Return-to-the-office

FUNDAMENTALS

Helping you create data-driven decisions for a safe return to a healthy office

Introduction

We answer your questions about how to return to the office safely

Now offices worldwide are reopening - after employees have been working from home due to the COVID-19 pandemic - organizations face the challenge of organizing a safe return. How can you balance the scale between abiding by social distancing restrictions and staff requests for a quiet office and team interaction?

We have spoken to several clients and dug into various reports. The desire to return to the office is high. Yet, on the other hand, staff members have their concerns. *What if too many people come to the office? Has the climate control system been maintained? What about the ventilation in our old building? How many team members can book the board room for a meeting?*

The answers to many of these questions depend on your situation, e.g., organization size, staff requirements, building dimensions, systems regulating indoor air quality, etc.

This document helps you answer your questions. We gladly share our knowledge, enabling you to take the required steps to make the return to the office pleasant, efficient, and safe.

The four partners offering you this white paper operate individually. However, we believe we can extend and complete our individual services by cooperating. We invite you to contact us. If we feel we can serve you better with one or more partners, we gladly stick our heads together for a tailored joint consultancy.

The Four Fundamentals

Occupancy management

Gradually open the office in a controlled and safe way for the employees to feel comfortable about going back. **Manage your workplace capacity for social distancing.**

Indoor air quality and climate

IAQ control is critical for returning to the office. The pandemic shows how vulnerable people are to diseases, and research showed how it affects performance.

Operational efficiency of BMS

Modern Building Management Systems (BMS) are often complex and challenging to manage.
This leads to discomfort, unhealthy indoor climates, and energy loss. Increasing efficiency is vital.

Relative humidity control

Relative humidity reduces the spread of bacteria and viruses through our buildings.
Also, it decreases complaints about discomfort.

Data-driven decisions to return to the office safely

How can we improve?
Continuous monitoring of office space availability, IAQ data automated ventilation, and technical installations.

Which technical solutions?
High-quality IoT sensors and real-time analytics, humidification systems, HVAC automation operator, and office booking tool.

Managing office spaces for a flexible and safe work environment

Define a safe workplace

First, implementing a capacity management solution enables a controlled and safe office reopening :

- **Manage the capacity for social distancing.**
  Define the restricted number of people who can come into the office to achieve physical distancing. Determine your maximum capacity limit according to the government guidelines and consider your employees' safety needs.
- **Organize a seating plan for a safe distance.**
  Determine which desks can be used within your maximum capacity limits and set up seating plans.
- **Register who is in the office for contact tracing.**
  Recording who has been when and where is vital for contact tracing in the case of an outbreak.

A flexible and hybrid workplace

With a reduced office capacity, only a part of your employees can be in the office simultaneously. Research shows that most employees want to maintain some form of working from home arrangement. Set up a hybrid workplace where employees come to the office a few days each week. Understanding employees' behavior will help create your new office model and increase employee engagement.

