



# HEALTHYBUILDINGS

The alliance of two leaders for outstanding comfort  
and enhanced indoor air quality

## CARRIER® AND BARRISOL® ADVANCED HVAC CEILING SOLUTIONS



# CARRIER® AND BARRISOL® ALLIANCE FOR OUTSTANDING COMFORT AND ENHANCED INDOOR AIR QUALITY

The alliance between two global leaders to provide outstanding opportunities for comfort, well-being, and aesthetics.



© Carrier® - Airside center of excellence Culoz - France

## Carrier®: the world leader in healthy, safe, sustainable and intelligent building solutions

Carrier® is the leading global provider of healthy, safe, sustainable and intelligent building and cold chain solutions.

For over a century, we have been developing innovative products and services that have changed the way people live and work. That drive for innovation continues today with a renewed focus on creating solutions that will change the world for the better. At Carrier®, we see possibilities everywhere.

Built on Willis Carrier's invention of modern air conditioning in 1902, Carrier® is a world leader in heating, air-conditioning and refrigeration solutions. We constantly build upon our history of proven innovation with new products and services that improve global comfort and efficiency.



© Barrisol® - Production site of Kembs - France

## Barrisol®: the world leader of stretch ceilings

Barrisol® Normalu® S.A.S. is the world leader for stretch ceilings and has been for more than 50 years.

The company has received more than 50 awards for its capacity to constantly innovate and create aesthetical, eco-responsible and qualitative products. Thanks to its high quality constitution, its adaptability to realize unique shapes and its high quality, Barrisol® stretch ceilings became and is the best choice for designers and architects. Their ceilings are 100% recyclable and up to 60% post consumer recyclable content.

"To make the world of tomorrow more beautiful, we first have to preserve it today".

Jean-Marc SCHERRER - President - Barrisol®

# INNOVATIVE HVAC CEILING SOLUTIONS FOR THE MOST DEMANDING BUILDINGS

Carrier® and Barrisol® advanced HVAC ceiling solutions combine high-level air diffusion and thermal performances for users' unrivalled comfort. They supply a unique combination of enhancing comfort and indoor air quality in a large scope of building configurations: offices, restaurants, hotels, sports centers, industry, healthcare facilities, and more.



Architect Jean-François Brodbeck - AMRS Architectes. © Barrisol®



© Carrier®

## Clim® and Pure Clim® HVAC ceiling solutions

Barrisol Clim® featuring Carrier® products combines a stretch ceiling with an air conditioning system. This solution allows for the **highest levels of aesthetic design**, the technical components being hidden by the ceiling. The solution not only delivers **outstanding thermal comfort**, generating a constant and uniform temperature but also ensures the **high levels of acoustic comfort**. Barrisol Clim® featuring Carrier® products can be upgraded with UV-C lamps for the Pure Clim® version to enhance **air indoor quality** even further.



© Barrisol®



© Barrisol®

## Cloud Clim® HVAC modular solution

Barrisol Cloud Clim® featuring Carrier® products combined installations consist of **modular ceiling units** providing **air conditionning, lightning and acoustic treatment** to the room.

The solution automatically adapts the air diffusion flow according to the temperature of the air blown. The fan coil can be integrated into the Cloud Clim module (42EP only) or installed remotely (all Carrier® ducted fan coil ranges).

Carrier® and Barrisol® HVAC ceiling solutions are part of Carrier's Healthy Buildings Program, an expanded suite of advanced solutions to help deliver healthy, safe, efficient, and productive indoor environments.



## INDOOR AIR QUALITY

A+ class\* in air indoor quality

High-efficiency air renewal

Indoor air disinfection with integrated UV-C light solution

\*According to the French labeling of construction products



## HIGH ENERGY EFFICIENCY

High-performance design

Lifetime equipment approach

Compliance with Ecodesign requirements



## COMFORT

High acoustic and thermal comfort

Class A for cooling and heating according to the standard ISO 7730

Uniform and constant temperature  
No draught



## ENVIRONMENTAL SUSTAINABILITY

100% recyclable membranes and profiles

Eco-responsible and sustainable manufacturing process



## AESTHETICS

Technical components are hidden by the ceiling solution.

100% customizable with lights, print design, shapes, and textures



Architect Agence A+ Architecture. © Barrisol®

# BARRISOL CLIM® AND PURE CLIM® FEATURING CARRIER® PRODUCTS

The innovative combination of cutting-edge stretch ceiling solutions with a highly efficient HVAC system.



