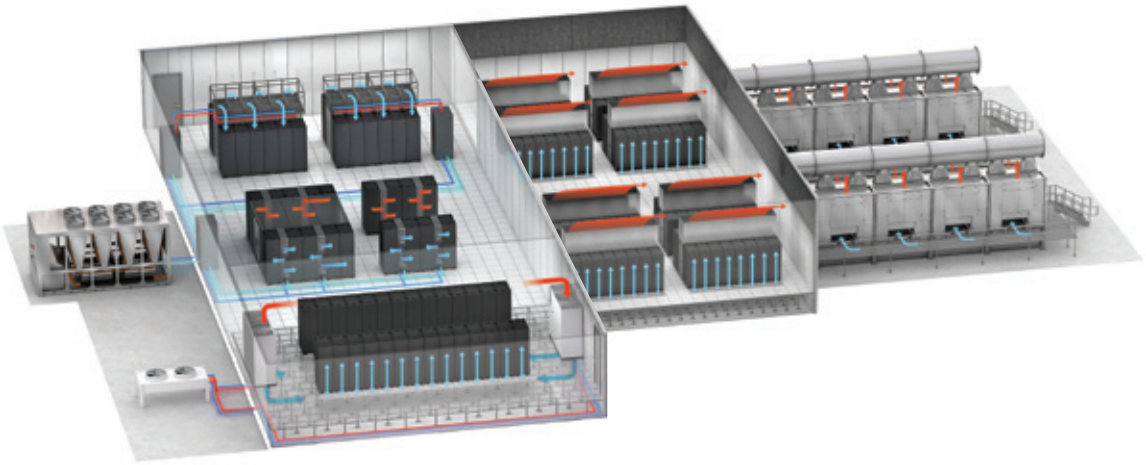
Cooling Solutions for IT Equipment

Right-sized systems for every environment, from network closets to data centers



Schneider Electric offers a comprehensive portfolio of solutions for virtually any cooling need in critical IT environments, from network closets and server rooms to data centers of all sizes. Our efficient, flexible, and reliable solutions are easy to install and service, and are readily available worldwide.

TOTAL POWER SOLUTIONS

Solutions for Cooling Business-critical IT Environments

Whether your customers need to cool their data center or have other environments that require precision cooling, Schneider Electric™ offers a comprehensive portfolio of solutions for virtually any critical cooling problem in any IT environment. Our solutions are efficient, flexible, and reliable while being easy to install and service, and our global presence ensures that our products are readily available worldwide.

At the core of our cooling offer are the Uniflair™ and EcoBreeze™ product families for room cooling and the InRow™ products for close-coupled cooling, which are typically installed in IT environments as the basis of the overall cooling system. To enhance the efficiency and effectiveness of our core cooling products, we offer a complete line of air distribution solutions, including thermal containment for rack and aisle level, as well as fan solutions to improve air distribution within the rack or room. In addition, our full selection of chillers and matched heat rejection products complete the cooling system framework. There are many features and criteria to take into consideration when selecting the proper cooling product, such as predictability, flexibility, and scalability. The benefits for each of these products are highlighted in this brochure, along with some important guidance on the selection process when considering the best cooling system for your IT environment.

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The Challenges of Cooling IT Environments

1 Reliability

Mission-critical Environments

Downtime in mission-critical environments can often mean lost revenue, damaged reputation, and dissatisfied customers. For vital businesses such as financial institutions, Web hosting environments, co-location centers, hospitals, medical equipment companies, and clean room manufacturing facilities, power loss can be disastrous.

To maintain uninterrupted power, these environments need special cooling solutions with design redundancies and highly available components that can reliably cool a heat load that exists year round. Unlike comfort cooling systems, precision cooling regulates humidity levels to prevent condensation or static electricity, and also provides a high level of filtration, providing more stable conditions.

Network Closets and Server Rooms

In addition to large data centers, network closets and server rooms are a key part of the reliability and uptime for a company. Without the right switches, routers, and other communications equipment in place, the productivity of a business and its employees can be greatly affected. In many cases, the main data center communicates to the branch offices of an organization through a network or server room, and for each data center there can be several server rooms involved. Each of these locations needs separate cooling solutions to ensure availability.

2 Changing IT Environments

Dynamic Servers

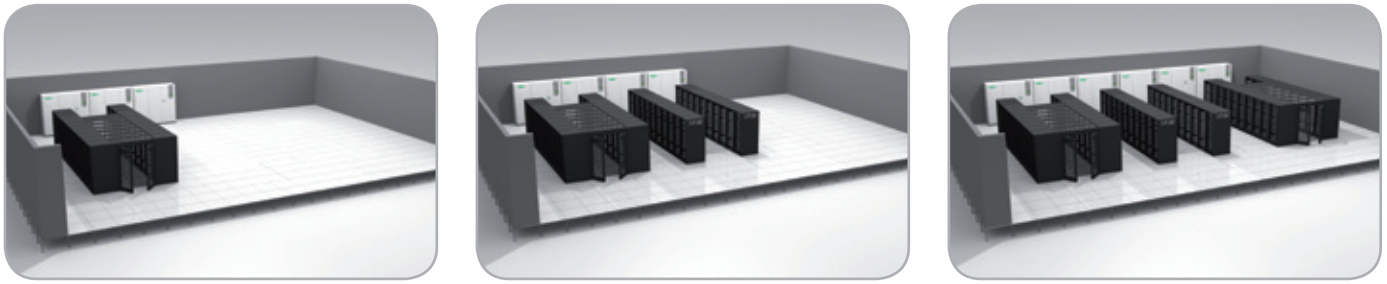
Dynamic servers can increase or reduce power consumption based on the amount of processing they perform at a given time. This fluctuating compute demand results in varying heat loads over time in the data center. In order to handle rapid changes in heat loads and cooling demands of the IT equipment, cooling systems need to conserve energy during low loads.

Virtualization

Virtualization also complicates the dynamic computing problem. Not only can the heat load change with demand, it can also change by area in the data center. With virtualization, processing is more efficiently distributed to maximize equipment, so a server can go from lightly loaded to fully loaded in a short period of time. Virtualized data centers usually run at higher densities per rack as a result of their increased utilization rates, making a reliable cooling system even more critical.

Growth over time

Most data centers are not fully populated. One of the challenges in IT infrastructure design is planning for the constant changes that will occur throughout the life of the environment due to the evolution of equipment and capacity requirements. Because things change so quickly, variables like power density, energy costs, and equipment can impact the effectiveness and life of the IT infrastructure. Intelligent, modular cooling solutions fit with today's IT environments and can scale to match future needs.



Choosing modular, scalable cooling solutions is important in today's data centers as equipment and capacity needs change and grow over time.

3 High Density

Hot Spots

Hot spots in the data center are a direct result of deploying higher density equipment within a rack enclosure and/or restricted airflow to the rack enclosure.

