



**Humidity matters!**  
CAREL solutions for your  
humidification needs

**Connected** Efficiency

# heaterSteam: electric heater steam humidifier

The ideal humidifier for technological or medical applications, where precision, reliability and a totally sterile environment are required. It can operate on both drinking water and demineralised water, for virtually maintenance-free operation.

- reliability and total protection against overheating;
- precision  $\pm 1\%$  RH, full-range modulation;
- maximum hygiene;
- models from 2 to 80 kg/h

heaterSteam combines the most advanced humidity control technology with the potential of connectivity, offering a product that is unrivalled on the market in terms of precision, reliability and simple management. The new colour touch screen display improves the user experience, offering all unit information simply and immediately.

heaterSteam is available in two versions: process and titanium.

**heaterSteam process** has heaters made from Incoloy® 825, a highly-resistant material that allows operation in complex conditions, even when feedwater quality is not controlled.

**heaterSteam titanium** is the world's only humidifier with titanium heaters. The reliability of titanium makes this the natural solution for applications where service continuity is crucial. In particular, it can operate with treated water of any quality, even extremely aggressive water with conductivity below  $1 \mu\text{S}/\text{cm}$ , and softened water down to  $0^\circ \text{fH}$ .



steam distributors

heater



## Precision

Controls relative humidity with a precision of 1%, modulating production from 0 to 100%.



## Reliability

The titanium heaters - unique on the market - are extremely resistant to corrosion, while the embedded temperature sensors protect against overheating



## Virtually no maintenance

Titanium heaters mean highly demineralised water can be used, thus effectively eliminating the need for routine maintenance.

# gaSteam: gas-fired steam humidifier

High-capacity steam humidifier for applications where the cost of energy is important.

Suitable for operation on drinking or demineralised water, it can be powered either by natural gas or LPG, and is installed in the same way as a normal heating system.



- Models with steam production of 45, 90, 150, 180 and 300 kg/h (450 kg/h outdoor version only);
- modulation from 25 to 100% of rated capacity (from 12.5% for UG180 and UG300);
- maximum efficiency and safety thanks to the pre-mix burner equipped with a proportional gas valve.

**±3%**  
Accuracy around the relative humidity set point

gaSteam humidifiers are equipped with the latest c.pHC microprocessor electronic controller, based on the CAREL programmable c.pCO. The user interface features a 4.3" touchscreen graphic display, which improves the user experience even for less-expert users, through instant information and easy navigation, with graphic icons and texts in various languages.

The default communication protocols on gaSteam units are: Modbus. BACnet and CAREL on the BMS serial port; Modbus® and BACnet™ also on the Ethernet port. The controller can be connected to an active probe and optional second limit probe; operation is either ON/OFF or proportional to an external control signal. A complete set of diagnostics is also provided for maintenance.



ultimateSAM



Burner



Blower



Heat exchanger



Linear steam distributors



## High efficiency

The advanced design of the stainless steel heat exchanger, with a large heat exchange surface, ensures high efficiency (94-96%) and excellent corrosion resistance.



## Precision

gaSteam is suitable for precision applications, thanks to continuous capacity modulation from 25% (12.5% for UG180 and UG300) to 100% (giving a precision of  $\pm 3\%$  around the set point).



## Savings in running costs

By running on natural gas/LPG, gaSteam has much lower operating costs compared to traditional isothermal electrode/heater humidifiers, in particular for high capacities.

# humiSteam: immersed electrode steam humidifier

This is the best choice for a wide variety of air humidification applications: commercial environments, offices, industrial plants and steam baths; the synthesis of CAREL's forty-year experience in the field of steam humidifiers.

- 3 control versions;
- models from 1.5 to 130 kg/h;
- control probe and modulating limit probe;
- disposable or openable cylinders;
- auto-tuning based on water quality

humiSteam is a versatile solution, suitable for many applications, from civil to industrial environments, and even steam baths. It is designed for installation in rooms, using the steam blower, and for installation in air ducts, using high-efficiency linear steam distributors. humiSteam works on mains water, and its control software automatically adjusts operation according to the characteristics of the water, so as to optimise operating life without maintenance.

