HygroMatik®

member of CAREL group CAREL

Planning healthy indoor air

Air humidification in air handling units

Health

Energy efficiency

Air exchange

Hygienic | Efficient | Certified

The planning of building ventilation with a new key role

PROMOTING HEALTH AND WELL-BEING

Today, a well-designed air handling system must do more than simply control the exchange of air in the rooms of a building. This primary task was extended by an important goal with the justified demand for **high energy efficiency.** At the latest with the outbreak of the SARS-CoV-2-pandemic, there is a further challenging aspect to the planning of an efficient air conditioning system for building ventilation

What can building ventilation actively contribute to promoting the health of the people in the rooms to be ventilated?

In answering this question, the scientific community now agrees that maintaining relative humidity **between 40 and 60% RH** is an important criterion in the fight against the virus epidemic.

The task for building owners, planners and architects is now to meet the health needs of the building‘s occupants with the requirements of energy efficiency in the sense of a sustainable solution with the help of a control system for relative humidity and indoor air quality.

In addition, when planning building ventilation, it may also be useful to address indoor humidity control due to other project requirements:

- Production processes that require precise control of relative humidity in order to ensure the quality of the end product (e.g. in the manufacture of pharmaceutical products, in electronics clean rooms or paint booths)
- Preservation of products that may be damaged or lose value due to lack of relative humidity control (e.g. works of art in museums, woods, paper goods and various food such as fruit, vegetables, meat)

DID YOU KNOW THAT...

…according to renowned associations 95% of the air handling units, at least in winter, do not fully meet the requirements to provide best possible air quality due to lack of air humidification?

Health

Energy efficiency

Air exchange

Planning with heat recovery and air humidification

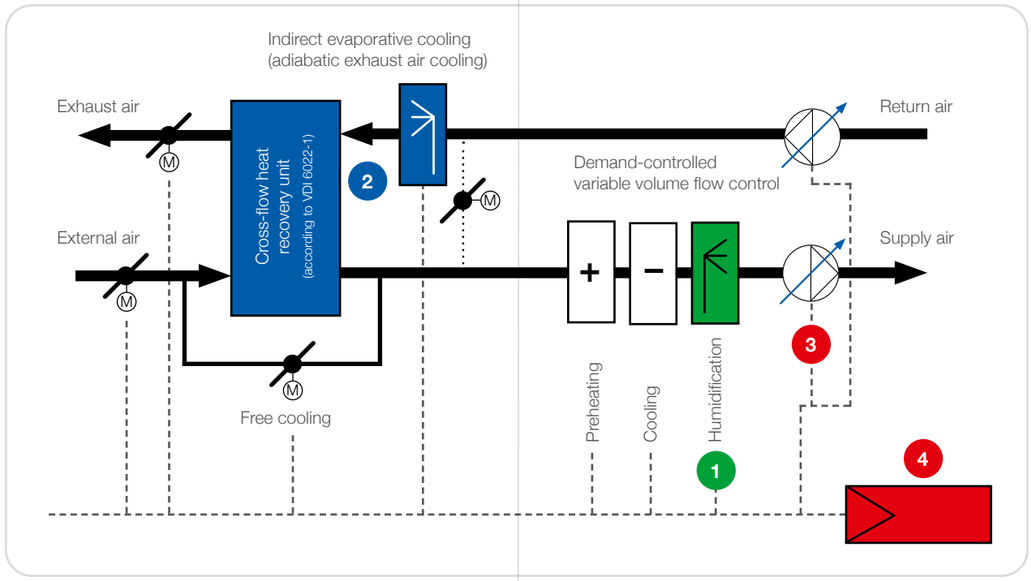
THE NEW STANDARD
FOR AIR HANDLING UNITS

Air handling units for healthy indoor air with reduced energy consumption

To keep the number of aerosols as possible carriers of viruses in rooms low, the air handling unit ensures permanent air exchange around the clock. Since cold air can absorb less moisture in absolute terms than warm air, the supply of colder fresh air not only leads to **a drop in temperature,** but also to **a drop in the relative humidity** in the room. Without correction, both effects cause increased energy consumption in 24/7 operation and reduced indoor air quality below the comfort field of 40-60% RH. Systems for air humidification and heat recovery can compensate these effects. A direct control and the monitoring unit take over the optimal control and coordination of the components.