Lack of Airflow

Higher density loads require more air and cabling, but under-floor air obstructions resulting from cabling and piping increase as power densities go up, further restricting airflow to heat-generating equipment.

Hot Air Recirculation

Mixing of supply and exhaust air lowers return air temperature to the Computer Room Air Conditioning (CRAC) unit and raises the supply air temperature to the IT equipment, resulting in an unpredictable, and less efficient cooling system.

4 Total Cost of Ownership (TCO)

Operating Costs – Energy Efficiency

As energy costs continue to rise, the need for energy-efficient products is on the forefront of data center operators' minds. Energy-related data across the whole site, including cooling, needs to be measured.

Standards and Regulation

Globally, more pressure is being placed on energy consumption, both at the manufacturers' and the consumers' levels. If regional/country standards and regulations are not met, businesses can incur additional costs in the form of fines and equipment upgrades required to comply with standards.

Capital Costs – Initial Investment

In a changing economy, companies are watching first cost more than ever. This financial caution can conflict with investing in energy-efficient solutions that would reduce total cost of ownership over time.

Read on to discover why Schneider Electric is the best provider for IT cooling, with reliable solutions that deliver flexibility to grow with your needs, and the efficiency to reduce power consumption and costs.

Volume Server Power Trends

Type	Size			Range of Average Heat Loads	Heat Load Chassis (W)			Heat Load/42U Rack (W)		
	W	H	Sockets		2010	2015	2020	2010	2015	2020
Compute Servers	17.5 in. (0.44 m)	1U	1S	+/-20%	255	290	330	10,710	12,180	13,860
			2S	+/-10%	600	735	870	25,200	30,870	36,540
			4S	+/-5%	1,000	1,100	1,200	42,000	46,200	50,400
		2U	2S	+/-20%	750	1,100	1,250	15,750	23,100	26,250
			4S	+/-5%	1,400	1,800	2,000	29,400	37,800	42,000
		4U	4S	+/-5%	2,300	3,100	3,300	23,000	31,000	33,000
		7U (Blade)	2S	+/-10%	5,500	6,500	7,500	33,000	39,000	45,000
		9U (Blade)		+/-10%	6,500	8,000	9,500	36,000	32,000	38,000
		10U (Blade)		+/-10%	8,000	9,000	10,500	32,000	36,000	42,000

Source: ASHRAE, *Datacom Equipment Power Trends and Cooling Applications.* 2nd Edition. 2012

Solutions for Cooling Business-critical IT Environments

Data Centers

Whether you are building a new data center or retrofitting an existing one, selecting an effective cooling solution is critical for a healthy data center environment. Every piece of IT equipment that consumes power produces an equivalent amount of heat in return. The wrong technology for the environment can result in higher costs and increased risk of downtime.

Schneider Electric offers a variety of cooling solutions for data centers of every size.

Large Data Centers (1 MW+)

The EcoBreeze solution is a modular air economizer that provides the most favorable TCO for large facilities. It offers the highest efficiency by maximizing "free cooling" hours in most climates with multiple modes of operation.

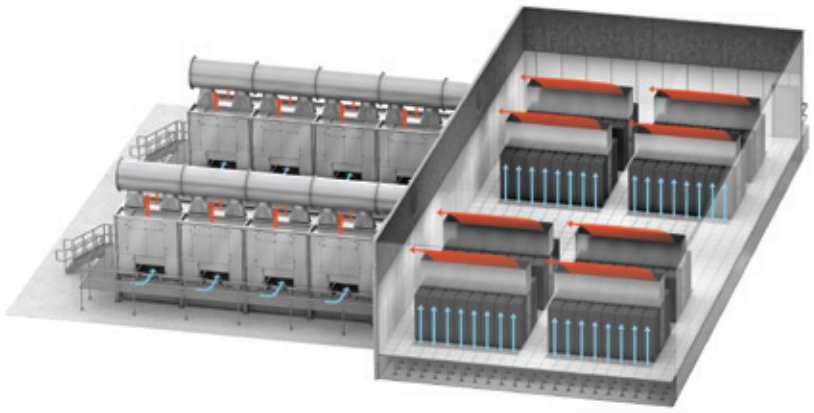
Medium Data Centers (200 kW – 1 MW)

The Uniflair solution is popular for medium-sized facilities due to its flexibility, efficiency, and lowest first cost. Utilized within raised floor environments, it offers flexible, intelligent temperature and humidity control to provide precision cooling at the room level.

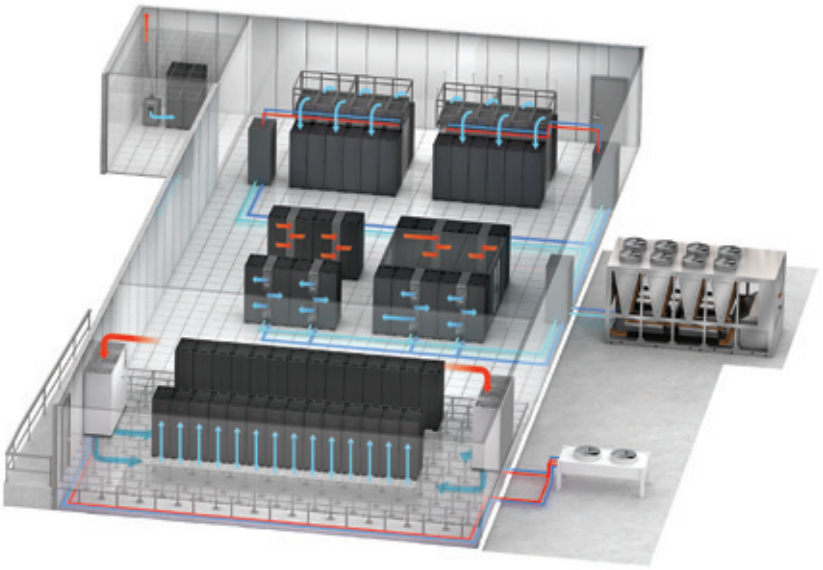
Small Data Centers (Below 200 kW)

InRow cooling products are optimal for smaller data centers, with the predictability of the close-coupled approach and integrated rack and row level temperature control. This also makes them well suited for high-density zones within larger data centers to create a hybrid cooling system.

To maximize cooling efficiency and predictability in any data center environment, the EcoAisle containment system minimizes hot or cold air recirculation and improves cooling system performance. The improved airflow enables higher density cooling with any of our cooling solutions, which can further reduce energy consumption and save valuable data center space. Customers can save up to 30 percent in operational costs versus an uncontained system.



Large Data Center
Air Economization Solutions like the EcoBreeze modular air economizer should be considered for large data centers for optimal TCO.



Small and Medium Data Center
Chilled water- and refrigerant-based Uniflair and InRow Cooling are optimal for small and medium data centers.