The main benefits of humiSteam are:

- patented AFS system (Anti Foaming System) that detects and manages foam to prevent droplets of water being carried by the steam;
- cylinders with plug-in power connectors for easy, quick and risk-free maintenance;
- quick start-up and a wide range of feedwater conductivity, for higher performance
- built-in conductivity sensor and control software to optimise energy efficiency and operating life, with constant performance over the life of the cylinder;
- modulating limit probe for maximum safety in AHUs/ducts.



steam distributors

cylinder complete with electrodes



## Easy to use

Large display with texts in 9 languages and graphics showing operating status and diagnostics.



## Fast maintenance

Long-life cylinders with quick-couplings for fast and uncomplicated maintenance.



## Quality and reliability

CAREL is the world's largest manufacturer of immersed electrode systems, and is unrivalled in terms of technology and quality.

# compactSteam: immersed electrode steam humidifier

The ideal choice for residential environments, professional offices or small businesses.



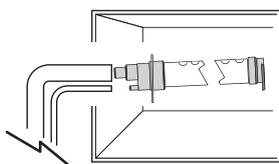
Humidity control in homes and offices, the hygiene of steam humidification in a compact, versatile product with an elegant design

compactSteam is an immersed electrode humidifier with the following main features:

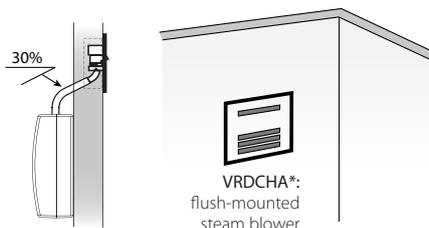
- elegant and discreet design, suits any environment;
- very quiet built-in steam distributor with adjustable louvres;
- large, immediately intuitive graphic LCD display;
- features, safety and ease of use at the highest level available on the market;
- models from 3.3 to 4.5 kg/h (adjustable).

A version without built-in distributor is also available, for steam distribution in the duct, while a remote blower can be used to distribute steam in a different environment from where the humidifier is installed.

duct applications



wall mounting



## Design

The elegant and discreet forms and silent operation make it perfect for any type of environment.



## Flexibility

Available both with direct steam distribution in the room and in the duct, for seamless installation in any context.



## Very easy to use

Graphic LCD display for easy interaction with all types of users.

# ultimateSAM: high-efficiency steam distributor

ultimateSAM minimises the steam absorption distance in the air and thus brings energy savings by reducing losses due to condensation when compared to a normal distributor.

- minimum steam absorption distance;
- uniform distribution and no dripping;
- less condensate through air insulation.

ultimateSAM (Short Absorption Manifold) is a ducted steam distributor, suitable for both pressurised steam (0.01–4 barg) and humidifiers (operating at atmospheric pressure). The special **air-cushion thermal insulation** reduces heat transfer to the air in the duct, thus minimising losses due to condensation.

ultimateSAM is **sized to measure** based on the steam flow-rate and the dimensions of the duct, so as to uniformly distribute steam without dripping and minimise the absorption distance.

All metal parts are made from AISI 304 stainless steel, guaranteeing **hygiene and a long working life**. It is supplied with a vast choice of steam valves with electric actuators for modulating the flow-rate. The range includes multi-upright models with bottom or top feed (SAB\*/SAT\*) for flow rates from 20 to 1,100 kg/h and single-upright models SA0\* with flow rates from 20 to 140 kg/h.



modulating valves



inlet connections



steam traps and condensate drains



Y filters



## Energy efficiency

ultimateSAM maximises energy savings. Insulated models reduce air heating and condensation.



## Precision

Suitable for precision humidification due to uniform distribution of steam in the AHU/ duct and the modulating valves.



