

CONTEG DATASHEET

TOTAL SOLUTIONS FOR DATA CENTERS

ROOM FEED WITH PLENUM RETURN

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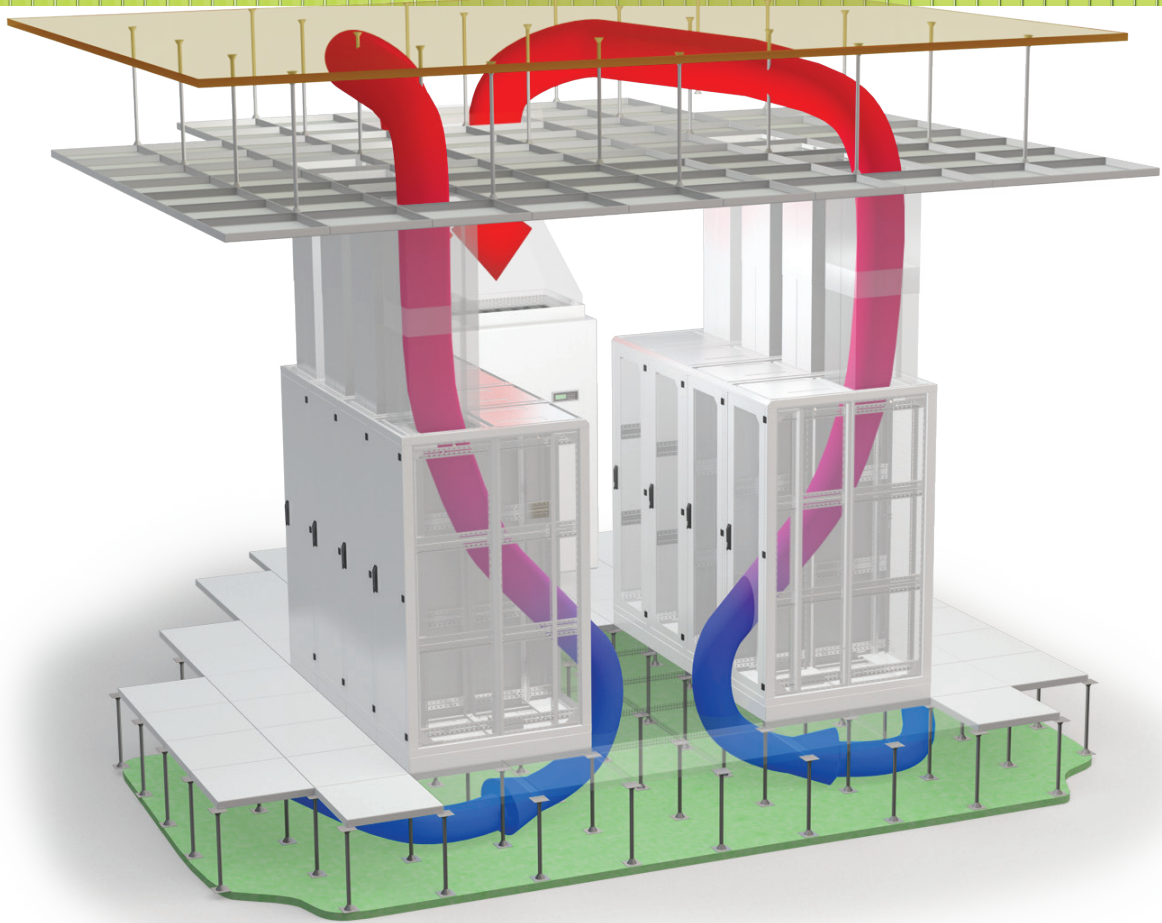
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1.6 ROOM FEED WITH PLENUM RETURN



Contained Cold Aisle and Plenum Feed/Room Return technologies release the warm exhaust air into the facility room. Generally, this should not pose a problem as long as the layout of the data center takes this into account. However, in certain very high-density applications it may be desirable to completely separate the hot exhaust from the cool supply air.

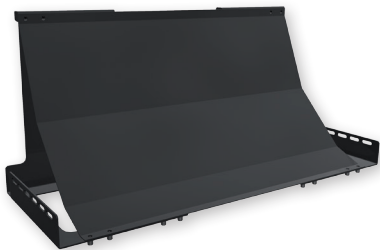
Conteg's Hot Plenum Return Kit (HPR) addresses this requirement by using a vertical "chimney" at the top rear of the rack directly connected to a hot plenum below the ceiling. A turning vane located at the bottom rear of the rack helps to optimize the flow of hot exhaust into the "flue", while the large surface area of the chimney ensures that large volumes of air can pass at relatively low velocities.

The hot plenum is formed by installing

a suspended ceiling within the facility room and rather than using the stratification principle warm exhaust (typical in a traditional hot/cold aisle arrangement), the hot exhaust air removal into a separate air handling space is used. The Computer Room Air Handlers (CRAC/CRAH) are also connected to the plenum so that an air loop is formed.