Network and Server Rooms/Telecom Enclosures

Network and Server Rooms

Network closets and server rooms are often converted offices or utility closets that were never designed to house IT equipment, and either have no planned cooling or depend upon the building HVAC, which doesn't provide adequate cooling and can reduce the life of the equipment. Cooling solutions in these confined environments need to have the smallest footprint possible, and should be flexible for easy deployment and redeployment. Uniflair and InRow Direct Expansion products, as well as our portable solutions, provide a wide range of options to deal with the varying conditions within network and server room environments.

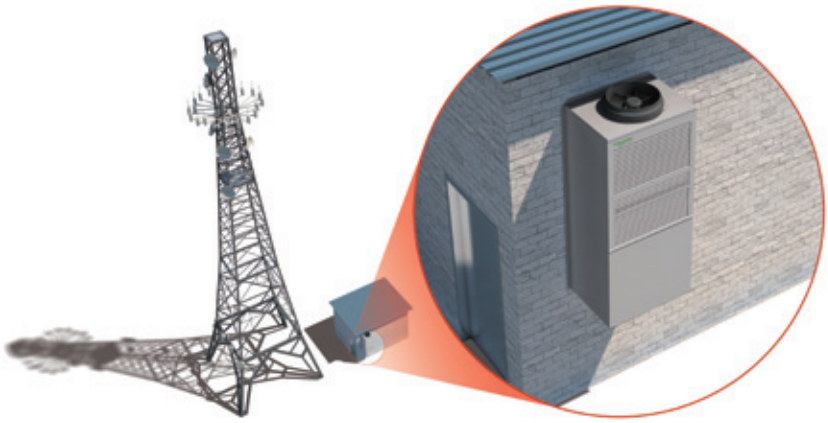


Some questions to consider when planning cooling solutions for small spaces:

- Is there access to a ceiling plenum or window?
- What is the density? Is there a plan for growth?
- What floor space is available?
- Is the equipment racked?

Telecom Enclosures

Constant operation makes the inside of telecom shelters prone to extremely high temperatures, requiring cooling even when outdoor temperatures drop. Due to the remote nature of these enclosures, visibility is also a concern. Uniflair Telecom and Wall Mount units are well-suited for these environments, with features such as around-the-clock operation, autonomous control for unmanned sites, intelligent free cooling, and low noise.



Uniflair AM

Flexible, Perimeter Cooling for Smaller IT Environments

5 kW – 20 kW

Leading-edge precision air-conditioning technologies integrated into one high-efficiency system allow the customer to adapt to the different and changing environments inside the data center.

Reliable

- **Dehumidification**
  Operates only when required, ensuring continuous, uniform air distribution without airflow reduction
- **Microprocessor Controller**
  Allows unit to restart without intervention after a power failure

  Allows for room-level redundancy with up to 10 units operating in a group

  Indicates operation mode and room conditions through user-friendly navigation with icon displays

  Allows for communication with multiple Building Management System (BMS) protocols



Efficient

- **Electronically Commutated Fans**
  Provide highest efficiency and reduce total power consumption by matching data center heat load
- **High Sensible-to-total Cooling Ratio**
  Through careful sizing of heat exchanger coils
- **Electronic Expansion Valve**
  Increases coefficient of performance (COP) and energy savings with accurate refrigerant control

Flexible

- **Humidity Control**
  Available on all units
- **Multiple Heat Rejection Configurations**
  Available in air-cooled, water-cooled, and glycol-cooled systems, in both upflow and downflow configurations
- **Advanced Controls**
  Enable unit operation to adapt to every type of installation
- **Automatic Floor Pressurization System (AFPS)**
  Ensures stable airflow pressurization under floor regardless of above-floor changes

Uniflair LE

Perimeter Cooling for Medium and Large Data Center Environments

20 kW – 200 kW

Uniflair LE products, perfect for racked and non-racked IT loads, meet the diverse requirements of any data center environment to efficiently provide room-level cooling. When combined with hot or cold aisle containment solutions, these flexible cooling solutions can further improve efficiency and achieve higher densities.

Reliable

- **Display Interface**
  Clearly shows any malfunctions or alarms with a record of the last 100 events
- **Microprocessor Controller**
  Provides complete reliability of the unit through intelligent controls
- **Continuous Operation**
  Designed specifically for data center environments, operating 24/7/365

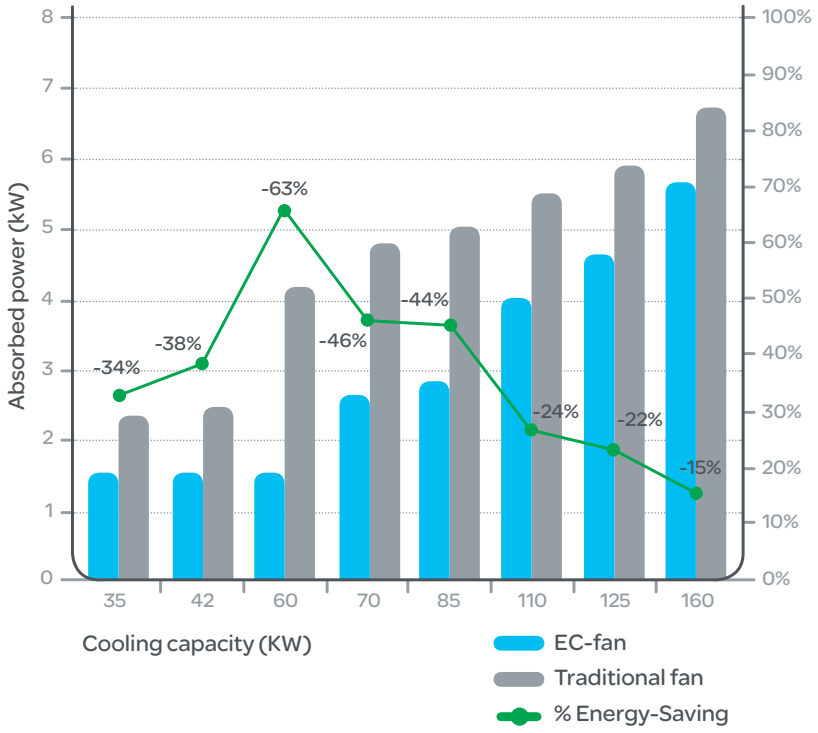
Efficient

- **Tandem Scroll Compressors**
  Increase efficiency by utilizing an oversized coil for one compressor during part-load operation
- **Economization**
  Utilizes cool ambient air during winter, and automatically changes outdoor heat exchanger set points to eliminate compressor operation during economizer hours (energy saving units)
- **Electronic Expansion Valve**
  Increases coefficient of performance (COP) and energy savings with accurate refrigerant control

Flexible

- **Multiple Heat Rejection Configurations**
  Available in air-cooled, water-cooled, glycol-cooled, twin-cooled, and economizer systems
- **Building Management Systems**
  Designed to work with the most common BMS systems including BACnet and Modbus
- **Complete Front Serviceability**
  Enables all maintenance through front access
- **Automatic Floor Pressurization System (AFPS)**
  Ensures stable airflow pressurization under floor regardless of above-floor changes
- **Multiple Configurations**
  Available in both upflow and downflow air configurations, with options for top, bottom, rear, or front air return (HDCV units available with underfloor fans)





Uniflair WM and Uniflair MB

Through-the-wall Packaged Cooling for Telecom Rooms and Shelters

4 kW – 17 kW

Controlling the temperature inside a telecom shelter is critical for improving electronic equipment performance. The equipment dissipates heat during operation in addition to the absorbed heat from the surroundings with high ambient temperatures, especially in a desert environment. These energy-efficient solutions easily handle such environmental conditions.



