The power behind competitiveness

Delta Precision Cooling

Data Center Infrastructure Solutions

www.deltapowersolutions.com

DELTA

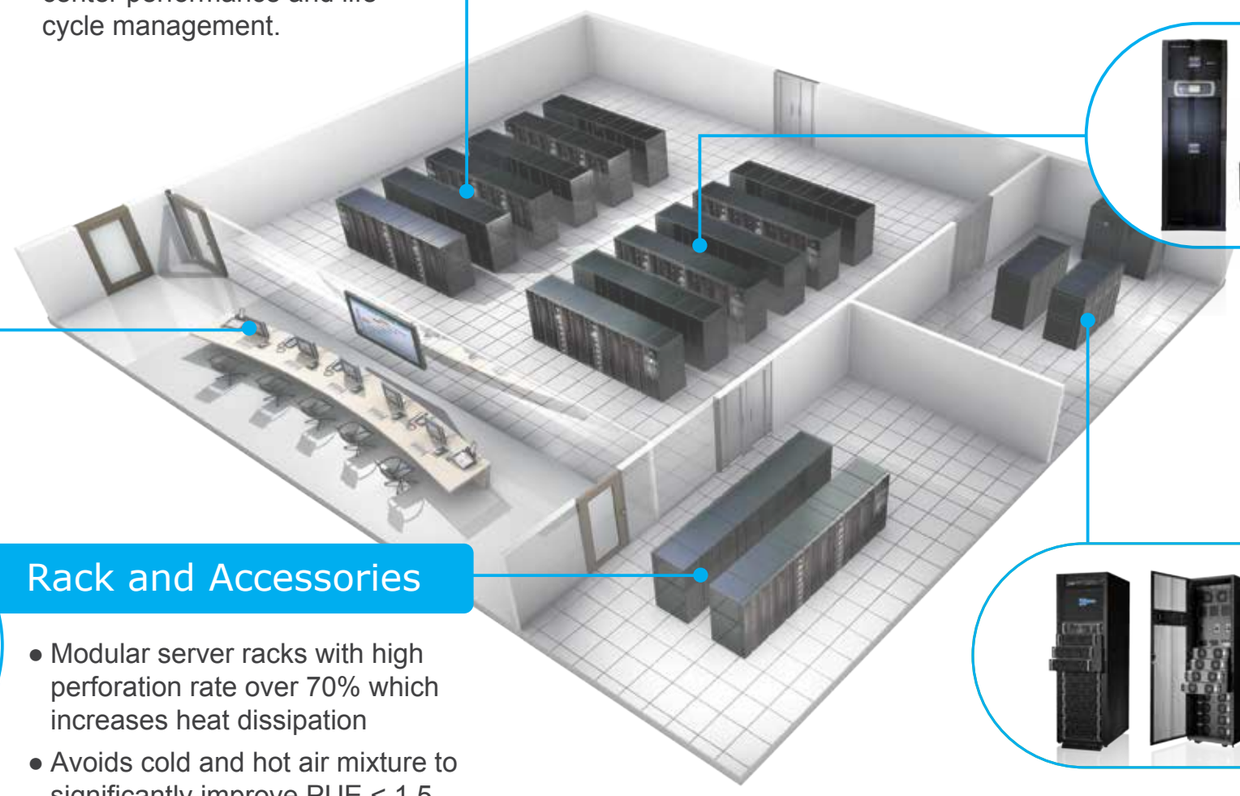
Smarter. Greener. Together.

Delta InfraSuite
Data Center Infrastructure Solutions

InfraSuite Manager (DCIM)

Have the entire data center at your fingertips!

- InfraSuite Manager integrates all facilities and IT equipment on one platform.
- InfraSuite Manager is Delta fully featured DCIM software solution that optimizes data center performance and life cycle management.



