Cooling Solutions

Future-ready for every cooling need

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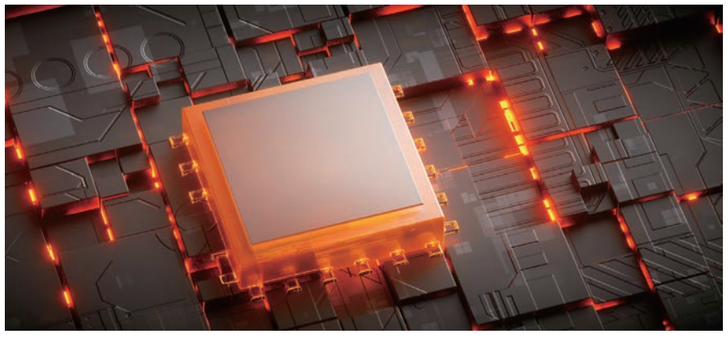
Cooling Dynamics for Digital Growth

In an era dominated by mature AI and high computing power, enterprises are propelled toward digital transformation by evolving technologies and market trends. The widespread use of social media, e-commerce, gaming, and self-driving cars underscores the need for robust data center support. However, the escalating power densities, doubling over the past six to seven years, pose a critical challenge with the rising demand for intensified heat dissipation. As rack density reaches 20-30 kW and beyond in high-performance settings, the role of efficient cooling becomes even more vital for sustained development.

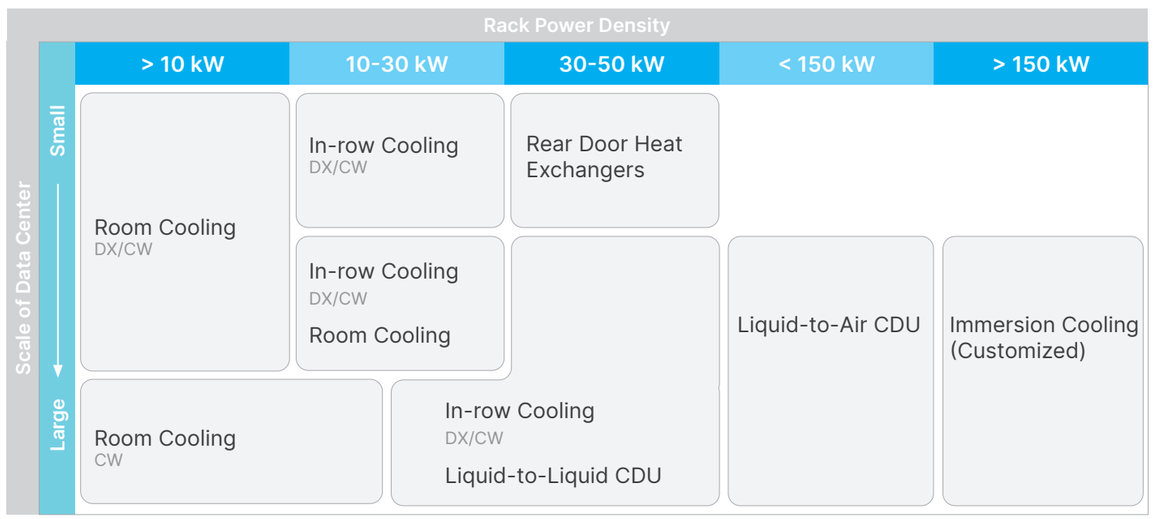


Efficient Cooling Powers Data Center Excellence

Optimizing cooling systems is paramount, since these systems constitute nearly 40% of a data center's overall energy consumption. The selection of efficient cooling solutions not only diminishes energy usage but also enhances overall efficiency, thereby contributing to a reduced Power Usage Effectiveness (PUE) for attaining peak efficiency in data center design.

Explore Delta's diverse range of cooling solutions, spanning from air to liquid types, meticulously designed to meet your specific requirements. Refer to the chart below for valuable insights into elevating your data center's efficiency and fostering a more sustainable future.

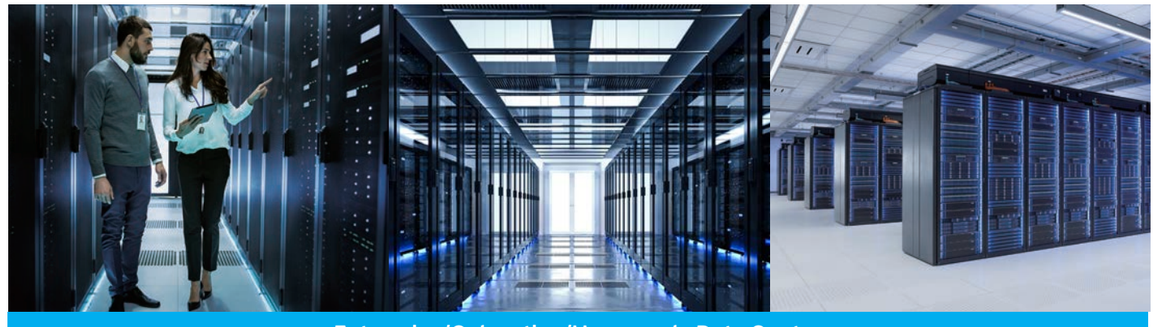
Cooling Solutions Across Data Center Scales by Rack Density



DX: Direct Expansion System CW: Cooling Water System

Delta: Your Source for Every Cooling Need

Delta presents an extensive array of air and liquid cooling products, delivering tailored solutions for enterprises, colocation facilities, hyperscale data centers, and HPC/AI workloads. As a prominent global manufacturer of fans and a specialist in power management, Delta Electronics is uniquely positioned to create Delta InfraSuite Precision Cooling Solutions. These solutions offer practical, optimized, and innovative methods for data center cooling. The precision cooling enthalpy laboratory at Delta meticulously verifies the performance and reliability of cooling systems throughout the engineering development and design process, ensuring unparalleled product excellence.



Room Cooling DX System

Room Cooling CW System

In-row Cooling DX/CW System

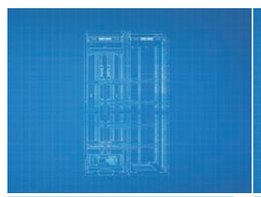
Rear Door Heat Exchangers

Liquid-to-Liquid CDU

Liquid-to-Air CDU

One-Stop Cooling Solution Provider

Functioning as a comprehensive service provider, Delta ensures a thorough and dependable cooling solution. This encompasses product consultation, customization, design, installation, and dedicated customer support, making Delta the go-to choice for all-encompassing and reliable cooling solutions.



Design

- Tailor-made cooling proposal
- Customized to align with specific power architecture setups

Manufacturing

- Craft in-house
- Third party certified lab
- 100% testing before shipping

Installation

- On-demand installation
- Testing protocols
- Service training

After Sales Service

- Maintenance
- Coolant Management

Delta's Cooling Brilliance

Reliable. Efficient. Peak Performance

With a reputation for reliability and efficiency, Delta's Cooling Solutions are acclaimed across a multitude of industries. Embraced by telecommunications, semiconductor manufacturing, and media technology data centers, Delta's prowess in cooling technology pitomizes excellence and trustworthiness in critical operational environments.

