



Success story

The Courtauld Gallery - London Humidification Solution and high level of service support

Indoor air quality control is a fundamental, albeit often overlooked, factor in the museums. The installation of CAREL Isothermal humidification systems and Reverse Osmosis water treatment, configured to perfectly match the air handling units through adaptation of CAREL's technologies, has made humidity management especially efficient. As a result, the highest standards in terms of indoor air quality and service continuity required of these systems has been met, regardless of the different needs of the environments where the air handling units are installed.

Where

The Courtauld Institute of Art

Somerset House
Strand
London, WC2R 0RN

It houses the collection of The Samuel Courtauld Trust and operates as an integral part of The Courtauld Institute of Art.

What

Planned Preventive Maintenance contract for seven CAREL heaterSteam humidifiers, three Water Treatment systems models various Compact WTS and one model WTS Large in order to ensure the correct environmental humidity control specification.

Why

To grant the continuity of humidifiers operativity and provide a high service level to the museum.

The CAREL proposal

The Courtauld Gallery is located at Somerset House, London. It is world renowned for its displays of priceless paintings and works of art. Humidity levels are critical, 50% relative Humidity (r.H.) must be constantly maintained, and are closely monitored to protect the exhibits.

CAREL was tasked to provide close control humidification for the galleries. Resistive humidifiers model heaterSteam with steam lances injecting steam into Air Handling Unit's coupled with Water Treatment System equipment was proposed to the client. This combination of equipment generates a very impressive +/-1 % controllability.

Isothermal technology

"heaterSteam"

Electric heater humidification is the ideal solution to meet the following requirements:

- use of steam;
- exceptional relative humidity control performance ($\pm 1\%$);
- a functional solution that is independent of feedwater characteristics;
- service continuity.



Technology: the air humidification technologies currently on the market have made a significant step forwards with the upgraded CAREL heaterSteam range of high-precision heater humidifiers, available in models from 2 to 80 kg/h. The product has been overhauled in every aspect, from its mechanical components to the new electronic controller with graphic interface based on the c.pCO platform. The new software functions make heaterSteam even more reliable and versatile, while its extensive connectivity allows seamless communication with any BMS system.

Steam distribution: heaterSteam can be used for humidification in the air duct, if used with the stainless steel distributors, or alternatively directly in the room, in combination with CAREL steam blowers.

Operating principle: heat is transferred to the water via the completely immersed heating elements. The solid state relays, managed by the PWM system with built-in humidity or temperature controller, modulate the quantity of heat delivered to the water so as to precisely control steam flowrate. The heating elements are made from titanium or Incoloy® 825, materials that are highly corrosion resistant, and feature an embedded PTC sensor to protect against overheating, for maximum reliability. These features mean heaterSteam is independent of feedwater quality, while ensuring very precise flow-rate modulation ($\pm 1\%$ RH around the set point).

Specific features:

- 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.

Water Treatment System technology

Supplied with mains water, it generates demineralised water with characteristics that make it ideal for use with humidifiers and evaporative cooling systems.

For heater or gas-fired steam humidifiers, the treatment minimises the buildup of mineral salts and fouling in the heat exchangers, increasing their working life: maintenance is reduced which in turn increases efficiency and optimum performance of the humidifiers.

Reverse Osmosis: It is a technique by which the water to be purified is pumped at high pressure through a semipermeable membrane, whose pores measure less than 0.001 μm in diameter: most of the dissolved ions are filtered by the membrane, producing extremely pure water. The removal of minerals, measured as a percentage of the original content, varies from 95% to 99% and even higher. Automatic operation and limited running costs extend the use of this technology, with undisputed advantages.

Available models:

- WTS Compact: developed for treating water intended for use with humiSonic and heaterSteam humidifiers and small atomisers.
- WTS Large: is suitable for higher-capacity steam humidifiers, such as gaSteam, and for the entire range of adiabatic devices.



WTS Compact

WTS Large

CAREL's simplified maintenance proposal

CAREL UK originally supplied replacement humidifiers and associated Water Treatment equipment in 2019 to maintain and control humidity levels in the Art Galleries, each unit is installed on air handling unit equipment located in various plant rooms throughout the building. The Humidifier Planned Preventive Maintenance contract was awarded to CAREL UK in 2021, the client's main reason for mobilising CAREL Services was mainly because they demonstrated extensive knowledge, experience, trust and support. The remit was simple, to maintain the CAREL heaterSteams and Water Treatment System equipment to a very high standard that is expected from a global leader in humidification.

Activities involved

Attention to detail when servicing, forward PPM planning, polite, knowledgeable, skilled, punctual engineers and the flexibility to attend site at short notice are just some of the requirements set out by the client. The critical application meant that if any fluctuations in humidity control occurred then prompt action can be called upon. The client opted for six maintenance visits per year, this enabled CAREL to structure the maintenance to give full support throughout the year. Based on the professional services provided the annual maintenance contract has been renewed year on year.

Services organisation

CAREL UK service is second to none, the service department utilises an in-house service team and service partner network to ensure that humidifiers run at their optimum levels, with good levels of service stock available at short notice. Our service engineers are experienced and knowledgeable in all aspects of humidification and water treatment and are certified and constantly updated to analyse the general conditions of units and components and implement corrective or preventive actions to keep them working efficiently to protect the customer's investments.



WTS Compact installation (up)



WTS Large installation (down)

Conclusions

At the end of the project, the customer achieved the following results:

- guaranteed correct operation over time;
- protected performance;
- extended product life;
- faster resumption of operation;
- reduced management costs for unexpected events;
- guaranteed service times;
- CAREL genuine original spare parts.

If you have any servicing/maintenance, installation or commissioning requirements for CAREL group humidifiers, please contact your nearest CAREL branch for more details. E-mail and phone contacts at <https://www.carel.com/branches>.



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