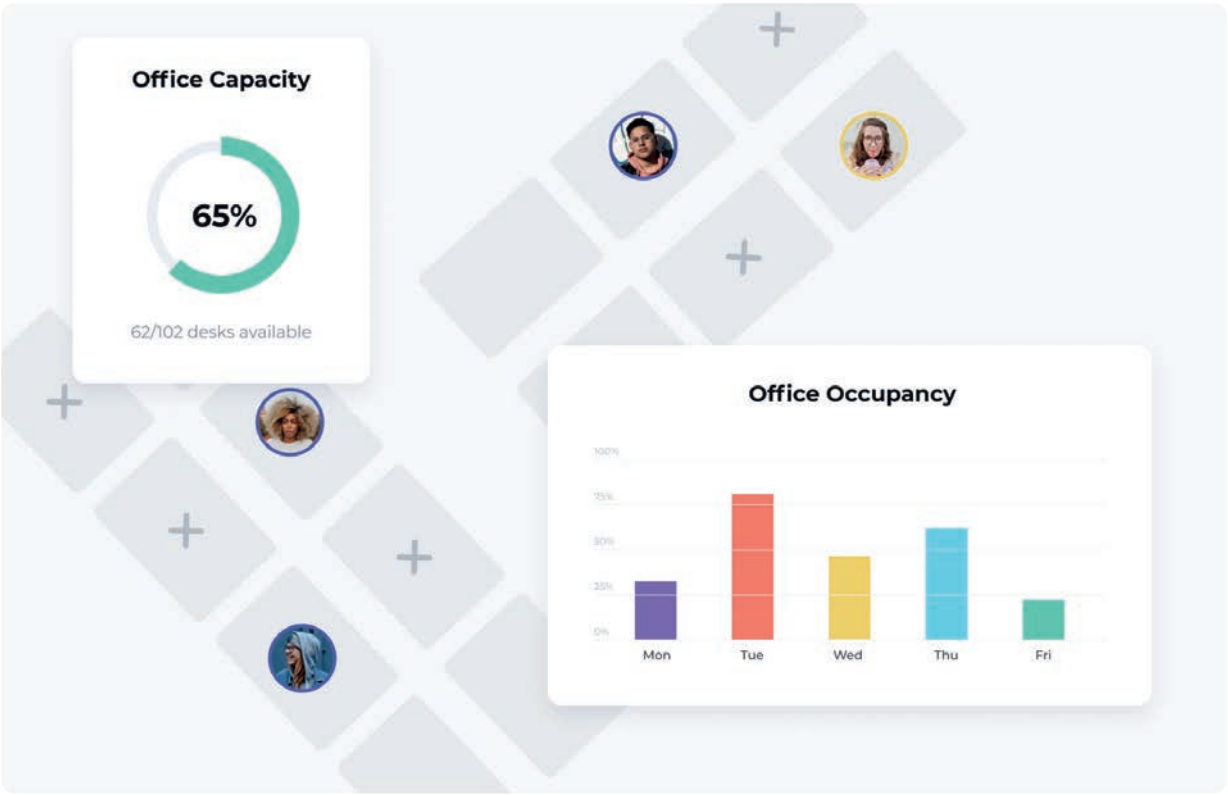
- **Define employee profiles and guidelines for in-person work.**
  Outline which activities require face-to-face interaction and which can easily be done remotely. This provides frequency and priority insights into activity and role-related requirements to access the office.
- **Offer your employees flexibility.**
  Let employees choose office days and home days to work from the place they are the most productive.

Technology-enabled workplace

How can you manage your office capacity easily, setting up the rules, sharing them with your employees, and keeping track of their activities? An excel spreadsheet can be enough for a small company. Yet, monitoring more than 20 employees is very timeconsuming and challenging.

The CIAO desk booking app allows you to gain a real-time view of your office capacity and occupancy.

- An interactive floor plan manages office spaces and easily books available desks.
- Define how your employees can come to the office and your custom hybrid work policy.
- Improve workplace safety through contact-tracing reports.
- Gain insights into office space usage and employee behavior to make data-driven decisions.



Indoor air quality & climate control

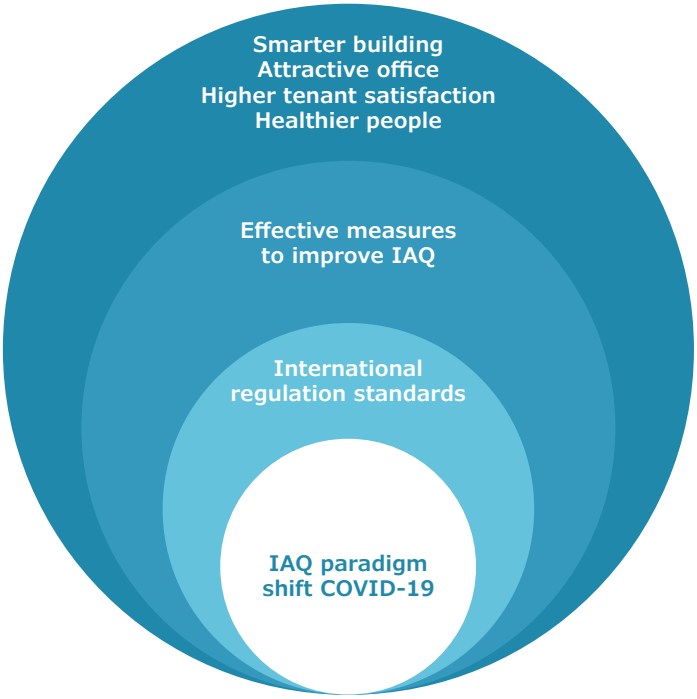
Studies show that Indoor Air Quality (IAQ) is the most influential factor in the building occupants' health [1]. Employees who work in a healthy environment tend to feel happier, and they are more productive. In 1987, the EPA (United States Environmental Protection Agency) already estimated that pollutants' concentration in indoor air could be 2 to 5 times higher than outdoors [4]. Despite the shift in time, inadequate IAQ remains a big problem.