Rack and Accessories

- Modular server racks with high perforation rate over 70% which increases heat dissipation
- Avoids cold and hot air mixture to significantly improve PUE < 1.5

Micro Data Center | Modular Data Center | Containerized Data Center | Power Container | DCIM | Cooling | AC Power | Converged Power

Precision Cooling

- Highly-efficient variable fan speed control saves 27% of power if fan speed reduced by 10%

Power Distribution System

- Power Distribution Unit (PDU): Modular and hot-swappable output breaker with transformer
- Remote Power Panel (RPP): PDU without transformer
- Rack-Mount Remote Power Panel (rRPP): An ideal power distribution solution to small datacenters
- Rack Power Distribution Unit (rPDU): Reliable branch circuit breaker protection

UPS System

- Fully modular design. Hot-scalable and hot-swappable.
- Ultra-integrated system with power supply, power distribution and runtime.
- Output PF up to 1
- Leading power efficiency up to 96.5%

Delta InfraSuite Precision Cooling

Modern data centers have implemented a high-density model, mainly based on blade servers, to increase space utilization and accommodate the rapid expansion of new IT equipment. This model requires a higher power supply density and creates bigger heat dissipation problems, where increased power consumption for air conditioning can account for 45% of total data center electricity expenses. With this in mind, heat dissipation and electricity expenses are important indices against which operational expenditures of the data center can be measured.

As a leading global manufacturer of fans and a specialist in power management, Delta Electronics was perfectly positioned to develop Delta InfraSuite Precision Cooling solutions in order to provide practical, optimized, innovative methods for data center cooling. Delta InfraSuite Precision Cooling solutions employ either chilled water or direct expansion types to remove the heat produced by the hardware within the data center. Delta provides various cooling solutions, including RowCool chilled water type, RowCool direct expansion type and RoomCool series direct expansion type, to fulfill customers' diversified requirement. Applicable sectors cover cloud, colocation, telecommunication, semiconductor, precision manufacturing, enterprises, education, etc.

Various design options can also be implemented for the optimal solutions. Delta's comprehensive offerings include hot aisle or cold aisle containment, chilled water temperature setting, free cooling technology, and more. Those flexible cooling configurations and designs play an important role for data centers to achieve target PUE for more energy savings.

Delta InfraSuite Precision Cooling

The most reliable and efficient cooling solutions

Power consumption for air conditioning can account for 45% of a data center's total electricity expenses. Delta's InfraSuite Precision Cooling is designed with smart cooling technology to effectively solve thermal issues and reduce the electricity required for cooling. It provides the best cooling solution to meet 24 hours × 365 days of continuous operation requirements for a constant temperature and humidity in a critical equipment environment, such as for:

- Data center from small, medium to enterprise
- Cloud data center
- Colocation data center
- Prefabricated data center
- Medical equipment room
- Research laboratory
- Precision manufacturing equipment room

Delta InfraSuite Precision Cooling

RowCool Series 29/43/70/95kW, Chilled Water

Delta's RowCool CW offers outstanding performance in high temperature chilled water applications via the optimized design of its heat exchanger. With industry-leading high cooling capabilities, the RowCool CW increases the overall cooling efficiency of data center precision cooling systems. The cooling capacity of a single unit can reach up to 260kW. The RowCool CW provides the best cooling solutions for data centers over hundreds of kW, focusing on both high efficiency and high density.

High Efficiency

- Optimized for high temperature chilled water applications, the heat exchanger design increases the overall efficiency of precision cooling systems.
- The Electronically Commuted (EC) Fans design provides variable fan speed control for optimal speeds in real-time according to load changes, avoiding unnecessary power waste.
- Closely couples to IT heat loads and quickly adapts to load changes for direct and effective heat removal.

High Availability

- Supports dual power feed input and is suitable for any tier level of power reliability architectures.
- Thanks to the inherent redundancy design of the fan system, other fans automatically increase fan speeds to make up for the required airflow if one of the fans malfunctions.
- 1+1 redundant design of the power modules increases reliability (applicable to some models).
- Hot-swappable power module and fan design allows replacement without the need of a power shut down while malfunctioning.
- The smart group control function is equipped with rotation, back up, competition free, and soft start functions.
- Comprehensive operation monitoring such as chilled water flow and leakage detection allows full control of machine operations and the ability to take necessary troubleshooting measures in real-time.