Features

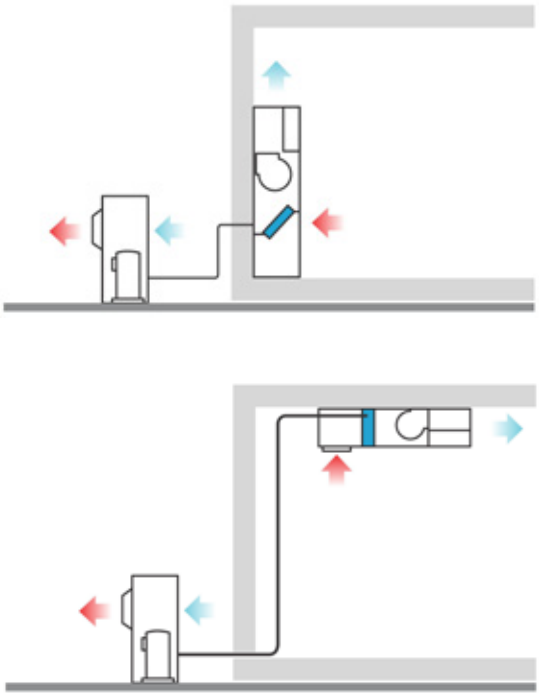
- **Direct Free Cooling**
  Increases energy efficiency by allowing ambient air to help cool the hot return air from IT equipment
- **Dual Power Supplies**
  Add reliability and redundancy to all units in case of a power failure
- **Compact Dimensions**
  Allow flexibility of the unit to be installed in very small areas where larger cooling equipment cannot be placed

Uniflair SP

Ceiling and Wall-mounted Split Systems for Network and Server Rooms

6 kW – 15 kW

Network closets and server rooms are an integral part of a company's IT infrastructure. Equipment in these spaces has similar cooling requirements to those deployed in a data center, but typically little or no cooling is provided due to space constraints. Available in ceiling- or wall-mount configuration, these products are easy to deploy without consuming floor space.



System is available as air-cooling, or as air-cooling plus free cooling.

Features

- **Direct Free Cooling**
  Increases energy efficiency by allowing ambient air to help cool the hot return air from IT equipment
- **Microprocessor Control**
  Maintains precise parameters inside the air-conditioned room for ultimate reliability
- **Split System**
  Can be ceiling- or wall-mounted inside the IT space for flexible installation

Portable Cooling

Self-contained Portable Spot Cooling for Network and Server Rooms

1 kW – 3.5 kW

Comfort cooling systems don't always prevent equipment from overheating. With the plug-and-play, self-contained design of the InRoom SC, you can install or redeploy the unit rapidly, and there is no need for a remote heat exchanger.

Reliable

- **Air Filtration**
  Removes dirt and dust particles for clean supply air back to the IT equipment
- **Evaporative Technology**
  Removes condensation through the exhaust airstream
- **Auto Restart**
  Automatically restarts after a power failure to ensure operation without human intervention

Efficient

- **On/Off Scheduling**
  Allows the user to determine when the unit operates, saving energy costs
- **Self-contained**
  Requires no remote heat exchanger, eliminating the need for long piping runs

Flexible

- **Ducted Exhaust**
  Allows for flexible removal of exhaust air
- **Adjustable Ceiling Kit**
  Fits into a dropped ceiling (or window) to provide a connection point for the ducting kit
- **Casters**
  Enables the unit to be easily deployed anywhere in the room









Close-coupled Air Conditioners

InRow Chilled Water/ InRow Direct Expansion

Up to 70 kW/ Up to 37 kW

In today's data centers, traditional cooling approaches involve complex air distribution systems that tend to be unpredictable. With InRow cooling, placing the unit in the row of racks moves the source of cooling closer to the heat load, minimizing air mixing and providing a predictable cooling architecture.

Reliable

Predictable
- Keeps hot air in the hot aisle

Redundancy
- Maintains availability at rack, row, or room level

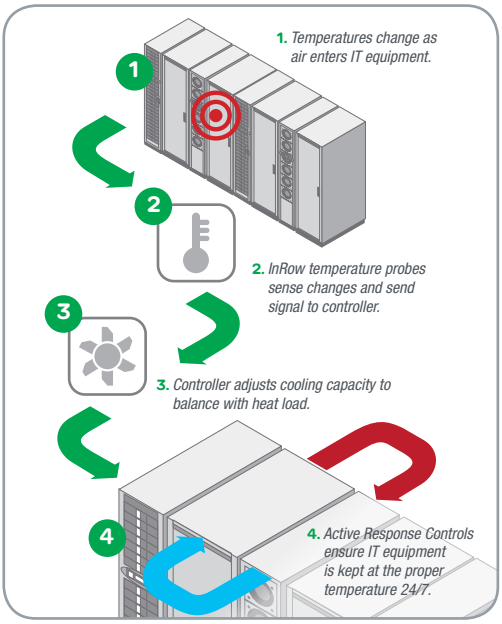
Standardized
- Provides centralized cooling distribution
- Deploys in any environment without modifying design



Efficient

Energy
- Shortens air movement path
- Increases efficiency with speed fans
- Employs variable speed compressors (InRow DX)

Cooling
- Offers higher cooling capacity due to higher return air temperature
- Controls rack inlet temperature
- Includes integrated active response controls that vary cooling capacity to match IT heat load



Flexible

Room Neutral
- Neutralizes the heat load of IT equipment to adapt to new and existing data center environments

Quick to Deploy
- Installs like a rack

Modular Components
- Reduces MTTR with hot-swappable assemblies

Close-coupled Air Conditioners

InRow Pumped Refrigerant

Up to 31 kW

A top concern with cooling an IT environment is the heat removal method. Fear of routing water through the data center limits the cooling systems that can be used. InRow Pumped Refrigerant cooling products, available in overhead or floor-mounted configurations, are energy efficient alternatives when deploying chilled water next to IT equipment is not an option.