IAQ is the collective term for variables that have an influence on indoor air, such as particulate matter (PM), CO_2, relative humidity (RH), and volatile organic compounds (VOC) [2,3]. Particulate matter can be an influenza virus [6] transmitter, and low outdoor air supply rates increase the risk of short-term sick leave by 35% [5]. New research proves that indoor ventilation is of great importance to combating COVID-19 [6].

Research-based decisions

One-third of all diseases originate inside buildings. Half of them are spread by particulate matter. So minimizing indoor particulate matter can decrease the overall spread of diseases by 16% [7]. More recently, aerosols, micro-droplet blends of fluids, particulate matter, and gasses are widely recognized as transporters of COVID-19.

Although the pandemic increased awareness around the impact of CO^2 and its effects on health and productivity, this is nothing new. Studies from TNO (Netherlands Organisation for Applied Scientific Research) (2003) and Harvard School for Public Health (2016) set the CO^2-concentrations limit at 600-800 parts per million [ppm}. Higher concentrations affect cognitive functioning [2,8]. Carbon dioxide is generally considered a good proxy for the pollution level in a building, but it goes further. Being exposed to VOCs can cause urgent and chronic health problems [9], such as irritation of the eyes, skin, and lungs, exhaustion, headaches, drowsiness, and disorientation. High VOC concentrations can act like drugs and potentially depress the central nervous system [9].



Butterfly effect

The will to change

The importance of IAQ has the governments' attention. EU is reshaping IAQ monitoring parameters for the built environment [10]. New policy trickles down to other national policymakers. In 2021, the Flemish Ministry of Health declared gyms should close at a CO_2 level of 1200 ppm [11] or higher. In the Netherlands, fresh air has become the 4th basic rule to combat COVID-19 [12].

Monitoring your IAQ and adjusting ventilation accordingly will benefit your organization. Indoor air quality sensors support analytics, and dashboard overviews create better insights into the current situation. To anticipate critical values, connecting the data to building management systems and applying predictive automation enables you to adjust in time. Displaying the indoor air quality in your buildings can also increase employee trust in the workplace for a safe return.

Humidification makes your building a healthier place to stay

An underestimated fact is that dry air (<40% humidity) in buildings and homes leads to unhealthy environments. In a dry air environment, viruses and bacteria live much longer, are more infectious, and spread easier. It increases illnesses (flu) and Corona infections, and people tend to feel less comfortable in such buildings. Common symptoms people experience in a dry air environment are feeling tired, having headaches, coldness, chills, coughing, (dust) allergy, a dry throat/nose/eyes, and an overall feeling of discomfort. Besides causing physical discomfort, dry air also negatively impacts the quality and lifetime of materials and equipment in our buildings.

Humans can easily feel heat and cold but are unfamiliar with recognizing dry air (<40%). Our body responds to dry air conditions with physical symptoms or problems that you might not immediately associate with this source. Lack of knowledge is one of the major reasons humidification is not considered a necessity like heating and cooling.

Keeping warm increases our well-being. So does the right humidity. But why accept a building without humidification if this makes us unhealthier?

What scientific studies teach us

Yale University in the USA researched the effect of dry air on our health and published this in many medical and scientific magazines [13]. One of the leading research conclusions is that our immune system is less effective against (flu/Corona) diseases, and people recover more difficultly in dry air or low humidity. Other conclusions of the research related to low humidity environments were:

- **Infections (regardless of the viral load) are more severe and make us much sicker.**
- **A substantial decrease in the ability of the human cellular tissue to repair itself**

Scientific research proves that maintaining the optimum humidity (40-60%) in our building environments improves the health of people occupying the building. This results in fewer people getting sick - which reduces absenteeism - and an increase in productivity.

