SUSTAINABLE **VAV & CONTROLS** SOLUTIONS

BARCOL-AIR | COMPANY PROFILE

BARCOL-AIR
AIR DISTRIBUTION

www.barcol-air.nl | www.hcgroep.com

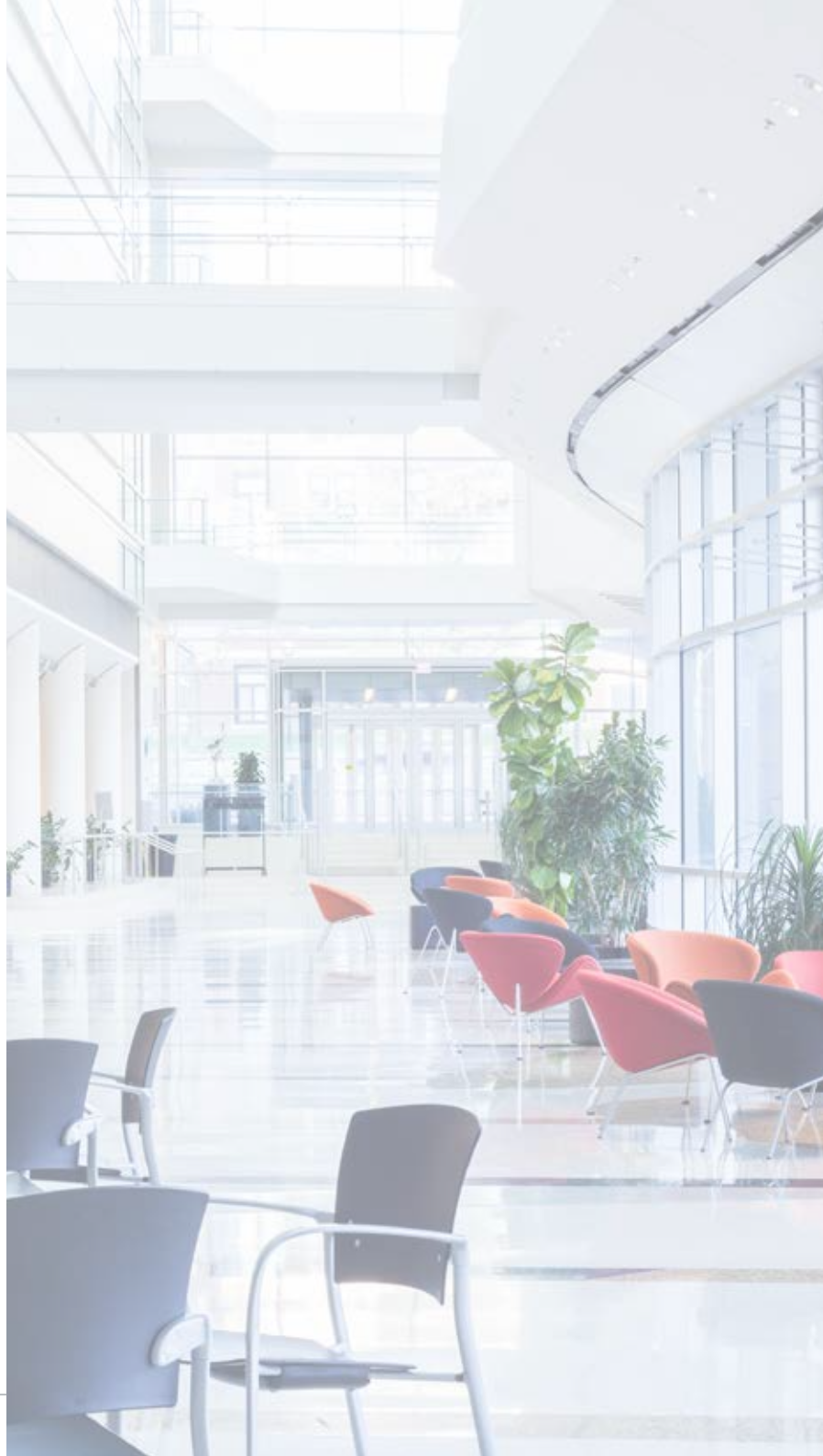


TABLE OF CONTENTS

BARCOL-AIR
AIR DISTRIBUTION

BARCOL-AIR | COMPANY INTRODUCTION

Barcol-Air specializes in creating an optimal indoor climate with environmental and state of the art products, services and solutions.

Our goal is to make every newly build office, healthcare centre, educational building or shopping mall into a space of optimal comfort.

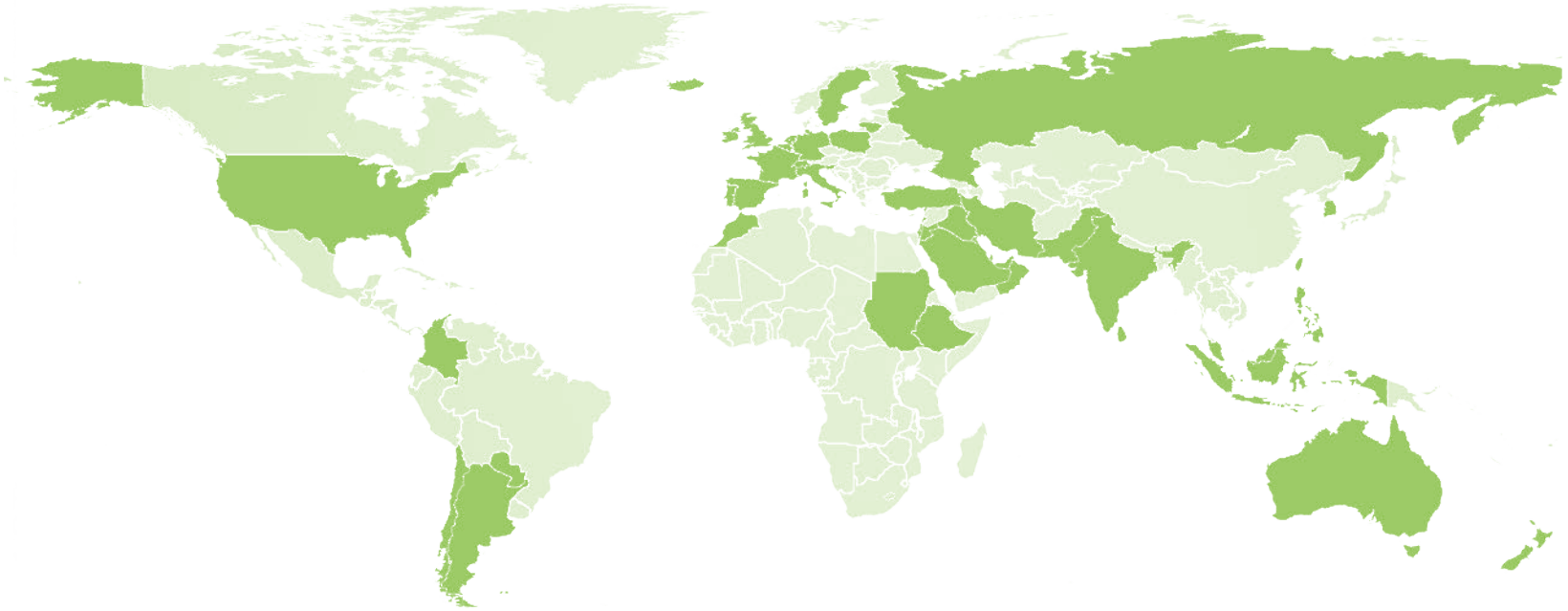
By creating a perfect balance between heating, cooling and ventilation, we provide optimum energy solutions and indoor air quality improvement.

Our products are all manufactured according to the latest NEN, ISO, AHRI, DIN, NFPA and UL standards.

