Aquaflair

Air-cooled chillers and free-cooling chillers with double screw compressors

BREC & BREF

The all-in-one solution for your business need

Combining cutting-edge technology with energy efficiency and environmental protection.

> All the units are all-in-one and completely configurable for easy design and installation, guaranteeing continuous and quiet operations in multiple applications and environmental conditions.

> Aquaflair™ chillers are designed to guarantee total cost of ownership (TCO) reduction and absolute integration in Tier III and IV mission-critical installations.

Data centres & networks

Buildings

Industry

Schneider Electric

Focus on your core business

The optimal solution for IT mission-critical applications

> Cutting-edge technology with extensive tests for energy efficiency and continuous avaiability.

> Energy savings, complete reliability, and total flexibility guarantee Total cost of ownership (TCO) reduction.

> The all-in-one design and the complete configurability allow easy installation and tailored solutions to meet the specific needs of each critical application.

Full-load operations in less than three minutes with specific settings permits:

> **Undersizing of the storage tanks**
> **Continuous chilled water avaiability**

Units can be fully integrated into the latest generation TIER III and IV data center.

The issue-free solution for industrial processes

> Needs vary from heat absorption to the necessity to keep components, rooms, and working phases at controlled temperature conditions.

> Reliability and easy adjustment of the cooling system to the specific application are key factors to ensure an uninterrupted production and to optimize the process reducing costs.

Water inlet temperature up to +30°C (+86°F) and outlet temperature down to -10°C (+14°F) allow application in many industrial processes.

±0.2°C (0.36°F) Close control on water temperature allows use in high-precision applications like laser machineries or biomedical devices.

Cooling for innovative building systems

> **Uniflair** long experience on mission-critical installations guarantees investment optimization, short design and on-site operation, complete flexibility, and ease of maintenance.

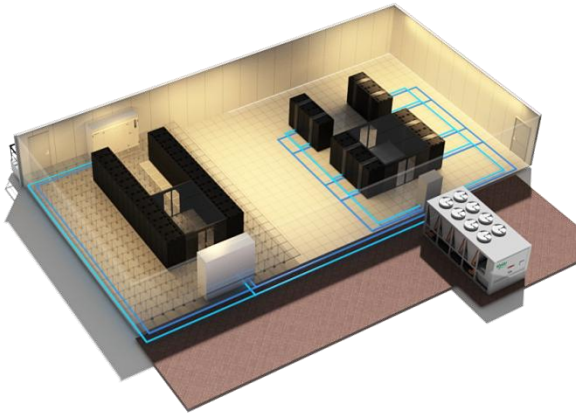
> **Aquaflair** units are usually installed in hospitals, hotels, and small and large buildings designed for smart operation.

Units are natively integrated with Schneider Electric SmartStruxure platform and, with specific adaptor, with all the main BMS platforms.

Units are totally assembled, cabled and refrigerant and oil charged in the factory for an easy and quick installation.

Cooling device integration: The Optimize Management

Management of the whole system is the only way to optimize energy consumption and to implement integrated control strategies.



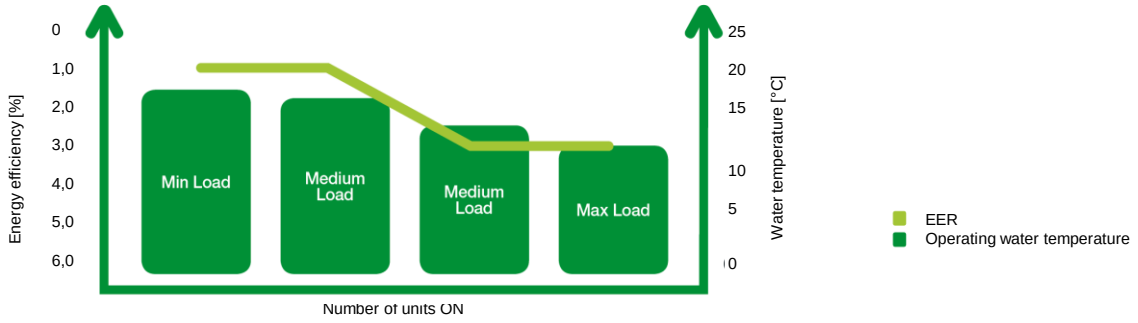
All the Schneider Electric cooling resources can therefore be linked* together in a network to maximize the operating parameters and the current required.

Row and room cooling units communicate to the chiller, reducing the energy requirement by means of a “tracking logic” for the current thermal load.