Arch. : KHR Arkitekter A/S. © Barrisol®

This solution consists of a ducted fan coil installed in the false ceiling or in an adjacent room that supplies cooled or heated air to the upper part of the stretch ceiling. The high-efficiency Carrier® fan coils offers **high responsiveness and excellent capacities** to manage rapid load changes.

The warm or cool conditioned air will flow gently over the inner walls, eliminating any unpleasant hot or cold walls-effect.

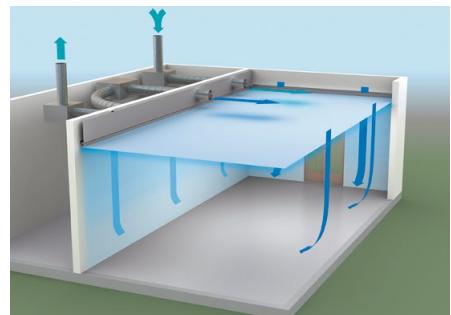
A natural flow of air develops throughout the space, **at speeds so low that they are barely perceptible**.

At the same time, the canvas performs its radiant capacities becoming a huge diffuser: heat or cold radiates through its entire surface providing pleasant, gentle heating or cooling.

## THE ADVANCED HVAC CEILING SOLUTION IS BASED ON TWO FUNDAMENTAL PRINCIPLES

Barrisol Clim® featuring Carrier® product technology uses radiation and convection. It uses a ceiling made from a bio-sourced membrane that is stretched and fixed in position, spanning a room. These ceiling acts like a high-level quality diffuser.

Combined with the responsiveness capacities of the Carrier® ducted fan coils, the solution is the perfect alliance for comfort and IAQ.



© Barrisol®



## Comfort and well-being

### Thermal comfort

The solution achieves a comfort rating of **Class A** for both cooling and heating, the highest possible under ISO 7730, the relevant international standard for measuring thermal comfort in buildings.

The performances of the Carrier® fan coils ensure a **constant temperature**, whether in cooling or heating, regardless of the outdoor conditions. Combined with the thermal properties of the canvas it gives the system incredible responsiveness, in only a few minutes the sensation of heating or cooling is perceptible.

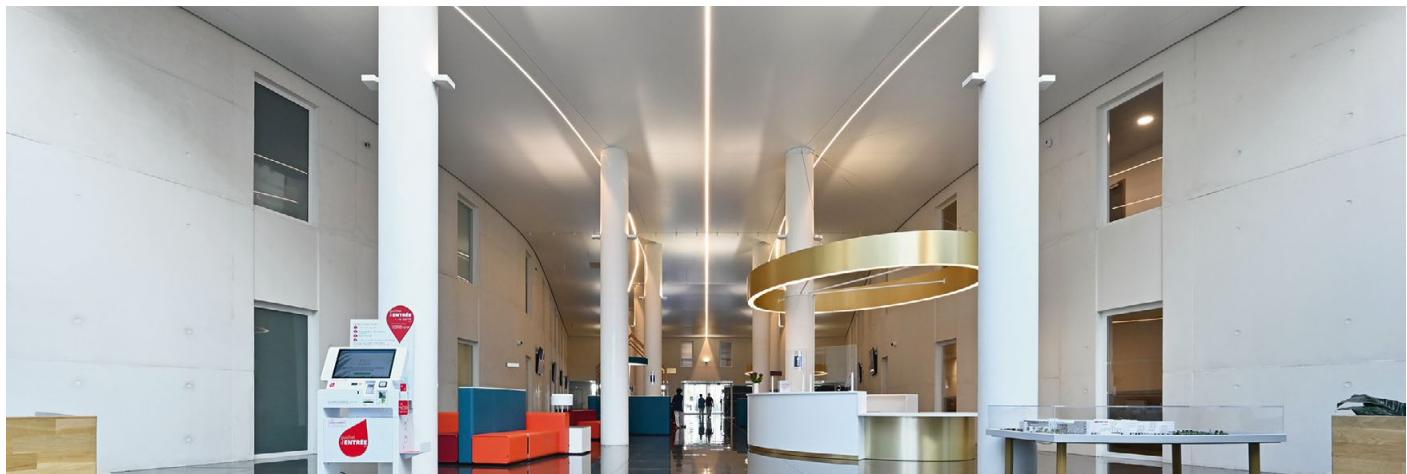
The HVAC ceiling system evens out the temperature of walls and ambient air, everywhere in the room for a **homogeneous temperature**, less than a 1.0°C temperature difference between the head and feet of the occupants (1.0°C in heating mode and 0.5°C in cooling mode).

