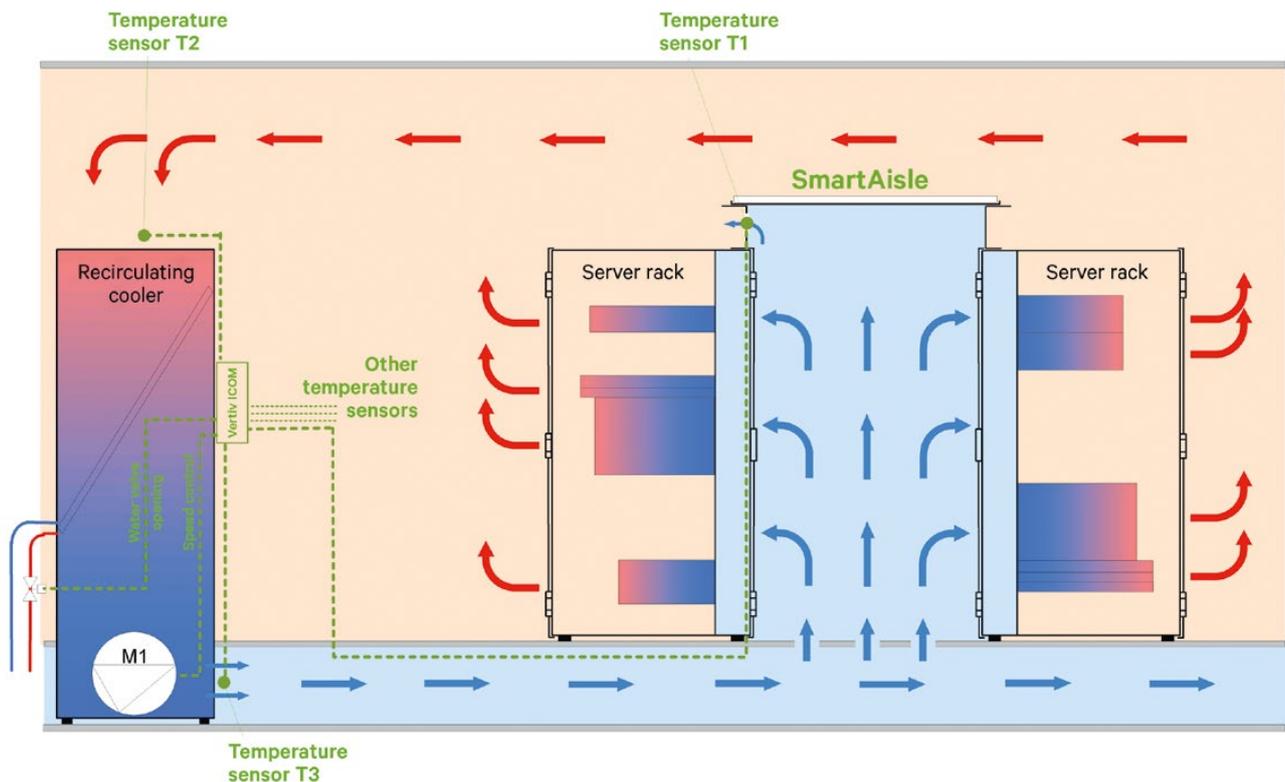
Many already ensure the basic separation of cold air from warm air with dummy (blanking) panels, bushings for cable entry, cold aisle containment, etc. The data-center can be further optimized by adjusting the fan speed of the recirculated air devices. This is an essential and important factor for an energy-efficient data-center. The operator can save enormous power costs by choosing the most appropriate type of regulation.

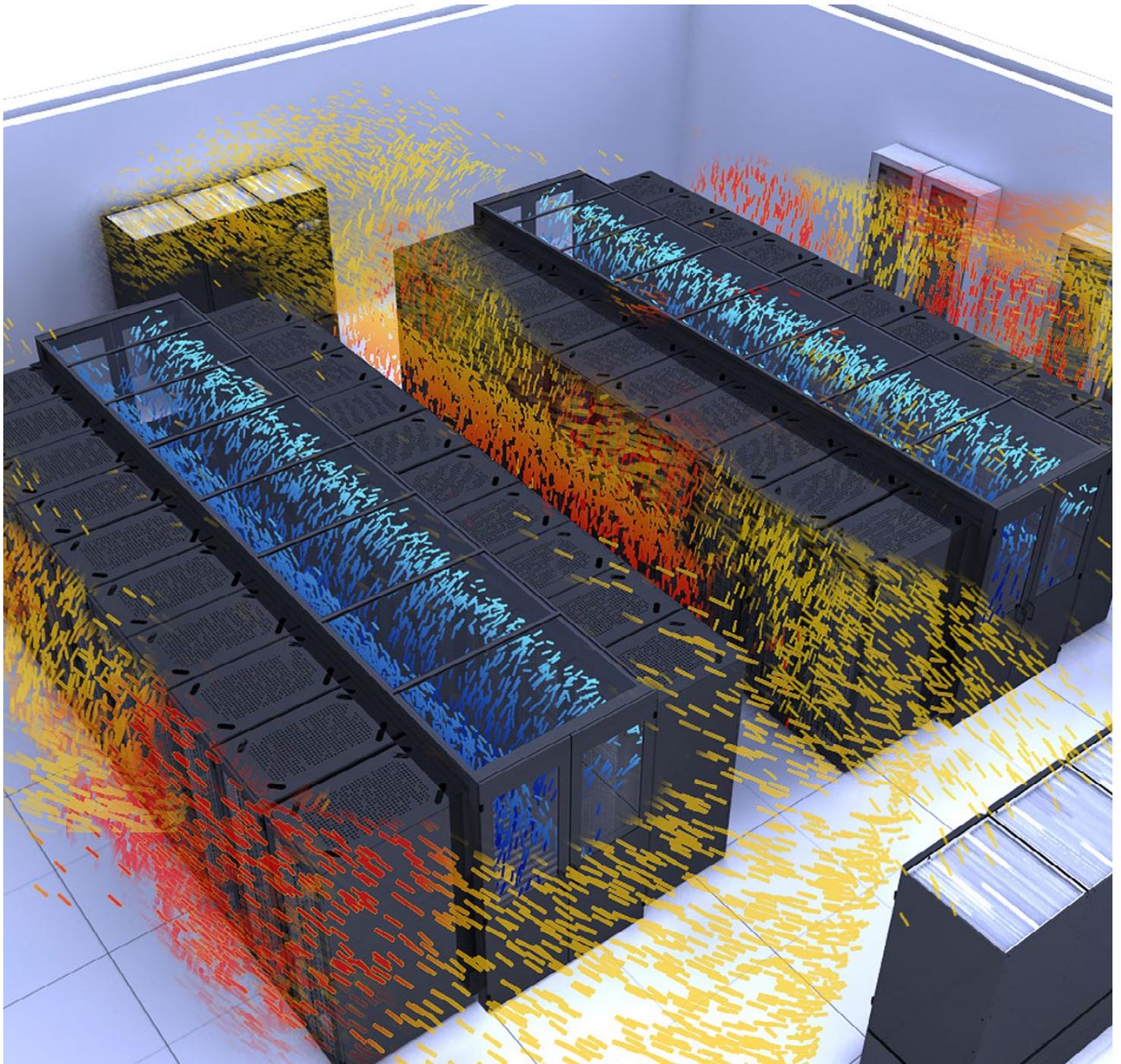
The right choice can also increase availability. The failure of a device serving to recirculate air is compensated by increasing the speed of the other devices. In terms of control, there are two main principles in use – pressure control and control via the cold aisle temperature.

With the Vertiv SmartAisle control principle, the cold aisle temperature, i.e. the temperature of the air supply to the servers, is used to control the fans which regulate the temperature in the room (see figure). This control principle is patented.



The principle of the Vertiv SmartAisle™ control





Vertiv™ SmartAisle™ containment – systematically separating cold from warm air forms the basis of an energy-efficient data-center

Vertiv™ SmartAisle™ – the comprehensive data-center solution

Overview of Vertiv SmartAisle Containments



STANDARD

Standard product range:

- Aisle width 1,200 / 1,500 and 1,800 mm
- Rack height 2,000 and 2,200 mm.

Features:

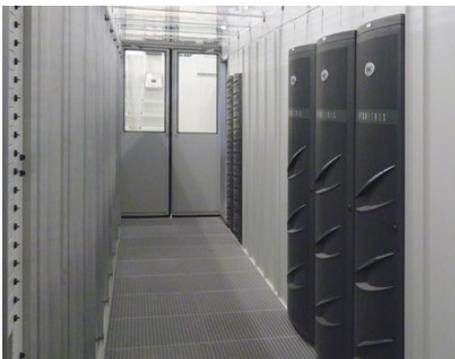
- Ideal for new data-centers and for retrofitting homogeneous cabinet aisles
- Industrial prefabrication makes for a highly economic solution
- Quick and easy to assemble on site.



CUSTOMIZED

Features:

- Precisely fitted to cabinets and cabinet positions
- Suitable for retrofitting non-homogenous data-centers
- Combination with Vertiv SmartAisle standard.



