HygroMatik®

member of CAREL group CAREL

Printing industry

Air humidification systems for a PLUS of

INTELLIGENT PROTECTION

LONG LIFE

MAXIMUM FLEXIBLE

SUSTAINABLE

COST SAVING

Productivity

Precision

Efficiency

INDISPENSIBLE.
PRECISE CONTROL OF AIR HUMIDITY

Precise air humidity control is essential to achieve high-quality results in the printing and paper industry. Both materials and processes react strongly to a change in humidity. A constant humidity level within a controlled value range, on the other hand, improves **quality, efficiency and productivity.**

Quality thanks to precision

Paper is a hygroscopic material that tends to equalise humidity with the environment. The relative humidity therefore plays a decisive role in the printability of the paper during storage. Conditioning the paper in accordance with the manufacturer‘s instructions is an important prerequisite for **high-quality printing results.**

Fluctuations in relative humidity before and during the printing process can lead to undesirable effects and even costly machine failures.

- **Register inaccuracies** due to dimensional changes (up to 2 mm on printed sheets) and unevenness of the substrate (e.g. corrugation, curling or dust)
- **Extension of the printing process and further processing** due to drying times that are not adhered to (possibly even unusable result)
- **Paper jam or misfeed** caused by static electricity in the environment

To avoid this, HygroMatik air humidification systems regulate the relative humidity in the storage and production facilities of the printing company precisely to the required values and keep them reliably constant - with positive effects on quality, efficiency and productivity.

A good working environment thanks to healthy indoor air

In terms of relative humidity, **the human comfort zone lies between 40 and 60%.** Between these two values, people feel comfortable, are efficient and remain healthy. At the same time, the spread of viruses and bacteria is slowed down and their ability to survive is reduced.

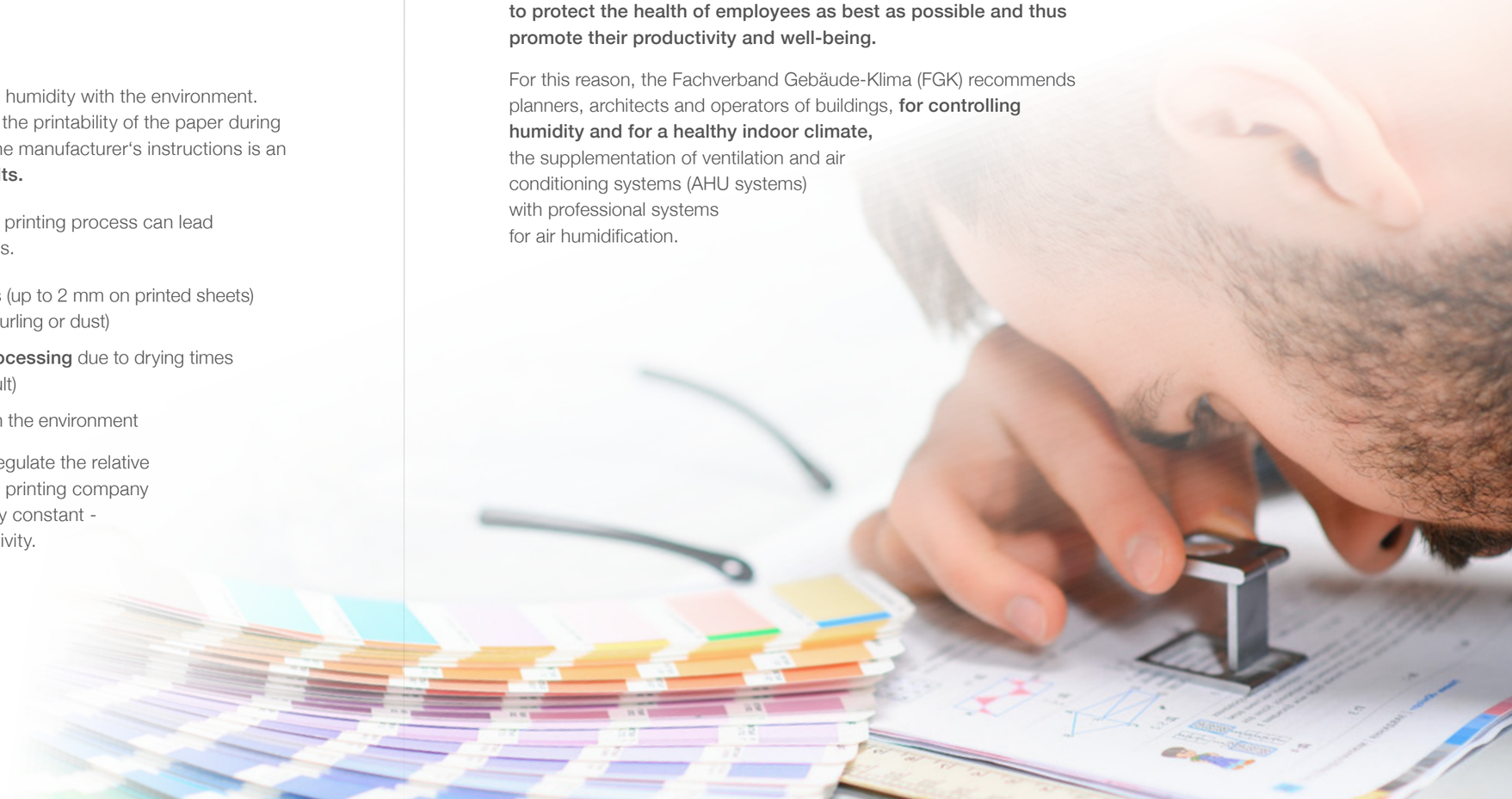
Employees who feel good and enjoy good health thanks to healthy indoor air have been shown to suffer less fatigue and are more productive.