Information Technology & Software

A Software and Cloud Giant
L2A CDU 144 kW*
L2L CDU 1000 kW

AI and High-Performance Computing

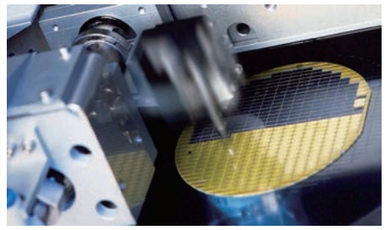
An AI and GPU Leader
L2A CDU 60*, 115 kW
L2L CDU 1500 kW

Cloud Computing

A Top Cloud Service Provider
L2A CDU 80 kW*
L2L CDU 1000 kW

Social Media & Digital Platforms

A Top-tier Social Media Platform
L2A CDU 20, 40 kW*



Semiconductors

A Dominant Semiconductor Foundry
Two-phase Immersion Cooling 100 kW*
In-row Cooling 29-250* kW

Colocation Provider

A Top Colocation Service Provider
L2L CDU 440 kW*

Telecom

HTC-ITC's Uptime TCCF TIER III Certified Data Center
In-row Cooling 30 kW
Room Cooling 30, 40 kW

Chemical Industry

Formosa Plastics Group
In-row Cooling 45 kW

Financial Services

IBF Financial Holdings
In-row Cooling 43 kW

* Customized products

Product Matrix

Cooling Type		Nominal Cooling Capacity	Cooling Medium	Page
Liquid Cooling				
	Liquid-to-Liquid CDU	500-1500 kW	DI Water & PG25	5-10
	Liquid-to-Air CDU	115 kW	PG25	11-12
Air Cooling				
	Rear Door Heat Exchanger (RDHx)	30, 50 kW	Pure Water	13-14
	In-row Cooling (CW)	29-95 kW	Chilled Water	15-16
	In-row Cooling (DX)	30, 45 kW	R410 Refrigerant	17-18
	Room Cooling (CW)	70-320 kW	Chilled Water	19-20
	Room Cooling (DX)	25-100 kW	R410 Refrigerant	21-22
	Assist Airflow Control Cooling	1000 CFM	Air	23-24

Liquid-to-Liquid CDU

SuperCDU-500

The increasing demand for high-performance computing and advanced GPUs highlights the limitations of air-cooling. Delta's SuperCDU offers a superior alternative, providing effective separation of facility and secondary circuits as well as precise control over flow, pressure, temperature, and coolant quality. It excels in managing high-density thermal load, maximizing computing power while minimizing data center PUE. The SuperCDU ensures operational reliability by preventing condensation and guarantees quality with its stainless steel plumbing and coolant filtration. Embrace the future of high-performance computing with Delta's SuperCDU!

Cost Effective

- Maximize energy saving: cuts power consumption, surpassing traditional air cooling
- Space optimization: compact design enables closer server placement further reducing Capex
- Flexible integration: supports direct-to-chip and Rear Door Heat Exchanger (RDHx) application, adapting to existing setups and blending air and liquid cooling for future upgrades

High Reliability

- Uninterrupted operation: dual power feed with ATS ensures continuous CDU operation
- Optimized redundancy design ensures no single point of failure in the system
- Leak detection: instant alarms with configurable response for efficient pumping action
- Durable construction: stainless steel plumbing with 50-micron filters for long-term coolant quality

Easy Management

- Intuitive interface: 10-inch color touchscreen displays real-time system status
- Efficient control: group and manual control enhance system management and reliability

Technical Specifications

Model		SuperCDU-500
Nominal Cooling Capacity		500 kW(1)
PRIMARY SIDE		
Coolant Type		Water
Nominal Coolant Flow Rate		660 LPM
Operating Pressure Drop		151.68 kPa @660 LPM water flow rate
Coolant Filter		500μ with bypass to enable cleaning
SECONDARY SIDE		
Coolant Type		Deionized water
Nominal Coolant Flow Rate		950 LPM
Approach Temperature		5°C
Coolant Filter		50μ with bypass to enable cleaning
External Pressure Drop		70 kPa
POWER SUPPLY		
Nominal Power Supply Voltage		380/400/415 Vac, 3P4W+PE
Operating Voltage Range		360-440 Vac
Frequency		50/60 Hz
Maximum Over Current Protection (MOCP)		17 A
Full Load Ampere (FLA)		12.5 A
Dual Power Feed		Standard
Power Feeds Location		Top
DEPLOYMENT		
Primary Connection		Victaulic coupling 475, DN65
Secondary Connection		Victaulic coupling 475, DN80
Primary and Secondary Connection Location		Bottom
PHYSICAL		
Dimensions (W x D x H)		600 x 1350 x 2100 mm
Net Weight	With Coolant	800 kg
	Without Coolant	675 kg
COMMUNICATION INTERFACE		
Display		10" color touchscreen
Protocols		SNMP, Modbus TCP, Modbus RTU
Monitoring		Primary Side: Temp. (Inlet/Outlet), Flow, Pressure (Inlet, Filter ΔP) Secondary Side: Temp. (Supply/Return), Flow, Pressure (Supply, Return, Filter ΔP) Dew-point Temp.
CONFORMANCE		
Safety		CE
FEATURES		
Leak Detection		Standard
Temperature/Pressure Sensor Redundancy		Standard
Integrated Variable Frequency Drivers (VFD's)		Standard
Pressure Independent Control Valve (PICV)		Standard
Flexible Secondary Side Coolant Options		PG25/Pure Water/Deionized Water
Auto-restart Function		Standard

(1) Conditions for rated capacity: facility inlet water temperature 34.5°C, approach temperature 5°C, secondary diff. temperature 8°C

All specifications are subject to change without prior notice.

Liquid-to-Liquid CDU

SuperCDU-1200

The increasing demand for high-performance computing and advanced GPUs highlights the limitations of air-cooling. Delta's SuperCDU offers a superior alternative, providing effective separation of facility and secondary circuits as well as precise control over flow, pressure, temperature, and coolant quality. It excels in managing high-density thermal load, maximizing computing power while minimizing data center PUE. The SuperCDU ensures operational reliability by preventing condensation and guarantees quality with its stainless steel plumbing and coolant filtration. Embrace the future of high-performance computing with Delta's SuperCDU!