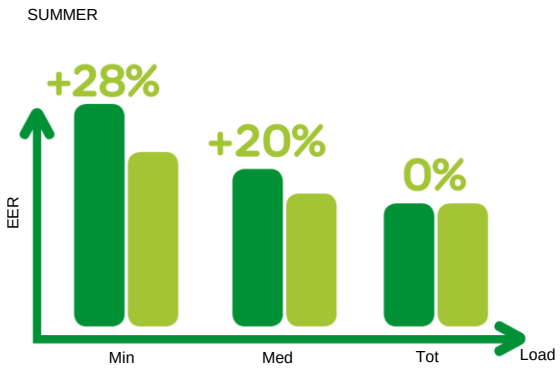
The chilled water temperature varies dynamically to minimize compressor consumption and maximize the use of free-cooling, while maintaining the optimum temperature in the data center.

** Specific configuration may be required.*

How it works

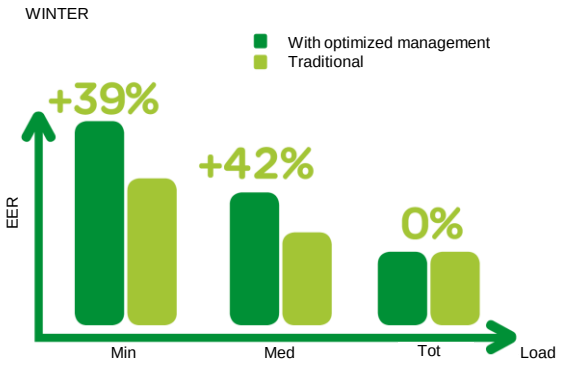


Energy saving improvement



Comparison between a traditional solution and an optimized management logic

Summer mode external temperature: 35°C (95°F)



Free-cooling external temperature: 8°C (46.4°F)

Load variation: 100 kW – 300 kW
Water set point: 12°C (53.6°F)

All in One

Prepackaged solutions

Uniflair chillers are designed to integrate the main electrical and hydraulic components onboard the units.

In order to reduce the design and installation phases, free-cooling circuit, primary pumps, VSDs, and automatic transfer switches are available to be factory installed

Thanks to this logic, the availability level is further increased since the usual single point of failure is removed, for instance:

> The **integrated ATS** connects the unit to both the redundant power supplies. According to the line presence, the unit manages the connection while the control board operates due to the integrated backup system.

> An **additional external UPS*** connection is available for critical components protection.

> The default **network connection** allows for group management without a master or external device which could represent a critical item.

> The possibility to choose **onboard pumps** guarantees better availability when compared to single external pump group.

Variable speed driven onboard pumps

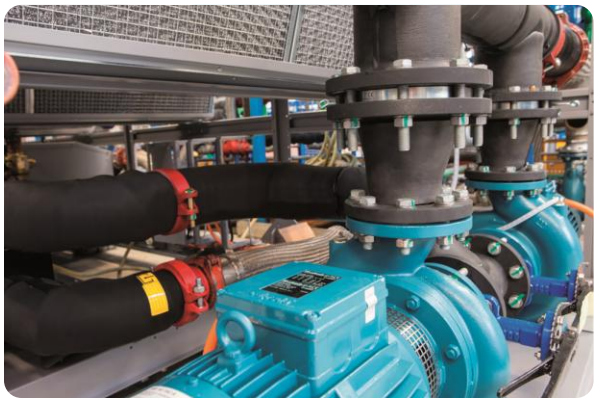
Choosing the best solution for pumps is certainly one of the most important challenges for the designer. Uniflair chillers have an onboard pump group which can be inverter-driven.

Variable speed driven pumps integrated in the units and driven by the chiller controller allow:

> Increased **efficiency** due to the continuous speed adaption on the pressure drops of the circuit.

> Increased **flexibility** and **modularity**. It is possible to change and adapt the available head pressure from the chiller terminal, guaranteeing on-site optimization and modular installations.

> **Reduction in capital expense**, since a single-circuit design can be easily applied, saving the extra cost for the additional devices typical of primary/secondary circuits and manifolds, tanks, and secondary pumps.



** Specific configurations may be required.*

Self management

Advanced control strategies

All the control software solutions for the Aqualflair range are developed by Schneider Electric and specifically designed for each unit configuration, in order to manage all the aspects of the unit.

Availability: the monitoring devices onboard the unit allows a preventive maintenance and a check of the working operation while the system is functioning.

Amperage monitoring: continuous supervision of the compressors absorbed current to signal possible discrepancies with the default values.

Precision: advanced algorithms to accurately control the chilled water temperature.

Quick restart: Providing full cooling capacity within three minutes after power failure, optimizing reliability and reducing the capital expense thanks to the downsizing of backup water tanks.

Local area network: a shared control between all the available resources for energy optimization and management of emergency situations.

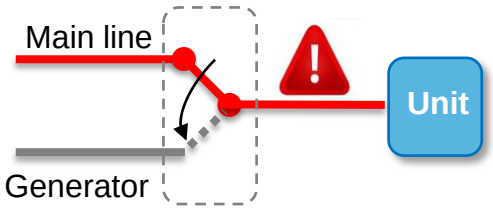
Connectivity: the unit sends alarms and data points to manage critical building infrastructure from a single system. Additional network interfaces provide management by connecting the device directly to the network with a dedicated IP address. This eliminates the need for a proxy such as a server. Monitoring is available via Web browser with specific adaptor.