- Best health protection for employees
- Prevention of virus spread
- Increased productivity
- Reduced sickness rate

A directive on the energy performance of buildings (EPDB) was adopted in March 2024. This directive sets indoor environmental quality (IEQ) requirements and takes into account factors such as **air quality and humidity.** Incorporating IEQ standards into building regulations means that health and wellbeing is given a higher priority in buildings across the EU.

In addition, it is both an ethical and an economic decision for companies **to protect the health of employees as best as possible and thus promote their productivity and well-being.**

For this reason, the Fachverband Gebäude-Klima (FGK) recommends planners, architects and operators of buildings, **for controlling humidity and for a healthy indoor climate,** the supplementation of ventilation and air conditioning systems (AHU systems) with professional systems for air humidification.



CLEVERLY UTILISED.
REWARDING SYNERGIES

The use of efficient air humidification systems in the printing industry can provide further interesting and worthwhile benefits.

In summer, adiabatic air humidification can reduce the heat load from the production process by up to a third thanks to the associated **cooling effect** - an efficient and sustainable way to reduce energy costs for air conditioning.

The osmosis water treated for air humidification is also available for use in the printing process if planned accordingly. This prevents, for example, blank running of the ink rollers due to limescale deposits and reduces deposits on the rubber blanket.

HygroMatik air humidification systems can be **precisely customised to the individual framework conditions** in order to achieve savings in investment and ongoing operating costs.

For over 50 years, we have been developing and producing energy-efficient and flexible solutions for air humidification at our company headquarters near Hamburg which are characterised by particular sustainability in terms of maintenance, quality and durability.

OPTIMALLY ADAPTED.
THE RIGHT SOLUTION FOR EVERY REQUIREMENT

The optimum design of the system for air humidification depends on many factors that result from the spatial situation and the respective process-related requirements for printing operation. Basic considerations are

- Can be integrated into an air conditioning system
- Necessity of direct room humidification
- Humidification performance based on the humidification requirement
- Utilisation of sustainable and efficient cooling

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Performance features

Humidification method	HPS Adiabatic atomisation	LPS Adiabatic atomisation	FlexLine Isothermal vaporisation	MiniSteam Isothermal vaporisation	humiFog Touch Adiabatic atomisation
Humidification capacity per hour	up to 600 litres	up to 110 litres	up to 130 litres	up to 10 litres	up to 1,200 litres
Integration in the AHU duct	✔	✔	✔	–	✔
Direct air humidification in the room	–	–	with ventilation unit VU	✔	✔
Efficient and sustainable cooling capacity	✔	✔	–	–	✔
Reverse osmosis water treatment	✔	✔	recommended	recommended	✔
Integrated communication protocol Modbus RTU or BACnet	✔	✔	✔	–	✔
Integrated galvanically isolated RS-485 serial interface (EIA-485)	–	–	–	✔	–
Freely programmable, overload-protected digital input	–	–	✔	–	✔
Capacitive touch colour display with convenient menu navigation for setting the relevant operating parameters	✔	–	✔	–	✔
Clear LED display with control buttons for quick and intuitive navigation	–	✔	–	✔	–
Optional functions can be retrofitted	–	–	✔	–	–
Long operating times and low maintenance requirements	✔✔✔	✔✔✔	✔✔	✔✔	✔✔

In the AHU duct

Cooling capacity

THE POWER PACK.
HIGH PRESSURE FOR MAXIMUM REQUIREMENT

The powerful HPS humidification system was developed for efficient use in process humidification and comfort humidification. It works in the high-pressure range with a pressure of 25 to 75 bar (High Pressure System) and enables a humidification capacity of up to 600 l/h. In addition, **the evaporation of the fine mist cools** the flow air in the duct and thus ensures noticeable cooling of the room air (adiabatic humidification).