FREE-STANDING

Features:

- Flexible fitting to cabinets with non-standard dimensions
- For cabinets and applications that are swapped out on rotation
- Can be combined with Vertiv SmartAisle standard.



SWITCHTUBES

Features:

- No hot spots
- Adequate airflow
- Can be used in energy-efficient data-center.

Vertiv™ SmartAisle™ Containment Standard

Containment Solution from Vertiv™

The Vertiv SmartAisle™ standard product range consists of flexible, adaptable and user-friendly components.

The individual components equate the tolerances of the racks, which are not usually installed with millimeter precision. The system fits not only onto Vertiv Knürr racks but also onto most commercially available racks. The racks do not need to be installed in pairs. The top panels are transparent to allow use of the available room lighting.

The standard top elements are ready for the patented Vertiv SmartAisle controller.

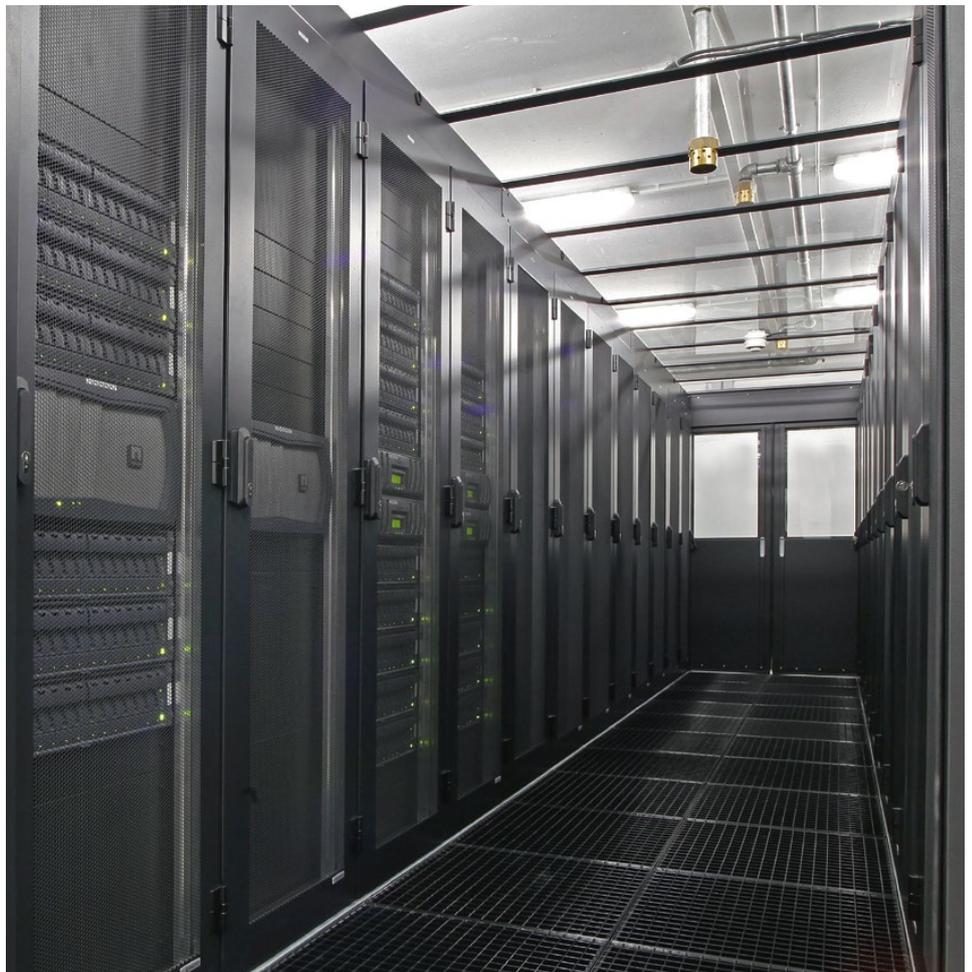
Different door systems are available – hinged doors and sliding doors. Hinged or swing doors are better in terms of safety and emergency exits. On the other hand, sliding doors take up less space.

Standard product range

- Aisle width 1,200 / 1,500 and 1,800 mm
- Rack height 2,000 and 2,200 mm.

Features

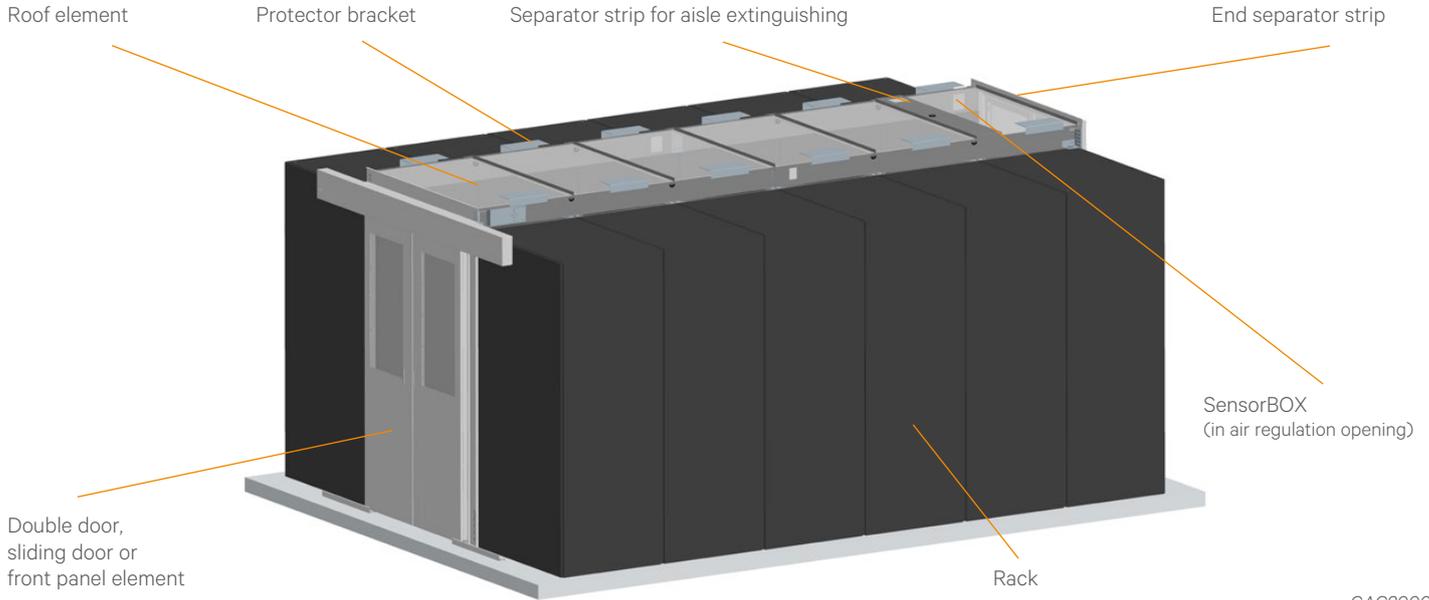
- Ideal for new data-centers and for retrofitting homogeneous cabinet aisles
- Industrial prefabrication makes for a highly economic solution
- Quick and easy to assemble on site.



Vertiv SmartAisle Containment Standard
ideal for homogeneous layout in the data-center

Vertiv™ SmartAisle™ Containment Standard

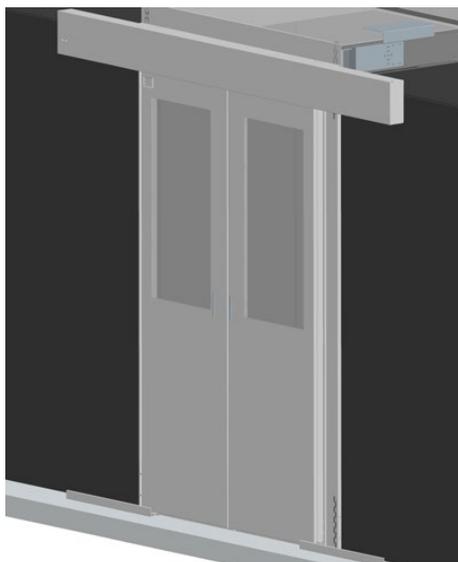
Configuration assistance



NECESSARY ITEMS FOR THE COLD AISLE	EXAMPLE
Aisle width (standard dimensions 1,200, 1,500 and 1,800 mm +/- 50 mm)	Aisle width (AW) = 1,200 mm
Rack height (standard dimensions 2,000 and 2,200 mm)	Rack height (H) = 2,000 mm
Aisle length	Aisle length (L) = 4,800 mm
Rack type	Vertiv Knürr DCM® B800
Color (light gray RAL 7035 or dark gray RAL 7021)	Dark gray RAL 7021