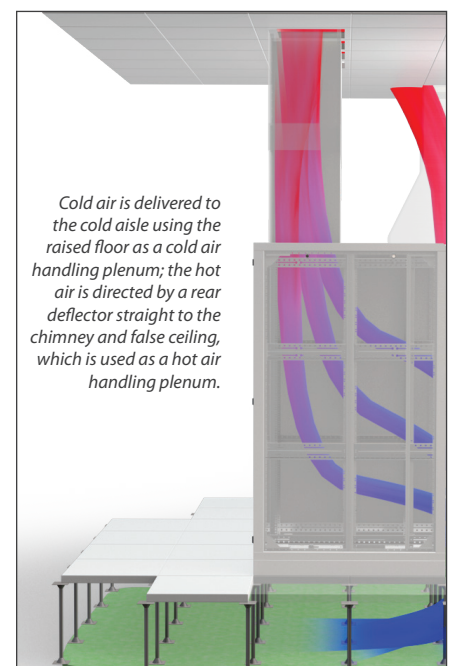
This layout can tolerate very high heat densities with excellent cooling system efficiency; a study

by Intel which originally pioneered this concept, shows that this design can handle as much as 30 kW per rack.



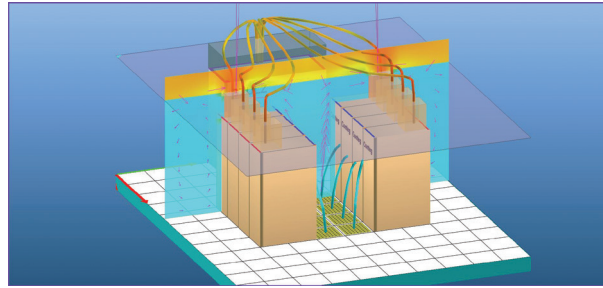
The Turning vane is designed to enhance the natural draw effect of the chimney. It is installed in the rear bottom part of rack and forwards the hot air directly to the above chimney.

The chimney is designed to form a duct for the hot exhaust between the rack and the hot plenum. Its height can be adjusted from 750 mm to 1360 mm.



Cold air is delivered to the cold aisle using the raised floor as a cold air handling plenum; the hot air is directed by a rear deflector straight to the chimney and false ceiling, which is used as a hot air handling plenum.

In the Room Feed with Plenum Return design, the cold air is usually produced by a central room cooling system with perimeter positioned close control units. The suspended ceiling is used as a hot air handling plenum, while the cold air is delivered to the room using a raised floor as a cold air handling plenum. In sites where there is no raised floor, displacement cooling can be used instead of traditional down-flow CRAC/CRAH raised floor solutions. This can be useful when there is insufficient clearance for the installation of both raised floor and suspended ceiling.



RECOMMENDED RACK SERIES

Rack series	Description	Read more
PREMIUM Server RSF	PREMIUM rack series, highly configurable with load rating up to 1500 kg	36
PREMIUM Cabling RDF	PREMIUM rack series provides maximum compatibility with Targeted Cooling solutions and is developed for cabling support; load rating up to 800 kg	32

- Front vented door (83% perforation rate) with multipoint swivel handle lock (universal key)
- Rear sheet steel door with multipoint swivel handle lock (universal key)
- Removable sheet steel side panels with lock (universal key)
- Two pairs of 19" vertical sliding extrusions
- Top and bottom openings for cable entry
- Adjustable feet as standard; recommended plinth or plinth with filter (not included)

Protection rating IP20, load rating RDF – 800 kg, RSF – 1500 kg, color black RAL 9005 (optionally light gray RAL 7035). For detail technical information on RDF or RSF racks please refer to page 32 & 36.

Code ¹
RSF-42-60/12T-WWSWA-OCF-H
RSF-42-80/12U-WWSWA-OCF-H

Code ¹
RDF-42-80/12C-WWSWA-OC5-H

¹ All racks in black; for gray – simply change H in the end of the code to B

RELATED PRODUCTS

Related products	Description	Read more
Air separation frame	Prevent by-pass airflow between frame and 19" extrusion to optimize cooling of equipment	112
Chimney	System for removing hot air from the rack directly to the plenum – ceiling	112
Turning vane	Part of a chimney solution used to turn the direction of airflow in the rear upwards	112
Cable entries	Products for passage of cabling/pipes through raised floor with minimal loss of air pressure	138
Modular plinths	Replace adjustable feet and use as stabilizing and aesthetic element	135
Brackets	Needed when vertical PDU installation into rack is planned	126
Blank panels	Prevent cold air by-pass through unused U positions	112



BASIC ROOM FEED WITH PLENUM RETURN DESIGN GUIDELINES

- Typically for heat loads up to 12.5 kW or greater per cabinet
- 42U to 48U – 600 mm or 800 mm wide cabinets – 1200 mm deep
- Air separation frames – 150 mm or 200 mm deep
- 83% vented front door
- Solid rear door
- Turning vane for bottom rear of cabinet
- Chimney system for directing hot air to return plenum
- 1200 mm or 1800 mm aisle spacing
- Double brush grommets for cable entries
- Blanking panels for all vacant equipment mounting locations in cabinets
- Monitoring of return plenum and environmental conditions in the cabinet

Note: Cooling capacity of this configuration can reach higher values depending on many variables such as the capacity and features of the precision computer room cooling unit, the ratio of supply air space to return plenum space and the amount of air obstructions in the supply and return air spaces.