WWW.BARCOL-AIR.NL

- Product categories: air volume control units (VAV, CAV), induction air volume control units (environmental friendly), ventilation, fire safety, air flow measuring and control stations, chilled beams, fan coil units and grilles & diffusers.
- Over 80 employees, with a combined experience full of knowledge and technical expertise in HVAC & Controls products, making Barcol-Air one of the strongest players on the market.
- Dedicated after sales services! We are dedicated to offer a continuing high value service after a sale is made.
- Barcol-Air is a member of the Dutch Green Building Council. DGBC assesses Dutch buildings and projects on its sustainability according to the BREEAM-NL standards.
- Worldwide coverage with projects in more than 50 countries with 35 distributors.

"SINGLE SOURCE, **SINGLE** RESPONSIBILITY"



1900

Founded in 1900 as
Barber-Colman Company (USA)

1982

Established in 1982
as Barcol-Air B.V.
the Netherlands

2006

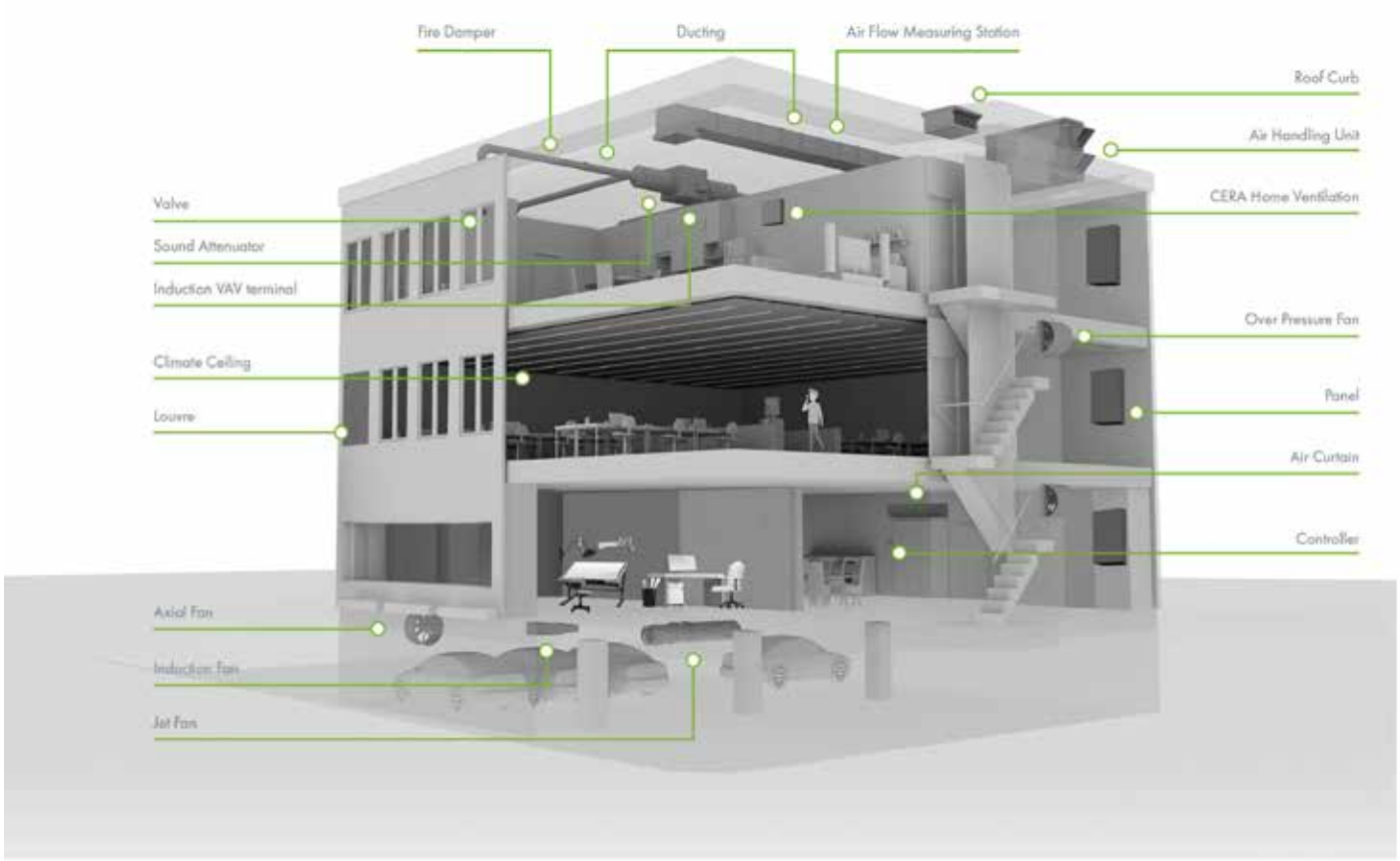
Acquired by
HC Groep
in 2006

2015

Acquired by
SIG Air Handling
in 2015

2020

July 2020, acquisition of the complete
HC Groep by the current management,
including all subsidiaries



BARCOL-AIR
AIR DISTRIBUTION

Barcol-Air | Air Distribution & Controls

VAV & CAV with DDC controls

- Induction VAV system
- Air flow & pressure measuring & control stations
- Chilled beams & special diffusers
- Next level controls software

HC PS
CAR PARK VENTILATION SYSTEMS

HC PS | Car park ventilation sytems

- Induction fans
- Axial exhaust fans
- CO/LPG/NOX
- Air dampers
- Smoke screens

HC KP
CLIMATE CEILINGS

HC KP | Climate Ceilings

- Active Chilled Ceilings
- Passive Chilled Ceilings
- Hybridair climate isle
- Tailor made

"IMPROVING AIR BECAUSE WE CARE"

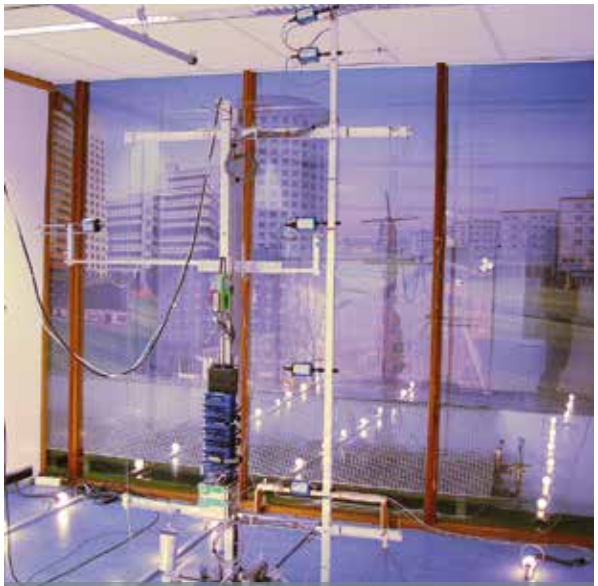
Indoor air quality has become a major concern for many people in Europe and all around the world.

"As a company and as a member of the HC Groep we have an important responsibility towards the environment, the society and future generations".

We must do everything we can to ensure a healthy and safe indoor climate and therefore constantly improve the quality and efficiency of our products.

This is why we want to contribute to a better indoor environment and create a better quality of life for everyone.

This is why we care.



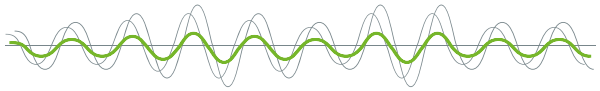
CLIMATE ROOM

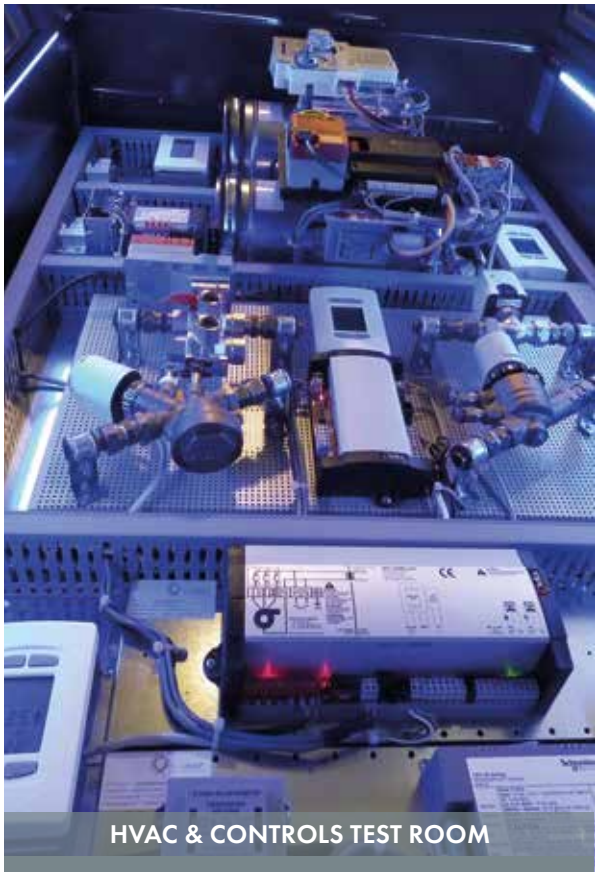
The Barcol-Air Climate Room meets the most recent NEN-ISO standards 7726 and 7730. It can perform full-scale tests with the room built to actual specifications. The laboratory can simulate any type of outdoor condition with its unique double climate facades from floor to ceiling. The mock-ups can also be added with other project specific specifications like: ceiling, floor, furniture, lighting and convectors.