Performance features

- **Precisely controllable humidification output** thanks to proportional humidification control and high-quality system control
- Optimum spray pattern with **minimum energy consumption**
- **Excellent ease of use** via a capacitive 3.5“ touch display
- High-precision stainless steel nozzles and turbulence modules (VortexModules) for **optimum evaporation in the shortest humidification distance**
- **Connection to the building technology** for high operational reliability and short response times in the event of a fault
- **Integrated communication protocol** Modbus RTU or BACnet
- Fully demineralised water excludes limescale precipitation and guarantees **minimal maintenance effort**
- Utilisation of cooling capacity enables **rapid amortisation of investment costs**
- Use of high-quality components for a **long service life**
- **TÜV certified** according to VDI 6022-1 and VDI 3803-1

SUSTAINABLY EFFICIENT

Long service life

High efficiency

Minimal maintenance required

High resource efficiency

Further information about the product.

LPS

LOW PRESSURE SYSTEM
Humidification capacity: 4-110 l/h

In the AHU duct

Cooling capacity

THE ALL-ROUNDER.
FROM SMALL TO LARGE

The LPS humidification system operates in the low-pressure range with a pressure of 5 to 15 bar (Low Pressure System) and provides three performance classes with a humidification capacity of up to 110 l/h. The modular design enables installation or retrofitting in almost any air conditioning duct. In addition, **the evaporation of the fine mist cools** the flowing air in the duct and thus ensures noticeable cooling of the room air (adiabatic humidification).

Performance features

- **Precisely controllable humidification output** thanks to proportional humidification control and high-quality system control
- Optimum spray pattern with **minimum energy consumption**
- **Intuitive operation** via a clear LED display with operating buttons
- High-precision stainless steel nozzles and turbulence modules (VortexModules) for **optimum evaporation in the shortest humidification distance**
- **Connection to the building technology** for high operational reliability and short response times in the event of a fault
- **Integrated communication protocol** Modbus RTU or BACnet
- Fully demineralised water excludes limescale precipitation and guarantees **minimal maintenance effort**
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SUSTAINABLY EFFICIENT

Long service life

High efficiency

Minimal maintenance required

High resource efficiency

Further information about the product.

FlexLine

STEAM HUMIDIFIER

Humidification capacity: 3-130 l/h

Further information about the product.

In the AHU duct

Directly in the room with ventilation unit VU

THE FLEXIBLE.
WITH MORE THAN HUNDRED OPTIONS

With the FlexLine, HygroMatik offers a modern generation of steam humidifiers that can be expanded from a basic model with a wide range of equipment options. This means that each humidifier can be **customised to your individual requirements in the best possible way.** The appliances are characterised by technologies that reduce the wear and tear of appliance components and are highly efficient in their use of energy and resources.

Performance features

- Available as an **electrode or heater type version**
- **Maximum flexibility** thanks to a wide range of equipment options
- **Reduced installation effort** thanks to customised pre-configuration ex works
- Optional expansion **options can be retrofitted**
- **Excellent ease of use** via a capacitive 3.5“ touch display
- Powerful and responsive thanks to **precise control technology** incl. numerous control, regulation and signalling functions
- Freely programmable, overload-protected **digital input**
- **Integrated communication protocol** Modbus RTU or BACnet
- Optionally integrated galvanically isolated RS-485 **serial interface** (EIA-485)
- **Extremely durable** for many years of continuous use
- **Intelligent service functions** for operational reliability and ease of maintenance

To make these benefits easily and conveniently available to you, the functions can be intelligently combined in a **modular system.** You only invest in the functions that you really need.