High Flexibility

- Top or bottom piping and wiring options are available to satisfy the pipeline design needs for different data center requirements.
- Multiple communication interfaces satisfy the surveillance and communication needs of a variety of data centers.
- High efficiency filter (MERV 8) or washable filters (MERV 1) are available for users to choose according to their needs.
- Equipped with casters for easy movement and positioning during installation without the need for additional handling tools.
- 2.4-meter-high models using the 52U rack are also available to customers. (For special height requirements, please contact your local Delta office)

Technical Specifications

Model		CW 29 kW HCH1850	CW 43 kW HCH1870
Power	Input	1-phase 220-240V, 50/60 Hz	
Capacity	Total Capacity (*1)	30.8 kW	43.4 kW
	Sensible Capacity (*1)	30.2 kW	43 kW
	Total Capacity (*2)	37.1 kW	50.4 kW
	Sensible Capacity (*2)	37.1 kW	50.4 kW
	Total Capacity (*3)	28.8 kW	36 kW
	Sensible Capacity (*3)	28.8 kW	36 kW
Fan	Type	EC	
Piping Connection		Top / Bottom	
Conformance		CE	
Communication		RS-485 x 1, Input dry contact x 2, Output dry contact x 2, SNMP slot x 1	
Dimension	Width	300 mm	300 mm
	Depth	1090 mm	1090 mm
	Height	2000 mm	2000 mm
Weight		185 kg	187 kg

*1. Rating capacity is measured at 40.6℃ DB / 21.6℃ WB / Inlet water temperature 7℃.
*2. Maximum capacity is measured at 48.9℃ DB / 23.9℃ WB / Inlet water temperature 7℃.
*3. High temperature water capacity is measured at 40.6℃ DB / 21.6℃ WB / Inlet water temperature 12℃ / Outlet water temperature 20℃.

Model		CW 70kW HCH1CB0	CW 70kW HCH1CB0 Humidity Control	CW 95kW HCH1CD0	CW 95kW HCH1CD0 Humidity Control
Power	Input	3-phase 380-415V, 50/60 Hz			
Capacity	Total Capacity (*1)	69.3 kW	69.3 kW	92.6 kW	92.6 kW
	Sensible Capacity (*1)	69.3 kW	69.3 kW	91.6 kW	91.6 kW
	Total Capacity (*2)	83.1 kW	83.1 kW	110.7 kW	110.7 kW
	Sensible Capacity (*2)	83.1 kW	83.1 kW	110.7 kW	110.7 kW
	Total Capacity (*3)	57.4 kW	57.4 kW	79.4 kW	79.4 kW
	Sensible Capacity (*3)	57.3 kW	57.3 kW	79.4 kW	79.4 kW
Fan	Type	EC			
Heater	Type	None	Finned tube reheater	None	Finned tube reheater
Humidifier	Type	None	Electrode	None	Electrode
Piping Connection		Top / Bottom			
Conformance		CE			
Communication		RS-485 x 1, Input dry contact x 2, Output dry contact x 2, SNMP slot x 1			
Dimension	Width	600 mm	600 mm	600 mm	600 mm
	Depth	1090 mm	1090 mm	1090 mm*4	1090 mm*4
	Height	2000 mm	2000 mm	2000 mm	2000 mm
Weight		368 kg	375 kg	415 kg	422 kg

*1. Rating capacity is measured at 40.6℃ DB / 21.6℃ WB / Inlet water temperature 7℃.
*2. Maximum capacity is measured at 48.9℃ DB / 23.9℃ WB / Inlet water temperature 7℃.
*3. High temperature water capacity is measured at 40.6℃ DB / 21.6℃ WB / Inlet water temperature 12℃ / Outlet water temperature 20℃.
*4. Depth is 1200 mm for top piping model.