The data acquisition system has an unique calculation module to present real time data, not only air temperature and velocity, but also the PMV (Predicted Mean Vote), PPD (Percentage People Dissatisfied) and DR (Draft Rate).

ACOUSTIC REVERBERATION ROOM

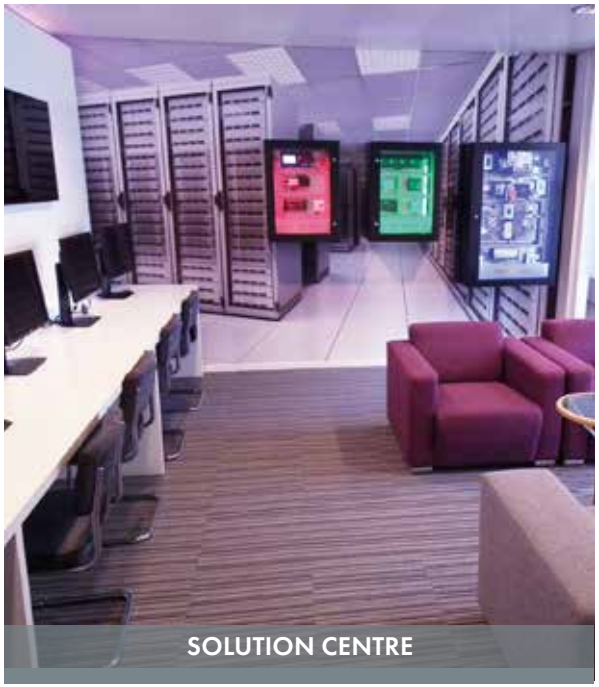
Our acoustic reverberation room is specially designed to measure the discharged, radiated, inlet and/or outlet sound levels of different products. The measured sound pressure levels will be corrected with the reverberation time of the room and the background noise to present the sound power levels in tabular and graphical format.





HVAC & CONTROLS TEST ROOM

In the HVAC test room different type of tests on our air distribution products can be carried out. This can be controls and air volume accuracy tests, pressure drop tests, induction ratio tests, etc.



SOLUTION CENTRE

The Solution Centre is developed to demonstrate our knowledge on system integration by showing a wide range of building controllers, field devices and room sensors. The client can train himself with the different devices, but it is also possible to login (via internet) into their existing buildings and to provide dedicated controls training sessions to, for example; facilities management personnel.

AIR TIGHTNESS

NEN-EN 1751 is an European method for measuring and catagorizing the level of air tightness of all products used in the HVAC. Since all air that is lost in poor quality ducting, VCD's, VAV's, etc, is a waste of energy, Barcol-Air aims on having all of it's products tested to these standards and not exceeding a certain level of air tightness. Our test facility is attested by TÜV.

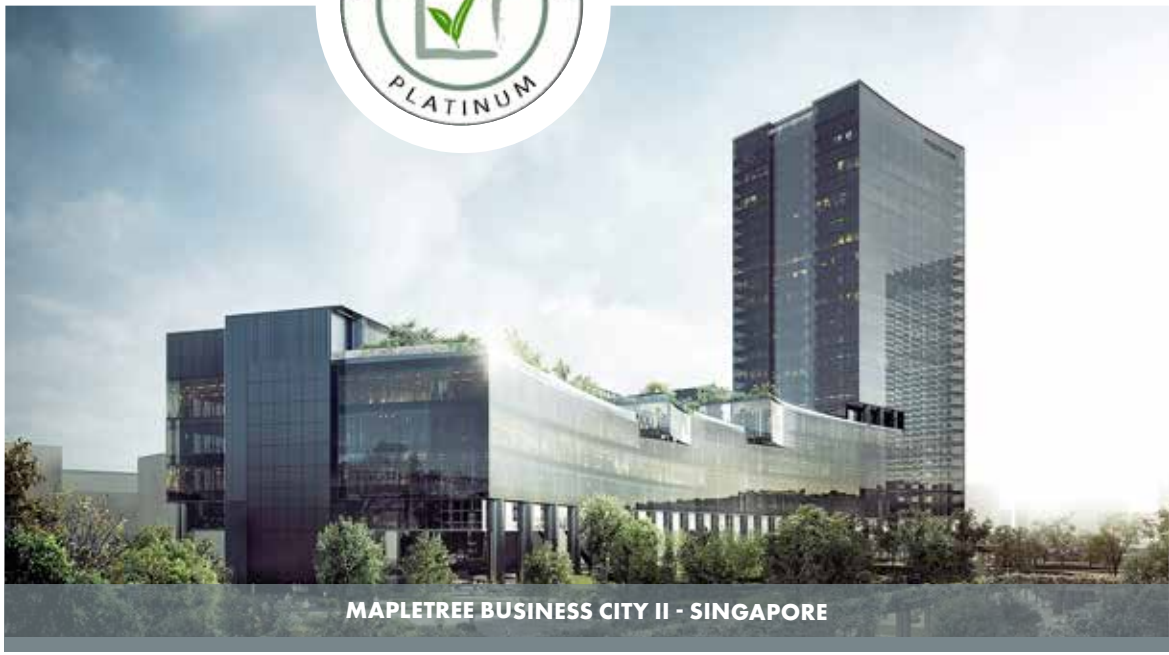
"WE DEVELOP
ADDED VALUE
PRODUCTS & SYSTEMS"

BARCOL-AIR | INTERNATIONAL STANDARDS & GUIDELINES

Barcol-Air complies to and follows the guidelines of the below mentioned standards:

- ISO 3741 and ISO 5135 standards for sound data test
- ISO 7730 and DIN 1946 (1994) standards for thermal comfort
- NEN-EN 1751and NEN-EN 15727 for casing and damper leakage as per LUKA qualtiy manual and certified by TÜV
- ISO 7726 and ISO 7730 standards for climate laboratory
- AHRI 880 certification for VAV terminals
- NFPA 90A and 90B surface burning characteristics for insulation material
- BS 476 part 6 fire propagation for insulation material
- BS 476 part 7 surface spread of flame for insulation material
- UL listing for electric heater coil elements

HELIOS MASSY - FRANCE



MAPLETREE BUSINESS CITY II - SINGAPORE

What is BIM?

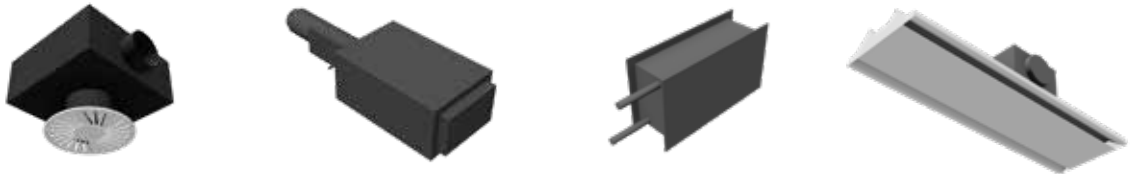
BIM stands for 'Building Information Modelling'. It represents the process of collecting all information of a construction process in one summarized model for presentation in a virtual building model. This model includes all relevant information, such as drawings, calculations, specifications, materials lists and planning. To make this process work properly, all concerned parties need to work according to one code/standard. Barcol-Air follows the European MEPcontent Standard (EMCS), developed by Stabiplan which makes sure that all processed models of different parties are build according to uniform parameters, codes, geometry and connections around the whole of Europe. The EMCS standard matches the international IFC standard.