Reliable

Predictable
- Requires no minimum loading
- Keeps hot air in the hot aisle

Redundancy
- Maintains availability at rack, row, or room level

Standardized
- Provides centralized refrigerant distribution
- Deploys in any environment without modifying design

Efficient

Energy
- Shortens air movement path
- Increases efficiency with speed fans
- Employs variable speed pumps (RDU)

Cooling
- Offers higher cooling capacity due to higher return air temperature
- Controls rack inlet temperature
- Includes integrated active response controls that vary cooling capacity to match IT heat load

Flexible

Room Neutral
- Neutralizes the heat load of IT equipment to adapt to new and existing data center environments

Quick to Deploy
- Eliminates need to reconfigure floor layout with zero white space consumption (InRow OA)

Modular Components
- Reduces MTTR with hot-swappable assemblies



Refrigerant Distribution Unit (RDU)



InRow RA



InRow OA



InRow Pumped Refrigerant shown deployed in an existing data center

Air Distribution

One of the biggest challenges in cooling IT environments is controlling the movement of air to and from the IT equipment in the space. Consolidation of IT equipment and the drive toward higher rack densities, combined with the variability of cabinet sizes, networking, and other equipment in these environments, makes it challenging for IT and facilities managers to address air distribution issues. Schneider Electric offers a wide ranges of products that contain air to eliminate mixing or to enhance airflow within the rack or room.

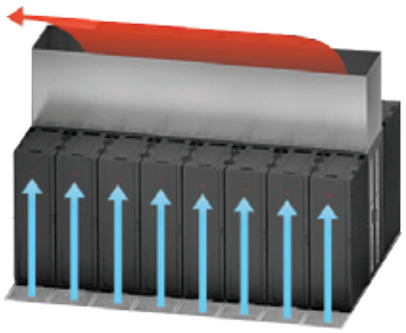
Thermal Containment

Thermal containment products from Schneider Electric address a wide range of applications, providing the flexibility to enable efficiency gains and improve cooling reliability in any IT environment.

Aisle Containment

- Flexible ceiling panel or ducted aisle configuration supports hot and/or cold aisle containment (HAC/CAC).
- Drop-out ceiling panels minimize installation costs and impact to fire suppression systems.
- Integrated LED lighting simplifies space planning and reduces operational costs.
- Active Flow control matches cooling system and IT equipment airflow increases efficiency and reliability.
- Customizable configuration installs in a wide range of applications.

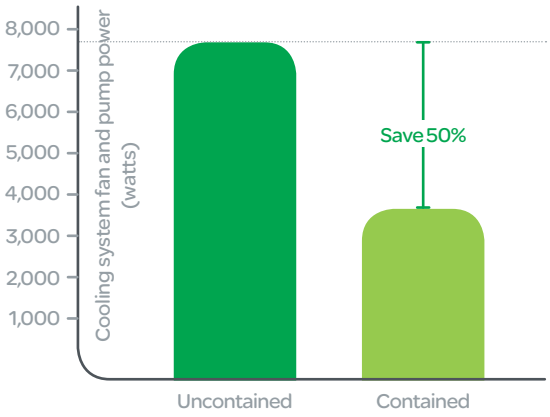




Rack Containment

- Modular design easily adapts to both the front and rear of the racks and close-coupling cooling units, simplifying installation.
- Scalable open plenum enables capacity sharing to improve cooling system redundancy and utilization.





Air Distribution

Rack Air Distribution

Rack air distribution products from Schneider Electric offer ducted and fan-assisted options to improve cold air distribution and heat removal to and from IT equipment racks.

Fan-assisted Units

Fan-assisted units help overcome hot spots caused by high-density loads and airflow restrictions due to cabling, piping, and restricted airflow paths within racks and raised floors.



Air Removal Unit (ARU), 1,600 CFM (2,718 m³/h)

- Eliminates hot spots by removing heat from high density racks
- Maintains server inlet temperatures with automatically adjusting fans
- Offers temperature monitoring and communication

Side Air Distribution Unit (SADU), 260 CFM (442 m³/h)

- Directs air up or down the side of the rack, supplying cool air to the inlet of side airflow equipment
- Provides fault tolerance with dual fans

Air Distribution Unit (ADU), 420 CFM (714 m³/h)

- Helps maintain rack inlet temperatures by promoting proper airflow from the raised floor to the top of the rack



Active Floor, 2,950 CFM (5,000 m³/h)

- Replaces raised floor perforated tiles to increase airflow to high-density racks
- Minimizes energy consumption and maintains rack inlet temperatures with variable speed fans

Duct Kits

Duct kits direct air within the rack for side airflow equipment, and exhaust ducts direct air to drop ceilings for ducted return systems.

Side Airflow Duct Kit, for Cisco® Catalyst® and MDS, 1,100 CFM (1,869 m³/h)



- Directs cool air from the front to the intake of side airflow equipment
- Isolates hot/cold air to ensure proper cooling of side airflow equipment

Side Airflow Duct Kit for Nexus® 7018, 3,000 CFM (5,097 m³/h)

- Tested and approved by Cisco for supporting Nexus 7018 Network Switches
- Optimized for cable management with additional clearance on both sides of the switch

Vertical Exhaust Duct



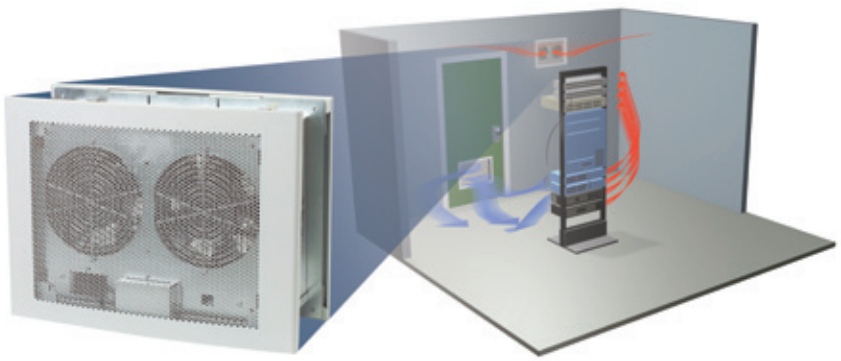
- Eliminates mixing and increases cooling system efficiency with ducted-rack return system
- Mounts to the rear of the rack leaving valuable U space for IT equipment
- Compatible with NetBotz™ environmental sensors for monitoring temperature and humidity

Room Air Distribution

Simplify cooling to small wiring closets and computer rooms by exhausting hot air from the closet to an adjacent space, allowing conditioned air to enter the space and cool the load.

Wiring Closet Ventilation Unit

- Flexible mounting allows for wall or ceiling installation.
- Optional remote notification provides visibility to cooling issues.