It achieves almost **imperceptible air velocity** (0.12 m/s). Barrisol Clim® featuring Carrier® fan coils technology thus offers an **unequaled level of comfort** since it is the only one able to create such a low airspeed while ensuring a homogeneous temperature throughout the room and a complete renewal air volume of the room\*.

\*According to ISO7730. Tests carried out by Carrier® Culoz Laboratory

## Acoustic comfort

With their **very low noise** EC fan motor and **acoustic insulation**, the Carrier® fan coil units make silent operation a reality. The special design of the microperforated membrane of the ceiling and its sound absorption capacity significantly **reduces the resonance effect and improve the acoustic performance of the environment**.

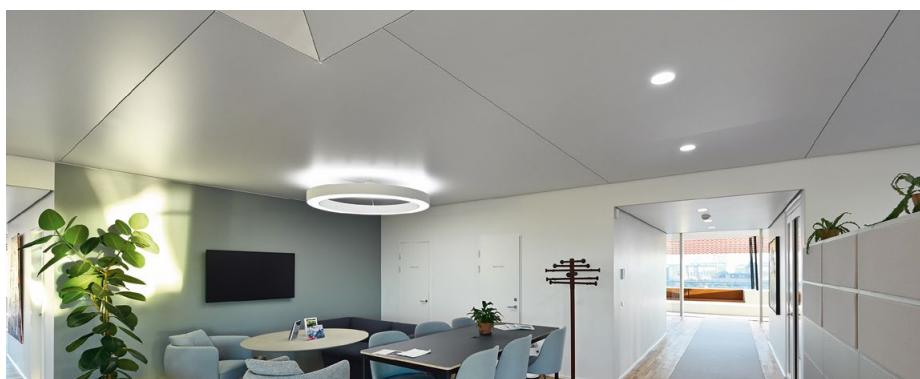


Architect Agence A+ Architecture. Clinique Saint Jean. © Barrisol®

Within the Clinique Saint Jean project, Carrier® and Barrisol® were able to propose a solution to answer to very high acoustic treatment requirements, due to the large volume of the reception hall, the height under the ceiling, and a high frequentation (entrances, exits, reception).



## Aesthetics



Architect KHR Arkitekter A/S. © Barrisol®

The system is **fully customizable: lights, print design, shapes, dimensions...** It integrates seamlessly within every building, **hiding all the technical components**, and giving architects and designers **freedom of expression**.

Flexible, the stretch ceiling can still be adapted once installed for space reshaping needs (in offices and open spaces for instance).



## High energy efficiency

The Carrier® fan coils are equipped with **energy-efficient variable-speed LEC fan motors**, known to achieve high performances while being particularly energy efficient.

Due to thermal radiation of the membrane, homogeneous and stable ambient temperature, the setpoint temperature can be lowered in heating mode or increased in cooling mode for an equal perceived temperature, resulting in **lower energy consumption**.

Thanks to the very low air velocity, the pressure losses are also very low, and the energy consumption is reduced even further.



## Environmental sustainability

Ceiling membranes are made from **100% recyclable material** that contains a plant-based plasticizer and are weak A+ class\* in terms of VOCs emissions (volatile organic compounds).

Support profiles are made from 80% recycled aluminum.

The primary environmental impact of HVAC equipment is due to the energy they use. Carrier® designs products that achieve **optimized energy performance** throughout the year and limit the indirect release of CO<sub>2</sub> associated with the consumption of electricity.

Carrier® products are **extensively tested** and maintained to a high level, thanks to an extended service offering to ensure the **best performance during the equipment's entire lifetime**.