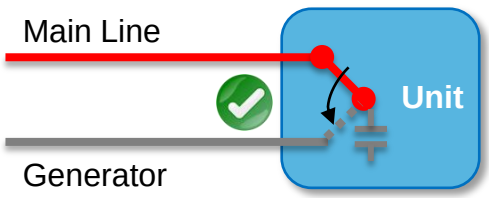
Double and/or separate power supply

When designing systems for which an uninterrupted service must be provided, reliability is fundamental.

The possibility to connect the unit to a secondary power supply guarantees advantages on controls, restarting procedures, and maximize the operational reliability of the units.

Installing secondary lines on data centers is a standard practice and Schneider Electric chillers are designed to offer a complete range of solutions to integrate the unit into the system.





Continuous cooling

High temperature management

The BREC/F units are provided with modulating condensation control:

> The influence of the external temperature variations on the condensation pressures are managed by varying the speed of the ventilating sections.

> In the event the external temperatures are such that the maximum condensation pressure is reached even with the fans at maximum speed, the control software automatically reduces the capacity of the compressors, consequently reducing the condensation pressure and maintaining the unit in operation, even if with a lower capacity (“Unloading procedure”).

Specific solutions for aggressive ambient conditions

Units can be fitted with specific solutions in order to guarantee absolute reliability in any climatic condition between -40°C (-40°F) and +50°C (+122°F), including:

> Metallic coil filter for sand protection

> Cataphoresis treatment in order to protect the surfaces from corrosion

> Low ambient temperature option (standard for BREF models)

Functional and performance test

Schneider Electric guarantees that all the chillers produced in the production facility located in Italy are fully tested at the end of the production process according to the relevant standards.

However, it is possible, with previous request, to check the unit performance attending a Factory Admittance Test (FAT)*: these tests are carried-out on the unit in specific climatic conditions, in the R&D laboratories in Conselve (Italy).

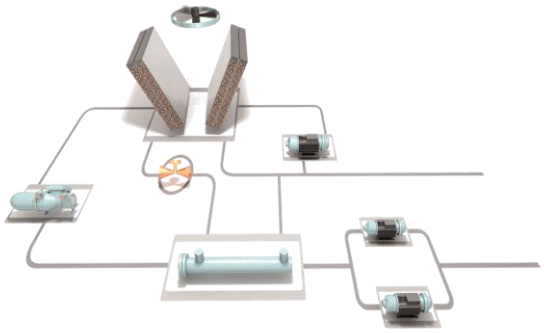
* Feasibility, costs and dates to be agreed upon in advance with the R&D team of Schneider Electric.

Free-cooling / Economizer

Free-cooling is an efficient method to reduce energy consumption at low outside air temperatures, enhancing the energy optimization.

According to the ambient temperature, the chilled water is partially or totally produced exploiting the thermal exchange with the external air. This significantly reduces the chillers energy impact.

When the external air temperature is low enough, the microprocessor control system activates the free-cooling pump, which circulates water inside special heat exchange coils. Water is cooled by external air brought in by the fans, which, together with the pump, are the only components that absorb energy.



Intelligent free-cooling (IFC)

Designing a reliable system means choosing units which are both intrinsically reliable and including “N+1” or “N+N” redundancy logic.

With IFC, all the available units are connected allowing chilled water to circulate through all the free-cooling coils, thus increasing the free-cooling surface and the benefit in terms of thermal dissipation:

+7% On Schneider Electric free-cooling*

+35% On traditional systems*

* Average values.

Glycol-free installations

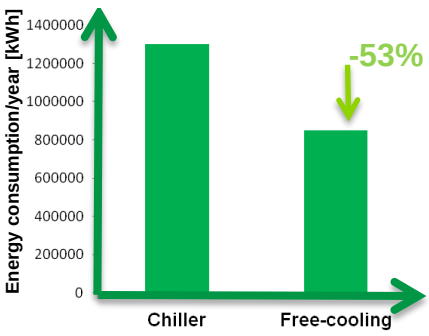
Designed for applications where the use of glycol is not allowed in the data center, this solution uses an intermediate heat exchanger to limit glycol in free-cooling circuit only, while using water in the main circuit.

The careful selection and position of the intermediate heat exchanger allows the installation of the onboard main pump too, to minimize the efficiency losses typical of intermediate heat exchangers.

delta T = 2°C (3.6°F)
in the heat exchanger

* Average values.