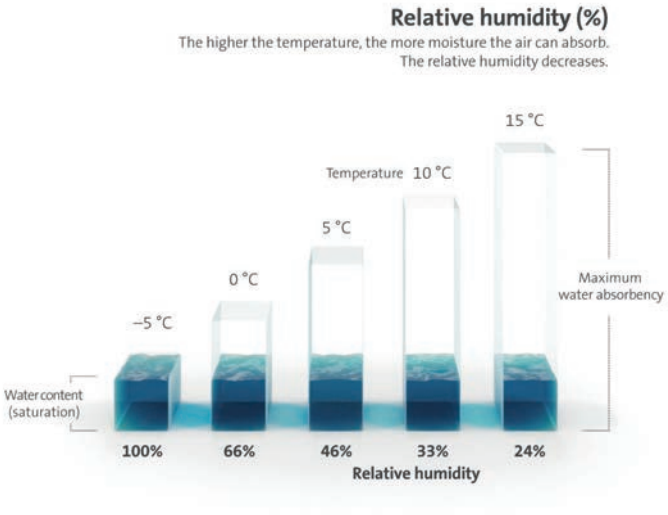
Technological solutions

A big misunderstanding is that extra ventilation or opening windows and doors can increase the humidity. This is scientifically impossible! Maintaining a certain indoor temperature with a heating or cooling system influences the humidity negatively even further.

The only way to guarantee the right humidity (40-60%) is to add moisture to the ventilation or environment air, using an active humidification system. Condair is specialized in advice and support to make your building a healthy, humidified place to stay. Our systems contribute to making your staff more infection resistant and reduce the spreading of viruses and bacteria. Based on your building specifications, energy consumption requirements, hygiene standards, investment and maintenance costs, we can help you find the best solution.

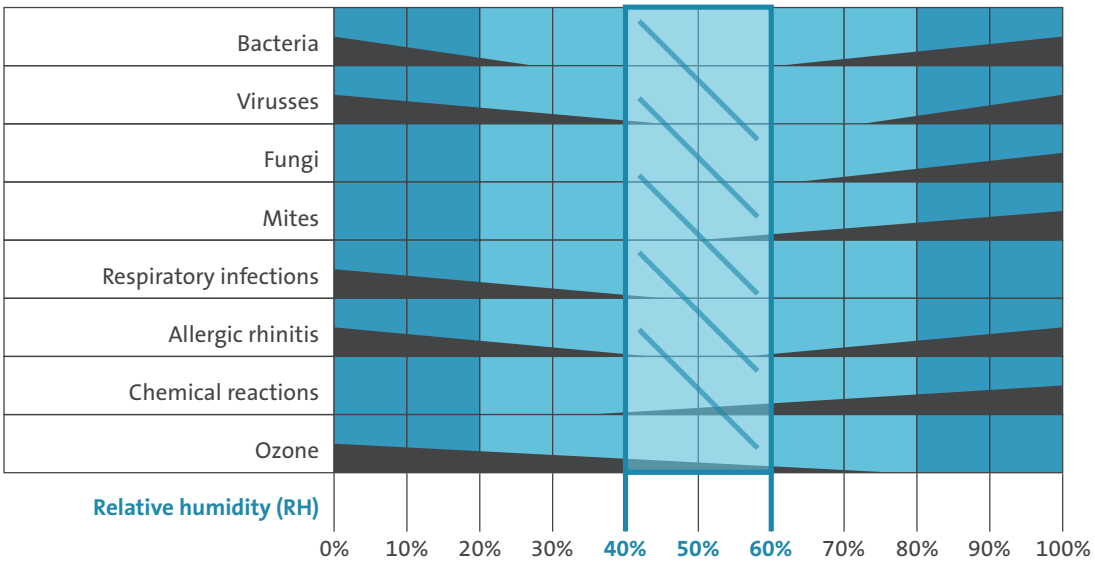
What is relative humidity?

The higher the indoor temperature and ventilation volume, the more the indoor air will dry out. This results in a relative humidity (<40%) that is too low, negatively affecting our health and resistance to diseases.



What makes 40 to 60% the optimal relative humidity?

Between 40 to 60% humidity, viruses and bacteria survive the shortest and remain floating in the air the least (minimizing the time to enter our lungs). Also, our immune system is much more capable of protecting us against diseases.