\*According to ISO7730. Tests carried out by Carrier® Culoz Laboratory





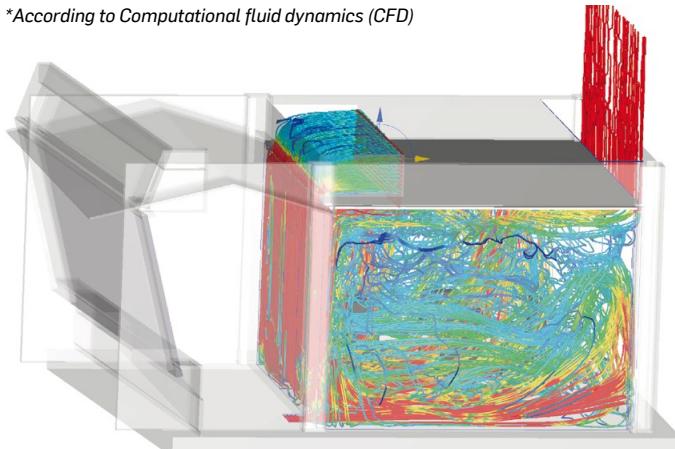
## Indoor Air Quality

### Complete air renewal

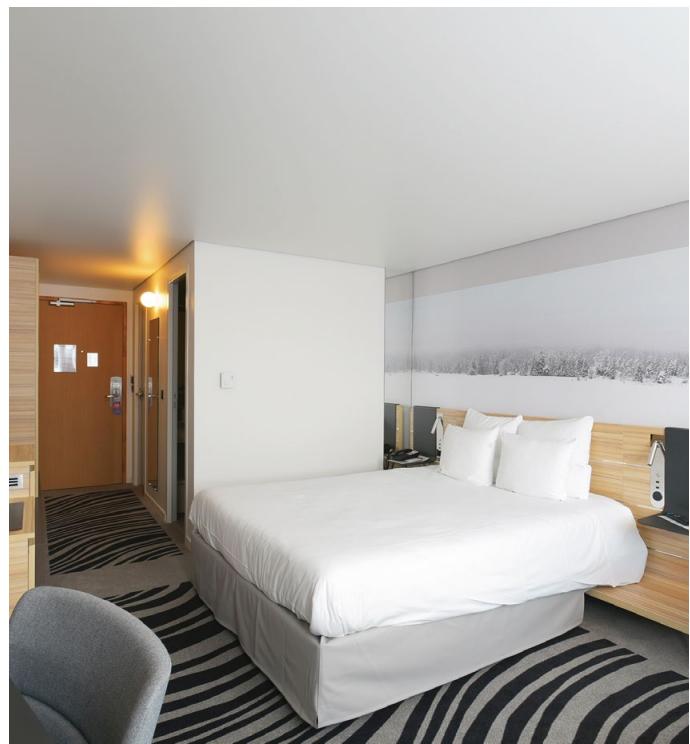
Air renewal is one of the most important actions to ensure good IAQ.

The Carrier® and Barrisol® HVAC ceiling solution can provide a total air circulation and volume renewal inside the room\*.

\*According to Computational fluid dynamics (CFD)



© Barrisol®

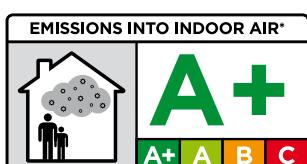


Design ACCOR. © Barrisol®

### Rated A+

The solution has been rated A+ for indoor air quality, respecting the effective legislation\*. Barrisol® ceiling membranes are CE certified and fire-rated following the European and international norms (BS1-d0, BS2-d0, BS3-d0).

\* According to the French labeling of construction products. No emission of VCM (vinyl chloride monomer) detected during the warming of the sheet (50°C), the installation of the ceiling, or after installation.



Information on the level of emission of volatile substances into the indoor air, presenting a risk of toxicity by inhalation, on a class scale from A+ (very low emissions) to C (high emissions).



Arch. : Filiptackdesignoffice & Devolder Architecten. © Barrisol®

### Air handling unit connection

As part of the Carrier® HVAC equipment, the advanced HVAC ceiling solution can be connected to a Carrier® air handling unit, to upgrade the level of air filtration.

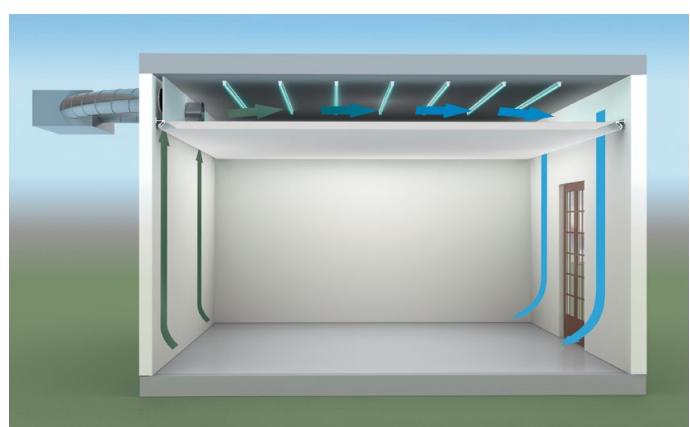
### Barrisol Pure Clim® featuring Carrier® products

For air purification needs, the system can be upgraded with UV-C lamps.