## Short absorption distance

ultimateSAM minimises the steam absorption distance due to uniform distribution across the entire height.

# humiFog multizone: high pressure adiabatic humidifier

Energy saving and hygiene, for adiabatic humidification and evaporative cooling. The spray humidification system for industrial, commercial and hospital applications that combines the highest efficiency with precision with hygiene.



- maximum hygiene (VDI6022) without chemical additives;
- precision  $\pm 1\%$  RH and wide range of modulation;
- up to 1,000 kg/h (5,000 kg/h in the custom version);
- models with stainless steel and silicone-free pump for automotive uses;
- seismic certification.



atomising rack



droplet separator

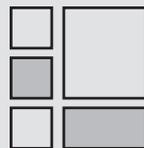
humiFog is an adiabatic spray humidification system comprising a high-pressure volumetric pump and a distribution system with special nozzles that produce very fine droplets for fast absorption in the air. The pumping station, available in capacities from 100 to 1,000 litres/hour and equipped with an inverter for maximum energy efficiency, delivers water at a pressure up to 70 bars, for very fine atomisation (average droplet diameter: 10-15 microns). humiFog can be used both for duct applications (AHUs) and for direct in-room humidification, and is suitable for a wide variety of applications for both humidification and direct or indirect evaporative cooling. Consequently,

just one investment to manage humidification in winter and cooling in summer. For duct applications, the atomising rack is supplied made-to-measure for the duct, with several nozzle manifolds, each managed by independent solenoid valves, and completed by a modular droplet separator to be installed downstream. A range of blower units is available for direct in-room humidification applications. The entire humiFog system is certified in accordance with the VDI6022 standard.



## Very low power consumption

It consumes just 4 W of power per litre/hour capacity, less than 1% of any steam humidifier



## Multizone

In the multizone configuration, humiFog can control humidity in 6 different ducts with the same pumping station, thus rationalising installation and maintenance costs.



## Maximum hygiene

VDI6022 certified for use with pure and simple water. No water is recirculated, and the system is automatically emptied after each period of operation.