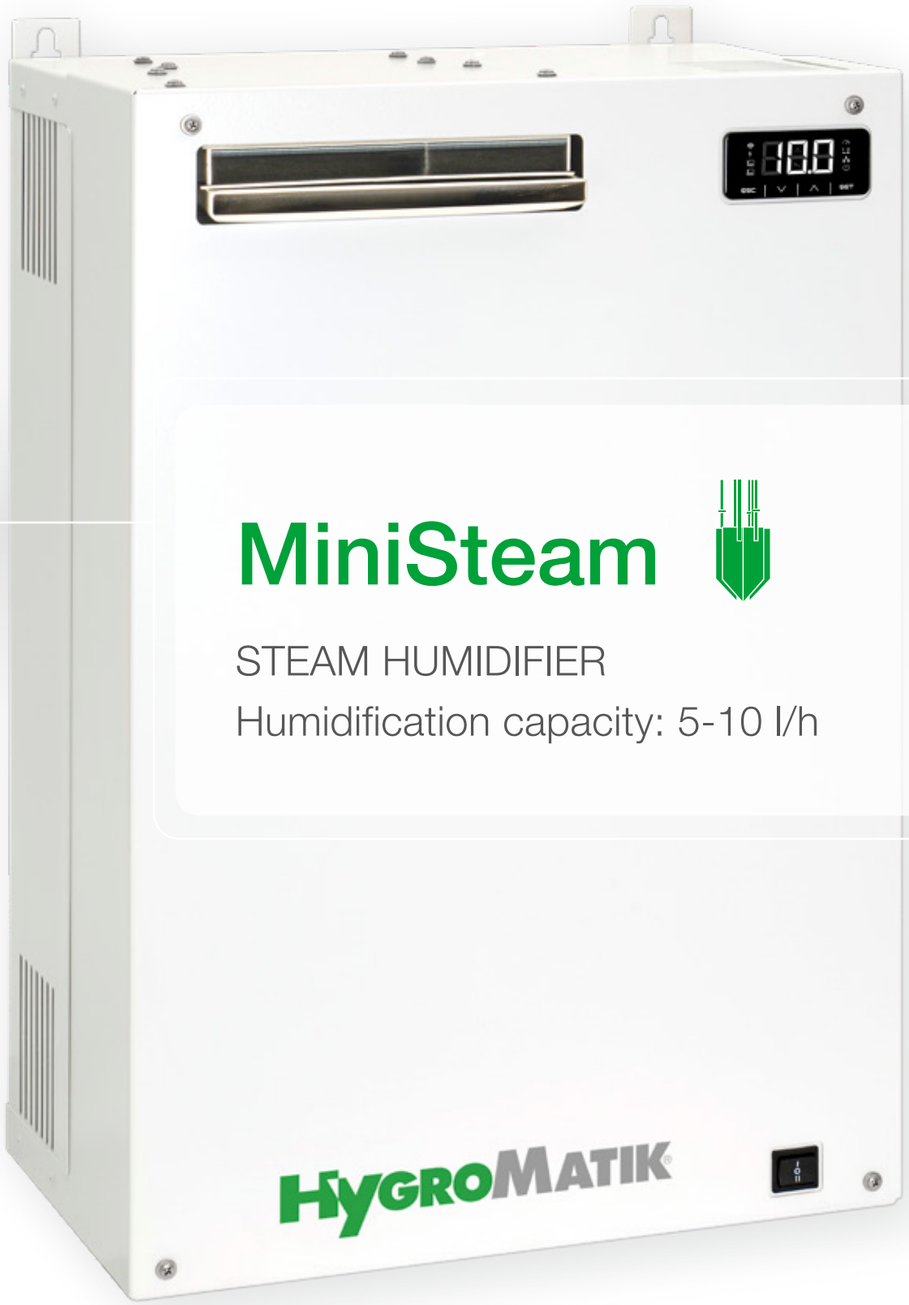
SUSTAINABLY EFFICIENT

Robust and durable housing

Reusable steam cylinders

Long and flexible service intervals

High resource efficiency



MiniSteam

STEAM HUMIDIFIER

Humidification capacity: 5-10 l/h

Further information about the product.

Directly in the room

THE COMPACT.
SMALL AND DIRECT

The HygroMatik MiniSteam E is an electrode steam humidifier for **direct room air humidification with steam outputs of 5 and 10 l/h.** It was designed for the humidification of small and medium-sized production and storage rooms as well as office units. The MiniSteam E generates hygienic steam from tap water and is particularly environmentally friendly and efficient.

Performance features

- **Durability:** housing tray made of corrosion-resistant stainless steel
- **Easy maintenance:** completely removable appliance cover
- **Security:** unit can be locked to prevent unauthorised access
- **Flexibility:** wide range of options for customised configuration
- **Intuitive operation** via a clear LED display with operating buttons
- **Reliable and safe thanks to precise control technology**
  - » Continuous or single-stage control
  - » Integrated PI control
  - » Automatic system test
  - » 2 potential-free remote signals
  - » Optionally integrated galvanically isolated RS-485 serial interface (EIA-485)
  - » Stand-by blow-down and stand-by heating

All units have been awarded the VDE, GS and CSA C/US test marks and are CE and EAC compliant.