Barcol-Air and BIM

As a producer of air distribution products, Barcol-Air is involved in the BIM process. Until now we have made 90% of our products BIM-ready which are all downloadable in REVIT format at: www.barcol-air.nl and www.mepcontent.eu. Our BIM partner is Stabiplan, a company with over 20 years of experience and a true BIM specialist with a strategy focusing on the future. Their Stabicad software enables an engineer to design, visualize, control and optimize technical installations with a sophisticated and future proof design. This contributes to an effective development, management and installation process, which results in cost savings and quality.

MEPcontent

The BIM library for MEP engineers



COMPLETE BIM DESIGN

AL JAHRA COURT COMPLEX | KUWAIT

HAGA HOSPITAL | THE NETHERLANDS

BREEAM®

| WWW.BREEAM.COM

BREEAM is a leading sustainability assessment method for master planning projects, infrastructure and buildings. It addresses a number of lifecycle stages such as New Construction, Refurbishment and In-Use. Globally there are more than 551,000 BREEAM certified developments and almost 2,252,800 buildings registered for assessment since it was first launched in 1990. The BREEAM method is mostly applied at the continent of Europe.

INTERNATIONAL WELL BUILDING INSTITUTE™

| WWW.WELLCERTIFIED.COM

The WELL Building Standard™ is an evidence based system for measuring, certifying and monitoring the performance of building features that impact health and well-being. Different from LEED and BREEAM, WELL focuses more on human health and well-being inside the working space.

U.S. GREEN BUILDING COUNCIL LEED USGBC

| WWW.USGBC.ORG/LEED

LEED, or Leadership in Energy and Environmental Design, is just as BREEAM a leading green building certification assessor. They rate newly build buildings on the following points: Sustainable Sites, Water Efficiency, Energy & Atmosphere, Material & Resources, Indoor Environmental Quality, etc. The LEED method is mostly applied at North- and Latin-America and the Middle East.

Barcol-Air VAV systems have proven to be very energy efficient in providing an optimal indoor climate.

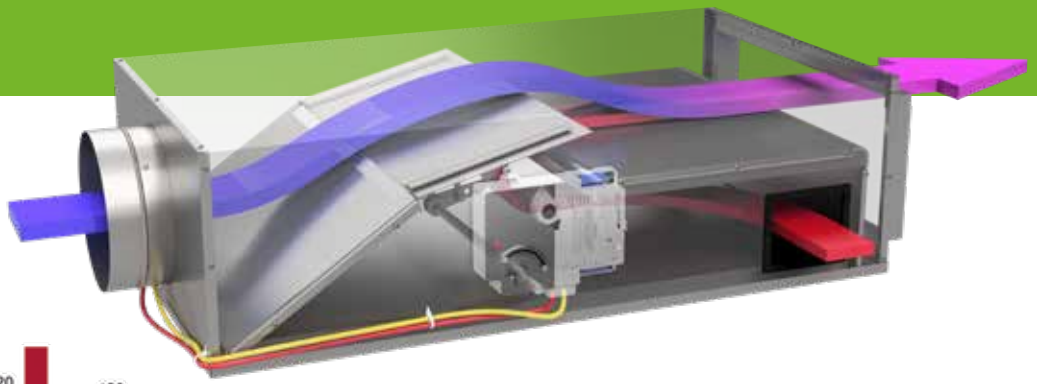
The latest standards and requirements for energy efficiency and human thermal comfort make it more and more challenging to design new HVAC systems that comply to these standards.

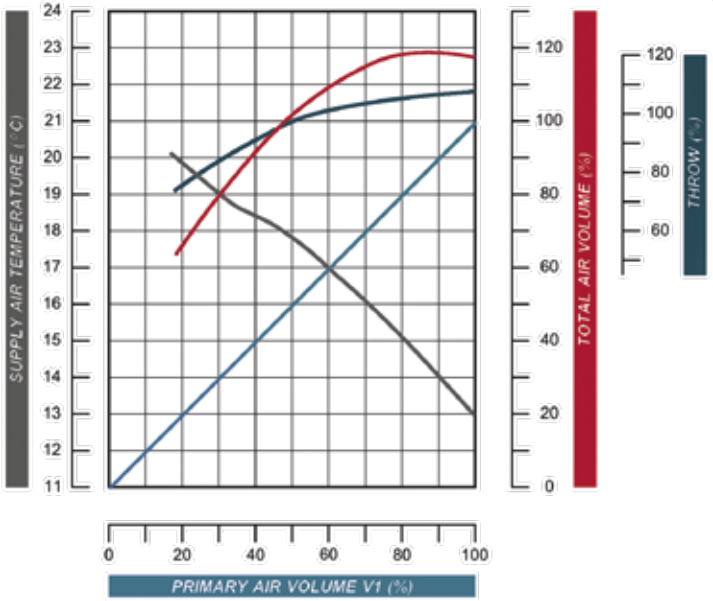
Energy could be saved by reducing primary air volumes to a minimum during reduced load conditions.

However with conventional VAV systems this could cause "cold air dumping" and lack of air movement in the room, resulting in occupants discomfort and a consequent decrease in productivity.

Induction VAV is the best solution to maintain proper air circulation and comfort levels, reducing the primary treated air to a very minimum (20% of maximum).

Without the use of an additional fan, room air will be induced and induction VAV guarantees that the required standards for comfort will always be achieved.





Energy efficiency

- Optimum in comfort
- Minimum energy use
- Capacity up to 200 W/m² without loss of comfort
- Cooling, heating and ventilation done by a single VAV terminal
- Pressure independent
- Induction without use of a fan and filter
- Savings in primary ductwork
- No cold air dumping
- Low noise levels
- Maintenance free
- Standard VAV controller can be used
- Highly accurate Flo-Cross® air flow sensor

Nowadays in a world where energy efficiency, renewable energy and sustainable products and workspaces are more important than ever, Barcol-Air comes with cutting edge technologies. With a strong partnership between Barcol-Air and our HC Groep associates, we created a new level of sustainability through HVAC excellence, which resulted in our contribution to the smartest building in the world, The Edge, Amsterdam-NL, awarded with the highest sustainability score by BREEAM (see also page 26).

Taking a closer look at an intelligent VAV system and with which products we implement this in the latest state of art buildings, we use the following items:

- Air Flow and Measuring Stations (AFMS)
- Induction VAV units and Chilled beams (energy efficient)
- Intelligent and communicating VAV controllers
- CO_2 sensors, occupancy sensors and other smart sensors
- BMS / home automation integrated solutions

"PLUG & PLAY"

BACNet	LonMark	KNX	Modbus	0-10 Volt
BACnet	LonMark	KNX	Modbus	

These items complement each other to ensure an energy efficient, fully functional and optimal comfort HVAC system. All controls are factory fitted, wired, calibrated and tested. Plug & Play installation is a given fact and an important reason for customers to choose for Barcol-Air products and systems.

The Edge: computer with a roof

About CERA?

CERA stands for Central Energy Recovery Air flow and is a total ventilation concept designed for use in stacked housing. The primary system includes a central heat recovery in the central AHU unit and is maintaining duct static pressures at a minimum. Air balance is carried out by measuring the supply air to the apartments and by controlling the return air accordingly.

The energy consumption required for ventilation and ventilation transmission is reduced by 30-50% compared to conventional systems. The result is a very energy conscious system. Optionally the system can be upgraded by providing some cooling capacity through the ventilation air. The unit is compact in size and can be used in new developments, renovations or transition projects.