Cost Effective

- Maximize energy saving: cuts power consumption, surpassing traditional air cooling
- Space optimization: compact design enables closer server placement further reducing Capex
- Flexible integration: supports direct-to-chip and Rear Door Heat Exchanger (RDHx) application, adapting to existing setups and blending air and liquid cooling for future upgrades

High Reliability

- Uninterrupted operation: dual power feed with ATS ensures continuous CDU operation
- Optimized redundancy design ensures no single point of failure in the system
- Leak detection: instant alarms with configurable response for efficient pumping action
- Durable construction: stainless steel plumbing with 50-micron filters for long-term coolant quality

Easy Management

- Intuitive interface: 10-inch color touchscreen displays real-time system status
- Efficient control: group and manual control enhance system management and reliability

Technical Specifications

Model		SuperCDU-1200
Nominal Cooling Capacity		1200 kW @5°C approach, 1200 LPM secondary flow rate, 1160 LPM primary flow rate, 1.0 LPM/kW 1200 kW @4°C approach, 1200 LPM secondary flow rate, 1350 LPM primary flow rate, 1.0 LPM/kW 1000 kW @4°C approach, 1500 LPM secondary flow rate, 1350 LPM primary flow rate, 1.5 LPM/kW 1000 kW @4°C approach, 1000 LPM secondary flow rate, 1100 LPM primary flow rate, 1.0 LPM/kW
PRIMARY SIDE		
Coolant Type		Water
Nominal Coolant Flow Rate		1160 LPM, 27°C primary inlet temperature
Operating Pressure Drop		121.35 kPa @1160 LPM water flow rate
Coolant Filter		500μ with bypass to enable cleaning
SECONDARY SIDE		
Coolant Type		25%PG
Nominal Coolant Flow Rate		3x pumps: 1200 LPM @317.16 kPa external pressure differential 3x pumps: 1500 LPM @206.84 kPa external pressure differential 2x pumps: 1000 LPM @255.11 kPa external pressure differential
Approach Temperature		5°C
Coolant Filter		50μ with bypass to enable cleaning
External Pressure Drop		317.16 kPa
POWER SUPPLY		
Nominal Power Supply Voltage		380/400/415/480 Vac, 3P3W+PE
Operating Voltage Range		374-528 Vac
Frequency		50/60 Hz
Maximum Over Current Protection (MOCP)		60 A
Full Load Ampere (FLA)		42 A
Dual Power Feed		Standard
Power Feeds Location		Top
DEPLOYMENT		
Primary Connection		4 in. sanitary ferrule
Secondary Connection		4 in. sanitary ferrule
Primary and Secondary Connection Location		Top
PHYSICAL		
Dimensions (W x D x H)		900 x 1200 x 2300 mm (35.4 x 47.2 x 90.6 inch)
Net Weight	With Coolant	1450 kg (3197 lb)
	Without Coolant	1200 kg (2646 lb)
COMMUNICATION INTERFACE		
Display		10" color touchscreen
Protocols		SNMP, Modbus TCP, Modbus RTU, BACnet
Monitoring		Primary Side: Temp. (Inlet/Outlet), Flow, Pressure (Inlet, Filter ΔP) Secondary Side: Temp. (Supply/Return), Flow, Pressure (Supply, Return, Filter ΔP) Dew-point Temp.
CONFORMANCE		
Safety		CE, UL/CSA 60335
FEATURES		
Leak Detection		Standard
Pump Redundancy		2x pump (N+1), 3x pump (N) run modes
Temperature/Pressure Sensor Redundancy		Standard
Integrated Variable Frequency Drivers (VFD's)		Standard
Expansion Vessel Redundancy		3x redundant 8L expansion vessels
Auto-restart Function		Standard

All specifications are subject to change without prior notice.

Liquid-to-Liquid CDU

SuperCDU-1500

The increasing demand for high-performance computing and advanced GPUs highlights the limitations of air-cooling. Delta's SuperCDU offers a superior alternative, providing effective separation of facility and secondary circuits as well as precise control over flow, pressure, temperature, and coolant quality. It excels in managing high-density thermal load, maximizing computing power while minimizing data center PUE. The SuperCDU ensures operational reliability by preventing condensation and guarantees quality with its stainless steel plumbing and coolant filtration. Embrace the future of high-performance computing with Delta's SuperCDU!

Cost Effective

- Maximize energy saving: cuts power consumption, surpassing traditional air cooling
- Space optimization: compact design enables closer server placement further reducing Capex
- Flexible integration: supports direct-to-chip and Rear Door Heat Exchanger (RDHx) application, adapting to existing setups and blending air and liquid cooling for future upgrades

High Reliability

- Uninterrupted operation: dual power feed with ATS ensures continuous CDU operation
- Optimized redundancy design ensures no single point of failure in the system
- Leak detection: instant alarms with configurable response for efficient pumping action
- Durable construction: stainless steel plumbing with 50-micron filters for long-term coolant quality

Easy Management

- Intuitive interface: 10-inch color touchscreen displays real-time system status
- Efficient control: group and manual control enhance system management and reliability

Technical Specifications

Model		SuperCDU-1500
Nominal Cooling Capacity		1500 kW @5°C approach, 1500 LPM secondary flow rate, 1500 LPM primary flow rate, 1.00 LPM/kW 1377 kW @4°C approach, 1200 LPM secondary flow rate, 1200 LPM primary flow rate, 0.87 LPM/kW 1210 kW @4°C approach, 1350 LPM secondary flow rate, 1200 LPM primary flow rate, 1.12 LPM/kW 1170 kW @4°C approach, 1400 LPM secondary flow rate, 1200 LPM primary flow rate, 1.20 LPM/kW 1035 kW @4°C approach, 1500 LPM secondary flow rate, 1200 LPM primary flow rate, 1.45 LPM/kW
PRIMARY SIDE		
Coolant Type		Water
Nominal Coolant Flow Rate		1200 LPM, 27°C primary inlet temperature
Operating Pressure Drop		93.08 kPa @1200 LPM water flow rate
Coolant Filter		500μ with bypass to enable cleaning
SECONDARY SIDE		
Coolant Type		25%PG
Nominal Coolant Flow Rate		4x pumps: 1500 LPM @337.84 kPa external pressure differential 3x pumps: 1500 LPM @258.55 kPa external pressure differential
Approach Temperature		5°C
Coolant Filter		50μ with bypass to enable cleaning
External Pressure Drop		337.84 kPa
POWER SUPPLY		
Nominal Power Supply Voltage		380/400/415/480 Vac, 3P3W+PE
Operating Voltage Range		342-528 Vac
Frequency		50/60 Hz
Maximum Over Current Protection (MOCP)		70 A
Full Load Ampere (FLA)		54 A
Dual Power Feed		Standard
Power Feeds Location		Top
DEPLOYMENT		
Primary Connection		4 in. sanitary ferrule
Secondary Connection		4 in. sanitary ferrule
Primary and Secondary Connection Location		Top
PHYSICAL		
Dimensions (W x D x H)		1200 x 1200 x 2300 mm (47.2 x 47.2 x 90.6 inch)
Net Weight	With Coolant	1900 kg (4188.8 lb)
	Without Coolant	1600 kg (3527.4 lb)
COMMUNICATION INTERFACE		
Display		10" color touchscreen
Protocols		SNMP, Modbus TCP, Modbus RTU
Monitoring		Primary Side: Temp. (Inlet/Outlet), Flow, Pressure (Inlet, Filter ΔP) Secondary Side: Temp. (Supply/Return), Flow, Pressure (Supply, Return, Filter ΔP) Dew-point Temp.
CONFORMANCE		
Safety		CE, UL/CSA 60335
FEATURES		
Leak Detection		Standard
Pump Redundancy		3x pump (N+1), 4x pump (N) run modes
Temperature/Pressure Sensor Redundancy		Standard
Integrated Variable Frequency Drivers (VFD's)		Standard
Expansion Vessel Redundancy		4x redundant 8L expansion vessels
Auto-restart Function		Standard

All specifications are subject to change without prior notice.