SUSTAINABLY EFFICIENT

Robust and durable housing

Reusable steam cylinders

Long and flexible service intervals

High resource efficiency

humiFog Touch

HIGH PRESSURE ATOMISER

Humidification capacity: 150-1,200 l/h

In the AHU duct

Directly in the room with blower units

Cooling capacity

THE SMART ONE.
POWERFUL AND DIGITAL

The CAREL humiFog is a **high-pressure atomiser system** for adiabatic room humidification. It was developed for industrial environments and combines maximum reliability with minimum operating costs. This efficient system is easy to install and suitable for any environment, no matter how complex.

Pure water is atomised into the finest mist, which evaporates spontaneously in the air and ensures the right level of humidity with the lowest possible energy consumption. A positive side effect: refrigeration systems can be equipped or operated with less power **- this reduces energy and investment costs.**

Performance features

- **Flexible blower units and plug & play manifolds** for direct humidification
- **Multi-zone control** with up to 12 zones with a single pump station
- **Linear or stepped control** of the atomising pressure enables precise adjustment to the humidification requirement
- **Excellent ease of use** via a capacitive 7“ touch display
- **Extended maintenance intervals** of up to 8,000 operating hours - this saves costs and reduces downtimes
- Integrated web server, standard communication protocols, USB and Ethernet connection **for control and monitoring remotely or in in-house systems**

SUSTAINABLY EFFICIENT

Energy savings for process and building cooling

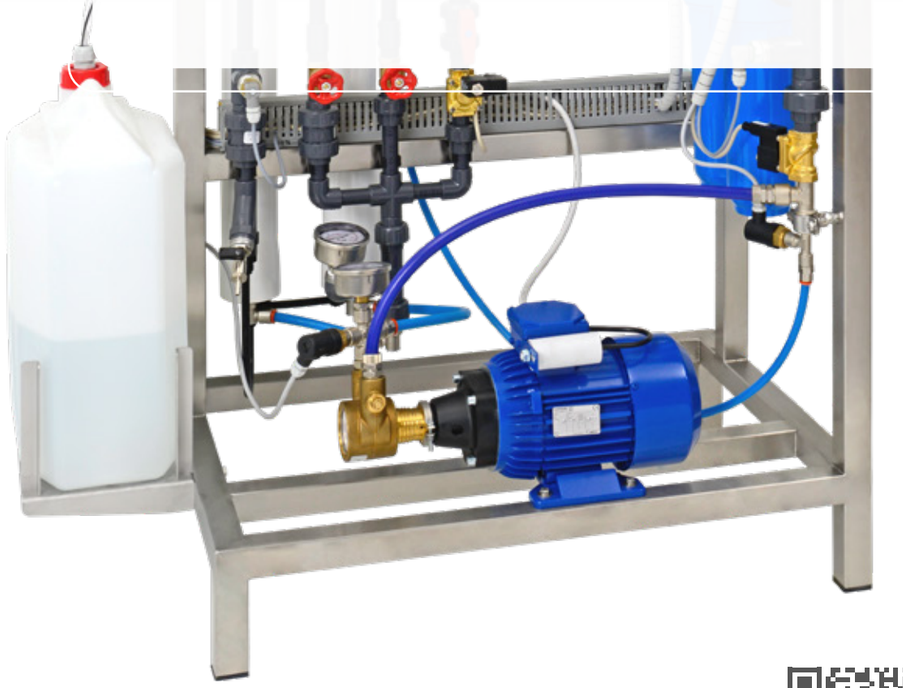
Digital remote access saves journeys to the site

Low energy consumption in operation

WaterLine

WATER TREATMENT

Permeate output: 25-1,200 l/h



Further information about the product.

REVERSE OSMOSIS.
EFFECTIVE PROTECTION, HIGH BENEFITS

Before our drinking water is fed into the water pipes, it flows through numerous different layers of rock. Depending on the region, it therefore contains more or less minerals such as calcium and magnesium. If this water is used in air humidification systems, minerals can build up and lead to malfunctions.

We therefore recommend precautionary water treatment with a **WaterLine reverse osmosis system.** This can **reduce** harmful deposits by **up to 95%.** Water treatment is mandatory for the HPS and LPS humidification systems.

With clear advantages

- Avoidance of malfunctions and operational interruptions
- Noticeable reduction in maintenance and operating costs
- Extension of the average operating time
- Synergies due to the additional use of osmosis water in the printing process

Performance features

- Durable and maintenance-friendly components
- Prepared for quick installation and commissioning
- Convenient and simple operation
- Clear display of fault and operating messages
- Digital maintenance display and operating hours counter
- External release possible via potential-free contact

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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