Aquaflair Technical Chillers

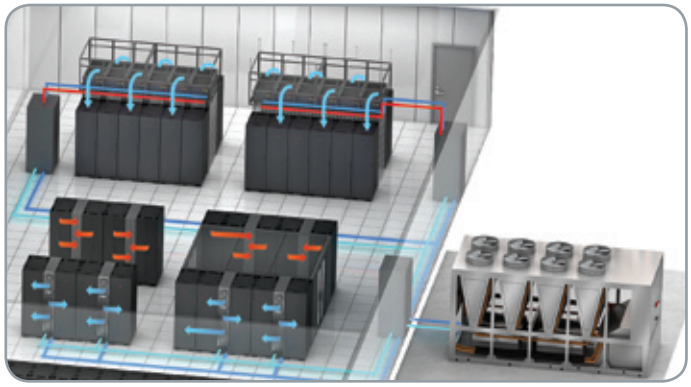
Air and Water-cooled Chillers and Heat Pumps with Options for Economizer, Pumps, and Water Storage

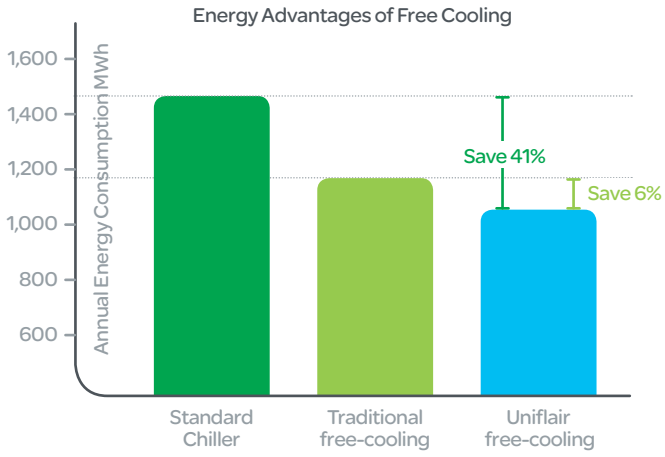
6 kW – 1,200 kW

These chillers support a wide range of applications and maximize the availability of row and room cooling products, including economizers, to provide a complete heat removal solution for small to medium data centers.

Efficient

- **Indirect Economization (free-cooling)**
  Units utilize low ambient temperatures to facilitate heat exchange and eliminate compressor usage, reducing operating costs significantly.
- **High-efficiency Modulating Compressors**
  Continuous modulation of cooling capacity ensures optimum efficiency at any load. Oil-free compressors, for large-range units, utilize magnetic bearings,while mid-range units can be fitted with VSD scroll compressors and combined with tandem solutions.
- **Partial-load Operation**
  Compressor cooling capacity adapts to the load extremely efficiently through advanced controls.
- **Tandem Scroll Compressors**
  Efficiency is increased by utilizing an oversized coil for one compressor during part-load operation.
- **Optimized Management**
  Combined use of room and row cooling units allows higher chiller discharge temperatures while maintaining room set point with integrated auto-adjust algorithms.
- **Modular Strategy**
  Mechanical equipment and intelligent control devices help meet growing demand, reduce CapEx, and defer further investment costs.
- **Electronically Commutated Fans**
  Data center heat load is matched to provide highest efficiency and reduce total power consumption.





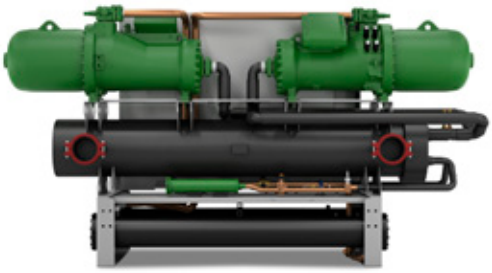
Available

- **Continuous Operation**
  Units are designed specifically for data center environments operating 24/7/365.
- **Advanced Controls**
  Set-point monitoring guarantees the unit is functioning within operating limits and signals any faults before breakdown occurs.

Aquaflair Technical Chillers

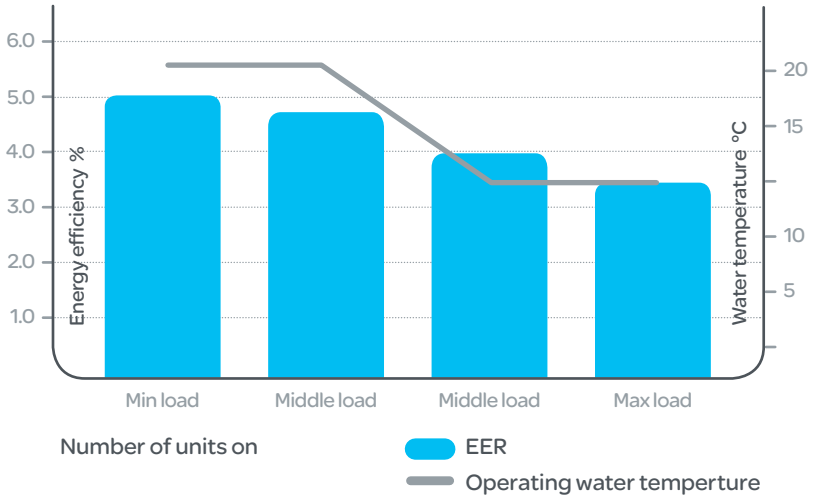
- **Quick Restart**
  Integrated quick-start procedures immediately respond after a power failure, restoring full load operation in three minutes*.
- **Integrated Double Power Supply**
  Integrated automatic transfer switch (ATS) removes any single point of failure in the data center design to prepare for TIER III and TIER IV installations.
- **Local Area Network**
  Chillers can share operating parameters and alarms, creating a distributed meta-unit to manage emergency mode without a single point of failure or direct external action by BMS or operator.
- **Current Monitoring**
  Continuous monitoring of the compressor's absorbed current signals possible discrepancies with the default values (large chillers only).
- **Serviceability**
  Critical components can be maintained/replaced while the system is in operation.





Flexible

- **Package Solution**
  Units can be fitted with all devices normally installed on site, i.e., main pumps, water tanks, and expansion vessel**.
- **VSD Onboard Pumps**
  Head pressure can be regulated directly on-site or dynamically according to working conditions.
- **Noise Impact**
  Units deliver low acoustic impact, due to Acousti-composite fans, extra-large air side exchangers, and exclusive algorithms to control fan speed.
- **Ductable Units**
  Some models are suitable for indoor or external installation with air ducts.
- **Small Footprint**
  Unit design provides maximum capacity and efficiency within the smallest footprint.



* Under suitable conditions. For some units, an external UPS is necessary for ensuring these timings.
** Water tanks are not available for some models.

Chilled Water Facility Module

Quickly Deployable Chilled Water Cooling Modules for Large Data Centers

500 kW

These modules deliver complete infrastructure support for turning unoccupied spaces (e.g., former warehouses or manufacturing plants) into highly available, energy-efficient, world-class data centers in just weeks. They also can be deployed to add capacity to some existing data centers.

Reliable

- **Pre-engineered Solution**
  CW modules are pre-tested, pre-wired, and certified for regional compliance to reduce overall data center design and deployment.
- **Thermal Capacity**
  A large amount of chilled water is stored in the module to achieve capacity of up to two minutes.
- **Redundancy**
  Each module includes redundant components such as pumps, as well as a redundant (N+1) chiller.
- **Continuous Operation**
  Chillers are designed to run continuously between -30 °C and 60 °C.