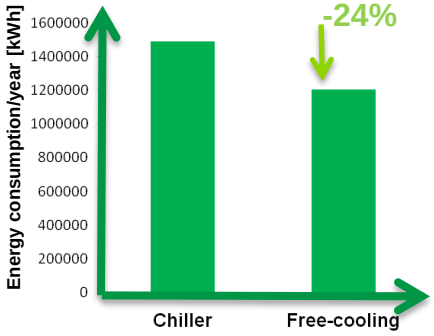
Schneider Electric free-cooling OpEx savings



> Load: 1000 KW

> Design water temperature: 10°C/15°C (50°F/59°F)

Location: Incheon (South Korea)



Location: La Paz (Bolivia)

Standard features

Range

Cooling capacity: 350 ÷ 1,200 kW

Available versions

- Basic
- Compressors soundproof enclosures, vibrations absorbers and low fans speed regulation

Refrigerant R134a

Double screw compressors

- Exclusive Uniflair free-cooling system completely managed by the microprocessor control (only BREF model).
- Self-supporting frame in galvanized steel with panels finished in epoxy powders (color RAL9022).
- Two semi-hermetic double screw compressors with internal thermal protection, discharge shut-off valve, oil heaters, and anti-vibration supports.
- Two refrigerant circuits conforming to EC norms (PED 97/23/EC) in copper tubes including: filter dryer, flow indicator, electronic expansion valve managed by the control system, electrovalve on the liquid line, pressure switches, transducers, and manometers of high and low pressure.
- High efficiency shell and tube single passage evaporator. The heat exchanger is insulated with UV resistant closed cell expanded neoprene.
- Air side exchange coils with aluminum fins and internally grooved copper tubes.
- Water flow differential pressure switch.
- Acousti-Composite fans with electronic commutated motors (EC): sickle-blade axial fans, statically and dynamically balanced, made from composite materials for high efficiency and low acoustic impact with safety protection grilles.
- Modulating condensation control with fan speed regulation.
- Electrical panel conforming to EC norms (Directive 2006/95/EC and EMC 2004/108/EC, IP54) with general cut-off switch, power supply electrical distribution bars, acquisition of absorbed current, minimum (optional for BREC units) and maximum internal temperature control, fuses for compressors, fans and auxiliaries.
- Sequence phase, minimum and maximum power supply monitoring.
- Free-cooling pump regulated by microprocessor control (only BREF model).

- Microprocessor control system including:
  - Local user terminal with external accessibility
  - Outlet chilled water temperature regulation by means of an exclusive PID algorithm
  - Electronic expansion valve managed by the control system
  - Advanced control of cooling capacity by automatic set-point sensitivity regulation
  - Refrigerant charge monitoring
  - Monitoring of the absorbed current and checking of possible malfunctions
  - Advanced antifreeze protection on evaporator
  - Integrated LAN card for local network connection of a group of chillers
  - Integrated clock card
  - Integrated RS485 card
  - Rotation of pump group setting functioning and start of pump in standby in the event of pump breakdown
  - USB port
- Microprocessor control system, in addition, allows:
  - Management of double set point from remote control
  - Limiting of absorbed current on preset value or external signal
  - Rapid quick start procedure to reach total cooling capacity within three minutes
  - Free contact for general alarm and two for addressable alarms
  - Remote ON-OFF switch
  - Compatibility with BMS by means the main protocols: Modbus/RTU, Modbus over IP, LONworks, BacNET MS/TP, BacNET Over IP, Metasys, TCP/IP, SNMP, Trend and Konnex.

Construction options

- Double power supply with automatic integrated management on the active line.
- Economizer (permits an increase in both capacity and EER).
- Operation possible with external temperature up to 50°C (122°F) at full load.
- Ultra-low noise version with soundproof casing and mufflers for the compressors.
- Intelligent free-cooling for an increase in efficiency with unit in standby.
- Glycol-free version*.
- Partial condensation heat recovery.
- Suction shut-off valves on compressor.
- Integrated hydronic system with one or two circulation pumps (1+1 standby).
- Integrated hydronic system with one or two inveter-driven circulation pumps (1+1 standby)*.
- Condensing and free-cooling coils equipped with metal safety grilles and filters.
- Coil manifolds protection panels.
- Condensing and free-cooling coil cataphoresis or prepainting treatment*.

The units can be supplied with the following external accessories:

- Remote user terminal for:
  - Entering of commands
  - Display unit status of alarms
- Spring anti-vibration kit.
- Flanged type hydraulic connection.
- Additional RS485 serial adaptor used to communicate with external BMS.
- LON FTT-10 serial adaptor used to communicate with external BMS managed with LON protocol.
- TCP/IP serial adaptor used to communicate with external BMS managed with SNMP protocol.