System operation

The system consists of a ventilation air control unit called the CERA unit, which is installed in each apartment. By measuring the air quality - i.e. the CO2 levels in the room(s) - the amount of fresh air supplied into each room is kept to a minimum. Under normal conditions the air volume is controlled between a minimum and maximum flow based on local regulations. By adding a switch in the kitchen (during cooking periods) and a switch in the bed/bathroom (during showering) the supplied air volumes will be increased to a higher factory calibrated set-point. During night time the system can be put in night-mode and providing sufficient fresh air into the bedroom.

Sustainable ventilation system

When the primary system uses a heat pump, thermal energy storage system or district heating or cooling system, it is possible to achieve an exceptionally low energy consumption. Depending on the application, the system can contribute to get a higher degree in a green building certificate. Another advantage of this is, when during the conversion of offices into apartments the existing infrastructure of ducts, shafts and technical spaces, can be used.

CERA

RHAPSODY | THE NETHERLANDS

Energy saving by (non-)occupancy

The HVAC part of buildings being about 20% of the total energy consumption of a standard utility building leaves a lot of room for improvement and energy efficient solutions. Lighting systems are already often connected to an occupancy sensor and are turned off when a room is unoccupied. The same saves a lot of energy when ventilation is turned down to a minimum when a room is left unoccupied. Barcol-Air offers these energy saving solution as a VAV package, by providing a wall or ceiling mounted sensor and supporting software build into the DDC controls together with the standard VAV package.

BTU metering by VAV controller

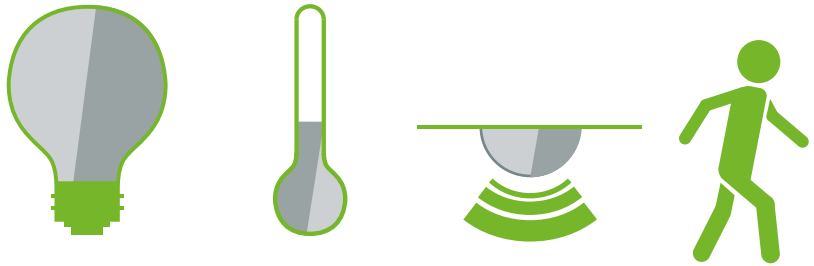
Same as water side BTU meters, VAV has the accuracy of measurement for accurate BTU metering on the air side. BTU = M x C_ρx ΔT. Thus enthalpy can be calculated at the AHU. BTU metering by an intelligent VAV controller allows building owners to bill its tennants on the amount of fresh air consumed. Air side BTU metering will bring a major innovation to the tenant billing and will encourage the occupants to further reduce the energy usage. Barcol-Air is the first to offer this solution.

$$BTU = M \times C_\rho \times \Delta T$$

Smart multi sensor technology

An environment controlled by a smart multi sensor runs efficiently and smoothly. Heating and cooling, ventilation, LED light sensors, and room controllers - can now monitor itself via sensoring technology. Each learns intuitively from use and can be adjusted manually via a smartphone application.
A ceiling installed multi sensor can contain following sensors (tailor made).

- Motion sensor
- LUX sensor
- Temperature sensor
- Relative Humidity sensor
- CO_2 sensor
- Infrared
- Bluetooth
- Location tracking



"Menara Astra could reach the LEED Platinum certification thanks to a smart HVAC design and integration of Induction type VAV, bringing down energy consumption considerably"

MENARA ASTRA TOWER, JAKARTA, INDONESIA

Demand based fresh air control

Nowadays project developers are giving much attention to intelligent building designs, like solar equipment. But the energy usage for HVAC equipment is often forgotten and a lot of energy/money can be saved with a smart design. Traditional pressure dependent designs are difficult to balance and since every zone is different there are always problems with too much fresh air or too little, high humidity, infiltration, etc. Therefor a pressure independent VAV system was introduced. When linked to a demand controlled ventilation, grade A offices can be reached with many advantages like; no water piping in offices, no machines above false ceiling, small zones with individual control, low noise, no vibration, flexibility for re-partioning and decoration and minimum intervention of maintenance teams.
With Energy metering by VAV (BTU), even the tenants can be billed according to their treated air usage.

Temperature control solutions w/o thermostat

A ceiling installed temperature sensor can be easily installed in the false ceiling of each zone, with direct connection to the DDC controller of the VAV. The required set point can be managed through the BMS system, by traditional thermostat or by smartphone.

Smartphone application

Dedicated applications can be developed for adjusting the required temperature set-point by the occupant of the room, by using his/her own smartphone.
These applications can be integrated with other smart solutions, such as lighting control, operation of window blinds, etc. This way, cost for the supply and installation of thermostats, light- and other switches, can be saved. As a result your building will become smart and future proof.

The basic functions of air flow control such as constant air volume, static pressure, supply/return balancing etc. are very simple and straightforward in theory. The practical application of these functions, however, is very difficult due to the small magnitudes of the measuring signals (velocity pressure in most cases).

Measurement

Most air flow control applications involve 4 stages of control process:

- Sensing the air flow based on a pressure differential signal (velocity pressure produced by an in-duct air flow sensor).
- Transducing and amplifying that signal into a format used by the controller (analogue, pneumatic, DDC, etc.).
- Converting the signal into a proper control relationship by use of a square root extractor to make the control signal linear to air volume. Analyzing that control signal and if necessary adjust (reset) the air flow.

Accuracy

The overall accuracy of the control system (loop) is totally dependent on the intrinsic accuracy of each of these components and a small error in the first step will be amplified by the second and so on. Because a controller can control no better than the signal it receives, Barcol-Air developed the Flo-Cross® air flow sensor, which provides a highly accurate test signal, averaged over at least 24 test points and amplified by at least 2.5 times the velocity pressure. This sensor has a proven accuracy of 2.5% even with irregular duct approach. This accurate signal can be read manually through a pressure-gauge or can be an input to any Building Management System to be used to control such functions as energy management, balancing supply and return air volumes, pressure control, monitoring and controlling minimum fresh air volumes, tenancy billing by floor or by zone, to provide a reliable accurate reference point for air flow commissioning in VAV systems, etc.

The Barcol-Air measuring and control station system consists of 3 different standard devices:

- Type AE..... for air flow measuring.
- Type AF..... for air flow measuring and air flow control.
- Type AH..... for air flow measuring and system pressure control.

Energy Savings with "Air-Trac®" system

Constant volume systems can be optimized by one time commissioning of manual operated dampers. However, today from an energy point of view, constant volume systems are no longer used in air conditioned buildings. Variable Air Volume or Induction VAV systems in combination with modern Building Management Systems comply with today's energy saving requirements. In order to maximize energy savings under all load conditions it is necessary to monitor and control air flow and pressure during operation. Unfortunately nobody can afford having commissioning engineers working in the building 24 hours a day throughout the buildings life. Therefor Barcol-Air offers its "Air-Trac®" solution.



Air Flow Measuring Station

Flo-Cross® air flow sensor

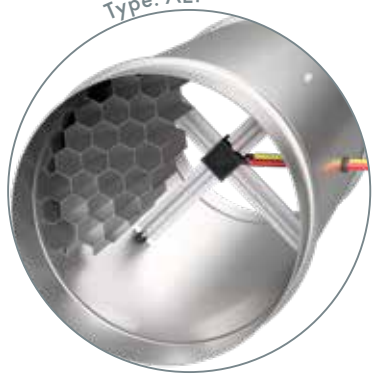
- Multiple test points (at least 2 x 12 points) equally distributed in the duct area
- Only 1 diagonal straight duct required
- Better than 2.5% accuracy
- Centre averaged signal
- Linear amplified

Differential pressure transmitter

- Backlit dot matrix display
- Output air volume 0...10Vdc (4...20mA)
- Accuracy by using auto zero point calibration
- Display either air volume or differential pressure (Pa)