# humiFog Direct: high-pressure humidifier for in-room applications

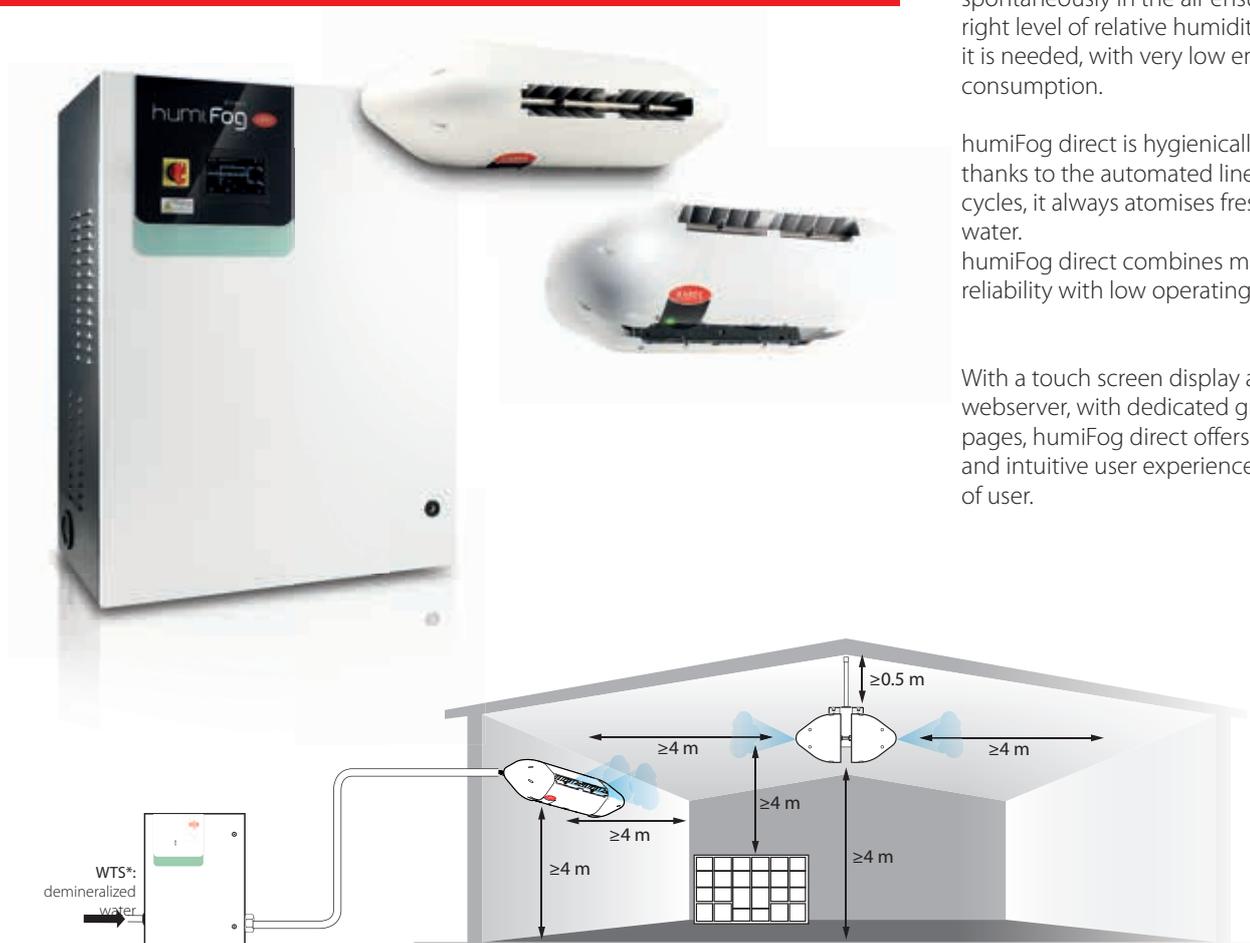
The ideal choice for controlling humidity in production processes, directly where it is needed, with minimum energy consumption

The right level of relative humidity ensures that materials preserve their properties and reduces waste.

humiFog direct is the CAREL solution for direct in-room adiabatic humidification. Introducing pure water in the form of very fine droplets that evaporate spontaneously in the air ensures the right level of relative humidity, where it is needed, with very low energy consumption.

humiFog direct is hygienically safe, as thanks to the automated line washing cycles, it always atomises fresh and clean water. humiFog direct combines maximum reliability with low operating costs.

With a touch screen display and built-in webserver, with dedicated graphic pages, humiFog direct offers a simple and intuitive user experience for all types of user.



## Flexibility

Single- or two-zone management, master/slave function for capacity expansion and blowers with one or two outlets.



## Easy installation

Designed with innovative features that minimise installation and commissioning times, including the line fill and drain valves already fitted in the cabinet.



## Energy saving

Minimum energy consumption, just 4 watts of power per l/h of atomised water.

# mc multizone: compressed air sprayer

The mc multizone adiabatic humidification system is ideal for industrial environments, air handling units or in-room applications (e.g. cold rooms, textile industries...).



- up to 6 zones, also with independent set points.
- easy installation: the compressed air lines are automatically balanced;
- periodic nozzle self-cleaning;
- 60 and 230 kg/h models.



nozzles

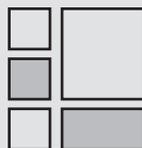


The system uses compressed air to atomise the water into very fine droplets that evaporate in the air, humidifying and cooling it. The electronic controller manages the water and compressed air supply and the automatic cycles, such as nozzle cleaning and washing cycles. Humidity can be controlled independently (up to 6 zones) using a Master-Slave structure. The system is equipped with a **large LCD display** and 6-button for immediate and intuitive access to information and parameters. mc multizone ensures a **high level of hygiene** thanks to automatic emptying of the water line whenever the unit stops, and **automatic washing** during periods of inactivity.