Liquid-to-Air CDU

L2A CDU-115

Unlock unmatched efficiency with Delta's Liquid-to-Air (L2A) CDU for HPC and AI workloads. L2A CDU provides a closed-loop liquid solution that eliminates the need for raised floors or extensive piping, and seamlessly integrates with direct-to-chip cooling for superior performance. Enjoy high cooling density, minimal power consumption, and simplified deployment. With customizable options, Delta's L2A CDU can achieve up to 115 kW per rack, ensuring reliability with redundant components and hot-swappable features. The L2A CDU-115 is ideal for data center retrofits and scalable growth.

Superior Heat Dissipation

- Excellent thermal resistance that significantly outperforms air cooling
- Maximizes cooling density, providing more efficient heat removal

Cost Efficient

- Ultra-efficient power usage: lower power consumption under 5%
- Seamless integration: no raised floors or facility piping needed; simplifies layout and adapts easily to specific requirements
- Optimizes space utilization: increases compute density and maximizes space without facility modifications
- Utilizes existing infrastructure: Room Cooling (CRAH), hot air containment and racks

Robust Reliability

- Redundant design for key components: pump, fan, sensor and controller
- Assures coolant quality with integrated 50-micron filter
- Hot-swappable pump and fan enable swift onsite replacement

Technical Specifications

Model	L2A CDU-115
Nominal Cooling Capacity	115 kW
DEPLOYMENT	
Ambient Temperature	35°C (95°F)
Airflow Rate	13,908 CFM
Coolant Supply Temperature	45°C (113°F)
Coolant Flow Rate	138 LPM
Coolant Supply Pressure	234.42 kPa
Approach Temperature	10°C (18°F)
Coolant Feed Location	Front
POWER SUPPLY	
Nominal Power Supply Voltage	380/400/415/480 Vac, 3P4W+PE
Operating Voltage Range	312-528 Vac
Frequency	50/60 Hz
Maximum Power Consumption	18 kW
Dual Power Feed	Standard
PHYSICAL	
Dimensions (W x D x H)	1200 x 1066 x 2286 mm (48 x 42 x 90 in)
Net Weight	1200 kg (2645.5 lbs)
COMMUNICATION INTERFACE	
Display	LCD touchscreen (optional)
Protocols	Modbus RTU
ENVIRONMENT	
Operating Temperature	10 to 35°C (50 to 95°F)
Humidity	20-80%
CONFORMANCE	
Safety	UL
FEATURES	
Leak Detection	Standard
Networking Remote Monitoring/ Control	Standard
Individual Fan Fail Sensing	Standard
Variable DC Fans	Standard

All specifications are subject to change without prior notice.

Rear Door Heat Exchanger (RDHx)

CoolDoor-30/50

Delta CoolDoor is the ideal solution for high-power-density racks. With EC fans ensuring reliability and efficiency, it removes heat at the source, preventing hot air in the room. No need for added footprint or raised floor, the CoolDoor saves space and reduces CAPEX. The turbo boost dissipates heat from neighboring racks, and the leakage detection ensures high reliability. Elevate your data center performance with Delta CoolDoor!

Unparalleled Reliability

- Built-in MCU precisely controls water and air flow for accurate temperature management
- Ensures chiller system stability during power recovery with a two-way ball valve design post-emergency shutdown
- Turbo boost control ensures uninterrupted operation by utilizing adjacent RDHx during ball valve or fan failure
- Enhances equipment protection with 4m water leakage detection and integrated cut-off valve (optional) to minimize potential damage
- Integr ated ATS (optional) for continuous operation
- Elevates security with lockable access door

Efficient Use of Space and Energy

- No hot aisle containment needed
- Low profile design mounts seamlessly on the rear of the rack, saving valuable space
- Enhance energy savings with an adjustable fan speed (30-100%) and high-efficiency EC fan

Easy Management

- LCD screen and LED indicators for onsite monitoring system status and control
- Empowers remote monitoring through input dry contact and external RTU device
- Tailor-made ducts, perfect for all rack types
- Hot-swappable fans and sensors allow for quick and easy maintenance
- Flow control valve (optional) delivers high cooling availability and control

Technical Specifications

Model	D30	D50
Cooling Capacity	30 kW(1)	50 kW(2)
Rated Air Flow	3812 CFM	4016 CFM
PHYSICAL		
Compatible Rack Heights	42-60(3)U	
Compatible Rack Widths	600-800 mm	
Dimensions (W x D x H)	600 x 345 x 1970 mm	
Net Weight	90 kg	98 kg
DEPLOYMENT		
Inlet Chiller Water Temperature	12°C (recommended) to 20°C(4) Inlet chiller water temperature should be higher than dew point temperature	
Maximum Operating Pressure	10 bar (999.74 kPa)	
Maximum CW Flow Rate	82 LPM (PICV 69 LPM)	122 LPM (PICV 108 LPM)
Rated Water Flow	55 LPM	90 LPM
Piping Connection	Top/Bottom	
Piping Size	1 inch	1 1/4 inch
POWER SUPPLY		
Nominal Power Supply Voltage	200/208/220/230/240 Vac, 1P2W+PE	
Frequency	50/60 Hz	
Input Connection Type	NEMA 6-15P	
Rated Power Consumption	0.44 kW	0.67 kW
Power Feed Location	Top	
MECHANICAL		
Valve Type	2-way valve, FC type	
Fan Type	EC	
Fan Quantity	4	
Water Leakage Detector	4m length	
COMMUNICATION INTERFACE		
Display	LCD display with LED indicators	
Port	Modbus RTU (RS-485), Remote On/Off input dry contact, Fire alarm input dry contact, Total alarm output dry contact	
CONFORMANCE		
Safety	CE, UL(5)	
FEATURES		
Leak Detection	Standard	
Dual Power Feeds	Optional	
Cut-off Valve (Isolate Leakage RDHx)	Optional	
T/ RH Sensor-Cold Side Dew Point Monitoring	Optional	
PICV Valve	Optional	
Air Static Pressure Sensor	Optional	
Quick Disconnect Couplings	Optional	
BACnet	Optional	
SNMP Card	Optional	

(1) Conditions for D30 rated capacity at return air: 42°C, Inlet water 12°C and outlet water 20°C
(2) Conditions for D50 rated capacity at return air: 50°C, Inlet water 12°C and outlet water 20°C
(3) Custom connect duct is required for heights over 42U or widths greater than 600 mm
(4) Over 12°C requires cooling capacity derating
(5) UL provided upon request

All specifications are subject to change without prior notice.

Complete System RDHx Connect Duct Rack

In-Row Cooling, Chilled Water

RowCool CW-29/43/70/95

Delta's RowCool CW delivers exceptional performance for high-temperature chilled water applications with its advanced heat exchanger design. Featuring industry-leading cooling capabilities, the RowCool CW enhances overall efficiency in data center precision cooling systems. Each unit offers a remarkable cooling capacity of up to 95 kW, making it ideal for data centers requiring hundreds of kW. Designed for high efficiency and high density, the RowCool CW ensures reliable, efficient cooling for even the most demanding environments.