All specifications are subject to change without prior notice.

Delta InfraSuite Precision Cooling

RowCool Series 35kW, Direct Expansion

Delta's RowCool DX series uses high-efficiency DC inverter compressors and electronically Commuted (EC) Fans. Using Delta's best fuzzy control mode, the RowCool DX series is the highly efficient, outstanding direct expansion (DX) type cooling product. Improving the high efficiency and power density of medium or small sized data center, and offering both convenience and easy maintenance, Delta's RowCool DX is the best choice for optimizing the total cost of ownership (TCO).

High Efficiency

- Both compressor and fans use DC brushless motors that provide high efficiency and great power-savings.
- The inverter-driven design provides variable fan speed control for optimal speed in real-time according to load changes, avoiding power waste.
- Condenser fan operation is more stable and energy-saving via fuzzy control compared to traditional control systems.
- Closely couples to IT heat loads and quickly adapts to load changes for direct and effective heat removal.

High Availability

- Supports dual power feed input and is suitable for any tier level of power reliability architectures.
- Thanks to the inherent redundancy design of the fan system, other fans automatically increase fan speeds to make up for the required airflow if one of the fans malfunctions.
- Using the optional condenser models for low temperature, the RowCool DX series can operate in environments below -40°C.
- The smart group control function is equipped with rotation, back up, competition free, and soft start functions.
- Complete operation monitoring such as air supply and return airflow temperature allows full control of operations and the ability to take necessary troubleshooting measures in real-time.

High Flexibility

- Top or bottom piping and wiring options are available to satisfy the design requirements of different data centers.
- Various communication interfaces satisfy the surveillance and communication needs of various data centers.
- High efficiency filter (MERV 8) or washable (MERV 1) filters are available for users to choose according to their needs.
- Equipped with casters for convenient movement and positioning during installation without the need for additional handling tools.
- Condensers equipped with AC fans are also available for budget customers.

Technical Specifications

Model		DXA 35kW HCH6C60	DXA 35kW HCH6C60 Humidity Control
Power	Input	3-phase 380-415V, 50/60 Hz	
Capacity *	Total capacity	35.6 kW	35.6 kW
	Sensible capacity	34.5 kW	34.5 kW
Fan	Type	EC	
Reheater	Type	None	Finned tube reheater
Humidifier	Type	None	Electrode
Connection		Top / Bottom	
Conformance		CE	
Communication		RS-485 x 1, Input dry contact x 1, Output dry contact x 1, SNMP x 1	
Dimension	Width	600 mm	600 mm
	Depth	1090 mm	1090 mm
	Height	2000 mm	2000 mm
Weight		340 kg	345 kg

* Capacity is measured at 24°C return air temperature, 50% relative humidity and 45°C condensing temperature.

Outdoor Unit

Model		HFC6B40-13S	HFC6B50-15S	HFC6B70-17D
Power	Input	1-phase 220-230V, 50Hz		
Fan	Type	AC		
Dimension	Width	1515 mm	1715 mm	1915 mm
	Depth	1100 mm	1100 mm	1100 mm
	Height	1090 mm	1090 mm	1090 mm
Weight		99 kg	107 kg	142 kg

Model		HCC6C50-13S	HCC6C50-15S	HCC6C70-17D
Power	Input	3-phase 380-415V, 50/60Hz		
Fan	Type	EC		
Dimension	Width	1515 mm	1715 mm	1915 mm
	Depth	1100 mm	1100 mm	1100 mm
	Height	1090 mm	1090 mm	1090 mm
Weight		102 kg	110 kg	148 kg

All specifications are subject to change without prior notice.