OPTIONS	EXAMPLE	ARTIKEL	
Front door element (sliding door, double door, front panel)	Sliding door	1 piece	03.029.026.8
Front door closer (mechanical, electric)	Front door closer (mechanical, electric)	1 piece	03.029.046.8
Rear door element (sliding door, double door, front panel)	Rear door element (sliding door, double door, front panel)	1 piece	03.029.021.8
Rear door closer (mechanical, electric)	Rear door closer (mechanical, electric)	<i>(integrated in double door)</i>	
Roof element	Roof element L2400	2 set	03.029.129.8
End separator strip	End separator strip AW 1200	1 pair	03.029.010.8
SensorBOX	Yes	2 pcs	03.029.132.8
Protector bracket	Yes	6 sets	03.029.041.8
DCM® balancing sheet metal	Yes	3 sets	03.029.137.8
Filler panel	No		
Height panel	No		
Sealing set	Yes (per rack)	2 sets	03.029.040.9
Raised floor air barrier for cable entry	Yes	22 pcs	03.029.211.9
Grate	Yes	28 pcs	03.029.090.8

Vertiv™ SmartAisle™ Sliding Door prepared for automatic door closers



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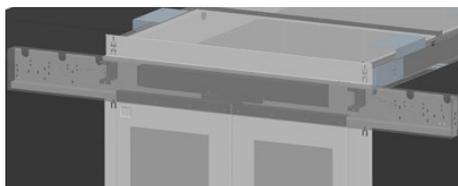
- For cold aisle containment for aisle widths: 1,200 / 1,500 / 1,800 mm (+/- 50 mm)
- Quick and easy mounting
- Suitable for Vertiv™ Knürr® MIR® and DCM® racks and most racks of other manufacturers.
- **Clear door opening**
Width: at least 1,050 mm
Height: 2,080 mm.
- **Material**
Door elements: sheet steel
Windows: single safety glass panel
Brush strips: polyamide (UL9 HF-1).
- **Finish**
Final digit of order number .1:
Powder-coated texture, RAL 7035, light gray
Final digit of order number .8:
Powder-coated texture, RAL 7021 dark gray.
- **Supply schedule**
1 frame structure
2 doors
2 floor guides
Covers
Sealing material
Mounting material.
- **Supplied as**
Flat-packed kit.
- **Please note**
The required closers (electric or mechanical) should be ordered for this!

W/L	H	D	AW	For rack type	Order no.	UP
	2,000		1,200		03.029.026.X	1 set
	2,200		1,200		03.029.027.X	1 set
	2,000		1,500		03.029.061.X	1 set
	2,200		1,500		03.029.062.X	1 set
	2,000		1,800		03.029.066.X	1 set
	2,200		1,800		03.029.067.X	1 set



CAC20004

Electric Closing mechanism for Sliding Door



CAC20005

- Suitable for Vertiv SmartAisle sliding door
- Increases energy efficiency as doors are closed automatically
- Opens with “push & go”
- Closes with “push & go” or automatically (0 ... 30 seconds)
- Opener/closer contact for control (e.g. fire alarm system).
- **Material**
Sheet steel
- **Finish**
Final digit of order number .1: Powder-coated texture, RAL 7035, light gray
Final digit of order number .8:
Powder-coated texture, RAL 7021 dark gray.
- **Supply schedule**
1 electric drive
1 cover
Various mounting brackets
Mounting material.
- **Technical data**
Power supply: 230 V / 50-60 Hz
Opening speed: 0.4 m/s
Closing speed: 0.2 m/s
Automatic closing time setting: 0...30 s
Force: 30 N.
- **Supplied as**
1 units.

W/L	H	D	AW	For rack type	Order no.	UP
					03.029.046.X	1 set

Dimensions in mm: W= width
H=height
D=depth
L=length
AW = aisle width

U = standard height unit
1U = 44,45 mm
UP = unit of packaging
kg = weight

Conversion: 1 mm = 0.03937 inch 1 kg = 2.2046 pounds



CAC20006

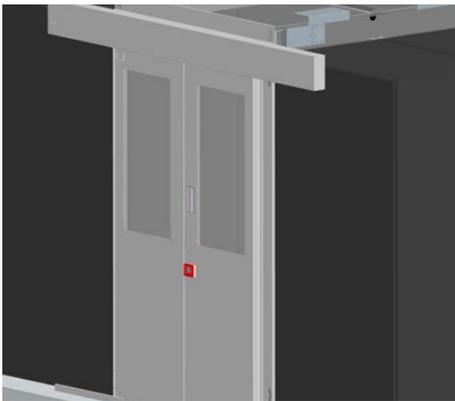


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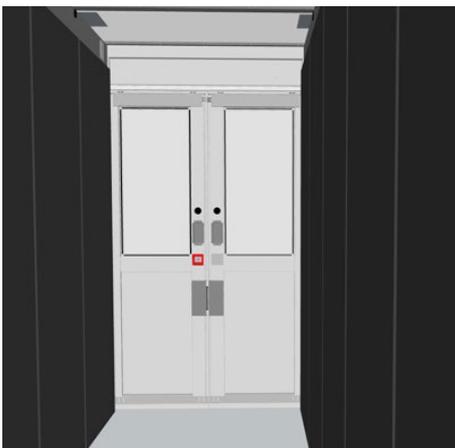
Mechanical Closing mechanism for Sliding Door

- Suitable for Vertiv™ SmartAisle™ sliding door
- Increases energy efficiency as doors are closed automatically
- Retaining function for open door.
- **Material**
Sheet steel.
- **Finish**
Final digit of order number .1:
Powder-coated texture, RAL 7035, light gray
Final digit of order number .8:
Powder-coated texture, RAL 7021 dark gray.
- **Supply schedule**
2 sets of gas pressure springs
1 cover
Various mounting brackets
Mounting material.
- **Technical data**
Force: 20 N.
- **Supplied as**
In units.

W/L	H	D	AW	For rack type	Order no.	UP
					03.029.047.X	1 set



CAC20002



CAC20003

Vertiv™ SmartAisle™ Sliding Door with access control

- For cold aisle containment for aisle widths: 1,200 / 1,500 / 1,800 mm (+/- 50 mm)
- Quick and easy mounting
- Suitable for Vertiv Knürr® MIR® and Vertiv Knürr DCM® racks and most racks of other manufacturers
- Safe closing through magnets; the door can be opened manually with little effort if there is a power failure
- Access control with keypad as standard (other systems possible in the respective project)
- Button inside for normal exit
- VdS-approved emergency switch inside for in case of emergency; height of the switch is under 1 meter
- VdS-approved emergency switch outside for rescue
- Door contact switch for monitoring door open – door closed".
- **Clear door opening**
Width: at least 1,050 mm
Height: 2,080 mm.
- **Material**
Door elements: sheet steel
Windows: single safety glass panel
Brush strips: polyamide (UL94 HF-1).
- **Finish**
Final digit of order number .1:
Powder-coated texture, RAL 7035, light gray
Final digit of order number .8:
Powder-coated texture, RAL 7021 dark gray.
- **Technical data**
1 frame structure
2 doors
2 floor guides
1 Rack Monitoring System
Electric closing
Covers
Sealing material
Mounting material.
- **Supplied as**
Flat-packed kit.

W/L	H	D	AW	For rack type	Order no.	UP
	2,000		1,200		03.029.029.X	1 set
	2,200		1,200		03.029.029.X	1 set

Dimensions in mm: W= width
H=height
D=depth
L=length
AW = aisle width

U = standard height unit
1U = 44,45 mm
UP = unit of packaging
kg = weight

Conversion: 1 mm = 0.03937 inch 1 kg = 2.2046 pounds



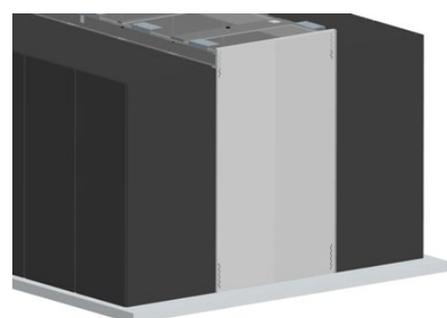
CAC20008

Vertiv™ SmartAisle™ Double Door with automatic door closer

- For cold aisle containment for aisle widths: 1,200 / 1,500 / 1,800 mm (+/- 50 mm)
- Quick and easy mounting
- Suitable for Vertiv™ Knürr® MIR® and Vertiv Knürr DCM® racks and most racks of other manufacturers
- Integrated automatic mechanical door closer (opening angle 180°, mounting bracket approx. 120°, from approx. 100° automatic closing).
- **Clear door opening**
Width: 1,200 mm
Height: 2,100 mm
(for rack height 2,000 mm);
2,300 mm
(for rack height 2,200 mm)
- **Material**
Door frame: aluminum
Door elements: sheet steel
Windows: single safety glass panel
Brush strips: polyamide (UL94 HF-1).
- **Finish**
Final digit of order number .1:
Powder-coated texture, RAL 7035, light gray
Final digit of order number .8:
Powder-coated texture, RAL 7021 dark gray.
- **Supply schedule**
1 door frame
2 doors
3 design covers
2 door closers
Mounting material.
- **Supplied as**
Flat-packed kit.