High Availability

- Dual Power Feed: supports dual power inputs, suitable for any tier level of power reliability
- Redundant Fan System: fans automatically adjust speeds if one fails, ensuring continuous airflow
- Hot-Swappable Parts*: replace power modules and fans without downtime
- 1+1 Redundant Power Modules: enhance reliability (available on select models)
- Real-Time Monitoring: tracks water flow and leaks for immediate troubleshooting

High Efficiency

- Optimized Design: enhances cooling efficiency for high-temperature chilled water systems
- Smart Fan Control: EC fans adjust speeds in real-time based on load changes, minimizing power waste
- Effective Heat Removal: closely integrates with IT heat loads for effective heat dissipation

High Flexibility

- Flexible Installation: supports top or bottom piping and wiring
- Filter Choices: high-efficiency (MERV 8) or washable (MERV 1) filters available
- Easy Mobility: casters make installation and repositioning easy

* Applicable for CW-29 and CW-43 models

Technical Specifications

Model	CW-29	CW-43	CW-70	CW-95
Total Cooling Capacity(1)	30.8 kW	43.4 kW	69.3 kW	92.6 kW
Sensible Cooling Capacity(1)	30.2 kW	43 kW	69.3 kW	91.6 kW
Total Cooling Capacity(2)	37.1 kW	50.4 kW	83.1 kW	110.7 kW
Sensible Cooling Capacity(2)	37.1 kW	50.4 kW	83.1 kW	110.7 kW
Total Cooling Capacity(3)	28.8 kW	36 kW	57.4 kW	79.4 kW
Sensible Cooling Capacity(3)	28.8 kW	36 kW	57.4 kW	79.4 kW
DEPLOYMENT				
Coolant Type	Chilled Water			
Piping Connection Location	Top/Bottom			
Chilled Water Flow Rate	68.3 LPM	80 LPM	111.2 LPM	120 LPM
Airflow Rate	2902 CFM	4415 CFM	6700 CFM	8200 CFM
Air Discharge Direction	Front			
Heater	N/A		Finned Tube (Optional)	
Humidifier	N/A		Electrode (Optional)	
POWER SUPPLY				
Nominal Power Supply Voltage	220/230 Vac, 1P2W+PE	220/230/240 Vac, 1P2W+PE	380 Vac, 3P4W+PE	380/400 Vac, 3P4W+PE
Operating Voltage Range	198-242 Vac	198-264 Vac	342-418 Vac	360-440 Vac
Frequency	50/60 Hz			
Maximum Power Consumption	1 kW	2.4 kW	3 kW 10.8 kW(4)	4.8 kW 12.9 kW(4)
Dual Power Feed	Standard			
PHYSICAL				
Dimensions (W x D x H)	300 x 1090 x 2000 mm		600 x 1090 x 2000 mm	
Net Weight	185 kg	187 kg	368 kg 375 kg(4)	415 kg 422 kg(4)
COMMUNICATION INTERFACE				
Display	LCD+LED indicators			
Protocols	SNMP, Modbus RTU			
CONFORMANCE				
Safety	CE			
Seismic Rating	GR63 Zone 4			
FEATURES				
Leak Detection	Standard			
Remote Rack Temperature	Standard			
Drain Pump	Optional			
Reheat and Humidifier Lockout	Optional			

(1) Cooling Capacity: At 40.6°C dry bulb, 21.6°C wet bulb, and 7°C inlet water
(2) Maximum Capacity: At 48.9°C dry bulb, 23.9°C wet bulb, and 7°C inlet water
(3) High Temp Water Capacity: At 40.6°C dry bulb, 21.6°C wet bulb, with 12°C inlet and 20°C outlet water
(4) With heater and humidifier

All specifications are subject to change without prior notice.

In-Row Cooling, Direct Expansion

R-30/45

Elevate your data center with Delta's R Series! Featuring state-of-the-art DC inverter compressors and electronically commuted (EC) fans, the R Series represents the pinnacle of cooling technology. By leveraging Delta's advanced fuzzy control mode, these units deliver unmatched efficiency in direct expansion (DX) cooling systems. Crafted to enhance efficiency and power density in medium- to small-sized data centers, the R Series offers unmatched convenience and simplified maintenance. Bid farewell to costly ownership expenses – with Delta, achieving optimal efficiency for your data center is within reach. Make the savvy choice, opt for Delta's R Series now!

High Efficiency

- Variable Speed Fans: EC Fans adjust in real-time to minimize power waste
- Adaptive Cooling: DC variable frequency compressor adjusts from 20% to 100% to maintain optimal temperature
- Effective Heat Removal: quickly adapts to IT heat loads for efficient cooling

Superior Reliability

- Dual Power Input: integrates seamlessly into any power reliability architecture of any tier level
- Automatic Safety: compressor shuts off at unsafe pressures
- Precision Control: MCU ensures accurate temperature and automatic unit adjustment
- Comprehensive Monitoring: includes real-time flow and leakage detection
- Secure Access: lockable front and rear door

Great Adaptability

- Flexible Installation: supports top or bottom piping and wiring
- Tailored Alarms: configurable with input and output dry contacts
- Tool-Free Mobility: casters allow easy installation and relocation without extra tools

Technical Specifications

Model	R-30	R-45
Nominal Cooling Capacity	30 kW(1)	45.6 kW(2)
Sensible Cooling Capacity	30 kW	45.6 kW
DEPLOYMENT		
Refrigerant	R410A	
Piping Connection Location	Top/Bottom	
Refrigerant Discharge Piping	5/8 inch	7/8 inch
Refrigerant Liquid Piping	1/2 inch	5/8 inch
Airflow Rate	5000 CFM	8600 CFM
Air Discharge Direction	Front	
POWER SUPPLY		
Nominal Power Supply Voltage	380/400/415/480 Vac, 3P4W+PE	
Operating Voltage Range	342-528 Vac	
Frequency	50/60 Hz	
Maximum Power Consumption	10.3 kW	
Full Load Current	29 A	45 A
Dual Power Feed	Standard	
PHYSICAL		
Dimensions (W x D x H)	300 x 1090 x 2000 mm	600 x 1090 x 2000 mm
Net Weight Cooling	216 kg	300 kg
Cooling+ Reheater+ Humidifier	220 kg	303 kg
Cooling+ Reheater+ Electrode Humidifier	223 kg	306 kg
COMMUNICATION INTERFACE		
Display	10" color LCD touchscreen	
Protocols	Modbus RTU, SNMP	
CONFORMANCE		
Safety	CE	
FEATURES		
Leak Detection	Standard	
Dual Power Feeds	Optional	
Modbus and BACnet	Standard	
Remote Rack Temperature and Humidity	Standard	
Seismic Rating Zone 4	Optional	
Reheat and Humidifier Lockout	Standard	
Optional Heater	3 kW	6 kW
Optional Wet Membrane Humidifier	1.5 kg/hr	3 kg/hr
Optional Electrode Humidifier	3 kg/hr	

(1) Cooling capacity is rated at a 40°C return air dry bulb temperature, 21°C wet bulb temperature, and 35°C outdoor temperature

Outdoor Unit-Condenser

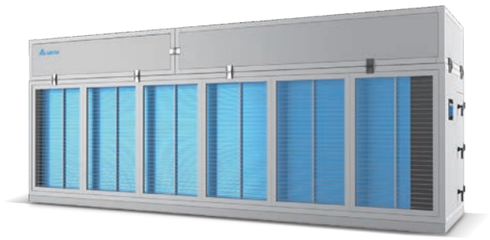
Model	R-30 Condenser - RDA037	R-45 Condenser - RDA059
Nominal Power Supply Voltage	380/400/415/480 Vac, 3P4W+PE	
Frequency	50/60 Hz	
Fan Quantity	1 pcs	
Dimensions (W x D x H)	1725 x 1100 x 1120 mm	
Net Weight	110 kg	120 kg

All specifications are subject to change without prior notice.