** On request.*

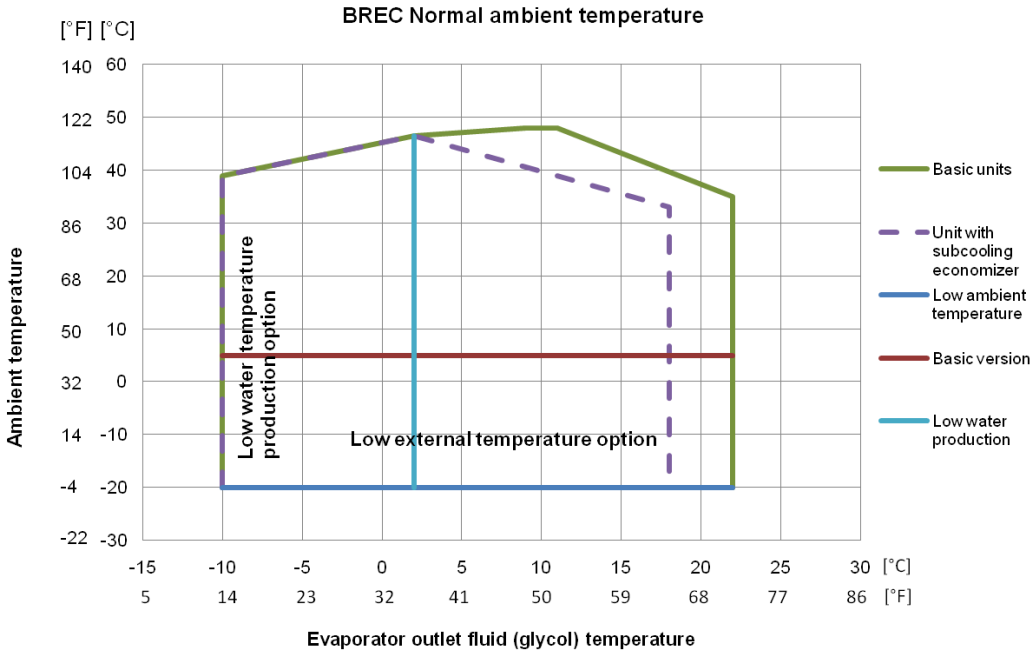
Models BREC 3212 and BREF 3212 are avaiable in High Temperature version only

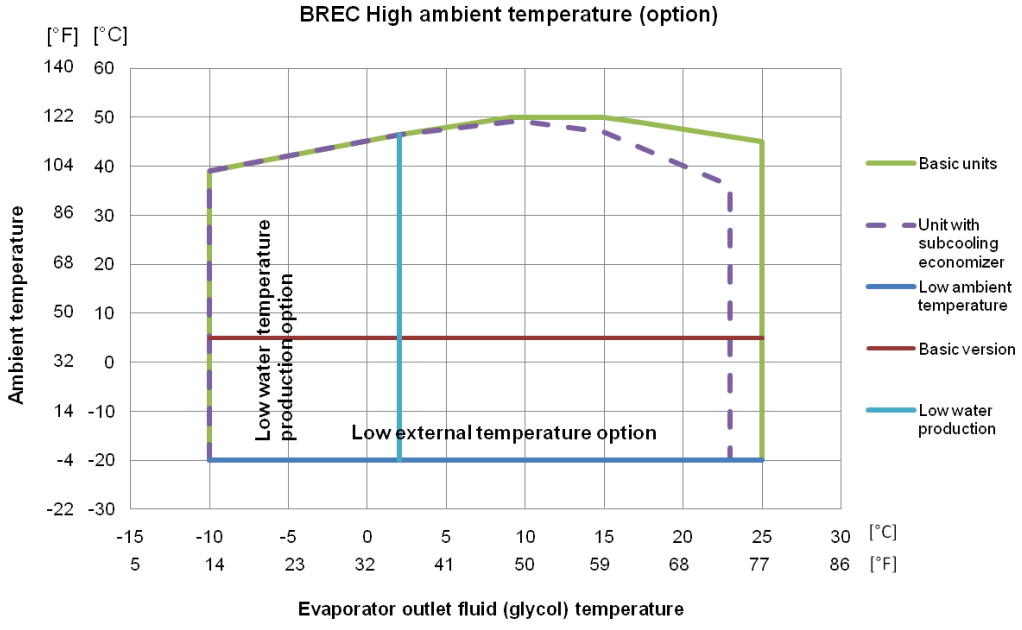
BREC - Operating limits

> Units can operate with chilled water outlet temperature > 20°C, while these operations must be checked with Schneider Electric

> Units equipped with subcooling economizer can operate continuously in areas out of the limits by switching-off the economizer. This operation is automatically carried out by the control board and it allows to operate at the limits as per units without economizer

> Operating conditions in areas out of the limits above are managed automatically by the control board. This unloading procedure allows operation, although with a lower cooling capacity (no high pressure trip)





