

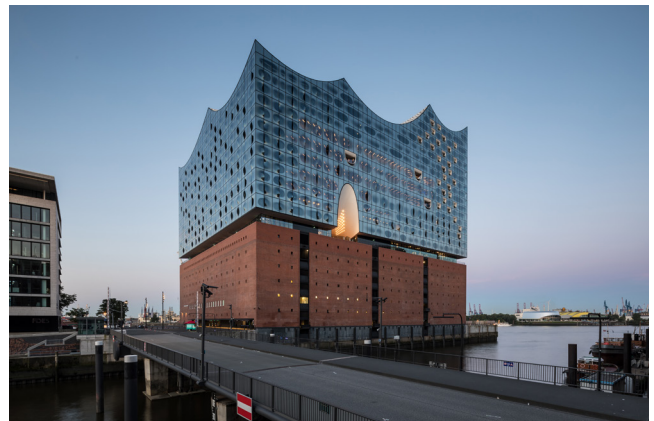


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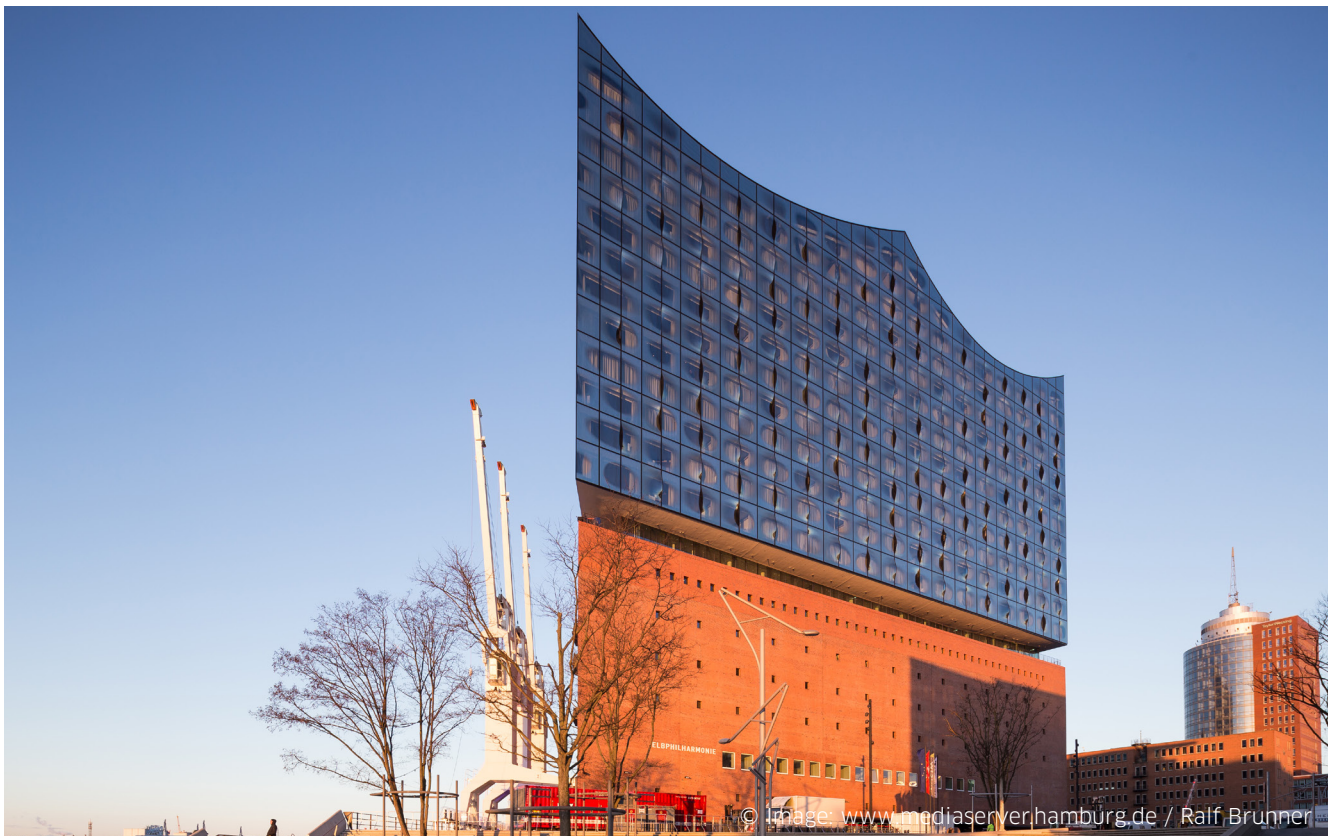
QUANTUM chillers in operation: perfect cooling for the Elbphilharmonie

The final chord fills the Grand Hall, the audience of 2,100 applauds enthusiastically and then, filled with satisfaction, exits from the Elbphilharmonie. While the musicians give their excellent performance in full view, the building technology provides an equally remarkable performance in the shadows. And that is a good thing. The building's cooling system at the Elbphilharmonie needs to be extraordinarily quiet, for example, so as to avoid interfering with concerts – and this cooling is provided by two QUANTUM chillers.

The Elbphilharmonie in Hamburg is one of the most spectacular buildings in the world. The glass facade of the concert hall rises 110 metres above its brick base, the historic Kaispeicher. In the first year after its inauguration in January 2017, 850,000 people experienced 600 concerts, while more than 4.5 million visitors enjoyed the view from the plaza at a height of 37 metres. The new Hamburg landmark, designed by Swiss architects Herzog & de Meuron, features terraced seating for 2,100 people around the stage in the Grand Hall, a multipurpose Recital Hall with 550 seats and several Kaisudios.



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Whisper-quiet climate with QUANTUM chillers

The building is cooled by two QUANTUM chillers, each with a cooling capacity of around 2,100 kW. Situated in the basement, their noise level of 75 dB(A), measured from one metre away, is so quiet that interference with concerts is impossible. In spite of their huge performance, the two chillers develop no more noise than a single standard car at medium performance.

Their ability to provide quiet cooling was the reason that the Elbphilharmonie chose us for this order. QUANTUM chillers also generate so little structure-borne sound that a coin stood on its edge on the appliance frame during operation will not fall over. The entire system has run well and without disruptions since it was put into service in autumn 2016.

Special feature: Water from the Elbe

For cooling water, the QUANTUM chillers use brackish water from the inner harbour. For this reason, the chillers are fitted with a particularly corrosion-resistant condenser with copper nickel pipes, which are cleaned automatically at regular intervals with a special brush system. The temperature of the cooling water returning to the Elbe must not exceed 28 °C. That is why the chillers use a special condenser with only one pass, which creates a minor temperature difference from a large volume of water flowing through. This allows the chillers to give their maximum cooling performance with water from the Elbe as long as the Elbe water temperature does not exceed 24 °C. Only at higher temperatures does the cooling system fall back on more expensive groundwater, for which several boreholes have been created. Using water from the Elbe considerably reduces the running costs of the Elbphilharmonie.



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