## Guaranteed hygiene

Automatic procedures to prevent water stagnation. UV disinfection system.



## Multizone

Multiple cabinets can be connected in a master-slave structure for multizone applications.



## Self-cleaning

The AISI316 stainless steel nozzles are available with different capacities, and have a patented automatic cleaning system to minimise maintenance.

# humiSonic: ultrasonic humidifier

Adiabatic humidification with low energy consumption for installations in small spaces.



- 1.0  $\mu$  • Droplet size just 1 micron: instant absorption;
- 10% • Power consumption compared to steam humidifiers: savings of 90%;
- 10k • Guaranteed operating hours for unprecedented reliability.



dedicated humidity probe



flow sensor



distribution system

humiSonic is the CAREL family of ultrasonic humidifiers for applications in industrial, museum and residential environments where there is limited space and the need for fast absorption and hygienic humidification. It is energy efficient: compared to steam humidifiers, it consumes 90% less energy (around 80 Watts per litre/hour of capacity). All the units come complete with an electronic controller that manages modulating operation, either based on an external signal or with an independent relative humidity probe, Modbus® connectivity and automatic drain and washing cycles. For maximum hygiene, humiSonic guarantees no stagnant water, through washing and drain cycles when the unit is not operating. humiSonic is available in three different versions:

- **Room** model, with adjustable multiple distribution outlets and built-in fans,

with a capacity from 2 to 8 litres/hour. The power and control electronics are integrated into the humidifier, ensuring very simple installation. The parts in contact with water are all made from stainless steel. Widely used in museum and high-tech industrial applications.

- **Duct** mode, with a capacity from 2 to 18 litres/hour, expandable in master and slave modes; the electronics are in a separate unit and installed outside of the ducting.
- **Compact kit** model, with a capacity of 0.5 and 1 litre/hour, designed for use in **fan coils** and **showcases**. The tank is made from a special plastic with the addition of silver due to its bacteriostatic properties, ensuring the highest level of hygiene. humiSonic compact comes complete with a built-in fan for blowing the droplets of water, and can be coupled to different types of distributors.



## Energy saving

Ultrasonic humidification requires very low power consumption (80 W per l/h). humiSonic is an energy saving solution that meets current expectations on reducing consumption.



## Hygiene

This is one of the main strengths of humiSonic, and is ensured through periodic washing cycles, completely emptying the tank at the end of the cycle, and the gradual release of the silver ions contained in the tank.



## Easy installation and maintenance

Its compact and ergonomic design make humiSonic easy to install and service.

# humiDisk: centrifugal humidifier

Practical and flexible solution: a small, sturdy and easy-to-install humidifier; ideal for cold rooms and small spaces, paper and printing industries, textile industries.



- easy to install;
- minimum maintenance;
- automatic emptying cycles;
- adjustable capacity.

**Simple and robust**, it can work on mains or demineralised water. A spinning disk atomises the water into very fine droplets that are easily absorbed by the surrounding air, humidifying and cooling it.

CAREL supplies mechanical humidistats, or electrical panels with electronic humidity controller, allowing one or more humiDisk units to be controlled in parallel. The electrical panels also run a **washing cycle whenever the humidifier is restarted.**

Automatic drainage of the water tank after each operating cycle ensures hygiene and makes it ideal for places where food is stored, for cold rooms or other small industrial environments and warehouses.

The humidifier can be equipped with a frost protection heater that is activated at temperatures near 0°C, allowing operation down up to -2°C.



electrical panel



humidistat



## Minimum maintenance

humiDisk is a sturdy product that can work for an extended period with very little maintenance.



## Any kind of water

The unit works with mains drinking water, softened or demineralised water.



## Low energy consumption

Around 34 W per kg/h of capacity.