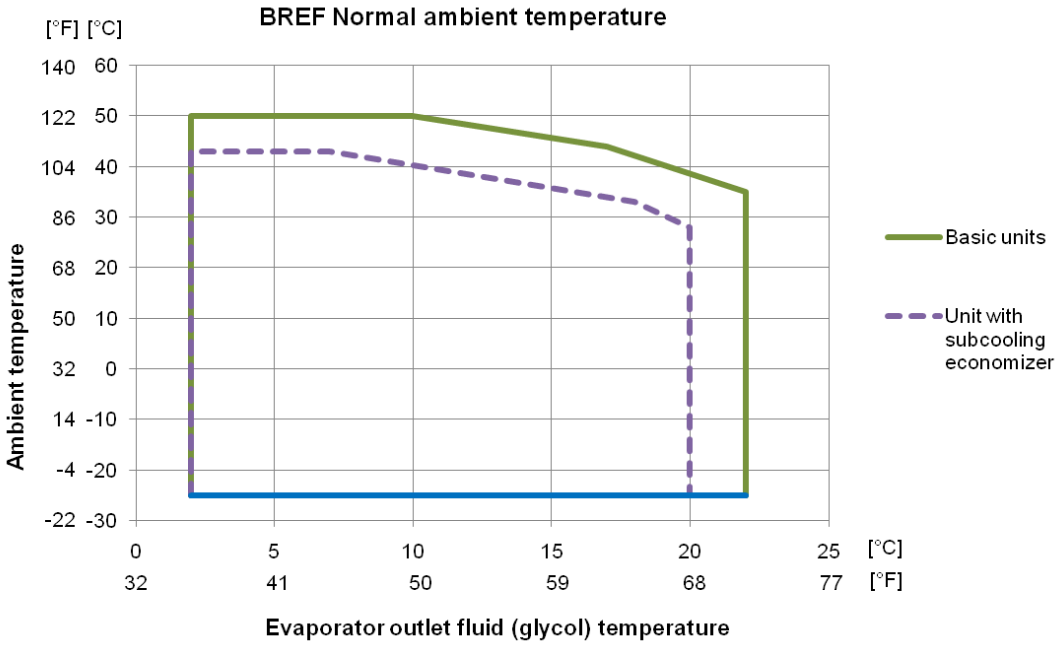
BREF - Operating limits

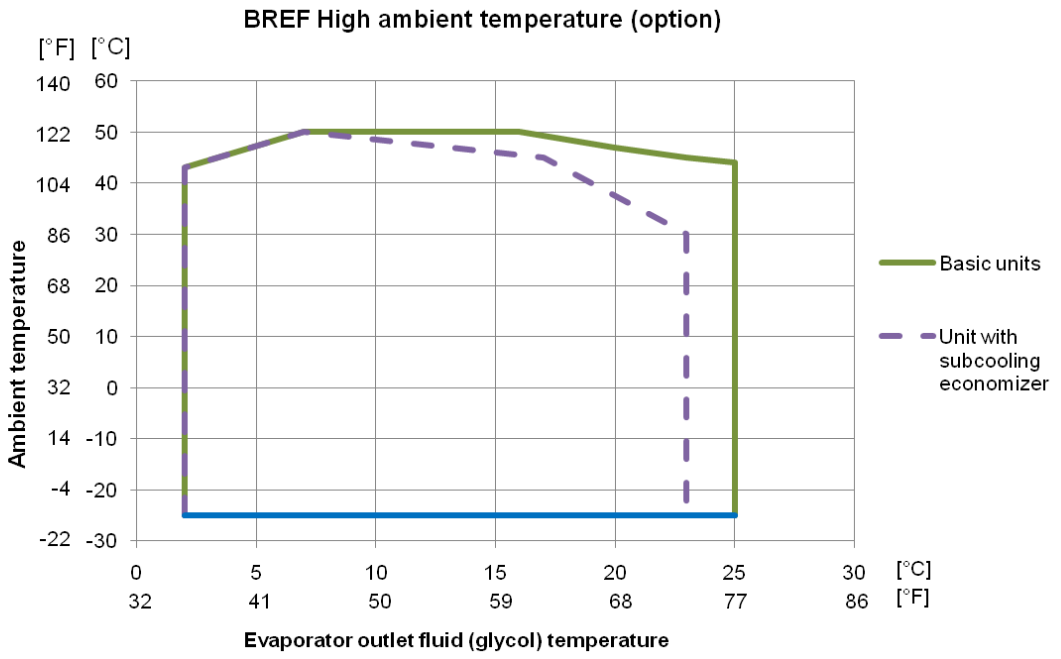
> Units can operate with chilled water outlet temperature > 20°C, while these operations must be checked with Schneider Electric

> Units equipped with subcooling economizer can operate continuously in areas out of the limits by switching-off the economizer. This operation is automatically carried out by the control board and it allows to operate at the limits as per units without economizer