W/L	H	D	AW	For rack type	Order no.	UP
	2,000		1,200		03.028.021.X	1 set
	2,200		1,200		03.028.022.X	1 set
	2,000		1,500		03.028.041.X	1 set
	2,200		1,500		03.028.042.X	1 set
	2,000		1,800		03.028.046.X	1 set
	2,200		1,800		03.028.047.X	1 set

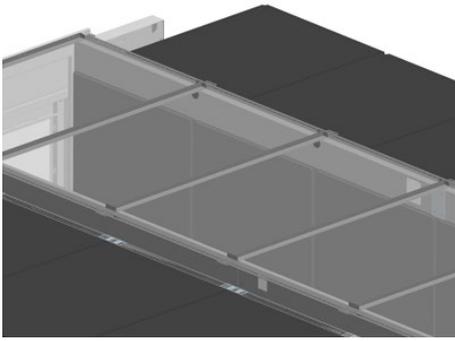
Vertiv SmartAisle Sliding Door prepared for automatic door closers



CAC20009

- For cold aisle containment for aisle widths: 1,200 / 1,500 / 1,800 mm (+/- 50 mm)
- Alternative to a cold aisle door
- Quick and easy mounting
- Suitable for Vertiv Knürr MIR® and Vertiv Knürr DCM® racks and most racks of other manufacturers.
- **Material**
Sheet steel.
- **Finish**
Final digit of order number .1: Powder-coated texture, RAL 7035, light gray
Final digit of order number .8:
Powder-coated texture, RAL 7021 dark gray.
- **Supply schedule**
1 bracing bracket
2 to 4 panel elements
Mounting material.
- **Supplied as**
Flat-packed kit.

W/L	H	D	AW	For rack type	Order no.	UP
	2,000		1,200		03.029.031.X	1 set
	2,200		1,200		03.029.032.X	1 set
	2,000		1,500		03.029.034.X	1 set
	2,200		1,500		03.029.035.X	1 set
	2,000		1,800		03.029.037.X	1 set
	2,200		1,800		03.029.038.X	1 set



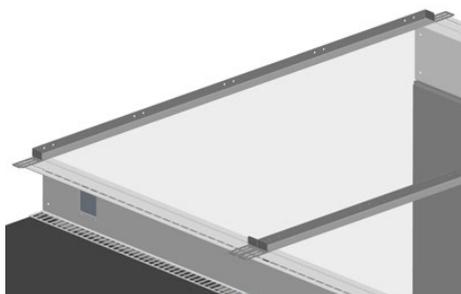
CAC20010

Vertiv™ SmartAisle™ Roof Element

- For cold aisle containment for aisle widths: 1,200 / 1,500 / 1,800 mm (+/- 50 mm)
 - Quick and easy mounting
 - Suitable for Vertiv™ Knürr® MIR® and Vertiv Knürr DCM® racks and most racks of other manufacturers
 - With rubber sleeves for cable routing
 - Roof panel with low fire load and low smoke generation (optionally with compound safety glass)
 - Roof panels can be quickly and easily removed
 - Prepared for SensorBox for energy-efficient operation of the recirculated-air cooling devices and for preventing hot spots.
- **Clear aisle height**
Rack height 2,000 mm: 2,150 mm
Rack height 2,200 mm: 2,350 mm.
 - **Material**
Angular extrusion, cross brace: sheet steel
Roof panel: Polycarbonate, UL 94-VO/DIN 4102 B1.
 - **Finish**
Final digit of order number .1:
Powder-coated texture, RAL 7035, light gray
Final digit of order number .8:
Powder-coated texture, RAL 7021 dark gray.
 - **Supply schedule**
2 angular extrusions with air regulation opening
1 separator strip at W300/600/800
3 separator strips at L2400
1 roof panel at W300/600/800
3 roof panels at L2400
2 angular extrusion plates
Mounting material.
 - **Supplied as**
Flat-packed kit.
 - **IMPORTANT**
When used with Vertiv Knürr DCM® Heavy-Duty Rack, please also order suitable balancing sheet metals!
 - **Please note**
The appropriate number of SensorBOXes to regulate the recirculating coolers should also be ordered!

W/L	H	D	AW	For rack type	Order no.	UP
	300		1,200		03.029.120.X	1 set
	600		1,200		03.029.123.X	1 set
	800		1,200		03.029.126.X	1 set
	2,400		1,200		03.029.129.X	1 set
	300		1,500		03.029.121.X	1 set
	600		1,500		03.029.124.X	1 set
	800		1,500		03.029.127.X	1 set
	2,400		1,500		03.029.130.X	1 set
	300		1,800		03.029.122.X	1 set
	600		1,800		03.029.125.X	1 set
	800		1,800		03.029.128.X	1 set
	2,400		1,800		03.029.131.X	1 set

Vertiv™ SmartAisle™ End Separator Strip

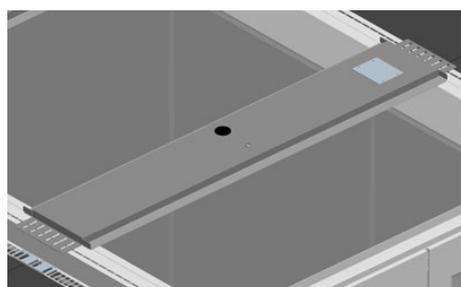


CAC20011

- For cold aisle containment for aisle widths: 1,200 / 1,500 / 1,800 mm (+/- 50 mm)
- Quick and easy mounting
- To connecting to the door element or front panel element.

- **Material**
Sheet steel
- **Finish**
Final digit of order number .1:
Powder-coated texture, RAL 7035, light gray
Final digit of order number .8:
Powder-coated texture, RAL 7021 dark gray.
- **Supply schedule**
2 end separator strips
Mounting material
- **Supplied as**
In units.

W/L	H	D	AW	For rack type	Order no.	UP
			1,200		03.029.010.X	1 pair
			1,500		03.029.011.X	1 pair
			1,800		03.029.012.X	1 pair



CAC20012

Vertiv SmartAisle Separator Strip for Aisle Extinguishing for Vertiv SmartAisle roof element

- For gas extinguishing in the cold aisle
- With rubber sleeve for inserting the piping or the nozzles into the cold aisle
- Possibility to screw in the fastening for the piping on the cold aisle containment
- Prepared for SensorBox for the energy-efficient operation of the recirculated-air cooling devices and for preventing hot spots.

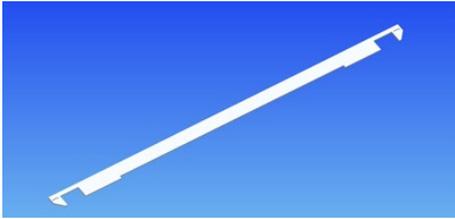
- **Material**
Sheet steel.
- **Finish**
Final digit of order number .1:
Powder-coated texture, RAL 7035, light gray
Final digit of order number .8:
Powder-coated texture, RAL 7021 dark gray.
- **Supply schedule**
1 separator strip for aisle extinguishing
Mounting material.
- **Supplied as**
Flat-packed kit.

W/L	H	D	AW	For rack type	Order no.	UP
200			1,200		03.029.115.X	1 set
200			1,500		03.029.116.X	1 set
200			1,800		03.029.117.X	1 set

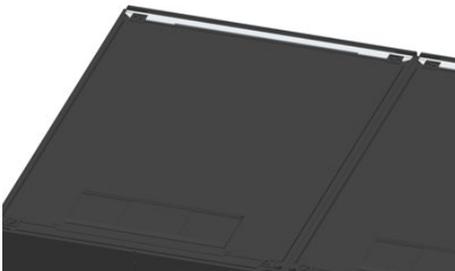
Dimensions in mm: W= width
H=height
D=depth
L=length
AW = aisle width

U = standard height unit
1U = 44.45 mm
UP = unit of packaging
kg = weight

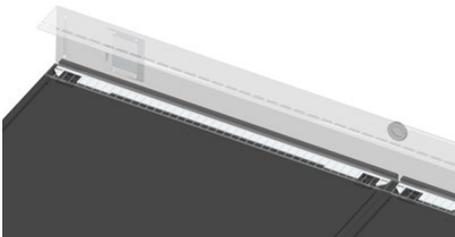
Conversion: 1 mm = 0.03937 inch 1 kg = 2.2046 pounds



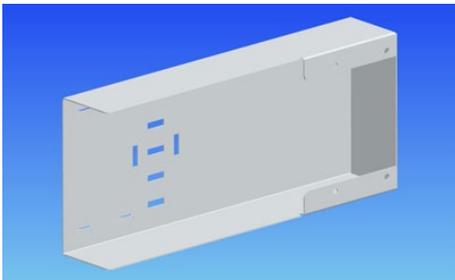
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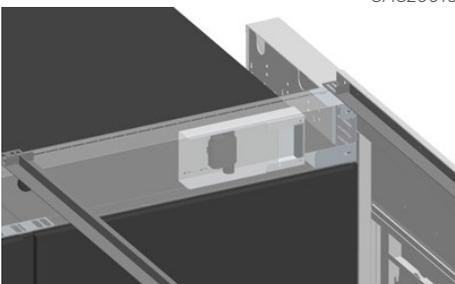
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CAC20017

Vertiv™ SmartAisle™ Vertiv Knürr® DCM® Balancing Sheet Metal for use with Vertiv Knürr DCM Heavy-Duty Rack

- For equalizing the height between Vertiv™ Knürr® DCM® Heavy-Duty Rack and cold aisle containment.
- **Material**
Sheet steel.
- **Finish**
Final digit of order number .1: Powder-coated texture, RAL 7035, light gray
Final digit of order number .8: Powder-coated texture, RAL 7021 dark gray.
- **Supply schedule**
1 balancing sheet metal.
- **Supplied as**
Flat-packed kit.