Room Cooling, Chilled Water

L-70/90/320

Introducing Delta's L Series room cooling -engineered for superior reliability and efficiency. This advance chiller offers precise temperature control with intelligent management, energy-efficient EC fans, and ATS. Engineered for high-temperature applications with its advanced heat exchanger design. The Delta L Series combines intuitive controls with superior insulation to deliver optimal performance and protection for your critical cooling needs.



Superior System Reliability

- Intelligent Control: built-in MCU adjusts cooling water and air flow to maintain optimal temperature control
- Built-in ATS: automatically switch to backup power feed to ensure uninterrupted operation
- Two-way Ball Valve: stabilizes chilled water flow and prevents fluctuations during power recovery

Optimized Energy Efficiency

- EC Fan: adjustable-speed fan (30-100%) for customized energy savings
- Double Wall Panel: high-insulation panels reduce heat loss and enhance energy efficiency
- User-Friendly Touchscreen Control Interface: simplifies system management and monitoring for efficient operation

Comprehensive Safety Features

- Alarm System with Smoke Detection: alerts user to system abnormalities and provides early fire warning
- Water Leakage Detection: immediate alerts for any water leakage to protect equipment
- Lockable Access Door: tool-required locking mechanism ensures secure access before startup

Technical Specifications

Model	L-70	L-90	L-320
Total Cooling Capacity	70 kW(1)	88.4 kW(2)	320 kW(3)
Sensible Cooling Capacity	70 kW	88.4 kW	320 kW
Airflow Rate	11500 CFM	10018 CFM	54086 CFM
DEPLOYMENT			
Maximum Water Flow Rate	133 LPM	180 LPM	633 LPM
Maximum Water Pressure Drop	79.98 kPa	59.98 kPa	97.91 kPa
Water Piping Connection	1 1/2 inch Flange	1 1/2 inch PT Female	3 inch NPT Male
Drain Piping Size	5/8 inch	3/8 inch	1 1/2 inch
Fan Type and Quantity	EC fan x2		EC fan x10
Air Discharge Direction	Front		
POWER SUPPLY			
Nominal Power Supply Voltage	460 Vac, 3P3W	380/400/415 Vac, 3P4W+PE	460 Vac, 3P4W+PE
Operating Voltage Range	414-506 Vac	342-456 Vac	414-506 Vac
Frequency	60 Hz	50/60 Hz	60 Hz
Maximum Power Consumption	8.6 kW	7.2 kW	20.6 kW
Dual Power Feed	Standard		
PHYSICAL			
Dimensions (W x D x H)	2134 x 914 x 2896 mm	1600 x 900 x 2150 mm	2380 x 5900.4 x 1600.2 mm
Net Weight	971 kg	494 kg	2449 kg
COMMUNICATION INTERFACE			
Display	10" color LCD touchscreen		
Port	Modbus TCP (RJ45) x1, Output dry contact x1	Modbus TCP (RS-485) x1, Input dry contact x1, Output dry contact x1	Modbus TCP/IP (RS-485)
CONFORMANCE			
Safety	UL	CE	UL
Seismic Rating	SDC D	GR63 ZONE4	
FEATURES			
Leak Detection	Standard		
Pressure Independent Control Valves (PICV)	Standard	N/A	
Drain Pump	Standard		N/A
Remote Rack Temperature and Humidity	Optional		

(1) Cooling Capacity: At 35°C (95°F) dry bulb, 18.3°C (65°F) wet bulb, and 21.1°C (70°F) inlet water
(2) Cooling Capacity: At 38°C (100.4°F) dry bulb, 23.9°C (75°F) wet bulb, 10°C (50°F) inlet water and 17°C (62.6°F) outlet water
(3) Cooling Capacity: At EAT/LAT 35.6/23.3°C (96/ 74°F), EWT/LWT: 18.3/26.1°C (65/79°F)

All specifications are subject to change without prior notice.

Room Cooling, Direct Expansion

M-25/30/40/50/60/70/80/90/100

In today's AI-driven data centers, where efficiency and adaptability are essential, the Delta M Series Room Cooling System offers a sophisticated solution that complements the growing need for effective air cooling alongside advanced liquid cooling technologies. Our system is meticulously engineered to deliver top-tier performance, energy efficiency, and flexibility, addressing the critical cooling demands of modern data centers.

Superior Efficiency and Energy Saving

- Advanced fan technology: EC and downdraft fans saves over 20% energy compared to conventional setups
- High sensible heat ratio: unit boasts a sensible heat ratio above 0.9 for enhanced cooling efficiency

Modular Design and Flexible Installation

- Modular operation: modules can operate independently or be combined as needed, simplifying on-site assembly and disassembly
- Compact footprint: high refrigeration capacity with a small footprint
- Adaptive layout: units can be installed together or separately, offering flexible space planning, overcoming size constraints, and allowing for easy adjustment to cooling load

Maintenance Convenience and Advanced Control

- Comprehensive interface support: RS-485, Ethernet, Modbus RTU, Modbus TCP, SNMP, HTTP
- Advanced control system: feature touchscreen with an intuitive interface, reliable CAN bus control for up to 32 units, and supports group control functions as round-up, backup and cascade, preventing competitive operation
- Fully front access: simplifies maintenance

Technical Specifications

Downward Air Supply Model	M-	25DA1	30DA1	40DA1	40DA2	50DA2	60DA2	70DA2	80DA2	90DA2	100DA2
Upper Air Supply Model	M-	25UA1	30UA1	40UA1	40UA2	50UA2	60UA2	70UA2	80UA2	90UA2	100UA2
Total Cooling Capacity		25.2 kW	30.3 kW	40.3 kW	40.2 kW	50.1 kW	60.1 kW	70.1 kW	80.2 kW	90.2 kW	100.1 kW
Sensible Cooling Capacity		22.9 kW	27.5 kW	36.5 kW	36.3 kW	45.3 kW	54.3 kW	63.3 kW	72.5 kW	83.4 kW	90.5 kW
Airflow Rate	m^3/h	6800	8000	10600		13300	15600	18300	21000	23500	26700
Heating Capacity		6 kW		9 kW					12 kW		
Humidifier Capacity		5 kg/h				13 kg/h					
POWER SUPPLY											
Nominal Power Supply Voltage		380/400 Vac, 3P4W+PE									
Operating Voltage Range		342-418 Vac									
Frequency		50 Hz									
Maximum Power Consumption		20 kW	21 kW	28 kW	29 kW	34 kW	40 kW	45 kW	50 kW	54 kW	60 kW
Full Load Current		34 A	37.5 A	50.1 A		57.2 A	67.2 A	79.1 A	90.3 A	97.8 A	105.9 A
MECHANICAL											
Refrigerant Type		R410A									
Compressor Quantity		1 pcs			2 pcs						
EC Fan Quantity		1 pcs					2 pcs				
Condenser Model and Quantity		CM35 x1	CM45 x1	CM60 x1	CM30 x2	CM35 x2	CM45 x2	CM50 x2	CM60 x2	CM65 x2	CM75 x2
PHYSICAL											
Dimensions (W x D x H)	mm	905 x 990 x 1980		1305 x 990 x 1980			1780 x 990 x 1980		2180 x 990 x 1980		
Net Weight		347 kg	381 kg	455 kg	475 kg	498 kg	664 kg	668 kg	724 kg	729 kg	749 kg
COMMUNICATION INTERFACE											
Display		LCD touchscreen									
Protocols		Modbus RTU, Modbus TCP, SNMP, HTTP									
FEATURES											
Leak Detection		Standard									
Room Temperature and Humidity Sensor		Standard									
Condensate Drain Pump		Optional									
Air Economizer for Direct Free Cooling		Optional									
Motorize Damper		Optional									
Dual Power Feeds		Optional									
PTC Heating System		Optional									
Electrode Humidifier		Optional									