The treated air is exposed to UV-C radiation throughout its path inside the plenum between the slab's natural part and the canvas.

The longer the air is exposed to UV-C radiation, the more effective the disinfection. Thanks to this configuration, the treated air injected into the plenum is exposed to UV-C radiation throughout its journey inside the plenum. Due to its large volume, the exposure time is particularly long, and therefore the disinfection is very effective.

Thanks to the use of two specifically designed fabrics, UV-C radiation cannot escape from the plenum.



© Barrisol®



# BARRISOL CLOUD CLIM® FEATURING CARRIER® PRODUCTS



This hybrid panel uses diffusion and radiation principles to combine a high level of comfort, aesthetic, and versatility.



© Barrisol®



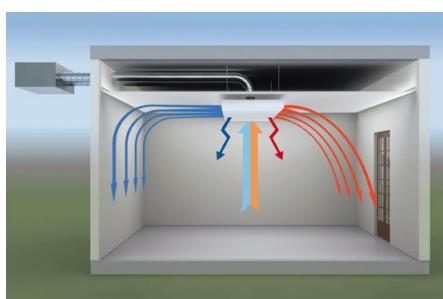
© Barrisol®

## Operation principle

The system uses modules that are suspended from the ceiling, through which conditioned air is delivered into the room. Air can be fed into ceiling modules via a fan coil unit concealed nearby or located in a plenum.

The combination of convection and radiation makes it possible to achieve high heating/cooling capacities whilst ensuring a homogeneous temperature.

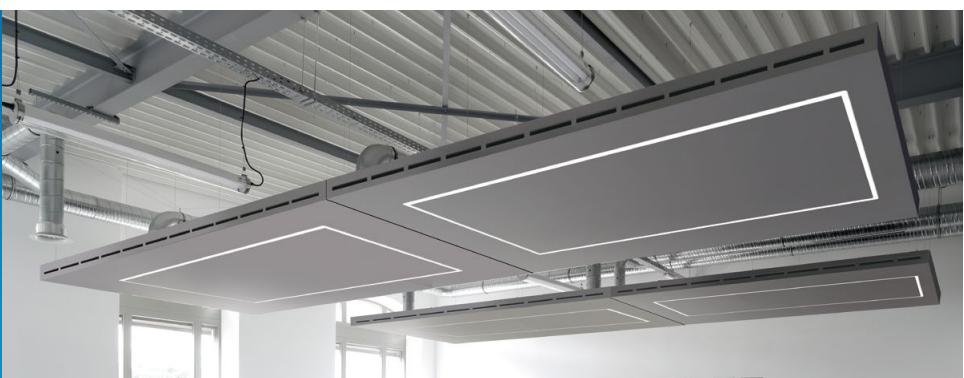
Unlike conventional diffusers which blow the treated air at the same speed and angle, the system automatically adapts the diffusion flow according to the supplied air temperature. There is no draught thanks to the patented adaptive air flow principle.



© Barrisol®

## FLEXIBILITY & AESTHETIC

Available in three different formats, the solution offers unlimited possibilities of assembly and configuration with total freedom of customization: frame colours, vent designs, printed membrane, light, acoustic...



© Barrisol®



Customized format on request

# COMPATIBLE CARRIER® PRODUCTS\*

Carrier® products comply with the requirements of European Ecodesign regulations applicable to energy efficiency.



## Air handling units

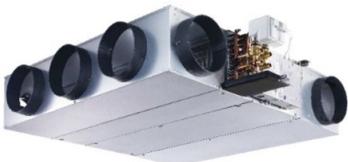


39CP



39HX

## Ducted hydronic fan coils



42NH



42EP



42BJ

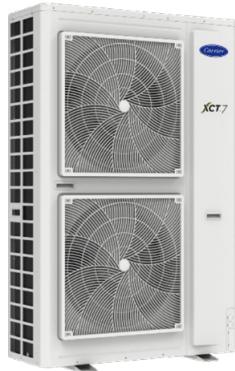


42GR

## VRF



38VT



38VS



40VD\*L



40VD\*S



40VD\*H

## Split systems



42QSS



38QUIS

\*products availability may vary depending on the countries

To know more : <https://www.carrier.com/commercial/en/eu/innovation/hvac-ceiling-solutions/>



HEALTHYBUILDINGS

# CARRIER® HEALTHY BUILDINGS PROGRAM

Carrier® has long been an industry leader in healthy, safe, sustainable and intelligent buildings. We were a founding member of both the U.S. Green Building Council and the International WELL Building Institute and have partnered with leading researchers and organizations to explore the impact of built environments.