W/L	H	D	AW	For rack type	Order no.	UP
300				Vertiv Knürr DCM*	03.029.134.X	1 set
600				Vertiv Knürr DCM*	03.029.135.X	1 set
800				Vertiv Knürr DCM*	03.029.137.X	1 set
1,000				Vertiv Knürr DCM*	03.029.139.X	1 set

Vertiv SmartAisle SensorBOX for Vertiv SmartAisle roof element

- Suitable for air- regulation opening of the roof elements
- Conforms to a patented regulation principle for the energy-efficient operation of cooling systems
- Ready for Liebert® temperature sensor
- Can be used for different sensors.
- **Material**
Sheet steel.
- **Finish**
Final digit of order number .1: Powder-coated texture, RAL 7035, light gray
Final digit of order number .8: Powder-coated texture, RAL 7021 dark gray.
- **Supply schedule**
1 SensorBOX
Mounting material.
- **Supplied as**
Flat-packed kit.

W/L	H	D	AW	For rack type	Order no.	UP
					03.029.132.X	1 set

Vertiv™ SmartAisle™ Filler Panel

for separating areas in the aisle without racks

- For separating areas in the aisle without racks
- Quick and easy mounting
- Height-variable; applicable for “gross” rack heights from 1,990 to 2,220 mm
- More filler panels can be mounted side by side.
- **Material**
Sheet steel.
- **Finish**
Final digit of order number .1:
Powder-coated texture, RAL 7035, light gray
Final digit of order number .8:
Powder-coated texture, RAL 7021 dark gray.
- **Supply schedule**
1 filler panel (two-piece)
Mounting material.
- **Supplied as**
Flat-packed kit.

W/L	H	D	AW	For rack type	Order no.	UP
300	2,000/2,200		1,200		03.029.055.X	1 set
600	2,000/2,200		1,500		03.029.056.X	1 set
800	2,000/2,200		1,800		03.029.058.X	1 set

Dimensions in mm: W= width
H=height
D=depth
L=length
AW = aisle width

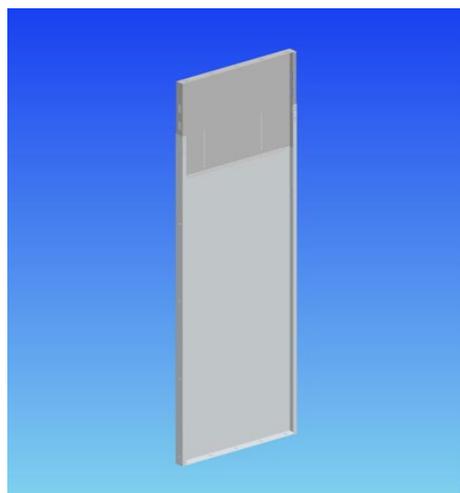
U = standard height unit
1U = 44.45 mm
UP = unit of packaging
kg = weight

Conversion: 1 mm = 0.03937 inch 1 kg = 2.2046 pounds

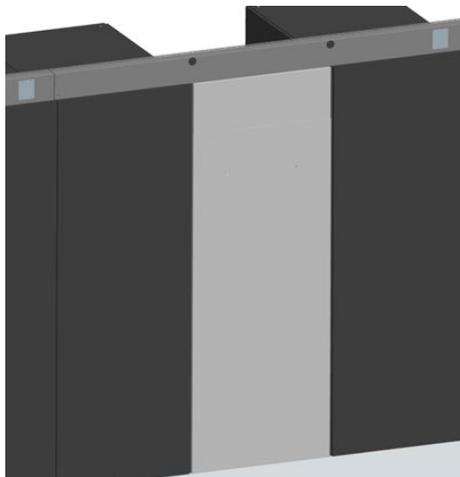
Vertiv SmartAisle Height Panel

- For balancing the separation of the cold and hot areas in smaller racks.
- **Material**
Sheet steel.
- **Finish**
Final digit of order number .1:
Powder-coated texture, RAL 7035, light gray
Final digit of order number .8:
Powder-coated texture, RAL 7021 dark gray.
- **Supply schedule**
1 height panel
Mounting material.
- **Supplied as**
Flat-packed kit.
- **Please note**
For several height panels positioned beside one another, please ask for the appropriate angular extrusion plates.

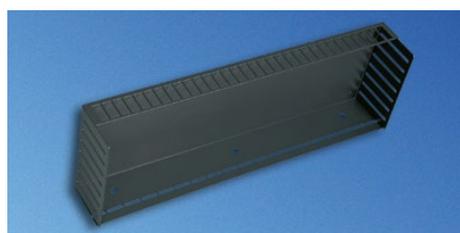
W/L	H	D	AW	For rack type	Order no.	UP
300	221			Vertiv Knürr DCM*	03.029.140.X	1 set
600	221			Vertiv Knürr DCM*	03.029.141.X	1 set
600	200			Vertiv Knürr MIR®	03.029.051.X	1 set
800	221			Vertiv Knürr DCM*	03.029.143.X	1set
800	200			Vertiv Knürr MIR	03.029.052.X	1 set
1,000	221			Vertiv Knürr DCM*	03.029.145.X	1 set



CAC20018



CAC20019



DCM20057



LUF20328



DCM20045



LUF20327



LUF20336



DCM20047

Vertiv™ SmartAisle™ Protector Bracket for Roof Element

- Prevents plexiglas panels from lifting up with excess pressure
- Enables safe pressure balance in the event of a fault or if a fire is being extinguished.
- **Material**
Sheet steel.
- **Finish**
Final digit of order number .1: Powder-coated texture, RAL 7035, light gray
Final digit of order number .8: Powder-coated texture, RAL 7021 dark gray.
- **Supply schedule**
1 pair of protector brackets
Mounting material.
- **Supplied as**
Flat-packed kit.

W/L	H	D	AW	For rack type	Order no.	UP
4,800					03.029.041.X	1 set

Vertiv SmartAisle Sealing Set for 4.8 meter aisle length

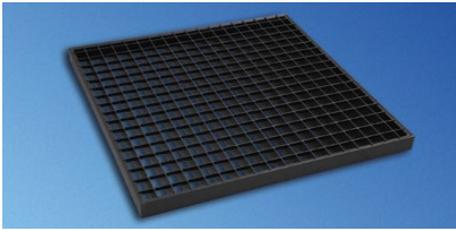
- Suitable for installation in Vertiv Knürr® MIR® rack
- For sealing the leveling area between the floor and rack
- For sealing Vertiv Knürr MIR rack aisles without side panels.
- **Material**
Foam: PUR-Ether UL94 HF-1, black
Cover extrusion: PVC extruder, black
- **Supply schedule**
10 meters of foam 40 x 25 mm
31 meter cover extrusion.
- **Supplied as**
Flat-packed kit.

W/L	H	D	AW	For rack type	Order no.	UP
4,800				Vertiv Knürr MIR®	03.029.040.9	1 set

Vertiv SmartAisle Sealing Material

- Suitable for sealing openings (e.g. leveling areas between floor and rack, between racks, etc.).
- **Material / color**
PUR-Ether UL94 HF-1, black.
- **Supply schedule**
5 x 2 meters of foam.
- **Supplied as**
Flat-packed kit.

W/L	H	D	AW	SIZE	Order no.	UP
				40 x 40 (glued surface) mm	03.029.042.9	1 set
				20 x 20 (glued surface) mm	03.029.043.9	1 set
				5 x 10 (glued surface) mm	03.029.044.9	1 set
				25 x 40 (glued surface) mm	03.029.045.9	1set



LUF20331

Vertiv™ SmartAisle™ Protector Bracket for Roof Element

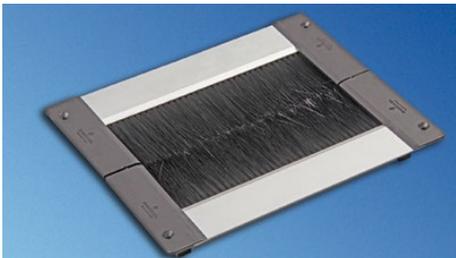
- For use on raised floors
- Can be used with high heat loads and high requirements for cooling air per rack
- For energy-efficient operation of the recirculated air devices.
- **Material**
Zinc-passivated steel.
- **Finish**
Final digit of order number .1:
Powder-coated texture, RAL 7035, light gray
Final digit of order number .8:
Powder-coated texture, RAL 7021 dark gray.
- **Standards**
Produced in acc. with RAL-GZ 638
Load capacity according to DIN EN 12825
 - on supports: deflection class 1A (2 kN) and 2C (3kN); measurement plate center
 - on supports and profiles: deflection class 2A (3kN).
- **Supply schedule**
1 raised floor grate.
- **Technical data**
Size 598 x 598 x 40 mm (WxLxH)
Free cross-section 88%
Max. surface load 50,000 N/m2 with even distribution
Max. point load (on 200 x 200 mm area) 4,500 N.
- **Supplied as**
In units.
- **Please note**
Suitable for raised floors with 40 mm thick panels!

