COFELY PROVIDES WHISPER QUIET AIR CONDITIONING IN BAMBERG.

The QUANTUM chiller for the Bamberg Concert and Congress Hall is extremely quiet and efficient.

Unique sound experiences and atmospheric listening pleasure from symphony orchestras, booming basses and screaming guitar notes at rock and pop concerts, alpenhorn and zither players at folk music events, artists and comedians: there is room for special evenings at the Bamberg Concert and Congress Hall, Outstanding acoustics and state-of-the-art stage technology provide ideal conditions for shows, musicals, concerts and word acrobats. There is enough room for them including the Joseph-Keilberth Hall (1,376 seats) and the Hegel Hall (668 seats),. And while hearing melodies from stage, QUANTUM provides silently the comfortable climate for each event.

Technical Data						
Refrigeration capacity	%	100	75	50	25	6
Refrigeration capacity Q_0	kW	615	461	308	154	37
Condensing capacity Q_k	kW	723	527	344	168	42
Power consumption	kW	108	66	36	15	5
COP (see Fig. 2)		5,7	7,0	8,5	10,6	7,4

Figure 1: *Technical Data: QUANTUM X060-P2C-LL Turbo chiller with cold water temperatures of 12/6 °C and cooling water temperatures 26/32 °C, decreasing cooling water entry temperature in part load operation.*

STATE-OF-THE-ART TECHNOLOGY – DECIDING FACTOR FOR THE QUANTUM CHILLER

Cooling is needed for the air conditioning of the concert halls, the adjoining rehearsal rooms and the foyer in the Bamberg Concert and Congress Hall. The former refrigeration plant was defective and would have needed cost-intensive repairs. Furthermore, the refrigerant was no longer allowed by law. The customer's main demands for the new plant were operational reliability, a future-proof refrigerant, very good part load efficiency, low maintenance costs and quiet operation. The new refrigeration plant had to be fitted into the existing air conditioning system and, last but not least, the reduction of energy consumption was an important criterion. With its new QUANTUM generation, COFELY REFRIGERATION generates extremely quiet refrigeration in Bamberg . The sound level is significantly reduced due to the magnetic bearings on the drive shaft. This results in flexible installation options and low installation costs because of the absence of additional noise reduction measurements.

EFFICIENT PART LOAD BEHAVIOUR

Most of the time, a building is cooled in partial load, as the load profile depends from the ambient temperatures and the outside climatic conditions. The chillers rarely run at "full speed". QUANTUM achieves the best efficiency and the highest COP values in partial load operation. Up to 50 % of the energy costs can be saved using this phenomenon (see Fig. 2).

COFELY
GDF SUEZ

Outstanding COP values

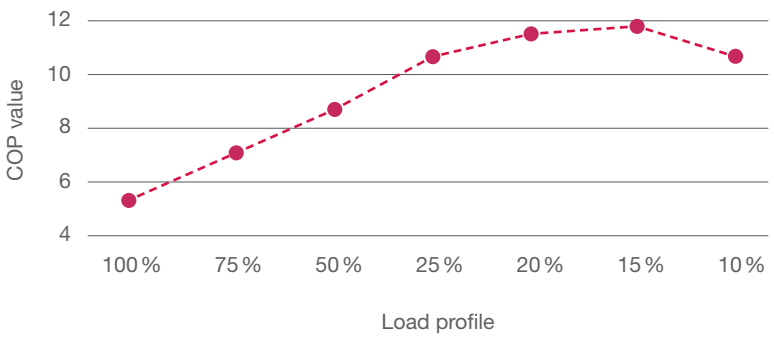

Figure 2: *Data for the QUANTUM X060-P2C-LL chiller used at the Bamberg Concert and Congress Hall. Energy efficiency, outstanding part load efficiency and variable speed regulation lead to very good COP values.*

Comparison of maintenance costs

Extremely low maintenance costs present a persuasive argument in favour of a QUANTUM chiller.

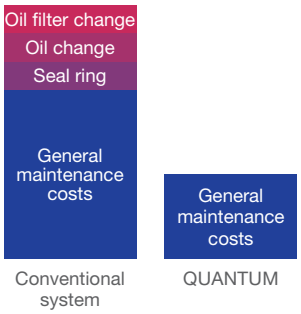

Figure 3: *Comparison of maintenance costs for a conventional system and QUANTUM*

WHISPER QUIET OPERATION

The low sound pressure level and practically vibration-free operation requires only a simple on-site construction and minimal noise reduction measurements. An ideal condition for the noise-sensitive Concert and Congress Hall.

LOW MAINTENANCE COSTS

Service costs for the QUANTUM decrease about 35 % compared to a conventional screw or piston compressor. The reason is the the oil-free QUANTUM chiller has only few wearing parts. It does not need any components for oil circulation and cooling or any oil-related maintenance (see Fig. 3).

SUSTAINABLE REFRIGERANT R134A

The QUANTUM operates with the safety refrigerant R134a. The approval from the EU for the use of R134a in stationary refrigeration plants is not limited. The QUANTUM chiller can hence continue to be operated in compliance with the law in future. This was one of the most important requirements for the Bamberg Concert and Congress Hall.

IMPLEMENTATION

In July 2007, a renting chiller from COFELY REFRIGERATION satisfies the cooling demand of the Concert and Congress Hall. The cold and cooling water piping was reconstructed in October so that the QUANTUM chiller could be connected easily at the end of October. For bringing the chiller into the building, the existing entry shaft was used. Most of the time was spent on the removal and the reinstallation of the piping. After the electrical connection of the chiller, the integration to the building management system followed. The entire implementation took two weeks.

Dimensions, weight and filling quantities

- L× W × H: 3,600 × 1,130 × 1,900 mm
- Transport weight: 2,610 kg
- Operating weight: 2,930 kg
- Refrigerant filling R134a: 150 kg
- Sound pressure level at 1m distance according to DIN EN ISO 3744: 70 dB(A)
- Sound power level according to DIN EN ISO 3743-1: 89 dB(A)

Customer

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SHG Stadthallen GmbH
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Planning and execution

Amt fuer Gebaeudewirtschaft
Pfeuferstrasse 16
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