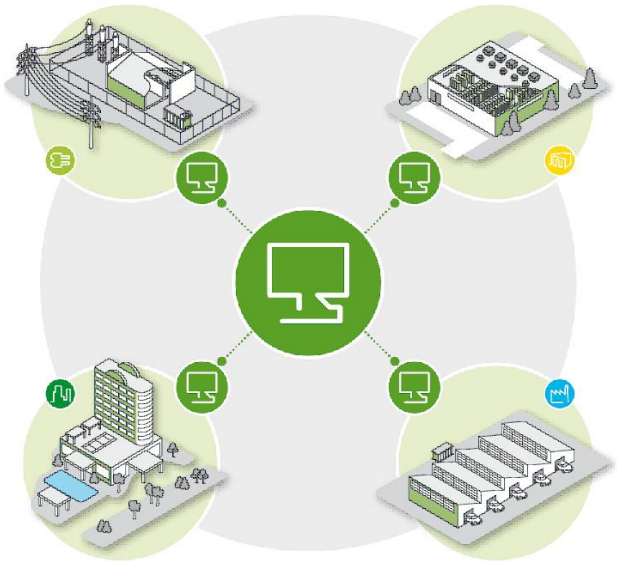
> Operating conditions in areas out of the limits above are managed automatically by the control board. This unloading procedure allows operation, although with a lower cooling capacity (no high pressure trip)

> Operations with ambient temperature lower than -5°C are possible on request





SmartStruxture solution



SmartStruxure solution enables you to monitor, measure, and optimize your building's performance throughout its life cycle — saving energy while saving money. Because you can't control what you don't measure, SmartStruxure solution facilitates the exchange and analysis of data from energy, lighting, fire safety, and HVAC.

The intelligent energy management approach

Your complex energy challenges require a stronger and more effi cient collaboration between your organization's key stakeholders. They demand comprehensive solutions that include enterprise-wide management of power, IT, HVAC, and security, with a level of intelligence that involves system dynamics across segments, platforms, and providers.

Schneider Electric SmartStruxure platform integrates multiple systems on one network to reduce training, operations, maintenance, and energy costs, which improves comfort and increases productivity.

Combining industry-standard technology with an easyto- use interface, SmartStruxure produces an integrated building management solution that is reliable, flexible, and cost-effective. Full integration of environmental control as well as facility and energy management in a single software package allows you to customize SmartStruxure for any building and security management application.

Integrated and intelligent systems deliver choices

SmartStruxure gives customers the freedom to select products from a wide range of suppliers, yielding true vendor independence. SmartStruxure runs on Microsoft® Windows® with standard LAN communication on Ethernet or fi ber optics using TCP/IP and standard network equipment. Field bus communication features open LonWorks, Modbus, and/or BACnet technology, which are used by more than 3,000 vendors worldwide.

TCP/IP offers a variety of networking architecture options

Using TCP/IP, SmartStruxure host workstations can communicate across the Internet and existing commercial WAN/LANs.

The SmartStruxure flexible architecture makes it highly scalable

SmartStruxure is well suited for any building management application, regardless of the size, the business, number of buildings, or what distances separate the buildings. SmartStruxure manages multicampus applications just as efficiently as single, small sites.

Aquaflair range is natively integrated with Schneider Electric SmartStruxure

Unifl air chillers allow a complete and easy integration into SmartStruxure. Units are able to send alarms and data points to the system in order to manage and optimize any critical infrastructure from a local or remote location.

Data center infrastructure management (DCIM)

Good design and quality construction alone do not ensure a highly available and efficient data center.

Data centers require ongoing monitoring and management to ensure the facility lives up to its design intent. StruxureWare™ for Data Centers is a software management suite designed to collect and manage data about a data center's assets, resource use, and operational status throughout the life cycle of the facility.

This information is then distributed, integrated, and applied in ways that help managers optimize the data center's performance and meet IT, business, and service-oriented goals. From IT assets to racks, rows, rooms, and buildings, StruxureWare for Data Centers delivers the right information to the right users at the right time.

StruxureWare™

Control level

Experts, on-site or remotely, can control process performance and ensure business continuity in real time, while tracking energy consumption in a highly critical and secure environment.

Operations level

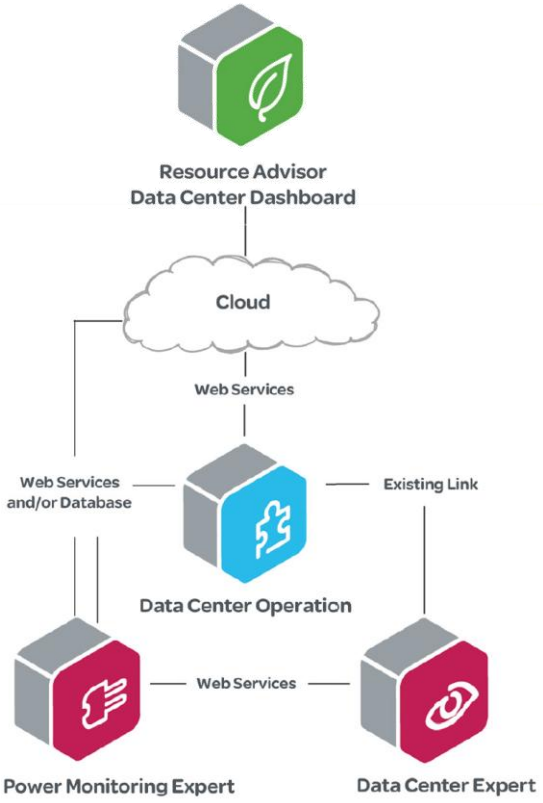
Functional managers can optimize operations, energy, and assets through smart analytical tools, often spanning multiple sites.

