



where

Torre Realia

Plaza Europa, Barcelona - Spain

what

gaSteam installation

- 6 HD003 units supplied with treated water

why

- Cost saving: savings in electricity bills;
- Precision of $\pm 2\%$ RH: continuous modulation from 25 to 100% (12.5% for 180 kg/h model);
- Reliability:
 - boiler and components in contact with water, in AISI 304L stainless steel
 - preheating function for a faster response
 - frost protection function
 - easy to clean
 - supplied with mains or demineralised water;
- Green solution: low NOx emissions.

Office comfort: air humidity control using gas-fired humidifiers. Torre Realia, avant-garde office architecture.

Torre Realia BCN is part of the emblematic construction that has become the symbol of the new Barcelona financial district. The buildings were designed as complementary sculptures, with organic and supple forms, by architect Toyo Ito, in collaboration with Fermín Vazquez. The Torre Realia building has 24 floors used as offices; construction was completed in May 2009, after three years' work.

The building has a total floor area of around 45,420 sq.m, and is 110 metres tall.

It is a cutting-edge construction built using the latest technology, designed to improve the everyday life of the people who work there.

To ensure an optimum work environment inside the offices and consequently the best possible conditions for the personnel, Carel was asked to install a specifically-designed humidification system.

Given the specifications and the size of the building and to meet energy saving requirements, together with design firm Cofely - which also dealt with system installation - it was decided to use a product that exploits the affordability of gas, a fuel already used in the building for other applications, thus installing 6 gaSteam units. The price gap between gas and electricity in fact makes gaSteam the ideal choice for these types of installations, where steam is needed many hours a day, allowing savings running into the thousands of euros every year.



A healthy and comfortable work environment

As on a normal day workers spend a lot of hours in the office, it is essential to ensure a comfortable and welcoming environment, so as to both improve work conditions and avoid health problems.

Indeed, air that is too dry as a result of central heating causes unpleasant feelings of tiredness, dryness of the throat, hands and eyes, as well as increased dust levels in the air, which can cause allergies and exacerbate seasonal illnesses.

This installation guarantees optimum comfort, keeping relative humidity at an acceptable level of around 40-60%. The building is served by 4 air handling units (AHUs), which are fitted with the gaSteam units in the humidification compartment, in accordance with required technical specifications.



Gas-fired isothermal humidifiers

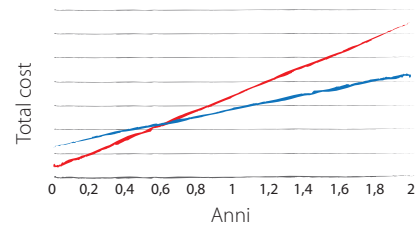
The isothermal humidification process involves production of steam by boiling water.

This procedure requires energy input from an external source (in this case gas) for the water to change state.

Steam humidifiers guarantee maximum hygiene, as boiling water produces aseptic steam (drinking water is always recommended to supply the humidifiers).

Moreover, one of the main factors when choosing an isothermal humidifier is energy cost. To generate 1 kg of steam at atmospheric pressure, keeping in consideration all the various factors, requires around 750 Wh of energy, either from electricity or other sources. The use of the gas as the energy source is thus an ideal solution in places where this costs less than electricity.

Comparison between a traditional electrode humidifier and gaSteam



— gaSteam

— traditional electrode humidifier

Values used: electricity 0.15 €/kWh, gas heat value 31.75 MJ/m³, cost of gas 0.7 €/m³



gaSteam



Temperature and humidity probe in the duct

Unique features of gaSteam humidifiers

gaSteam humidifiers have very high overall thermal efficiency, meaning the units fully exploit the affordability of gas. The stainless steel heat exchanger guarantees an efficiency of around 94-96%. gaSteam can operate on mains or demineralised water (from RO), the latter being more costly but means less scale formation due to the softer feedwater, and less maintenance. In Torre Realia, treated water is used to supply the gaSteam units as the mains water in Plaza Europa, where the building is situated, has a very high conductivity (1300/1800 $\mu\text{S}/\text{cm}$) and is very hard (300-350 ppm CaCO_3 eq), and moreover typically has a very high chlorine content. The main features of gaSteam are summarised in the following table:

Features	UG045	UG090	UG180
Rated steam production (kg/h)	45	90	180
Modulation of steam production	25%...100%	25%...100%	12.5%...100%
Heat input to burner (kW)	34.8	65	130
Heat output converted to steam (kW)	33	62.5	125
Single-phase power supply	230 Vac (-15%...+10%), 50/60 Hz		

The control system directly detects the flame, guaranteeing maximum reliability and safety. In addition, when required, the system automatically reignites the flame or closes the gas supply. The controller with intuitive graphic interface, settable in 5 languages, features a "quick set" screen to guide users through the initial configuration of the humidifier.



Flame safety and control



Electronic controller



Heat exchanger

A powerful and complete solution

Torre Realia has been installed with four 180 kg/h, one 90 kg/h and one 45 kg/h unit, divided as follows:

- basement: 2 UG 180 kg/h, 1 UG 90 kg/h, 1 UG 45 kg/h;
- roof: 2 UG 180 kg/h.

The humidifiers installed on the roof are also fitted with rain protection covers designed for outdoor installations, to further protect the units.

