



Condair Dual hybrid humidifier

ELBPHILHARMONIE, GRAND CONCERT HALL

Top climate for top concert experiences

After a construction period of around ten years and a total investment of more than 800 million euros, the Elbphilharmonie Hamburg was officially opened in January 2017.

As a new landmark of the Hanseatic city, the spectacular 110-metre-high building with 1,100 double-glazed elements combines three concert halls, a hotel, 45 luxury apartments, restaurants, a public plaza with a panoramic view and a multi-storey parking lot.

Humidification, dehumidification
and evaporative cooling

Architect

Herzog & De Meuron

Subsegment

Concert Hall

Product

Condair Dual

Year of installation

2016

A clear goal was set for the Elbphilharmonie: To create a concert hall that would be a world-class venue from the very first note of an orchestra. At the heart of the huge overall project, in which more than 100 HVAC units, over 1,900 fire dampers and 425 individual room control systems were installed, is the 25 m high Great Concert Hall.

There are 2,100 seats in the Great Hall, arranged in several terraces around the central stage. This means that no audience member is more than 30 meters away from the conductor. To create a perfect sound experience in the Great Hall, Swiss architects **Herzog & de Meuron Architekten** and acoustician Yasuhisa Toyota developed a unique wall and ceiling structure especially for the Elbphilharmonie.

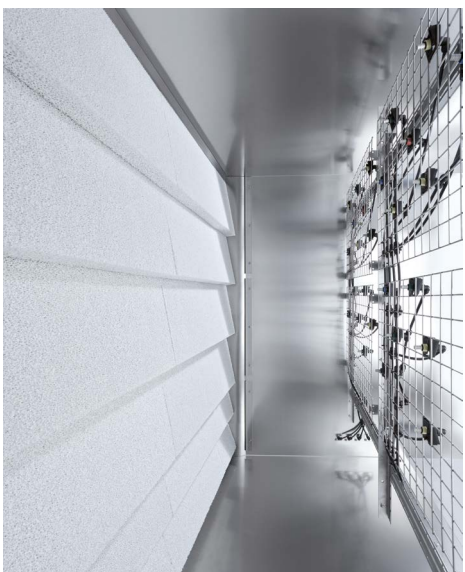
Air conditioning systems for maximum comfort

Just like the architecture and acoustics, the ventilation and air conditioning systems for the Great Hall also meet the highest standards. The systems have to fulfill two essential tasks:

- Tight limits for air temperatures, humidity, air quality and air velocities must be maintained throughout the entire hall, but especially in the stage and orchestra area, all year round. All air parameters for the singers' voices, for the musicians, for the often extremely valuable instruments and also for the furnishings of the Great Hall (wood, plasterboard) must always be within an optimum range.
- At the same time, optimum thermal comfort and air quality should also be ensured for visitors to ensure the best possible concert experience.



During a concert, each of the 2,100 seats is supplied with draught-free supply air via a combined swirl/swirl diffuser



Interior view of a hybrid humidifier



Grand concert hall

The planning realization of these requirements was entrusted to the specialist engineers of the m+p Group. Dipl.-Ing. Jörg Kegel from m+p, who helped plan and supervise the Elbphilharmonie project, explains why the following solutions were chosen:

To ensure the best possible thermal microclimate and good air quality for every visitor, there is a combined displacement/swirl diffuser under each of the 2,100 seats in the Great Hall. The supply air is blown in from each of these diffusers in such a way that there are no draughts for visitors.

For these tasks, a nominal outside air volume flow of 65,000 m³/h per unit is conditioned year-round in two identical central air conditioning units, so that the supply air always flows into the main hall at a set temperature of around **20 to 21 °C and a relative humidity of around 40 to 50 %**.

All air conditioning systems in the concert areas must operate inaudibly. In addition to extensive sound insulation measures in the air conditioning units and at the air diffusers, all air ducts were also thoroughly soundproofed. The systems are controlled by sensors for temperature, humidity and air quality, which are positioned at various points in the main hall and connected to a comprehensive building automation system.

Air conditioning

The following components, among others, are used in the air handling units to condition the outside air for supply air:

- high-quality two-stage filtering of the outside air
- a multi-functional closed-circuit system (CCS)
- reheater/cooler
- hybrid humidifier
- indirect evaporative cooling on the extract air side
- frequency-controlled centrifugal fans with flat belt drive

The Condair Dual hybrid humidifiers

A total of **eight Condair Dual hybrid humidifiers** are used in the Elbphilharmonie project. The units work to humidify the air in the Great Hall as well as in the air conditioning systems for the Small Hall and the associated foyers, the rehearsal rooms and the backstage/administration areas and have nominal

humidification capacities of **90 to 550 kg of water per hour**. Frequency-controlled **reverse osmosis system with Condair AT2 constant pressure control and an output of 1,250 liters of water per hour** is used to produce hygienically perfect humidification water with minimized energy requirements.

By combining the humidification methods of atomization and evaporation, the Dual Hybrid humidifiers are able to work **cost-effectively** and effectively prevent the proliferation of germs thanks to the **“Hygiene Plus Concept”**.

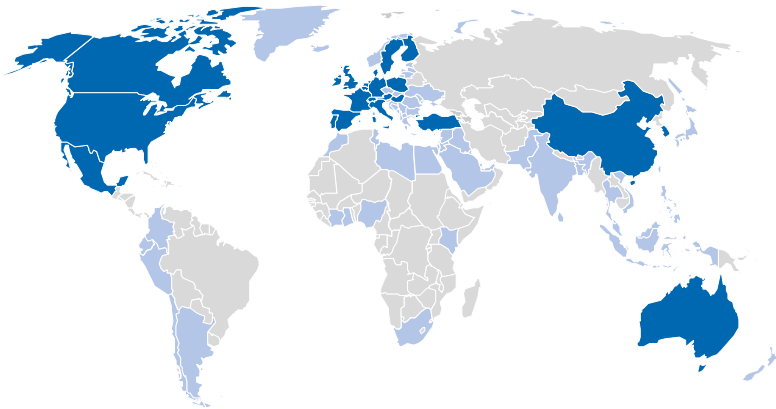
The optimized molecular atomizer nozzles spray the ceramic evaporator leaving no blind spots. This ensures optimal utilization of the humidification water and high humidification efficiency. The air exiting the humidifiers is aerosol-free and hygienically humidified.

Condair Group,

Condair Group, founded in 1948 and based in Switzerland, is the global leader in humidification and a leading manufacturer of dehumidification and evaporative cooling systems.

Supported by science, we engineer individual, holistic solutions that customers can trust through the entire lifecycle. With optimal humidity, we increase productivity and create healthier built environments.

Condair Group has production sites in Europe, North America and China, its own sales and service organizations in 23 countries, and representatives in 50 locations worldwide.



75+ Years of Industry Leadership in humidification and evaporative cooling solutions



Global Sales and Service offices in 23 countries



Worldwide coverage with operations and support in over 50 countries



Swiss-Made Quality designed and manufactured with high precision and quality standards



Broad Product Range across steam, adiabatic, and hybrid humidification for diverse applications



Energy-Efficient Solutions that reduce energy consumption by up to 80 %



Certified Health and Safety Compliance meeting strict international health and safety standards (ISO 9001, ISO 14001)

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