# optiMist: evaporative cooling and humidification

The all-in-one solution for evaporative cooling and adiabatic humidification in air handling units.



“Green” AHU: overall energy savings in the air handling unit due to the combination of evaporative cooling and adiabatic humidification.

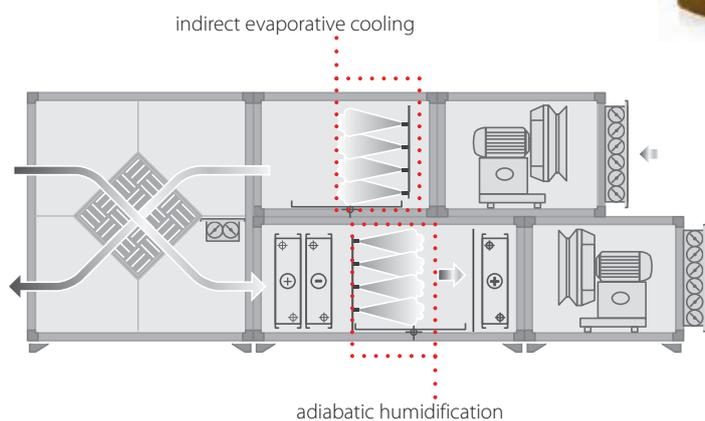


droplet separator



drain valves

optiMist can be used to implement, in a duct equipped with a heat recovery unit, the dual function of air humidification and indirect evaporative cooling. Alternatively, humidification only for applications without particularly stringent requirements. Capacity modulation by inverter, combined with two independently activated water circuits, guarantee continuous control across a wide range, suitable for applications that do not require extreme precision. The duct distribution rack, with special stainless steel nozzles, is managed by solenoid valves installed inside the pumping station, making installation very simple. optiMist can be supplied with demineralised, softened or even mains water, as long as hardness is relatively low (<math><400\text{ uS/cm}</math>).



indirect evaporative cooling

adiabatic humidification



### Energy saving

optiMist guarantees overall energy savings in the AHU, 68 kW per 100 l/h of evaporated water, with very low power consumption and pressure drop (30 Pa).



### Any kind of water

The unit works with mains drinking water, softened or demineralised water.



### Integrated solution

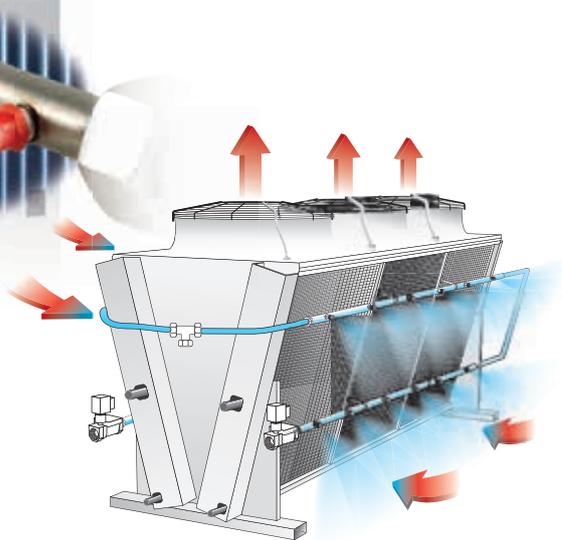
optiMist is a single solution that allows efficient management of direct evaporative cooling (DEC), indirect evaporative cooling (IEC) and adiabatic humidification.

# chillBooster: evaporative cooling

Low pressure optimiser that helps reduce the energy demand of chillers and dry coolers on the hottest days.



Energy saving on chillers and dry coolers through evaporative cooling.  
chillBooster is an extra gear for tackling peak demand on the hottest days of the year.