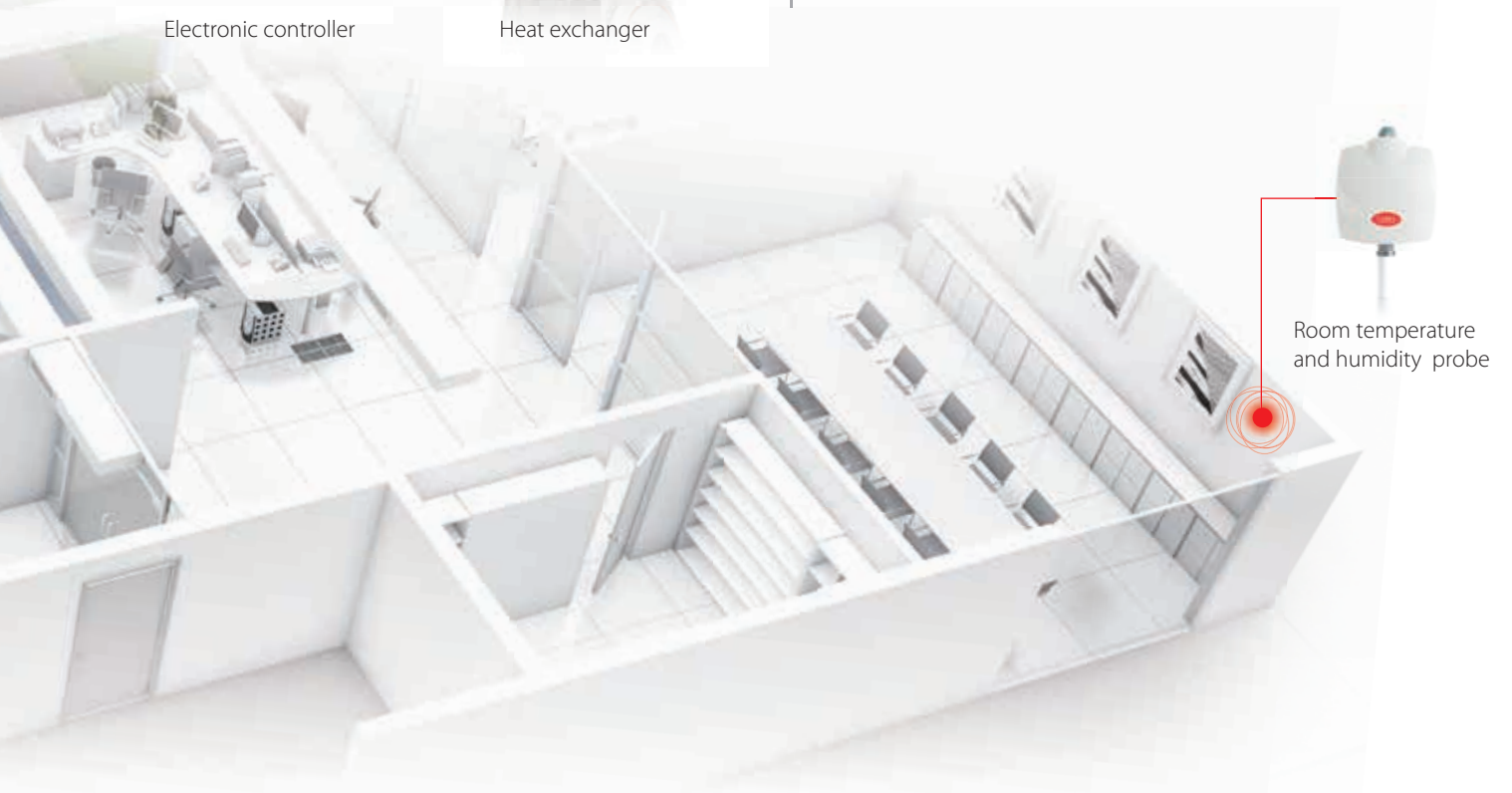
To reduce gaSteam demineralised water consumption, the right balance has been found between performance and feedwater demand, setting the parameters in accordance with the specific requirements of the customer.



gaSteam installation in Torre Realia

P/N	Description	Qty
UG180HD003	180 kg/h gas-fired humidifier	4
UG090HD003	90 kg/h gas-fired humidifier	1
UG045HD003	45 kg/h gas-fired humidifier	1
DP125D40R0	Steam distributor: 40 x 1250 mm	20
DPDC111000	Temperature and humidity probe	6

Finally, also supplied were the steam distribution hoses and the condensate drain lines, and Carel Iberica handled the commissioning stage.



Room temperature and humidity probe

Conclusions

For Torre Realia, a complete air humidification system was required, with special focus on energy saving and suitable for such a large construction, keeping down installation costs and above all running costs. Six gaSteam humidifiers were supplied, units that ensure significant savings in terms of energy costs, while guaranteeing an optimum and comfortable work environment. The ventilation and air-conditioning system is switched on just before opening times, completely independently, and likewise is switched off at the end of the working day, thus avoiding unnecessary operation when the offices are closed. Moreover, the units operate on demineralised water, meaning less maintenance is required and thus further limiting running costs.

The design was managed in collaboration between Carel Iberica, under the supervision of Elvi Macario, and Cofely, a leading Barcelona that design firm works throughout Spain and abroad (for example, in France and Italy). The firm knows Carel's products very well, having worked with us for some time now, and is especially interested in the potential of gaSteam.

The customer is very satisfied with the work done, the service provided by Carel and operation of the units.



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