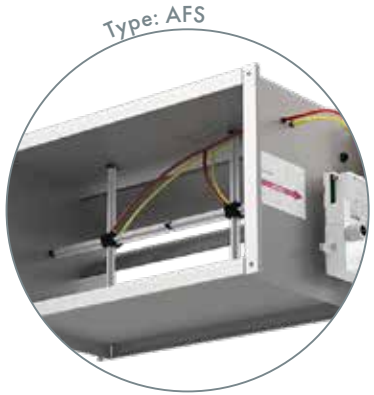
Type: AER

Type: AEP

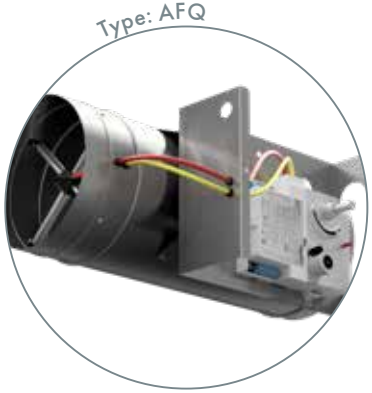


AIR VOLUME MEASURING STATION

Type: AFS

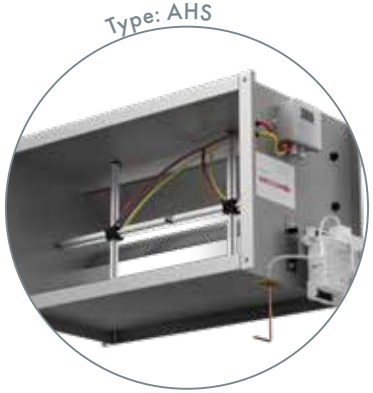


Type: AFQ

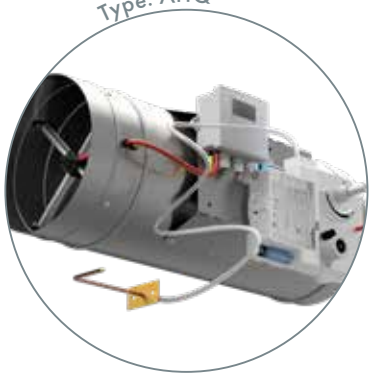


AIR VOLUME MEASURING AND CONTROL STATION

Type: AHS



Type: AHQ



AIR VOLUME MEASURING AND PRESSURE CONTROL STATION

22 BISHOPSGATE, LONDON, UK

CIRCULAR PRESSURE INDEPENDENT VAV — TYPE NA/NB

Features

- Pressure independent
- For individual room temperature control
- Single or double wall construction
- Low leakage damper
- High accurate air flow sensor
- Quiet in operation
- Optional: sound attenuator and / or reheat coil (hot water or electric)

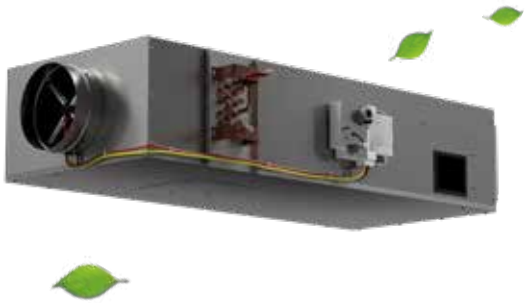
Circular single duct VAV/CAV terminal	100 - 400 mm

INDUCTION VAV | LOW IN ENERGY HIGH IN COMFORT — TYPE NV

Features

- Pressure independent
- For spaces with high load variation
- Optional: reheat coil (hot water or electric)
- High accurate air flow sensor
- Integrated sound attenuator (very quiet)
- Low leakage damper
- Highly energy efficient

Induction VAV terminal	100 - 400 mm



EXPO 2020, DUBAI, UAE

RECTANGULAR PRESSURE INDEPENDENT VAV — TYPE NK/NL

Features

- Pressure independent
- For large air volumes
- Single or double wall construction
- Low leakage damper (optional)
- High accurate air flow sensor
- Quiet in operation
- Optional: sound attenuator and / or reheat coil (hot water or electric)

Rectangular single duct VAV/CAV terminal	200 x 100 mm to 2000 x 1000 mm


THE INTERNATIONAL QUARTER S9, LONDON, UK

VAV FOR LOW NOISE REQUIREMENTS — TYPE NS

Features

- Pressure independent
- For low noise requirements in high pressure or high velocity systems
- Low leakage damper
- High accurate air flow sensor
- Integrated sound attenuator (very quiet)
- Optional: reheat coil (hot water or electric)

	∅
With integrated sound attenuator	100 - 400 mm


MASHREQ BANK HQ, DUBAI, UAE

MIXING / DUAL DUCT VAV — TYPE NZ

Features

- Pressure independent
- For individual room temperature control
- Low leakage damper
- High accurate air flow sensor
- Constant air flow to the room
- Quiet in operation
- Optional: sound attenuator and / or reheat coil (hot water or electric)

	∅
Dual duct VAV/CAV terminal	100 - 400 mm


W-HOTEL, DUBAI, UAE

MECHANICAL SYSTEM POWERED CAV — TYPE NR/NT | NM/NN

Features

- Pressure independent
- Single wall or double wall
- Control accuracy ±10%
- Factory set, saves commissioning time
- Provision for on-site adjustment across the full volume scale
- Optional: sound attenuator and / or reheat coil (hot water or electric)

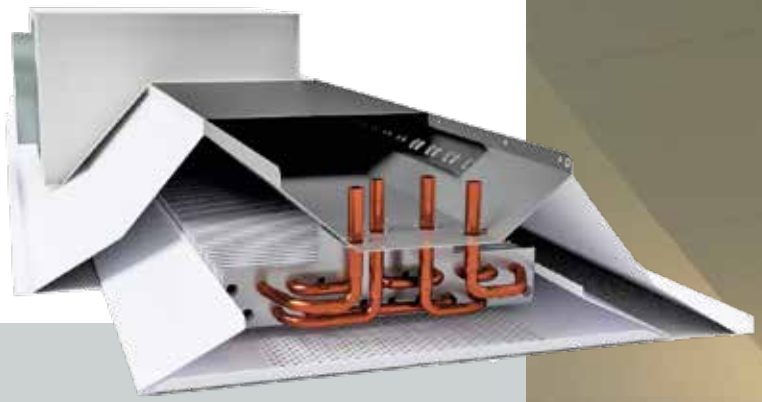
	∅
Type NR/NT, circular Type NM/NN, rect.	80 - 400 mm 150x150 - 600x600
Type KVR-R, CAV for in-duct installation	80 - 250 mm

