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COFELY KEEPS WDR COOL AROUND THE CLOCK.

QUANTUM ensures reliable broadcasting at WDR in Cologne.

The radio station “Westdeutscher Rundfunk” is the largest from nine regional public broadcasters belonging to Germany’s most important public broadcasting organisation ARD. The WDR provides high-quality viewing and listening with six radio stations, 1Live, WDR2, WDR3, WDR4, WDR5, the European Broadcasting Centre, WDR Television, and also numerous other local studios.

COOLING SUPPLY SECURITY

The five chillers operated by the WDR broadcasting station were- for economic and environmental reasons- replaced in 2008 by two water-cooled QUANTUM B210 chillers from COFELY REFRIGERATION with seven compressors each. The objectives of this replacement were mainly the supply security for the WDR’s increasing cooling demand and the energy efficiency optimisation. Both aspects are highly important for the WDR. Broadcasting around the clock, the chillers have to ensure continuous air conditioning in the WDR building complex, especially inside the radio and television studios.

| Technical Data | | | | | | |
|---------------------------|----|-------|-------|-------|-----|----|
| Cooling capacity | % | 100 | 75 | 50 | 25 | 6 |
| Cooling capacity Q_0 | kW | 2.000 | 1.500 | 1.000 | 500 | 37 |
| Condensing capacity Q_k | kW | 2.378 | 1.714 | 1.103 | 547 | 42 |
| Power consumption | kW | 378 | 214 | 103 | 47 | 5 |

Figure 1: Technical data for the Turbo Chiller QUANTUM B210-P7C-LL at cold water temperatures 12/6 °C and cooling water temperatures 26/35 °C.

CONVINCING SECURITY AND EFFICIENCY

The new QUANTUM technology convinced the air conditioning engineers of WDR Gebäudemanagement GmbH for several reasons:

Security. The WDR is obliged by law to be capable to broadcast 24 hours a day. The QUANTUM’s low start-up current ensures that the network is not overloaded in case of using the emergency power supply.

Excellent part load values. Adjusting to external climatic conditions, air condition cooling operates in partial load mainly and therefore rarely runs at “full speed”. Because of the high

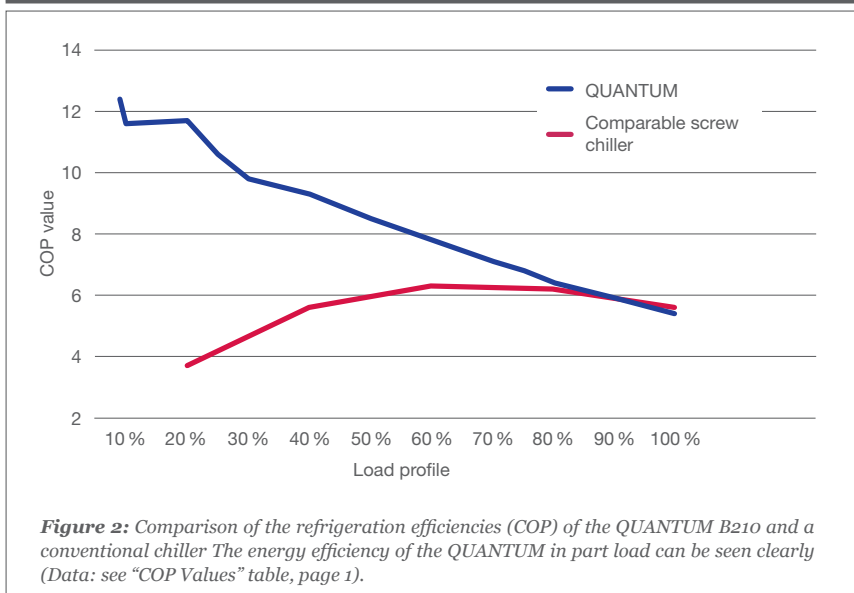
COP values in part load operation, the QUANTUM chiller is able to reach a very high efficiency here (see Table and Figure 2).

| COP values | | |
|------------|---------|--------------------|
| Load | QUANTUM | Comparable chiller |
| 20 % | 11,7 | 3,7 |
| 40 % | 9,3 | 5,6 |
| 60 % | 7,8 | 6,4 |
| 80 % | 6,5 | 6,2 |
| 100 % | 5,5 | 5,7 |

Thanks to their new QUANTUM chillers, the WDR was able to save a significant amount of energy costs in 2008. The additional investment costs for



Outstanding COP values



QUANTUM were paid off in 18 months approximately.

Low maintenance costs. Deciding for QUANTUM, the maintenance costs¹ have been reduced by approximately 65 % compared to conventional screw or piston compressors. The QUANTUM system is oil-free and has hence very few wearing parts. Components for oil circulation and cooling as well as all oil-related maintenance costs are obsolete.

Sustainable refrigerant R134a. The QUANTUM operates with the safety refrigerant R134a having unlimited approval from the EU for use in stationary cooling plants. This means the QUANTUM chiller can be operated compliant to the law in future also.

A SPECIAL CHALLENGE: INSTALLATION AND IMPLEMENTATION

The goods elevator in the WDR building was designed for a maximum load of four tonnes. A QUANTUM type B210 weighs 7.5 tonnes. After the factory acceptance test at COFELY REFRIGERATION in Lindau, the two chillers were transport-

Dimensions, weight and filling capacities

- L x W x H: 5,500 x 2,300 x 2,200 mm
- Transport weight: 7,720 kg
- Operating weight: 8,940 kg
- Refrigerant filling R134a: 750 kg
- Sound pressure level at 1-m distance according to DIN EN ISO 3744: 75.8+/-3 dB(A)
- Sound power level according to DIN EN ISO 3743-1: 93.7+/-3 dB(A)

ed to Cologne in separate modules. Thanks to the modular design, the machines could be brought into the cooling centre without any problems – one more argument in favour of COFELY REFRIGERATION. In January 2008, the QUANTUM units were integrated into the WDR's existing piping system and the QUANTUM control was adapted to the existing control system. The start-up followed in March 2008.

"In addition to the compressor redundancy allowing us a 24 hours and 365 days broadcast, the energy efficiency of the Quantum chiller was a crucial factor. We expect annual energy costs savings amounting to a five or six-figure sum. We were, and still are, very satisfied with the support from Cofely Refrigeration before, during and after the implementation."

Hans Kos
WDR Gebäudemanagement GmbH, Engineering and Planning Department, Technical Operations Cologne.

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