Dimensions in mm: W= width
H=height
D=depth
L=length
AW = aisle width

U = standard height unit
1U = 44,45 mm
UP = unit of packaging
kg = weight

Conversion: 1 mm = 0.03937 inch 1 kg = 2.2046 pounds

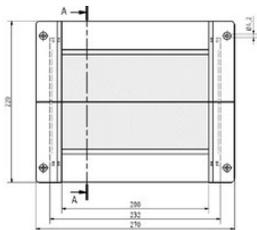
W/L	H	D	AW	For rack type	Order no.	UP
					03.029.090.X	1 unit



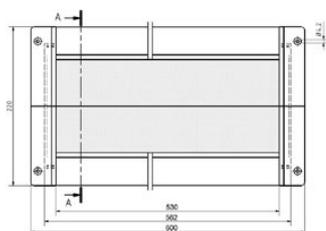
LUF20334

Vertiv SmartAisle Raised Floor Air Barrier for cable entry

- For cable entry from the raised floor
- Sunk in to the raised floor, or can be used as superstructure
- Two-row tight brushes for pressure-resistant cold-hot separation
- For new breakouts; as superstructure for existing breakouts
- Two-piece – option to easily extend and upgrade.
- The length can be easily shortened onsite (metal saw)
- Also suitable for cabling on the rack wall (U-shape, two-piece)
- Slot-in connection – additional threaded connection.



LUF20301



LUF20302

- **Dimensions**
03.028.211.9:
 - External dimensions (270 mm x 220 mm)
 - Usable cable entry (200 mm x 126 mm)
 - Raised floor breakout (240 mm x 180 mm)
- 03.028.212.9:
 - External dimensions (600 mm x 220 mm)
 - Usable cable entry (530 mm x 126 mm)
 - Raised floor breakout (570 mm x 180 mm).
- **Supply schedule**
1 pair of raised floor air barriers
Mounting material.
- **Supplied as**
Flat-packed kit.

W	H	D	U	D (max)	kg	MODEL	Order no.	UP
270	220					Length 270 mm	03.028.211.9	1 set
600	220					Length 600 mm	03.028.212.9	1 set

Vertiv™ SmartAisle™ Containment Customized



Customized – Retrofitting Solution from Vertiv

Data Centers are often the result of a structure that has developed over the course of many years.

Cabinets have different dimensions and are not always positioned in a line. Knürr offers this customized solution based on a profile construction that can be made on site to accommodate the data-center precisely.

With this solution, the dimensions are recorded on site and the profiles and panels for the enclosure are cut and

assembled according to your requirements. The panels are normally cut away from the data-center in a designated area.

If possible, the customized elements are combined with standard components. The standard sliding or hinged doors are generally used. The standard top element is also sometimes used as the customized elements are only used for the gaps between the cabinets.

Features

- Precisely fitted to cabinets and cabinet positions
- Suitable for retrofitting non-homogenous data-centers
- Can be combined with Vertiv SmartAisle standard.





Vertiv™ SmartAisle™ Containment Customized adapts to specific conditions in the data-center

Vertiv™ SmartAisle™ Containment Free-standing



Free-standing – Special Solution from Vertiv

Free-standing

In many data-centers, what are known as "free-standing systems" are installed in addition to the server cabinets. These cabinets are often of non-standard dimensions and are regularly swapped out in line with a defined rotation schedule (usually one to three years).

Free-standing systems may include storage cabinets, cluster applications (e.g. IBM, SUN) or server cabinets (e.g. IBM, HP, SUN etc.). There are many reasons for delivering these as a complete package including cabinets.

For storage applications, one of the main reasons is product liability. Cluster applications on the other hand are usually leased, while the reasons pertaining to server applications are often related to marketing.

The challenge with "Vertiv SmartAisle for free-standing" is to construct a flexible cold aisle enclosure that allows a fast and modular exchange of free-standing systems.

The free-standing cold aisle enclosure solution is based on Vertiv SmartAisle™ standard products and is used in

combination with these elements. The panels for the free-standing solution can be customized in terms of both dimensions (height and width) according to the cabinet dimensions.

Features

- Flexible adjustment to cabinets with non-standard dimensions
- For racks and applications that are swapped out on rotation
- Can be combined with Vertiv SmartAisle standard.





Vertiv™ SmartAisle™ Containment Free-standing
for special applications in the data-center

Vertiv™ SmartAisle™ Containment SwitchTubes

SwitchTubes – Switch Cooling from Vertiv

Cooling of switches

Servers draw in cold air for cooling from the front and blow out the heated air at the back. In contrast, switches generally suck in cold air from the side and blow the air out at the side or from the back. This leads to cooling problems in racks which have a consistent separation of warm and cold air. Special air-conduction systems are needed for switch applications in order to ensure a safe, energy-efficient solution.

The Vertiv SmartAisle SwitchTube is a safe and flexible supplement to the entire SmartAisle range. Different standard products are available depending on the switch type.

Switches have special requirements.

Cooling / ventilation:

- Usually side-to-side airflow (right to left, left to right, left and right to back, ... and combinations of different directions)
- Switches suck in hot air!
- Often high cooling capacity required (up to 10 kW per switch).

Maximum supply-air temperature:

- Maximum supply-air temperature is approx. 37- 40°C
- Problems in environments with energy-efficient cold / hot air separation
- Increased energy demand for cooling.

Cabling:

- Large number of cables
- The fan unit is not blocked by cables, which enables repairs to be carried out during operation
- Airflow should not be obstructed by cables.

Mechanics:

- Different heights (1U to approx. 24U)
- Different depths with different intake areas

Vertiv offers a wide range of SwitchTubes for the most common switches on the market.

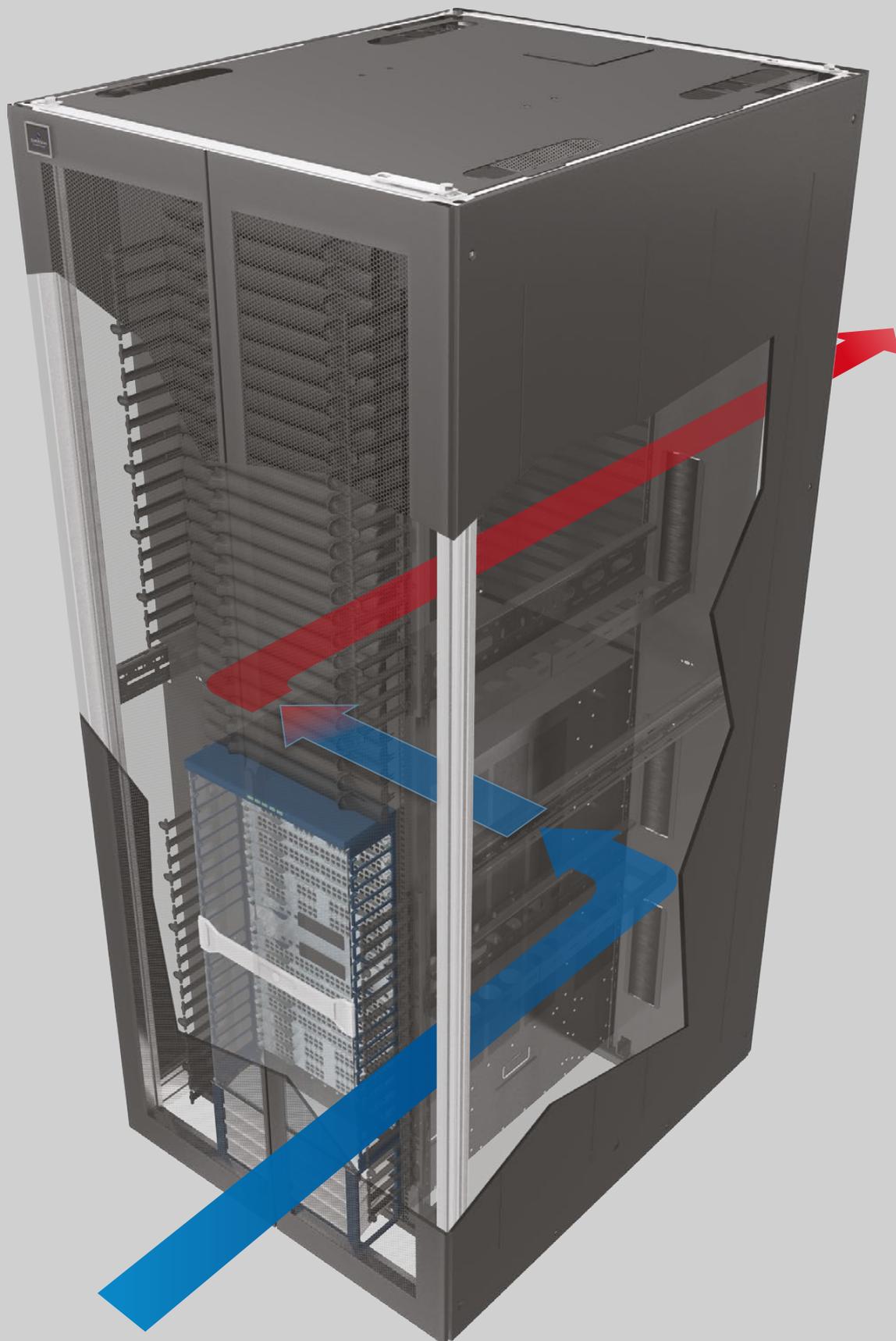
Features

- No hot spots
- Adequate airflow
- Allows use in energy-efficient data center.