Enterprise level

C-level executives can drive their sustainability strategy efficiently, choosing the best scenario that meets their business objective to conserve enterprise-wide resources.

StruxureWare for Data Centers allows for flexibility when requirements and implementation strategies change over time. StruxureWare software applications and suites simplify integration time, improve reliability, enhance visibility to energy information, and streamline operational efficiency.

> Visit www.apc.com/software to learn more about StruxureWare for Data Centers!



Schneider Electric Cooling Services

Schneider Electric offers service solutions for all of our cooling customers. These services are customized to best meet your cooling service needs.

Proper care is essential to ensure your solution is operating at its peak performance, and thereby prolonging the life of your critical cooling equipment.

Why choose Schneider Electric as your Cooling Specialist?

Schneider Electric provides quality service and solutions from trained and trusted HVAC professionals. Our best-in-class service organization ensures your receiving the highest quality service from Schneider Electric certifi ed engineers. Our global cooling service organization is there to support you from commissioning to maintaining your critical applications.

Whether you are planning, installing, or operating a facility, Schneider Electric has the expertise and services to support you throughout the many phases of its life cycle.

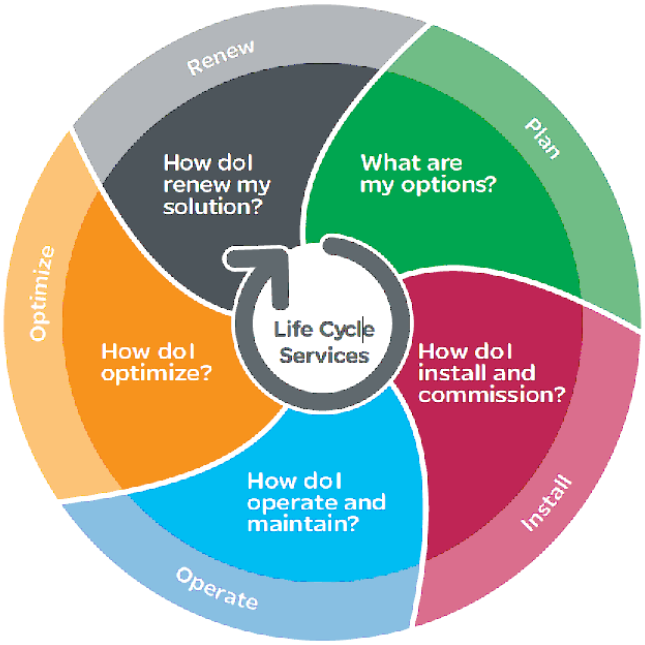
Plan: Our experts can help you plan, define, and design the right solution for increased efficiency and availability.

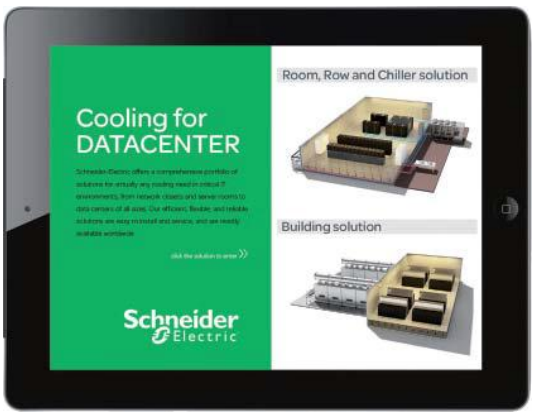
Install: Convert your plan into an efficient, reliable, and safe solution with project management, installation, and integration services from Schneider Electric to ensure quick and efficient implementation of your equipment.

Operate: Maximize your solution uptime and performance with Advantage Plan service packages that keep your equipment running efficiently and maintain maximum availability, while protecting your investment.

Optimize: Our solution experts and remote monitoring systems will provide proactive and tailored recommendations to reduce risk and improve solution's performance and reliability.

Renew: Schneider Electric enables you to increase performance and flexibility, while controlling the costs of aging infrastructure.





Cooling for Datacenter interactive application

To learn more about Schneider Electric cooling solutions, download the interactive application "Cooling for Data Center", available for iPad® and flash based

(http://www.apc.com/products/category.cfm?id=9).

To learn more about Schneider Electric cooling solution visit *www.schneider-electric.com*

Make the most of your energy™

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