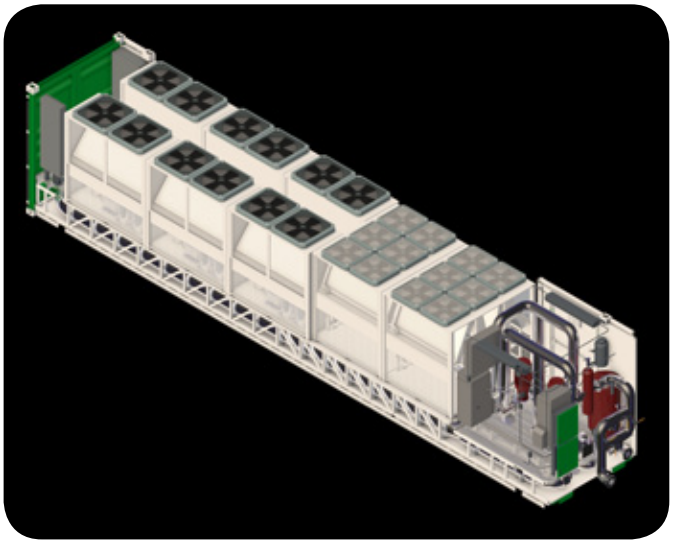
Efficient

- **Economization**
  Integrated economizers achieve operating expense savings of 20 – 35 percent.
- **Rapid Deployment**
  Installation time is greatly reduced by having the whole chiller plant in one, single footprint.
- **Tandem Scroll Compressors**
  Efficiency is increased by utilizing an oversized coil for one compressor during part-load operation.

Flexible

- **Two Options for Cooling**
  CW modules can be air-cooled with or without economizers.
- **Modular Solution**
  Modules can be deployed in 500 kW increments to rightsize cooling for increasing IT loads.
- **Supply Chain Optimization**
  Lead times are reduced from months to just weeks compared to a traditional approach.







Condensers and Fluid Coolers

Matched Heat Rejection Systems for Room and Close-coupled Cooling Products

These heat removal systems support and maximize the availability of row and room cooling products to provide a complete solution for a wide range of applications in small to medium data centers.

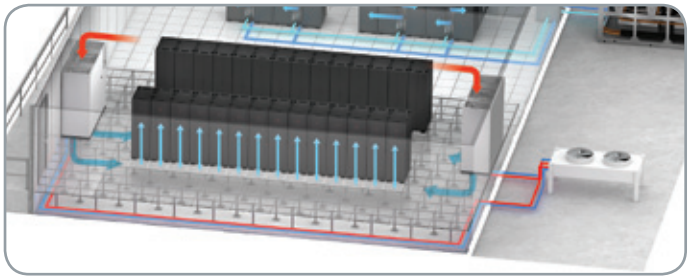
Reliable

- **Weatherproof Control Panel**
  Controls are not susceptible to environmental conditions.
- **Factory Tested**
  Control panels are factory wired and tested to ensure proper operation during commissioning.
- **Durable Finish**
  Epoxy-coated powder coat finish for R410A systems or aluminum-embossed finish for R407C systems provide high weather resistance.



Efficient

- **Direct Drive Fans**
  Fans reduce bearing stress to increase useful life.
- **Variable Speed Axial Fans**
  Axial fans are lower speed, which reduces sound pressure levels and reduces energy consumption during off-peak cooling periods.
- **Economization**
  When the ambient temperature falls below room set-point, perimeter cooling units communicate to reset discharge, leaving temperature of the fluid cooler to allow partial or full free cooling.



Flexible

- **Adjustable Mounting Legs**
  Height of the unit can be easily adjusted.
- **Varying Low Ambient Options**
  Options for -20°C to -40°C ambient temperature ensure unrestricted installation possibilities.
- **Optional Coil Coatings**
  For harsh environments such as coastal regions, optional coil coatings can be applied to decrease the effects of corrosion to metal surfaces.



EcoBreeze

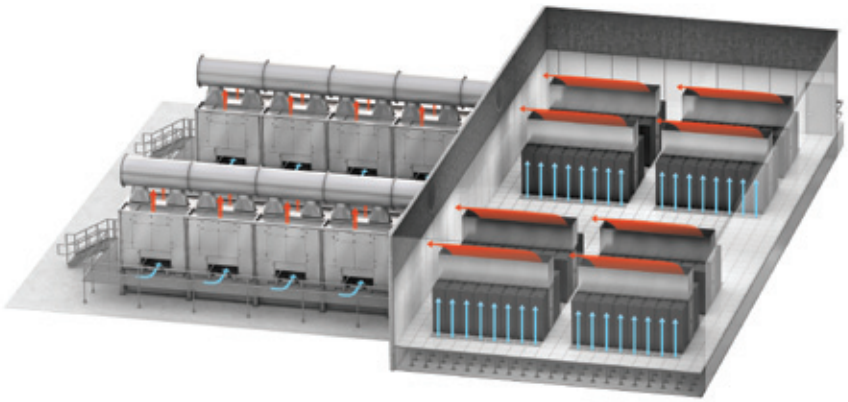
Modular, Indirect Economizer For Large Data Centers

50 kW – 400 kW

Modular and innovative EcoBreeze units are among the most efficient forms of cooling on the market, maximizing localized climate conditions to increase economization time, and meeting the environmental cooling challenges and energy efficiency requirements that today's data centers face.

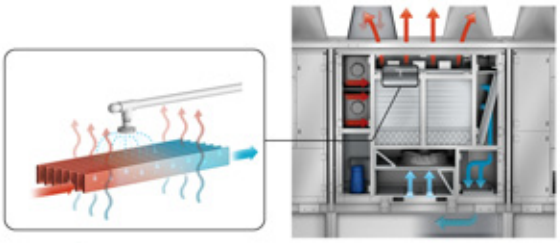
Reliable

- **Redundancy**
  All modules can operate independently.
- **Supplemental DX Circuit**
  Proportional supplemental R-410a refrigeration circuit can maintain the supply air set point during extremely high ambient conditions.
- **Isolated Airstreams**
  Airborne pollutants and humidity swings are prevented from entering the data center environment.