SwitchTubes – Controlled Cooling for Switches

Servers are usually cooled from front to back. This fits into the concept of a modern, energy-efficient data-center. However, the cooling direction of switches is mostly side-to-side. In this application, switches tend to suck in cold air from a warm area.

The SwitchTube enables the switch to receive air from the cold aisle, while hot air is guided into the hot aisle.



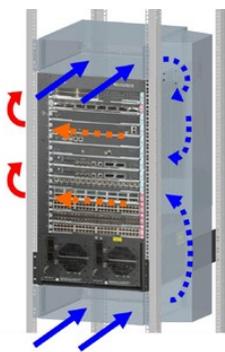
Airflow in SwitchRack
for switches with side-to-side cooling

Vertiv™ SmartAisle™ Containment SwitchTubes



LUF20360

03.029.217.X



LUF20379

03.029.217.X

Vertiv™ SmartAisle™ Switch 19"-Tube for cooling a core switch from the cold aisle

- For applications with and without raised floors
 - Applicable to switches with side-to-side cooling for energy-efficient cooling
 - Air inlet from the cold aisle (ideally with containment)
 - Suitable for Vertiv Knürr MIR® and Vertiv Knürr DCM® rack; rack width 800 mm
 - Requires 3 or 6U of the 19" installation space
 - Applicable to different switch heights
 - Height variable installation in the rack possible
 - INFO: cold-warm separation necessary in rack.
- **Material**
Tube: sheet steel
Sealing foam: PUR-Ether UL94 HF-1.
 - **Finish**
Final digit of order number .1:
Powder-coated texture, RAL 7035, light gray
Final digit of order number .8:
Powder-coated texture, RAL 7021 dark gray.
 - **Supply schedule**
2 intake drawers (for type 12-21U)
1 intake drawer (for type 7-12U / 4-6U)
1 height-adjustable air tube
Sealing foam
Mounting material.
 - **Supplied as**
Flat-packed kit.
 - **IMPORTANT**
Suitable for cooling a maximum of 5 kW heat load (at $\Delta T = 13\text{ K}$) per SwitchTube.
 - **IMPORTANT**
If there are many switches installed in the rack, one part of the front inlet perforated section is covered (since they are often very close to the front behind the front 19" extrusions).
 - **IMPORTANT**
May not be suitable for switches with different cooling directions.
 - **Please note**
Additional installations may be difficult due to existing cabling and accessory components.

W	H	D	Application	For rack type	Order no.	UP
800			Core-Switch 12-21 HE	Vertiv Knürr MIR®, DCM®	03.029.217.X	1 set
800			Core-Switch 12-21 HE	Vertiv Knürr MIR®, DCM®	03.029.218.X	1 set
800			Core-Switch 7-12 HE	Vertiv Knürr MIR®, DCM®	03.029.213.X	1 set
800			Core-Switch 7-12 HE	Vertiv Knürr MIR®, DCM®	03.029.215.X	1 set
800			Core-Switch 4-6 HE	Vertiv Knürr MIR®, DCM®	03.029.214.X	1 set



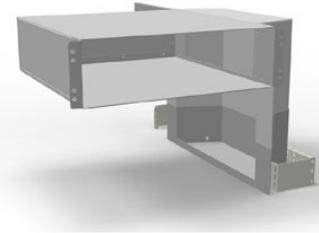
LUF20358

03.029.213.X



LUF20377

03.029.215.X



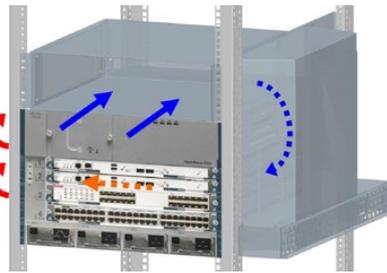
LUF20359

03.029.214.X



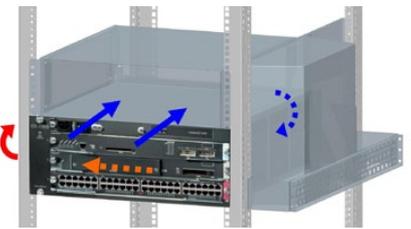
LUF20375

03.029.213.X



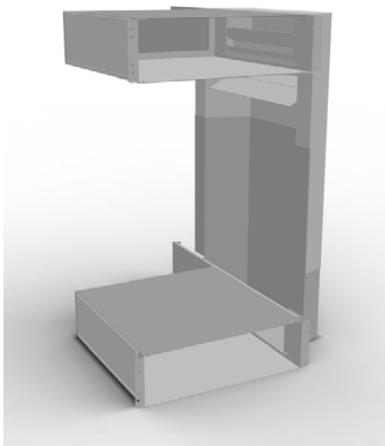
LUF20378

03.029.215.X



LUF20376

03.029.214.X



LUF20354

03.029.218.X



LUF20380

03.029.218.X



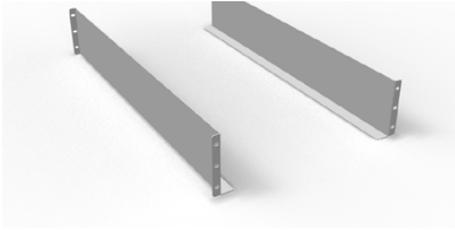
Intake area

Item no.	Switch height [U]	Cooling max.	Max. intake area regarding depth [mm] (distance to the 19" area)	Suitable for e.g.
03.029.217.X	12-21	approx. 7 kW (T=13 K) per SwitchTube	460	CISCO Catalyst 6506(-E), 6509(-E), 6513, MDS 9509 Director
03.029.218.X	12-21	approx. 7 kW (T=13 K) per SwitchTube	600	Cisco Nexus 7009
03.029.213.X	7-12	approx. 3 kW (T=13 K) per SwitchTube	320	CISCO Catalyst 4503(-E), 4506(-E), 4507R(-E), 4510R(-E)
03.029.215.X	7-12	approx. 3 kW (T=13 K) per SwitchTube	600	Cisco Nexus 7004
03.029.214.X	4-6	approx. 3 kW (T=13 K) per SwitchTube	550	CISCO Catalyst 6503(-E), 6504(-E)

Dimensions in mm: W= width
H=height
D=depth
L=length
AW= aisle width

U = standard height unit
1U = 44.45 mm
UP = unit of packaging
kg = weight

Conversion: 1 mm = 0.03937 inch 1 kg = 2.2046 pounds



LUF20364



LUF20365



LUF20366

Chassis Runner Tube D740

to support switches when installed in the rack

- Supports the weight of the switch during installation and securing in the rack
- Can be used with Vertiv™ SmartAisle™ Switch 19" Tubes 12-21U
- Suitable for insertion depth 740 mm
- Suitable for all 19" extrusions
- **Suitable e.g. for: CISCO Catalyst 6506(-E), MDS 9509 Director.**
- **Material / finish**
Sheet steel 2.0 mm, zinc-passivated.
- **Supply schedule**
2 chassis runners
Mounting material.
- **Supplied as**
In pairs.

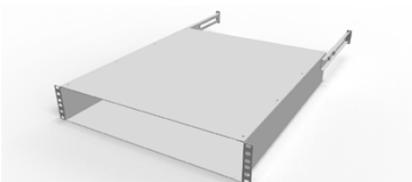
W/L	U	D	For insertion depth	Order no.	UP
130	3	from 900	740	03.029.230.7	1 pairs

Vertiv™ SmartAisle™ SwitchTube 1U back-to-front

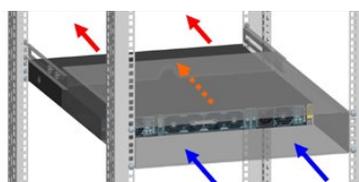
for 1U high switches

- For 1U switches with "back-to-front" cooling
- Can be applied flexibly for different switch depths
- Suitable for different insertion depths
- Suitable for Vertiv Knürr® MIR® and DCM® rack
- **Suitable e.g. for Enterasys SSA 180.**
- **Material / finish**
Tube: sheet steel
Sealing foam: PUR-Ether UL94 HF-1.
- **Finish**
Final digit of order number .1: Powder-coated texture, RAL 7035, light gray
Final digit of order number .8: Powder-coated texture, RAL 7021 dark gray.
- **Supply schedule**
1 intake drawer
2 rear support brackets
Sealing foam
Edge protection
Mounting material.
- **Supplied as**
Flat-packed kit.
- **Please note**
Additional installations may be difficult due to existing cabling and accessory components.