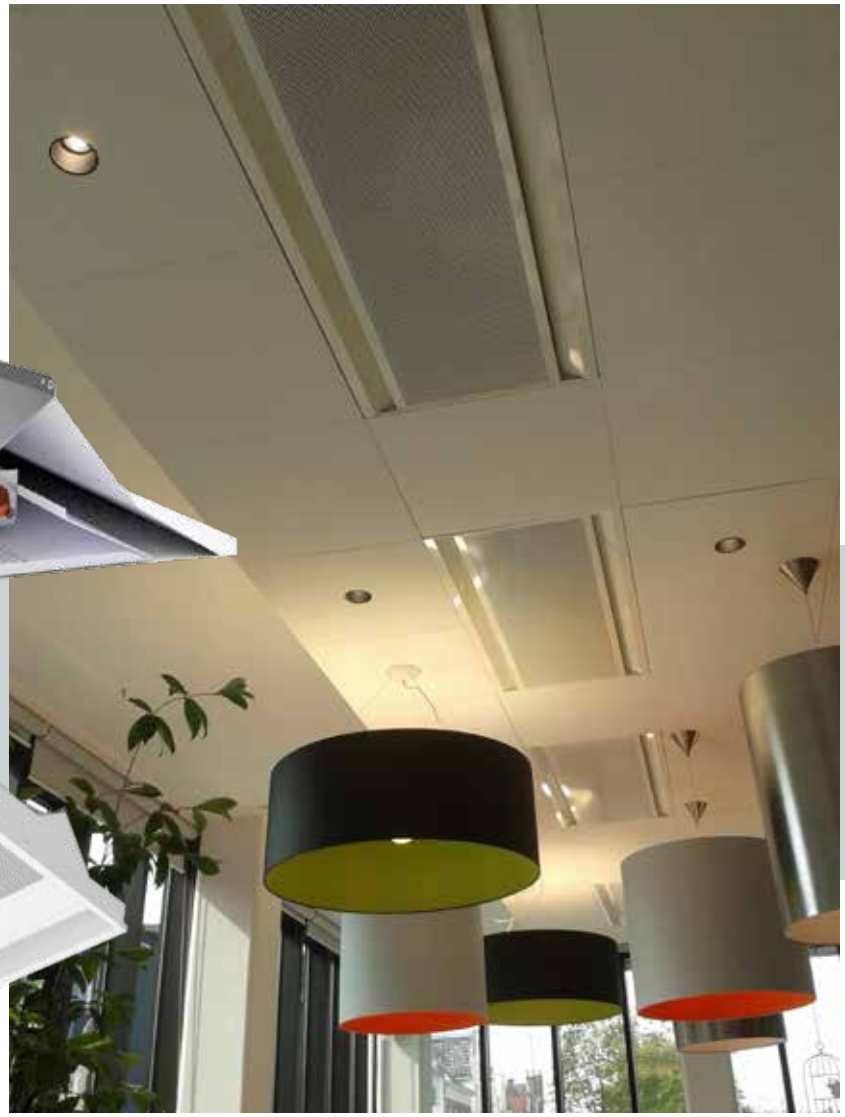
ACTIVE CHILLED BEAMS

Chilled beams operate using water-based heat exchangers, having a high cooling and heating capacity and are suitable to ventilate. The system allows a flexible solution to indoor climate control with minimal maintenance. An active chilled beam above a passive one has the added benefit of providing fresh air as well as cooling and/or heating.

FEATURES

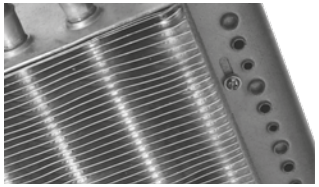
- High capacity
- Low maintenance
- Low noise
- Compact in size
- Low built-in heights
- Flexible design
- Selection software: www.beamadvisor.com





AIR-FIT®

Type Air-Fit-300 or 600, active chilled beam	Size 600, 1200, 1500, 1800, 2400 or 3000



Different nozzle settings

MARKET LEADER INDOOR CLIMATE ENGINEERING

A healthy and comfortable indoor climate has a positive effect on its users. But how to create such an environment? HC Groep utilizes and -if possible- combines the expertise and knowledge of each company to create a healthy and energy efficient indoor climate for everyone.

We have more than 100 years of experience in the field of indoor climate engineering. This enables us to realize and maintain a healthy indoor climate for every conceivable situation. By cleverly combining our products, systems and services with the latest (building) technologies, we create a living and working environment in which the well being of the occupents is centralized, and enabling them to regulate their own indoor climate.

Innovative, reliable, socially responsible, environmentally aware and involved. These are some of the core values that the companies of HC Groep offers to its customers. Spread over 4 locations in the Netherlands and 2 locations abroad, more than 250 employees are involved daily in the development of specific topics in the field of indoor climate.

WWW.HCGROEP.COM

ABOUT HC PS

HC PS is an active player on the market of Car Park Ventilation and Tunnel Ventilation. Since 1995 they have designed and installed over 3.000 car parks worldwide. Thanks to their extensive international experience they gained a lot of knowledge on the wide variety of local regulations and requirements. This makes them a professional player in this very specific and demanding market. HC PS is involved in every step of the project. From pre-design until the opening of a new car park and future service and maintenance, they completely unburden the client. HC PS takes full care of the ventilation needs with supply and exhaust fans, induction fans, MCC's, frequency invertors, air dampers, grilles, CO detection systems and sound attenuators. Thanks to extensive international experience, the company is able to design a smart ventilation system in accordance with applicable codes and legislation, installing their efficient induction fans and other related products into one integrated system. This results in exceptional cost savings, both in the investment of the system as well as future service, maintenance cost and energy consumption.

DESIGN SUPPORT

HC PS provides as a special service, a conceptual design with e.g. the needed spaces and locations that they require in a building design in order to have a suitable and efficient ventilation system. After the architectural design phase and close cooperation with consultants and architects, HC PS will engineer the systems in order to deliver an optimal performing system that also complies with local regulations. Based on their engineering design HC PS provides tender documents and can make installation drawings as detailed as is required. Additionally the company is able to make a complete CFD simulation in order to convince local authorities about the performance of the designed system.

COLD & HOT SMOKE TESTS

Besides CFD simulations as performance verification in the design phase, real life smoke tests, both cold as well as hot, are performed during the testing and commissioning phase. A cold smoke test they do primarily to check the ventilation efficiency, blind spots and dilution rate. A second test is to indicate local air movement. After a cold smoke test a more demanding test with hot smoke can be performed. This test has been specially developed for testing fire ventilation systems since the thermo and fire dynamic effects significantly influence the air flow in the car park.

PRODUCTS

IDV-HC-50v2 / IDV-HC-100v2

This induction fan has been developed to provide many technical advantages, using a patented outlet venturi and ultra-flat centrifugal impeller, resulting in a very low installation height of 257 mm or 325 mm. The HC PS induction fan can induce up to 19 times the air actually passing through the fan.

The minimized casing height in combination with the special designed outlet nozzles, enables the designer to position the fans at the ideal location, since they do not interfere with traffic circulation.

This flexibility allows for the following advantages:

- A reduction in the number of thrust fans required (by up to 65%) due to improved system performance
- Lower energy consumption
- Less cables, including ancillaries
- Less installation and maintenance costs

IDV-HC-50V2 INDUCTION FAN

ABOUT HC KP

HC KP is an active player on the market of Chilled Ceilings. The company is market leader in the Dutch market and recently starting to market and distribute their ceilings worlwide.

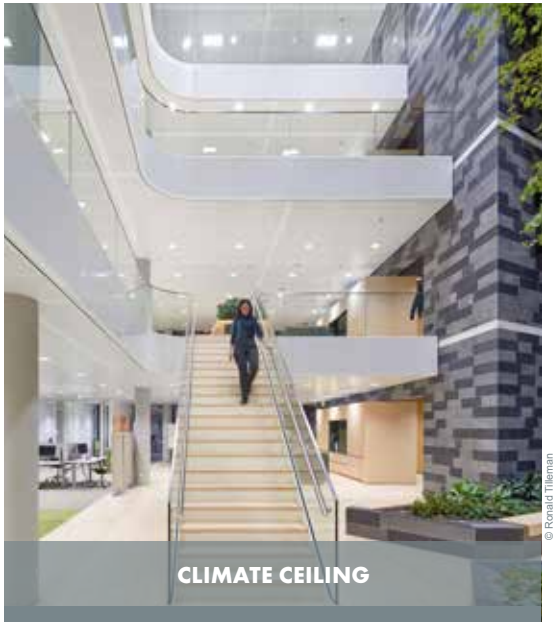
As an indoor climate specialist, HC KP is the most suitable partner for creating and maintaining an optimal indoor climate. The various types of climate ceiling systems are offered against the highest quality standards. System-type, shape, size, color and perforation can be combined endlessly, creating not only an optimum in comfort but also an a-class ceiling design.

The offered climate ceiling systems can be installed with various built-in components such as grilles, diffusers and (LED-)lighting components, which contributes to a sustainable indoor climate solution.

HC KP uses two basic principles in its business operations:

- Creating an optimal indoor climate and the unburdening of the customer
- Principles in which quality is always assured.

"QUALITY GUARANTEES A MAXIMUM LIFETIME"



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CLIMATE CEILING

HYBRIDAIR CLIMATE CEILING

© JDVF

CLIMATE ISLES WITH ROUND CURVES

THE EDGE - AMSTERDAM - THE NETHERLANDS

This flexible and future proof office is world's greenest and smartest office building. Individual control is possible with a specially designed smartphone app. It knows the schedule of every single employee and guides them for example to a parking spot because it knows when they arrive. The app will then guide them to a work space and knows their preferences for light and temperature. British rating agency BREEAM gave the Edge the highest sustainable score ever awarded: 98,4%.

Barcol-Air together with its partners of HC Groep, supplied and installed all HVAC installations and the BMS system.