Delta InfraSuite Precision Cooling

RoomCool F Series

The Delta RoomCool F series, using electronically commuted (EC) fans, are room-based precision cooling of modern data center developed specifically for medium or small sized data centers. The Delta RoomCool F series' design achieves a high Annual Energy Efficiency Ratio (AEER), as well as high reliability and flexibility. As most data centers use traditional air supplies under a raised floor, the new approach of the F series offers both traditional and modern options. The F series is the best choice for medium or small sized data centers, for both building new data center facilities and retrofits.

High Efficiency

- Fans can be configured under a raised floor to reduce fan power consumption by about 20%.
- All series use EC fans with variable fan speeds set according to static pressure of data centers' requirement, optimizing the operation and performance of the precision cooling system.
- Smart fuzzy control of condenser fan operation is more stable and energy saving compared to traditional controls.
- Highly efficient scroll compressor with various energy-saving optimization designs provides traditional data centers with outstanding AEER performance.

High Availability

- Compact design with full front access maintenance minimizes footprint and maintenance space and creates maximum available IT space in the same data center area.
- Dual compressor system models offer internal redundancy function for continuous system operation when other systems malfunction.
- Color graphical touch panel offers user-friendly, interactive operation.
- Using the optional condenser models for low temperature allows operations in environments below -40°C.
- Smart group control offers rotation, back up, competition free, and soft start functions.
- Used with Delta ADU provides sufficient cooling capacity for some high power density racks.

High Flexibility

- Depending on raised floor height or customer preference, fan installation can be below the raised floor or inside the RoomCool machine. Installing fans directly does not require additional accessories, settings, or tools. Fan installation under the floor reduces power consumption and noise.
- Full front access maintenance does not require rear maintenance space. Installation against a wall to fit with the layout design of the data center is possible for maximum flexibility.
- Multiple communication interfaces satisfy the surveillance and communication needs for a variety of data centers.
- Condensers equipped with AC fans are also available for budget customers.

Technical Specifications

Model		HCD6640-20	HCD6660-30	HCD6660A-35	HCD6670A-40	HCD6680A-50	HCD66A0A-60	HCD66B0A-70
Air flow		Down flow						
Power	Input	3-phase 380-415V, 50 Hz						
Capacity*	Total capacity	17.8 kW	25.7 kW	34.1 kW	36.8 kW	48.5 kW	55.1 kW	65.8 kW
	Sensible capacity	16.0 kW	23.1 kW	28.3 kW	30.5 kW	43.7 kW	49.6 kW	59.2 kW
Compressor	Type	Scroll compressor						
	Referigerant	R410A						
Fan	Type	EC						
Heater	Type	Electronical heater						
Humidifier	Type	Electrode humidifier						
Filter	Type	MERV 8						
Conformance		CE						
Display		Touch panel						
Communication		RS-485 x 1, Input dry contact x 2, Output dry contact x 6, SNMP x 1						
Dimensions	Width	852 mm	852 mm	852 mm	852 mm	1702 mm	1702 mm	2052 mm
	Depth	850 mm	850 mm	850 mm	850 mm	850 mm	850 mm	850 mm
	Height	1970 mm	1970 mm	1970 mm	1970 mm	1970 mm	1970 mm	1970 mm
Weight		250 kg	288 kg	311 kg	314 kg	520 kg	527 kg	595 kg

* Cooling capacity is measured at 24°C return air temperature, 50% relative humidity and 45°C condensing temperature.

Outdoor Unit

Model		HFC6B40-09S	HFC6B40-11S	HFC6B40-13S	HFC6B50-15S	HFC6B70-17D	HFC6B70-20D
Power	Input	1-phase 220-230V, 50Hz					
Fan	Type	AC					
Dimension	Width	1115 mm	1315 mm	1515 mm	1715 mm	1915 mm	2215 mm
	Depth	1100 mm	1100 mm	1100 mm	1100 mm	1100 mm	1100 mm
	Height	1090 mm	1090 mm	1090 mm	1090 mm	1090 mm	1090 mm
Weight		79 kg	89 kg	99 kg	107 kg	142 kg	154 kg