1 AIR HUMIDIFICATION

The VDI 6022-1 „Hygiene requirements for ventilation and air-conditioning systems and equipment“ is one of the normative basics for planning. It represents the reference for the functional and constructive characteristics of the air handling unit for the hygienic and safe management, operation, and maintenance of the entire ventilation system. In addition, it provides information on the characteristics of the materials, types, sequence, and arrangement of the components in the air handling unit. The scope of application extends from offices and meeting rooms to ventilation systems of all rooms, in which persons can be present for at least 30 days a year or for at least 2 hours per day.



2 HEAT RECOVERY

The Commission Regulation (EU) No 1253/2014 of 7 July 2014 implementing Directive 2009/125/EG of the European Parliament and of the Council regarding eco-design requirements for ventilation equipment specifies that for non-residential ventilation units with a volumetric flow rate of more than 250 m³/h a heat recovery system must be provided. Its efficiency must be at least 73% since 1 January 2018 (No. 1253/2014). In the same ordinance the presence of a thermal bypass (free cooling) is demanded, and limit values are set for the specific internal performance of the air handling unit.

3 CONTROL

A digital volume flow controller enables air flow rates to be adapted to the actual demand and thus contributes decisively to minimising the energy of the air handling unit.

4 MONITORING

A higher-level monitoring system can analyse operating conditions and evaluate any deterioration in performance compared to the design conditions.

The PLUS for health, well-being, performance

ROOM AIR WITH OPTIMAL **AIR HUMIDITY 40-60% RH**

Air humidification

Health

THAT'S WHY WE STAY HEALTHY

At a relative humidity between 40 and 60% RH, our natural protective barriers are provided with optimal working conditions. Our mucous membranes in the nose and mouth protect us from the penetration of harmful foreign substances, bacteria and viruses that adhere to particles and would otherwise have free access to our airways. At lower air humidity our mucous membranes dry out and the protective mechanism only works to a limited extent.

Fortunately, viruses do not feel quite as comfortable in our comfort zone. This is because at an air humidity level of 40-60% RH there are fewer particles in the air or „clump" together to form larger units. These in turn sink to the ground faster, thus reducing the risk of direct droplet infection via the indoor air. Once the virus particles have reached the ground or surfaces, studies show that viruses are less stable at a humidity of 40-60% RH and therefore become inactive more quickly. This shortened survival time further reduces the risk of indirect smear infection.

Well-being

THAT'S WHY WE FEEL COMFORTABLE

The skin is the largest sensory organ in the human body. It is therefore easy to understand why people with skin complaints such as irritation or itching quickly feel unwell. Under humidified conditions in the comfort zone 40-60% RH, these complaints are significantly lower than under unhumidified conditions. Below 30% relative humidity, the skin's hydration status has been proven to decrease.

Our eyes also appreciate an air humidity level of 40-60% RH. A low relative humidity leads to a significant increase in the eyelid blink frequency and an increase in the evaporation rate of tear fluid.

The results of a further investigation of the relationship between relative humidity and stress, physical activity and sleep quality indicate that optimal indoor air quality (IAQ) exists at about 45% RH.

Performance

THAT'S WHY WE CAN PERFORM BETTER

A relative humidity within our comfort zone of 40-60% RH increases our general well-being and actively contributes to the protection of our health.

People who feel good and enjoy good health are demonstrably more concentrated, awake and motivated. Our performance improves with the increase of exactly these three factors. At a young age it is easier for us to learn and understand new things. In the further course of our lives, we benefit from the increased performance until old age.

Heat recovery

Maximum hygienic and efficient

When planning the heat recovery unit, it is important to ensure that there is **no contamination** between the two air streams. Where this is not possible, solutions should be chosen that exclude the contact between the currents.