- 1.000 VAV terminals with DDC controllers and 2.000 pieces of grilles and diffusers (Barcol-Air)
- 30.000 m^2 chilled ceilings (HC KP)
- Ventilation system for 9.750 m^2 of car park (HC PS)
- Smart Building Management System (HC RT)

MEP Contractor: Homij / Bosman
Consultant: Deerns

Green Building Rating: BREEAM - Outstanding ★★★★★ BREEAM®

"THE **SMARTEST** BUILDING IN THE WORLD"




SHEIKH KHALIFA HOSPITAL - FUJEIRAH - UAE

This project contains two centres of care: the Central Hospital and the Disability Rehabilitation Centre as well as a separate Hotel. The site offers a commanding and uninterrupted view of the ocean. Barcol-Air was appointed to provide a complete VAV + Controls Solution. In close cooperation with the MEP Consultant; Consolidated Consultants Group, we developed 6 nos. types of software to control 30 nos. VAV control strategies for various types of applications, such as pressure control, humidity control, supply/exhaust control and fast acting controls. This because the consultant demanded a stand alone operation of the VAV terminals independent of the Building Management System. The BMS is solely used for monitoring and post ajustments purposes. Within this project Barcol-Air can really show its capabilities on the field of applied controls software. Much is possible with current DDC VAV controls and SKCH is a perfect example on how Barcol-Air is able to wield this type of controls software. Our Centre of Excellence in the Middle East, NG Global, was responsible for the final handover and integration of the installed VAV terminals to the Honeywell BMS system.
A true "Single Source Single Resposibility" scope of work as a provider of complete VAV System Solutions.

Barcol-Air supplied:

- Barcol-Air supplied around 560 pieces of pressure independent VAV's with thyristor type electrical reheat coils, all fully equipped with factory fitted, wired and calibrated Schneider Electrical Micronet™ BACnet™ DDC VAV controllers, room thermostats and transformers (Plug&Play).

MEP Consultant:	Consolidated Consultants Group
MEP Contractors:	Fibrex Construction Group
Centre of Excellence:	NG Global

"SINGLE SOURCE, **SINGLE** RESPONSIBILITY"




Mercedes-Benz Flagship Store, Netherlands

- 120 pcs Diffusers
- 50 pcs double wall mechanical CAV's
- Smart Building Management System (HC RT)
- 4.000m² chilled ceiling (HC KP)

22 Bishopsgate, London, UK
62-storeys (2nd tallest building London with 278m)

- Rectangular VAV terminals +
- Cylon VAV controls
- Barcol-Air UK
- Hotchkiss Limited

102 Wakefield, Adelaide, Australia

- ±200 pcs Induction VAV
- LTHW reheat coils
- Schneider LonMark controls
- Barcol-Air Engineering PTE Ltd.

ADNOC Business Center, Abu-Dhabi, UAE

- PI VAV and Induction VAV with E-heater
- Schneider BACnet controls
- Bayaty Architects
- ADNOC (client)

CMPR St. Jacques, Nantes, France

- ±160 pcs PI VAV + LTHW reheat coils
- Belimo compact controls
- Axima
- Hospital project

EXPO 2020 - Mobility Pavilion, UAE
EXPO 2020 - Opportunity District, UAE
EXPO 2020 - Sustainability Pavilion & District, UAE

- Circular VAV terminals
- Rectangular VAV terminals
- Mechanical CAV terminals
- Siemens KNX controls
- Al Futtaim
- Al Shafar General Contracting
- JLW Middle East

Qatar Petroleum District, Doha, Qatar

- ±4.000 pcs VAV terminals
- Siemens controls calibrated by BA
- Close cooperation with Siemens Qatar
- Arab Engineering Bureau Qatar

Royal Oman Police, Muscat, Oman

- 1500 pcs Induction VAV terminals
- Schneider BACnet controls
- Hot water reheat coils
- Aspire Projects and Services

KGOC new HQ, Kuwait

- VAV + sound attenuators
- Electric reheat by thyristor
- Yusus A. Alghanim & Sons WLL
- Gulf Engineering

Dubai Opera House, UAE

- Mix of Circular and Rectangular VAV
- Electric reheat coils
- Siemens DDC controls
- Dutco Tennant LLC
- BK Gulf, Dubai, UAE

MBR Library - Dubai, UAE

- VAV terminals +
- Schneider BACnet controls
- Aspire Controls LLC Dubai
- Al Shafar General Contracting

Saudi Electricity Company HQ, Riyadh, KSA

- 1750 pcs Induction VAV terminals
- Schneider BACnet controls
- Saudi Aircon, KSA

Control Tower Ezeiza, Argentina

- ±50 pcs PI VAV with electric reheat coils
- Schneider BACnet controls
- Passair SRL
- Air Technik SRL

Immeuble Eklaa, Lyon, France

- 55 pcs Rectangular PI VAV
- All Schneider LonMark controls
- Engie Cofely

All DAFZA buildings, UAE

- VAV & CAV terminals +
- Air flow measuring stations
- BMTS Dubai
- IEMS contracting

BARCOL-AIR | DISTRIBUTORS & PARTNERS

Europe

Reliance Engineering Services Ltd.	Nicosia	Cyprus	www.reliance.com.cy
Ouest Ventil	Alizay	France	www.ouestventil.fr
Strulik GMBH	Hünfelden	Germany	www.strulik.com
Rafn Jensson Mechanical Engineers	Reykjavik	Iceland	www.rj.is
Coolair Ltd.	Dublin	Ireland	www.coolair.ie
Officine Volta S.p.A.	Bologna	Italy	www.officinevolta.it
Dimo HB	Stockholm	Sweden	
Barcol-Air AG	Schwerzenbach	Switzerland	www.barcolair.com
Barcol-Air UK Ltd.	Bath	United Kingdom	www.barcol-air.co.uk

North and South America

Cermac Air-Technik SRL	Buenos Aires	Argentina	www.cermac.com.ar
Barcol-Air Ltd.	OxfordUSA	USA	www.barcolairusa.com

Middle East

Almoayyed Air Conditioning	Manama	Bahrain	www.almoayyedcg.com
ACE Supplies & Trading Co.	Amman	Jordan	www.ace-jordan.com
Leminar Air Conditioning Co WLL	Sharq	Kuwait	www.leminarkuwait.com
Yusuf A. Alghanim & Sons WLL	Safat	Kuwait	www.alghanim.com
Alies Automation Company WLL	Doha	Qatar	www.aliesqatar.com
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MTTS	Jeddah	Kingdom of Saudi Arabia	www.mtts.com
Al Tayer Engineering LLC	Dubai	United Arab Emirates	www.altayerengineering.com
Bahri & Mazroei Technical Systems Co.	Dubai	United Arab Emirates	www.bmts.ae

Far East and Asia Pacific

Air Con Serve Pty. Ltd.	Adelaide	Australia	www.airconserve.com.au
Controlworks	Sydney	Australia	www.controlworks.com.au
Modernizing Trends	Mumbai	India	www.modsales.co.in
PT. Barcol Nusantara	Jakarta	Indonesia	www.barcol-air.com
I&MS Engineering Private limited	Karachi	Pakistan	www.ims.com.pk
Air Filters Philippines Inc.	Manila	Philippines	www.barcol-air.com
Barcol Air Engineering Pte Ltd	Singapore	Singapore	www.barcol-air.com
TEA	Seoul	South Korea	www.te-a.kr
Barcol Industries Inc.	Taipei	Taiwan	www.barcol.com.tw

ADNOC HQ, Abu-Dhabi, UAE (LEED Gold)

Barcol-Air and Centres of excellence

Barcol-Air currently has two parties appointed worlwide to function as a local Centre of Excellence offering support to our distributors,contractors, consultants and clients. They have a team of engineers trained by Barcol-Air to analyse and solve the sometimes complex problems which can exist during installation and commisiong of our products.

NG GLOBAL

Centre of excellence Middle East

Located in Dubai and covering all GCC and MENA countries with Barcol-Air products and expertise/ service on controls software.

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BARCOL-AIR ENGINEERING PTE. LTD.

Centre of excellence Singapore

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