(1) Outdoor ambient temperature: 35°C

Condenser

Model	CM-30	CM-35	CM-45	CM-50	CM-60	CM-65	CM-75
Airflow Rate	7920 m^3/hr	8280 m^3/hr	9620 m^3/hr	12000 m^3/hr	13420 m^3/hr	15230 m^3/hr	16980 m^3/hr
Nominal Power Supply Voltage	200/208/220/230/240 Vac, 1P2W+PE						
Frequency	50 Hz						
Power Consumptions	0.55 kW			1.1 kW			
Fan Quantity	1 pcs			2 pcs			
Dimensions (W x D x H)	1290 x 975 x 965 mm	1290 x 1076 x 965 mm		1795 x 975 x 965 mm	2095 x 975 x 965 mm		2095 x 1076 x 965 mm
Net Weight	73 kg	79 kg	87 kg	120 kg	128 kg	139 kg	148 kg

All specifications are subject to change without prior notice.

Air Distribution Unit

ADU-1000

In a data center with an raised floor, air-conditioned cold air is often delivered to each rack through channels under the floor. However, as the cold air is delivered to a remote rack, air flow is reduced. Raised floors are often laid with cables and pipes that hinder the delivery of cold air and result in major hot spot issues.

Delta's Air Distribution Unit (ADU) is designed to address this problem. Its air supply capacity of up to 1000 CFM assists in the delivery of cold air to the cabinet location where greater heat dissipation is required, to remove hot spots.

Delta's ADU is easily attached to dedicated raised floors. The ADU detects the temperature of the cooled air source and the temperature inside the rack and adjusts the fan speed for energy savings.

High Efficiency and Cost Saving

- 6 fan modules provides air supply capacity up to 1000 CFM
- Intelligent fan speed control saves electricity costs

Extra Safe

- Automatic abnormal temperature and short-circuit protection

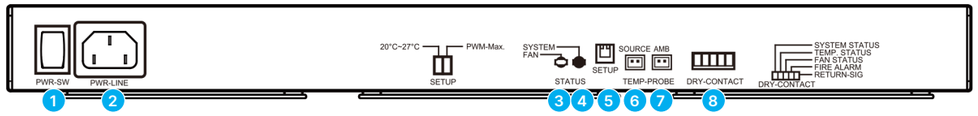
Easy Management

- Easy to install for standard raised floor
- LED indicators for fan status and error
- 4 dry contact outputs for alarm message

Technical Specifications

Model	ADU-1000
Air Supply Volume	Up to 1000 CFM
DEPLOYMENT	
Nominal Power Supply Voltage	100/115/120/200/208/220/230/240 Vac, 1P2W+PE
Operating Voltage Range	90-264 Vac
Frequency	50/60 Hz
Power Consumption	0.21 kW
Input Connection Type	IEC320 C14
Perforated Raised Floor Airflow Rate	> 50%
PHYSICAL	
Dimensions (W x D x H)	430 x 400 x 54 mm
Net Weight	5.6 kg
ENVIRONMENT	
Operating Temperature	0 to 45°C
Storage Temperature	-20 to 60°C
Operating Humidity	20-90% (non-condensing)
Storage Humidity	0-90% (non-condensing)
CONFORMANCE	
Safety	CE

All specifications are subject to change without prior notice.



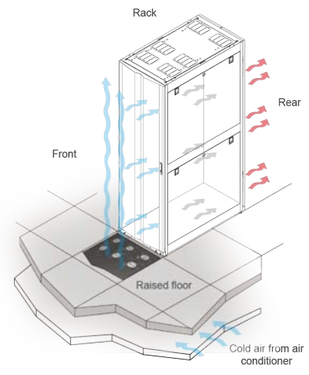
1. On/Off switch
2. Input power supply
3. Fan status indicator
4. System status indicator
5. Fan speed setup dip switch
6. Cooling air source temperature detection
7. Cabinet temperature detection
8. Output dry contact

Optional Accessories

Raised Floor

Model	HC5991
Dimensions (W x D x H)	600 x 600 x 50 mm
Net Weight	8.9 kg

Airflow Schematic



Delta: Your Complete Data Center Solutions Provider

In the data center environment, dependable power distribution and high-reliability UPSs are equally vital alongside efficient cooling. Delta ensures excellence on every front, delivering uninterrupted power flow for optimal performance.

Uninterruptible Power Supply (UPS)

Modular UPS

- Rating: 20-600 kW
- High power density: 50 kW in 3U, 20 kW in 2U
- AC-AC efficiency up to 96.5%, load aggregation function ensure highest system efficiency
- Fully modularized design and hot swappable design ensure minimizing MTTR

Monolithic UPS

- Rating: 250-2100 kW, 3P3W+PE/3P4W+PE
- AC-AC efficiency up to 97.7%. VI mode efficiency up to 99%
- Built-in synchronized multiple bus (SMB) function
- Grid interactive elevate grid stability and power demand management

Power Management

Busway

BL Series

- Rating: 400-6400 A. IP 68 certified, designed for outdoor use
- Crafted with vacuum-cast epoxy, ensures safety and reliability with copper or aluminum conductors for efficient power transmission
- IEC 61439, UL 857 certified

BR Series

- Rating: 250-2000 A. IP20 (IP55 optional) for white space use
- Uses epoxy cast resin for safety and reliability, with copper conductors exceeding 99.9% purity
- Hot-swappable plug-in units and successive plug-in slot
- IEC 61439, UL 857 certified

Power Distribution Unit (PDU)

- Support for customization
- Robust resilience: adopts compartmentalized electrical components, redundant aux-power, K-factor isolation transformer
- Enhanced efficiency: uplevels natural convection cooling and DOE-compliant copper transformer
- Easy management: offers real-time & optional billing grade metering system

Rack Power Distribution Unit (rPDU)

- Basic, metered and switched types available (Support for customization)
- Space saving: supports Zero-U, vertical/horizontal, rear and side installation
- Effortless handling: uses network module for remote management

Static Transfer Switch (STS)

- Rating 200/800/1800 A (Support for customization)
- Excellent reliability: provides redundant aux-power, control board and fan
- Easy maintenance: modular design offers full front access, top/bottom cable entry

Rack Static Transfer Switch (rSTS)

- 1-phase and 3-phase rPDUs with CE or UL certification
- Patented SCR with parallel relay enhances reliability without sacrificing efficiency

Rack & Accessories

Modular Rack

- Tool-less setup, smooth cable management with 70% perforation for heat dissipation
- Compliant with EIA-310-D rack standards
- Versatile accessories for organized data centers with customized service

Management System

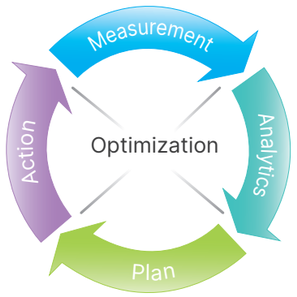
Data Center Infrastructure Management (DCIM)

- Consolidates all aspects of facility and IT equipment management into one platform
- Integrates modules for data center operations, including asset and server management, PUE energy monitoring, and graphical analysis for energy optimization

Data Center Infrastructure Management (DCIM)

One Tool. Complexity Mastered.