The plates or rotors of the recovery unit must be equipped with almost **leak-free** sealing specifications. To achieve an optimal result, it is necessary, that the components are properly designed, installed and maintained. Attention must be paid to the outlet sector and the pressure distribution within the systems [Eurovent 6/15 - 2020].

The heat recovery unit is designed and manufactured with **hygienic and corrosion-resistant** characteristics to ensure proper maintenance:

- All materials are inert to the multiplication of bacteria and fungi (according to VDI 6022-1)
- When using adiabatic cooling, blades with a hydrophilic absorbent coating (BBLUE) allow better water distribution on the surface than with a traditional epoxy coating

What is the need for action?

RETROFITTING AND UPGRADING MEASURES

With the outbreak of the SARS-CoV-2 pandemic, **new guidelines** for the operation and function of air handling units were introduced. Adequate ventilation and regular air exchange along with maintaining comfortable conditions, have been recognised as one of the most effective strategies for reducing the risk of airborne disease. **Existing air handling units are now being checked for compliance with the new directives and, if necessary, brought up to the new standard by means of retrofitting or upgrading measures to bring them up to the new standard.**

NEW CONSTRUCTION OF STATIONARY AIR HANDLING SYTEMS

For the planning of new stationary air handling units, the following points are relevant for compliance with the current directives and must be taken into account:

- Automated air exchange 24/7 for the safest possible stay for people
- Ensuring a relative humidity of 40-60% RH for healthy indoor air
- Demand-oriented control and reliable monitoring of the air handling unit
- Energy-efficient heat recovery

Success begins with the right partners.

Within the CAREL Group, essential fields of expertise for retrofitting or new construction of your air handling unit to comply with the new directives are united.

Air Humidification | AHU system control | Heat recovery

HygroMatik · CAREL · RECUPERATOR THE HEAT EXCHANGER · KLINGENBURG

Direct, flexible and reliable – worldwide

INDIVIDUAL PLANNING
UNIQUE SERVICE

HygroMatik since 1970 – More than 50 years – Quality and Innovation

„We are only satisfied
if **you** are 100% satisfied.“

Technical hotline
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EXTENSIVE PLANNING SUPPORT

Our engineers support you in the new planning or conversion of air conditioning systems, especially in the integration of units for heat recovery and air humidification. You will also have a direct line to our developers via our technical hotline if you have application-specific questions. This is how we ensure that you receive quick and professional help. Benefit from over 50 years of experience!

SPARE PARTS SERVICE

Our products are designed for a long service life, so we make sure spare parts are available in the long-term for quick and easy repair and maintenance. Spare parts for any HygroMatik units are available many years after production has been ceased. This service is part of our practised sustainability and in our understanding a responsible use of the available resources.

EXTENSIVE ONLINE SERVICE

Online service

- Available immediately
- Always up-to-date
- Environmentally friendly

On our website www.hygromatik.com we offer you help with calculating the required steam output, choosing the right unit and professional commissioning. Of course you will also find all product brochures, operating instructions, specifications and videos on the function and maintenance of our products - immediately available, always up-to-date, digitally and environmentally friendly. You are also welcome to visit our digital showroom, use our Planer's Guide or participate in our webinars

HYGROMATIK SERVICE PARTNERS IN YOUR REGION

In order to provide you with a reliable service with consistent quality all over the world, we select our regional service partners carefully. In extensive seminars and workshops these are well trained by our employees.

A close-knit network of trained service partners which has increased over the years makes it possible for us to be there on site with you, with all our technical expertise.

With many advantages:

- Fast response times in service cases
- Reliable, highly trained contacts
- Know-how of regional characteristics

Please do not hesitate to contact us if you have any questions or require further information. Our friendly staff at the head office will be pleased to receive your call and, if necessary, connect you with the right contact.

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Our service for 100% customer satisfaction

- Long availability of replacement parts
- Technical hotline +49 4193 895-293 or hotline@hygromatik.com
- HygroMatik distributes in more than 45 countries
- Operating manuals, planning data and information on workshop events available online at www.hygromatik.com

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