Efficient

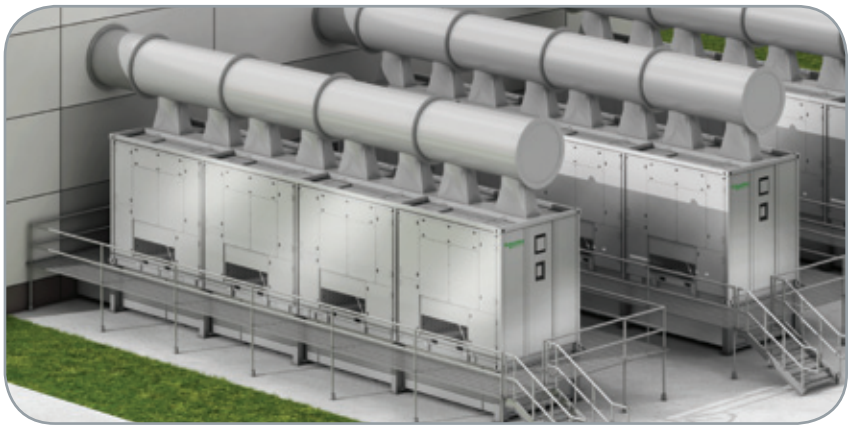
- **Electronically Commutated Fans**
  Data center heat load is matched to provide highest efficiency and reduce total power consumption.
- **Two Forms of Economization**
  Indirect evaporative cooling and air-to-air heat exchange utilize ambient air to cool the data center, reducing operating costs by up to 75 percent.
- **Partial (Mechanical) PUE**
  Economization eliminates the need for compressor operation, only requiring fans and pumps to facilitate cooling, achieving partial PUEs as low as 1.05.



EcoBreeze uses evaporative cooling to increase the hours of econimization during warmer temperatures.

Flexible

- **Modular**
  Design allows the user to add 50 kW modules to the frame as their cooling needs increase.
- **Single Footprint**
  All cooling is done in a single footprint outside the data center, allowing fast and easy deployment as well as eliminating the need for multi-system cooling.
- **Ducted Return/Supply**
  Eliminates cooling equipment inside the white space and allows highly flexible air distribution to and from the data center.



Management Capabilities with Product-specific Controls

Active Response Controls

Active response controls ensure that servers consistently operate at the desired rack inlet setpoint. As temperatures shift, built-in probes detect changes and send a signal to the controller. The cooling output is continually adjusted to accommodate varying loads, determined by the difference between the setpoint and the actual temperature as well as the airflow for each cooling unit. The fluid valve modulates fluid flow into the cooling coil, keeping equipment at the proper temperature, and saving energy by only consuming the amount required to cool the IT heat load.

Chiller/CRAC Communications

Uniflair chillers and CRAC units efficiently work together to optimize the system performance according to the different load and operating conditions.

When a single modulating chiller is connected to a single internal unit, the CRAC regulates the cooling load according to the discharge air temperature by means of the three-way valve and the chilled water temperature, which is regulated on the chiller and connected via LAN. When connected to more than one chiller, or when one or more large chillers are installed and connected to all internal CRAC units within the same room, internal and external units can communicate in LAN. The CRAC units regulate the load according to the average suction air temperature by means of the three-way valve and the chilled water temperature.

Automatic Floor Pressurization System

Maintaining the right pressure is critical for an efficient air conditioning system, so it must be sustainable for the lifespan of the room and modifiable over time. The AFPS automatically adjusts airflow according to server locations, enabling flexible infrastructure installation.

During routine maintenance, raised floor panels are often removed, reducing airflow and static pressure under the floor. The AFPS eliminates the risk of hot spots that this creates, automatically adjusting airflow from the perimeter units with electronically commutated fans to preserve constant under-floor pressure. The control module manages fan speed to stabilize nominal pressure under the raised floor during all phases of operation, as well as when new equipment is added or when under-floor partition walls break or are damaged.



StruxureWare for Data Centers Software Suite

UPS units, cooling equipment, and secure power systems from Schneider Electric are core components of any architecture designed for highly critical applications, such as data centers, industry environments, infrastructure, and buildings.

Intelligent energy management of these systems is enabled by Schneider Electric EcoStruxure™ integrated hardware and software system architecture. StruxureWare software applications and suites are a key element of the EcoStruxure architecture. The software helps maximize system reliability and optimize operational efficiency.

StruxureWare for Data Centers software collects and manages real-time information about assets, resource use, and operation status throughout the data center life cycle. This data center infrastructure management (DCIM) software provides full system visibility, allowing managers to monitor information and act quickly in order to optimize data center performance and meet IT, business, and service-oriented goals.



Commitment to Quality and Reliability

Commitment to quality is at the core of what we do at Schneider Electric. We are focused on continuous improvement and have made tremendous investments in development, manufacturing, and rigorous testing to ensure our cooling products are of the highest quality, and are properly matched for every application to maximize availability for you.

Manufacturing

Our state-of-the-art manufacturing facilities in the U.S., China, India, and Italy deploy the latest in lean manufacturing processes and adhere to ISO standards to ensure quality and repeatability.

Testing

Schneider Electric has over 4,000 m^2 of dedicated laboratories and test rooms, and 500 m^2 of raised floor space focused on cooling product testing and development to ensure the highest levels of reliability. The average product goes through more than five years of performance and application run-testing before ever being installed in the field.

Customer Design and Configuration

Hundreds of thousands of hours of performance and application testing have been invested in the development of our design and configuration tools UniCalc and InfraStruxure™ Designer to ensure our products meet every customer's specific need. Not only do these tools enable quick access to cooling product performance, but we also can quickly simulate and validate the entire system to ensure your solution meets the level of redundancy and availability you require.



Cooling Services

Schneider Electric offers dedicated services to ensure reliable implementation and operation of your key critical applications, giving you the peace of mind to focus on your business's core competencies. We offer the following dedicated services to optimize performance and availability for your cooling solution:

Installation Services

Startup of your solution by a Schneider Electric Critical Power & Cooling Services engineer ensures your system is safely installed and properly configured for optimal performance.

On-site Warranty Extension Service

In the event of a system issue, a Field Service Engineer (FSE) will arrive on site by the next business day to isolate, diagnose, and correct the problem in as little time as possible. Upgrades to even faster on-site response time are available.

Service Plans

Flexible service packages offer hassle-free system maintenance to improve uptime at a predictable cost. Advantage Plans include technical support, preventive maintenance, and quick on-site response. Optional services and response time upgrades can be added to customize a service plan to meet your specific requirements and budget.

Online Resources

Product Showcase Videos

EcoBreeze Simply Cool
Visit http://tv.schneider-electric.com

New Data Center in France: Plays it Cool with EcoBreeze
Visit http://tv.schneider-electric.com

Cooling Capabilities for the Data Center and Beyond
Visit http://tv.schneider-electric.com

InRow Pumped Refrigerant Cooling System
Visit http://tv.schneider-electric.com

Market Solutions
Visit http://tv.schneider-electric.com

Additional Resources

White Paper #130:
"Choosing Between Room, Row, and Rack-based Cooling for Data Centers"
Visit www.apc.com/wp?an=130

White Paper #132:
"Economizer Modes of Data Center Cooling Systems"
Visit www.apc.com/wp?an=132

White Paper #135:
"Impact of Hot and Cold Aisle Containment on Data Center Temperature and Efficiency"
Visit www.apc.com/wp?an=135

White Paper #153:
"Implementing Hot and Cold Air Containment in Existing Data Centers"
Visit www.apc.com/wp?an=153

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