## The science of Healthy Buildings

As humans, we spend 90% of our time indoors. Consequently, buildings play a significant role in our lives and directly impact our health. Through the [COGfx Study](#), research has shown that healthy buildings can significantly improve cognitive function. In addition, healthy buildings can impact the bottom line for a business – from reducing energy waste and the related costs to increasing worker productivity.



# HEALTHYBUILDINGS

## The human impact of healthy buildings

From the most fundamental elements of safety and security to the cognitive and health benefits of improved air quality and ventilation, healthy buildings provide environments that are optimized to positively impact the people inside. It's why Carrier® is leading the way in helping customers think about buildings differently – starting by thinking about building occupants first.



## Carrier's Approach to Healthy Buildings

Carrier's Healthy Buildings Program provides an expanded suite of advanced solutions to help deliver healthier, safer, more efficient and productive indoor environments across key verticals including commercial offices, healthcare, hospitality, education, and retail. From products to improve indoor air quality and remote services to manage ventilation in buildings to touchless solutions in public spaces, Carrier® is redefining the spaces of the future, today.

### + ASSESSMENTS

Many building owners and operators may be unsure about how to move forward in developing a healthy building strategy. That's why, through our best-in-class BluEdge service offering, Carrier® is here to help – starting with assessments across all aspects of your building.

### + OPTIMIZATION

Through advanced controls and digital solutions and services, Carrier® is here to help you confidently optimize your building – and the investment in creating a healthy, safe environment.

### + EXPERTISE

Carrier® has a history of expertise in healthy buildings. We invented modern air conditioning and helped establish the first NICU – and one of the earliest examples of a healthy indoor environment – at Allegheny General Hospital in 1914. We drove the green building movement and we invigorated the dialogue around the impact of indoor environments on people, performance and health with the groundbreaking COGfx and HEALTHfx studies. Today, we continue to apply more than 100 years of experience creating optimal indoor environments, partnering with academic researchers and global experts to unlock the incredible potential of indoor environments.



### + IMPLEMENTATION

Healthy buildings must strive to meet a number of foundational criteria, which cover everything from ventilation and air quality to lighting, views and physical security. Carrier® has built a complete portfolio of solutions to address these criteria, with a full range of HVAC solutions and controls and fire and security solutions covering everything from fire detection and prevention to thermal screening and touchless access.

Contact your local Carrier® expert to learn more about the solutions and services that will help improve the air quality, ventilation, and overall health in your buildings.



# YOUR SERVICE PARTNER

Your daily challenge is a complex balance between maintaining optimal comfort levels, maximising system uptimes and minimising cost of ownership. BluEdge® service teams are committed to ensuring your peace of mind and supporting your business objectives throughout the lifecycle of your equipment. We can help you create a customized program that is suited to your specific goals and needs.



## Customer needs come first

### Proximity & Responsiveness

BluEdge service expert technicians are there to take action, quickly. Comprehensive and highly efficient maintenance processes mean your equipment works at peak performance level.

If necessary, you can rely on Carrier® rental systems and readily available spare parts to avoid extended downtime.

### Expertise & Consultancy

The BluEdge service platform has experienced teams, an extensive network of branches, top grade logistics and powerful information systems. These industry-leading resources come together to deliver a best-in-class service.

Your BluEdge service experts will help you to find the right balance between enhancing energy efficiency and maximising your investments.

### Proactivity

As your preferred partner, Carrier® designs tailored maintenance programs to meet your goals and optimize your business performance.

## Worldwide-recognized experts

### Asset Management

- Advise on fast-moving regulatory environment.
- Guidance for energy optimization solution.
- Information on EH&S guidance.
- Providing educational sessions.

### Technical expertise

BluEdge service technicians benefit from a multifaceted training program based on 115 years of industry experience to bring you top level, up-to-date service.

- Technical training to ensure the teams remain familiar with all equipment types.
- Environmental, Health and Safety (EH&S) training to ensure the highest standards of ongoing safety.

Present  
in more than  
**60**  
countries

**24/7**  
on-site  
availability

More than  
**115**  
years  
of experience

[www.carrier.com](http://www.carrier.com)

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HEALTHYBUILDINGS