### chillBooster for chillers or dry coolers

chillBooster cools the air before it is taken in by the unit to cool the fluid in the coil. Water is sprayed against the flow of air, giving the droplets the longest possible trajectory so as to have sufficient time to evaporate. The cooled air is drawn in by the fans and increases heat exchange right through the coil! Some of the droplets may wet the fins on the coil: this water will tend to evaporate, absorbing heat and thus providing additional cooling capacity. Part Some of the water, however, will drip down from the fins and will be drained.

chillBooster allows liquid coolers and condensers to achieve rated capacity even on days with high outside temperatures, which often coincide with maximum load, without requiring costly oversizing of the systems.



quick connections



atomising nozzles



### Very low energy consumption

ChillBooster has very low power consumption: a dry cooler system with an air flow-rate of 200,000 m<sup>3</sup>/h atomises 1000 l/h with power consumption of less than 0.7 kW!



### Also ideal for retrofits

The IP55 pumping station and the easy-to-install modular system makes ChillBooster ideal for retrofitting chillers, dry coolers and liquid coolers.



### Easy to install

The water distribution system features nozzle racks available in various lengths, quick fittings and flexible connection hoses, making chillBooster easy to install without needed special tools or welding.

# WTS: water treatment systems

CAREL completes its offering of adiabatic steam humidifiers with a new range of reverse osmosis water treatment systems.

Safety, guaranteed reliability and hygiene for all CAREL humidifiers.

Connecting a humidifier to a WTS system guarantees maximum safety and reliability, minimising maintenance while at the same time having the certainty of purified water with no pollutants that could be introduced into the air we breathe

### What is reverse osmosis?

It is a technique in which the water being purified is pumped at high pressure through a semi-permeable membrane with pores less than 0.001  $\mu\text{m}$  in diameter: most of the dissolved ions are filtered out by the membrane, thus producing very pure water. The removal of minerals, measured as a

percentage of the original content, varies from 95% to 99% and even higher.

### Why use demineralised water?

For heater steam humidifiers, the treatment minimises the build-up of mineral salts and fouling in the boilers, increasing their working life: maintenance is reduced, and there is no unit downtime for periodic cleaning.

In adiabatic humidifiers, demineralised water avoids fouling of the nozzles, the build-up of mineral salts in air handling units and the introduction of mineral dust into the humidified environments. The maintenance costs are reduced, and the hygiene of ventilation systems is improved, as the RO water has been purified of all bacteria and pollutants. In the specific case of ultrasonic humidifiers, the elasticity of the transducers will not be affected by scale: CAREL humiSonic components are guaranteed to work without interruption for a minimum of 10,000 hours!



UV lamp disinfection system



expansion vessel



### Easy commissioning

WTS is pre-calibrated, so as to get up and running very quickly. The automatic "flushing" procedure minimises maintenance requirements.



### Integration

The new WTS system guarantees perfect operation with Carel humidifiers.



### Maximum hygiene

WTS supplies reverse-osmosis water, further purified of all bacteria and pollutants by the ultraviolet disinfection system.

# Applications



## Office buildings

Humidification and/or cooling for optimum comfort.



## Hospitals

Health, well-being, safety and regulatory compliance through humidification of wards and operating rooms.



## Book stores and museums

Humidification for the conservation of books, paintings and works of art in perfect temperature-humidity conditions.



## Pharmaceutical industry

Maintaining the humidity level required by production process.



## Paint spray booths/systems

Maintaining the best humidity level to ensure quality and uniformity of the painted product.



## Tobacco industry

For the processing, ageing and storage of tobacco at optimum humidity.



## Direct/indirect evaporative cooling

Humidity control eliminates the risk of electrostatic discharges. Evaporative cooling maximises energy saving.



## Hotels and call centres

Humidification and/or cooling for optimal comfort and to prevent diseases caused by dry air.



## Textile industry

Humidification to limit dustiness and breakage of fibres, with evaporative cooling to "absorb" the heat generated by the machinery.



## Food industry

Humidification in the production of biscuits, pasta and all hygroscopic materials and ingredients.



## Printing and paper industries

To ensure productivity and final product quality.



## Wood/timber industry

For processing and preserving timber and wood.

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