Model		HCC6C40-09S	HCC6C40-11S	HCC6C50-13S	HCC6C50-15S	HCC6C70-17D	HCC6C70-20D
Power	Input	3N~, 380-415V, 50/60Hz					
Fan	Type	EC					
Dimension	Width	1115 mm	1315 mm	1515 mm	1715 mm	1915 mm	2215 mm
	Depth	1100 mm	1100 mm	1100 mm	1100 mm	1100 mm	1100 mm
	Height	1090 mm	1090 mm	1090 mm	1090 mm	1090 mm	1090 mm
Weight		82 kg	92 kg	102 kg	110 kg	148 kg	160 kg

All specifications are subject to change without prior notice.

User-friendly color touch screen display

Energy-saving EC Fans

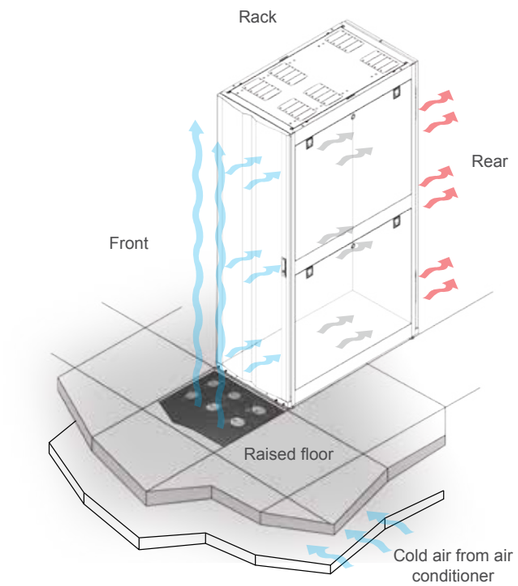
Fans under raised floor provide same air flow with 20% less power consumption

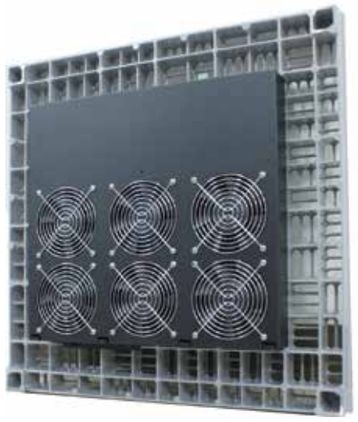
Delta InfraSuite Precision Cooling

Air Distribution Unit

For data centers with raised floors, the space beneath the floors are usually used as the cold aisle to deliver cold air to the IT racks. In data centers with this type of architecture, the amount of cold air that can be received by each IT rack depends on the static pressure of the cold aisle, the opening areas on floors as well as the suction capability of the racks. If any of these three criteria are insufficient, the rack will face the problem of insufficient supply of cold air and result in overheating.

The Delta ADU provides data centers with a simple solution for hot spots at the end of an aisle or for overheated high power density racks. Delta's ADU installs under the original openings of a raised floor where it detects the temperature inside a target rack or hot spot. The ADU automatically adjusts the rotation speed of its electronically commuted (EC) fan to provide the cool air needed by the target rack or hot spots.





Features and Benefits

- Maximum airflow above 1000 CFM.
- Inherent redundancy design if a fan malfunctions, other fans automatically increase in speed to make up the required airflow.
- The EC fan uses internal temperature data feedback of the target rack to automatically adjust fan speed and achieve the required rack temperature.
- Installs directly under raised floors with common openings - no need for special raised floors.
- Four dry contact outputs and one input for administrators to monitor and control.

Technical Specifications

Model		HC5990
Power	Rated voltage	1-phase 100-240 Vac
Fan	Type	EC
	Communication	Dry contact x 4
Conformance		CE, EN55022 Class A
Dimensions (W x H x D)		430 x 400 x 54 mm
Weight		5.6 kg

All specifications are subject to change without prior notice.

Easily installed beneath raised floor

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