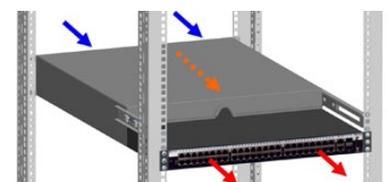
W	H	U	For insertion depth	For rack type	Order no.	UP
450	87.5	2	600-740		03.029.212.X	1 unit



LUF20372



LUF20373



LUF20374

Vertiv™ SmartAisle™ SwitchTube 1U / 2U for 1U / 2U high switches

- For 1U or 2U switches with side-to-side cooling
- Can be used in racks with “back-to-front” cooling
- Can be applied flexibly for different switch depths
- Front or rear mounting possible
- Suitable for different cooling directions (left to right, right to left or right and left to back)
- Suitable for insertion depth of 740 mm
- Suitable for Knürr Vertiv Knürr® MIR® und Vertiv Knürr DCM® server extrusion
- Suitable for rack widths 600, 700, 800 and 1,000
- Suitable e.g. for CISCO Catalyst 3750, Juniper EX3200, Juniper EX4200.

Material / finish

Tube:sheet steel
Sealing foam: PUR-Ether UL94 HF-1.

Finish

Final digit of order number .1: Powder-coated texture, RAL 7035, light gray
Final digit of order number .8: Powder-coated texture, RAL 7021 dark gray.

Supply schedule

1 intake drawer
2 side air ducts
1 side cover
Sealing foam
Mounting material

Supplied as

Flat-packed kit.

Please note

Additional installations may be difficult due to existing cabling and accessory components.

W	H	U	For insertion depth	For rack type	Order no.	UP
440	43.6	1	740		03.029.210.X	1 unit
440	43.6	2	740		03.029.211.X	1 unit



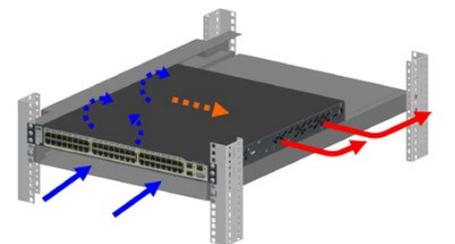
LUF20356

03.029.210.X



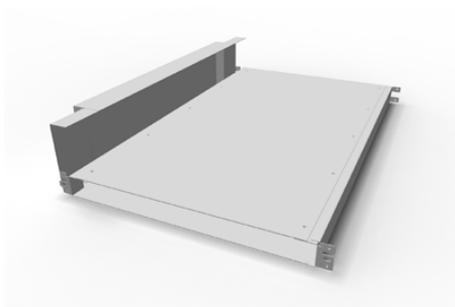
LUF20368

03.029.210.X



LUF20369

03.029.210.X



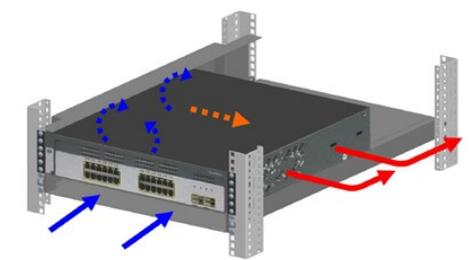
LUF20357

03.029.211.X



LUF20370

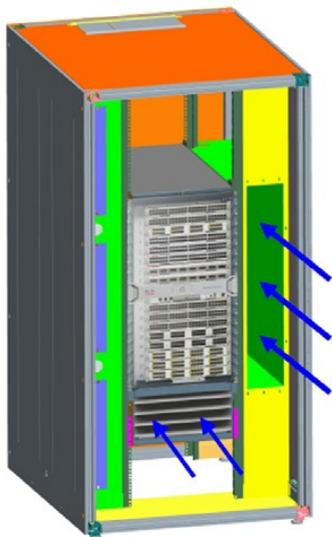
03.029.211.X



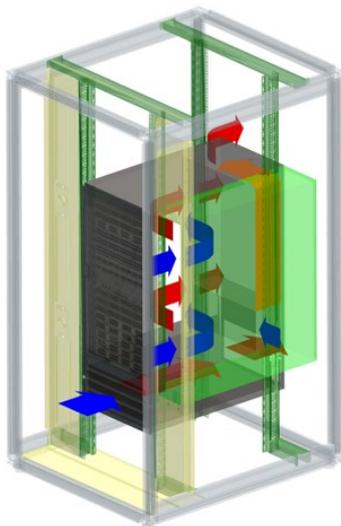
LUF20371

03.029.211.X

Dimensions in mm: W= width
H=height
D=depth
L=length
AW = aisle width
U = standard height unit
1U = 44.45 mm
UP = unit of packaging
kg = weight
Conversion: 1 mm = 0.03937 inch 1 kg = 2.2046 pounds



LUF20362



LUF20363

Vertiv™ SmartAisle™ SwitchRack for CISCO Nexus 7018

- For assembling a CISCO Nexus 7018 at a height of 7U to 31U
 - Base Vertiv Knürr® DCM® rack
 - Rack width of 1,000 mm according to the CISCO specification for adequate cold air
 - Avoids hot spots (recirculation of air)
 - Front area depth of 200 mm for orderly cabling
 - Panels for separating cold and warm air for an energy-efficient operation
 - Cold air intake from the cold aisle.
- **Material / finish**
Basic frame: extruded aluminium, polished
Corner piece: die-cast aluminium, polished
Doors: sheet steel, powder-coated texture
Covers: zinc-passivated sheet steel, powder-coated texture
Foam: PUR-Ether UL94 HF-1.
 - **Color**
Final digit of order number .1:
Visible surface of covers
RAL 7035 light gray
Final digit of order number .8:
Visible surface of covers
RAL 7021 dark gray.
 - **Supply schedule**
1 basic frame
4 19" server extrusions, sheet steel incl. U marking
2 side panels with quick-release fasteners
1 top cover with cable entry (three-piece sliding plates, can also be opened completely)
1 front door, double, perforated, sheet steel, with handle and mounting for cylinder lock
1 rear door, double, perforated, sheet steel, with handle and mounting for cylinder lock
1 complete air separation (on the left: cover with 3x 2U 19" cutouts, right side with air tube)
4 leveling feet
1 complete earthing set (VDE 0100).
 - **Supplied as**
Assembled.
 - **Please note**
Mounting adapters for 19" server extrusion should also be ordered for mounting Knürr accessories (01.147.640.9).

W	H	D	U	Front depth	Insertion depth	Rack type	Order no.	UP
1,000	2,000	1,200	42	200	740	DCM®	03.029.222.X	1 unit

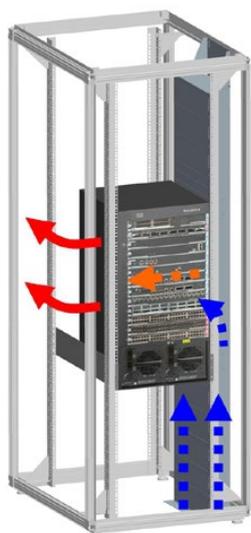
Dimensions in mm: W= width
H=height
D=depth
L=length
AW= aisle width
U = standard height unit
1U = 44,45 mm
UP = unit of packaging
kg = weight

Conversion: 1 mm = 0.03937 inch 1 kg = 2.2046 pounds

Vertiv™ SmartAisle™ SwitchTube Raised Floor for cooling a core switch from a raised floor



LUF20355



LUF20367

- Suitable for switches with side-to-side cooling for energy-efficient cooling
- Air inlet from the raised floor
- Suitable for Knürr Vertiv Knürr® MIR® rack; rack width 800 mm (NOT for DCM® rack)
- Suitable for different switch heights
- Height-variable assembly possible in the rack; tool-free blanking panels to cover the areas outside switches
- Base area tube: 420 cm²
- Cut-out in the raised floor (min./max.): 355/410 x 127/162 mm
- INFO: cold-warm separation necessary in rack
- INFO: for max. switch intake depth of 460 mm (distance from the 19" area)
- **Suitable e.g. for CISCO Catalyst 6509(-E), Catalyst 6513, Catalyst 6506(-E), MDS 9509 Director, HP ProCurve 8212.**

- **Material / finish**

Tube: sheet steel
Sealing foam: PUR-Ether UL94 HF-1.

- **Finish**

Final digit of order number .1:
Powder-coated texture, RAL 7035, light gray
Final digit of order number .8:
Powder-coated texture, RAL 7021 dark gray.

- **Supply schedule**

1 tube with blanking panels (1U, 3U)
1 bottom plate
Sealing material
Mounting material.

- **Supplied as**

Flat-packed kit.

- **IMPORTANT**

Suitable for cooling a maximum 5 kW heat load (at $\Delta T = 13$ K) per SwitchTube.

- **IMPORTANT**

The tube covers one part of the front inlet perforation section when many switches are installed in the rack (as they are often close to the front behind the front 19" extrusions).

- **IMPORTANT**

May not be suitable for switches with different cooling directions.

- **IMPORTANT**

The highest 3U in the rack cannot be used for cooling.

- **Please note**

Additional installations may be difficult due to existing cabling and accessory components.

W/L	U	D	ITEM	For rack type	Order no.	UP
800	2,000		Tube	Vertiv Knürr MIR	03.029.200.X	1 set
800	2,200		Tube	Vertiv Knürr MIR	03.029.202.X	1 set



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