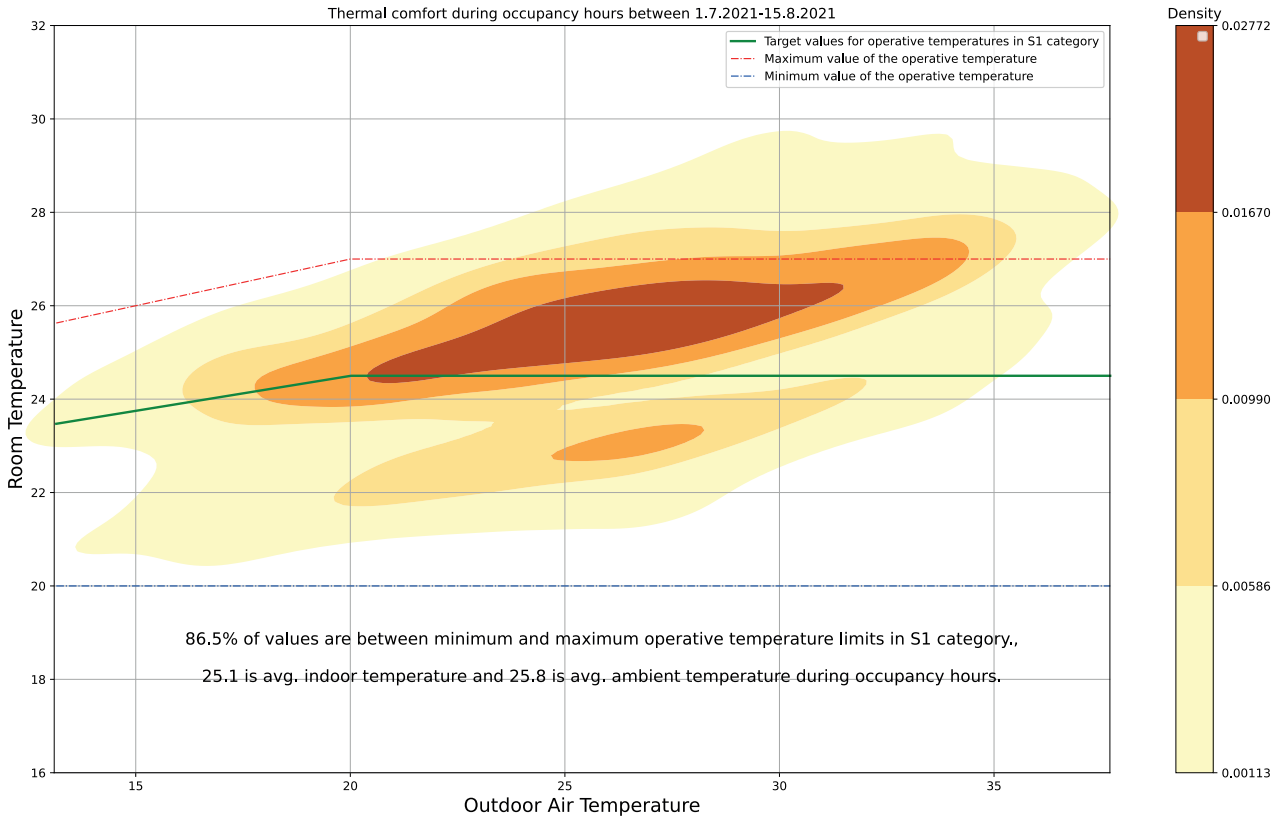
Sterling Diagram

Building Management Systems operational efficiency

An HVAC system provides heating, cooling, and ventilation to the building. Modern Building Management Systems (BMS) controlling such HVAC systems have become more complex over the years and more difficult to manage. This could lead to comfort complaints, unhealthy indoor climates, and energy loss. Research shows that over 70% of the HVAC systems are not working properly. Today, having a system that operates efficiently and effectively is crucial to letting your employees return to the office safely.