The Delta Data Center Infrastructure Management (DCIM) system integrates all datacenter facilities and IT equipment management tasks onto one platform. It efficiently oversees energy, power systems, cooling, environment, security, asset management, server monitoring, and more across multiple sites, using advanced alert algorithms to optimize resources and minimize downtime. Key features include 3D rack thermal simulations for comprehensive heat management, a PUE dashboard with trend and raw data and detailed asset management for immersion cooling, ensuring optimal performance and maintenance. Delta DCIM is ideal for IT and AI server rooms utilizing every cooling technology need.



Exceptional Value DCIM Software: Modular Options for Every Unique Need!

Operation (1)
Power
Cooling
Environment
Security
IT Device

PUE Energy (3)
PUE/ EUI
Electricity Cost
Energy Analysis

Capacity (4)
Capacity Analysis
Best Installation Position
Capacity Plan

Smart Energy (2)
Energy Optimization
Precision Control
Abnormality Prediction

BIM 3D (5)
3D Navigation
Device Summary
Event Highlight

Incident
Assign Owner
Search History
Classification
Business Impact
Business Risk

Asset
Asset Model
Document
Quick Search
Connectivity
Failure Impact

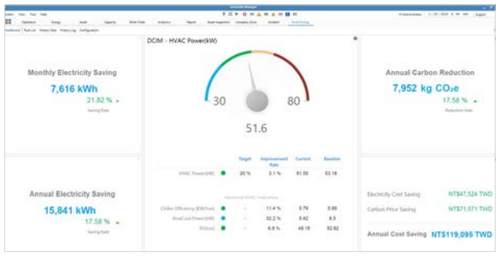
Work Order
Template
Schedule/ Event Trigger
Statistics and History

Asset Inspection
On-site Audit App
Download Plan
Executing
History Data Analysis

Analytics
Predict Trend
Capacity Forecast
Modeling

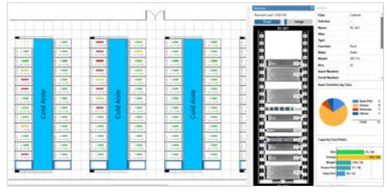
1 Data center one-stop management

2 Smart Energy dashboard



3 PUE analysis

4 Automatic availability calculation

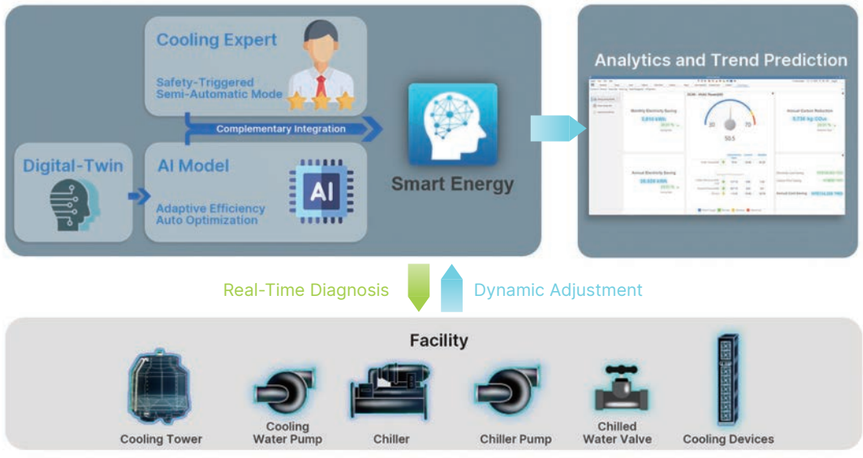


5 Data center 3D visualized layout

Smart Energy, Smart Saving

Building on Delta DCIM's comprehensive integration of data center management, the Smart Energy feature takes efficiency and sustainability to the next level. Leveraging advanced expert rules and a robust knowledge base, Smart Energy empowers customers to achieve net-zero carbon emissions through precise diagnostics, tailored optimization, and actionable insights. Key features include:

- Full-Duplex Mode:
  Integrate Cooling expert rule and AI model to enhance cooling system performance while ensure system stability and reliability.
- Automatic Energy Diagnosis:
  Identify and diagnose energy-saving opportunities to boost operational efficiency.
- Custom Optimization Plans:
  Tailored strategies to individual customer needs, maximize efficiency and minimize energy use.
- Precise Thermal Control:
  Dynamically adjust cooling parameters for optimal system performance.
- Advanced Failure Prediction:
  Forecasts potential issues using device stability and sensor data.
- Dynamic Baseline Analysis:
  Establishes and monitors chiller power consumption baselines and dynamic limits suing historical data.
- Adaptive Parameter Control:
  Utilizes manually measured ambient temperature to set dynamic thresholds and activate protective measures, ensuring stable and efficient operation.



This integrated approach not only maximizes operational efficiency but also propels your sustainability initiatives by significantly reducing energy consumption and minimizing your carbon footprint. Whether you're optimizing cooling systems, securing reliable power with our UPS and distribution solutions, or deploying our full-scale data center management system, Delta stands as your premier partner in achieving exceptional carbon reduction and unparalleled sustainability. Choose Delta for a future where efficiency and eco-consciousness go hand in hand.

About Delta Group

Leading expert in power management and thermal management solutions

Delta, founded in 1971, is a global provider of power and thermal management solutions. Its mission statement, "To provide innovative, clean and energy-efficient solutions for a better tomorrow," focuses on addressing key environmental issues such as global climate change. As an energy-saving solutions provider with core competencies in power electronics and automation, Delta's business categories include Power Electronics, Automation, and Infrastructure.

Delta offers some of the most energy efficient power products in the industry, including switching power supplies with efficiency over 90%, telecom power with up to 98%, and PV inverters with up to 99.2% efficiency. We have also developed the world's first server power supply certified as 80 Plus Titanium.

Global Footprint

World's No. 1 in Switching Power Supplies, DC Brushless Fans and Telecom Power Systems.
166 sales offices and **52** manufacturing facilities worldwide.
Over **8%** of annual sales revenues invested in R&D with over **10,000** engineers in **73** R&D centers worldwide.
Awarded over **12,000** patents and received internationally recognized design awards including iF, Reddot, and the Taiwan Excellence awards.

	Asia-Pacific	Americas	EMEA	Total
Sales Offices	99	29	38	166
Plant Sites	40	6	6	52
R&D Centers	48	11	14	73

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Smarter. Greener. Together.