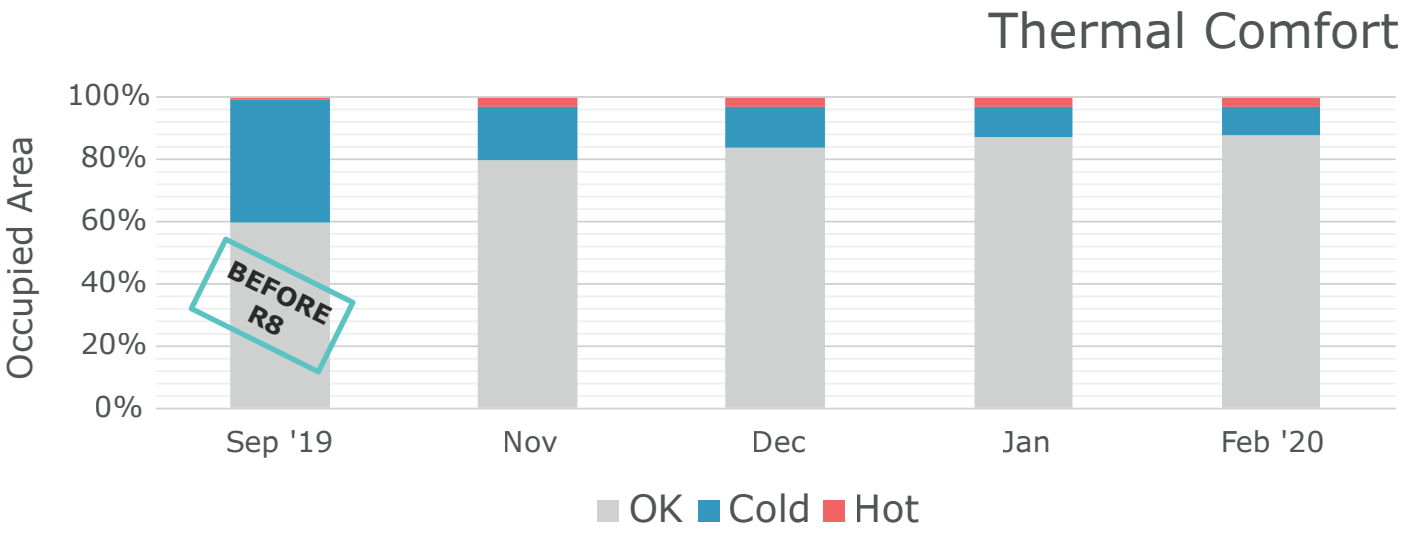
There are three major reasons why a BMS may not work effectively:

- **Faults made during construction or renovation.**
  If unnoticed, a system can work inefficiently for years.
- **System failure.**
  Equipment is subject to wear and my fail over time. How long does it take to discover and resolve failures?
- **Human interference.**
  Changing settings in case of complaints or requests can resolve or mask an issue momentarily. But is it a real solution?



Experience shows that human operators are often insufficiently equipped to operate and service complex Building Management Systems, as these systems have become very complex, with many data points to monitor and act upon. This can cause serious health risks or complaints of not feeling well, and it reduces productivity.

One of the ways to improve the efficiency of your HVAC system is to implement a Digital Operator. This software layer, developed by R8Tech, runs algorithms 24/7 to detect faults and anomalies in the BMS. It generates tasks as soon as an anomaly or defect is detected. The same software controls the BMS and changes your system from a ruled-based control strategy (passive) to a more flexible and adaptive control strategy. With the help of artificial intelligence, the Digital Operator makes micro-changes to settings, ensuring the most optimal program for heating, ventilation, and cooling. It allows for detailed demand programming and considers building characteristics, weather forecasts, and human behavior.



The R8Tech Digital Operator ensures a steadier indoor climate with full transparency on the operational effectiveness of the HVAC system. Moreover, it conserves energy of 15-20%. The input from other sources like an occupancy management system and IAQ sensors increases the effectiveness of the Digital Operator even further.

Get in touch

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Clairify helps you improve indoor air quality. People-focused, data-driven

Our team builds next-generation analytics software and Internet of Things (IoT) devices that revolutionize how office buildings manage indoor air quality and thermal comfort, enabling you to work in a healthy and productive environment every day.

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R8tech is an Estonian based SaaS scale-up founded in 2017

R8tech's Digital Operator is artificially intelligent add-on software for your BMS. It increases the energy and operational efficiency of your building up to 20%, detects HVAC system faults and improves the indoor climate.

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CIAO is a workplace management solution for the hybrid office.

Empower your employees to choose when to work at the office while management stays in control of the office occupancy and safety.

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The Condair Group, founded in 1948, has its Head Office located in Pfäffikon (SZ) / Switzerland.

We offer consultancy and delivery of specialized industrial air humidification and evaporative cooling systems contributing to a healthy work environment.

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Create a healthier environment, good policies and therefore a safe return to your office.

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