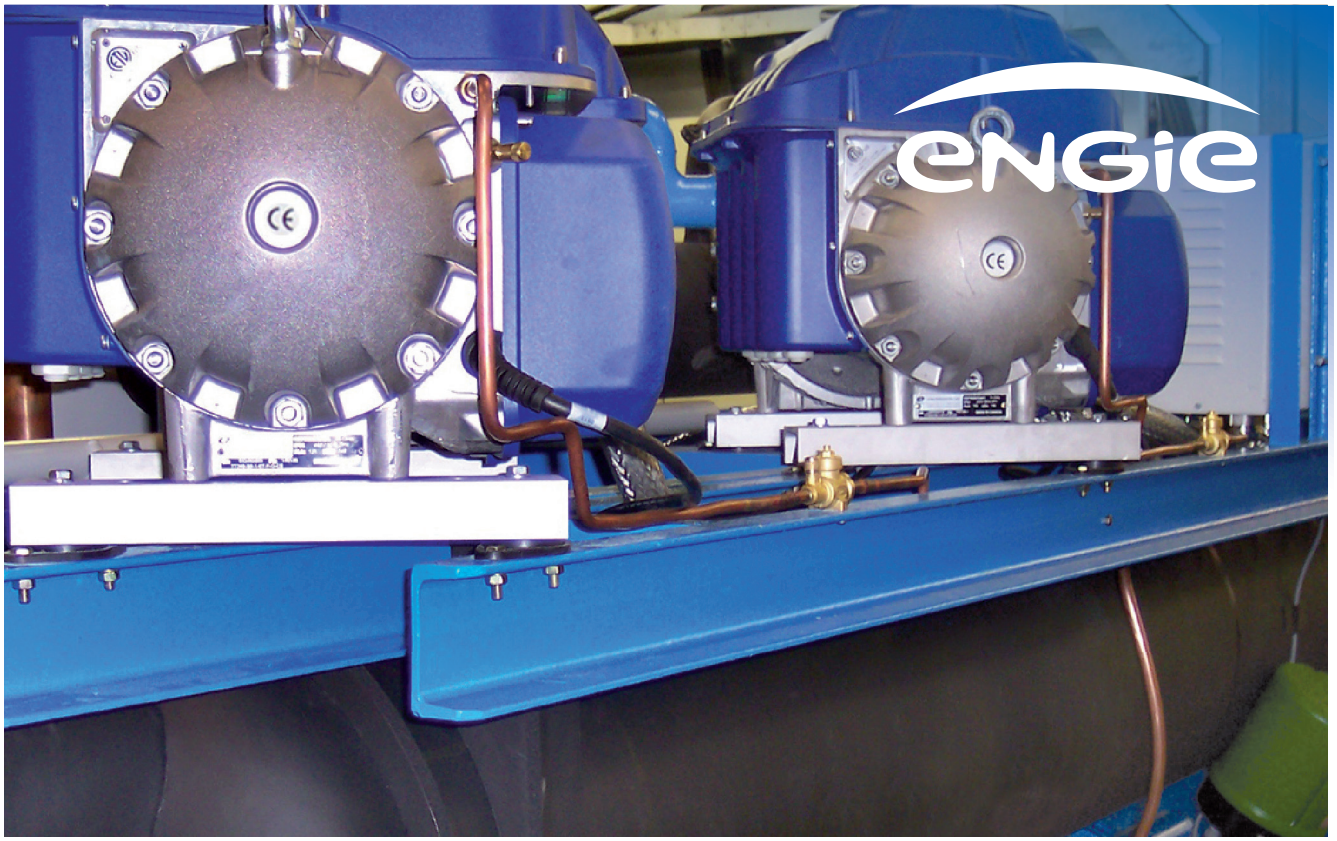


ENGIE Refrigeration Retrofits your Old Chiller.

The QUANTUM-Retrofit-Program saves energy and costs.

DRV, otherwise known as the Deutsche Rentenversicherung Rheinland, takes care of social security tasks in the Rhine and Ruhr area. As one of the largest German agencies representing public pension schemes for workers, the DRV is responsible for about 7 million people in North Rhine-Westphalia.

Project specifications and goals

The DRV Rheinland refrigeration system supplies its almost 2,000 employees in Düsseldorf with temperate facility con-ditions. Before ENGIE Refrigeration modernised, the existing system was faulty and caused high operation costs. The goal to modernise the existing system with the QUAN-TUM- Retrofit-Program included sinking operation costs and assuring a reliable cooling source. In the spring of 2006, the old system was transported to our factory in Lindau. The old compressor and machinery oil was disposed of pro-fessionally. The heat exchanger was sandblasted, primed, freshly painted and insulated. The next step involved the installation of three new 250 kW turbo compressors including pipes, cables and inspection.

To fix the exact dimensions of the existing machine was a special challenge. The guidelines were 180 × 490 × 180 cm. In order to meet these requirements, the compressor had to be mounted diagonally onto the machine's framework and the suction line led through a main pipe.

Through professional planning, the refrigeration system could also be integrated into the management building. The total renovation including installation only took about six weeks. On site, the changeover to the modernised refrigeration system went smoothly.

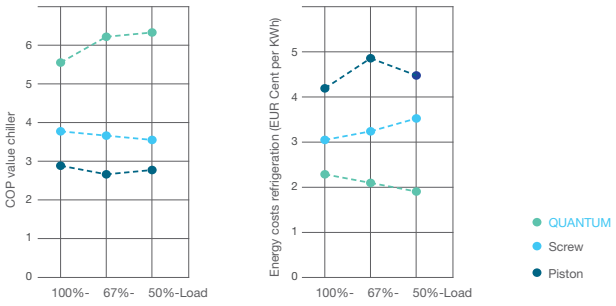
Reliable temperatures, lower operating costs

A considerable decrease in the yearly maintenance costs occurred as a result of modernising. This was realised by using magnetic bearing technology (see diagram “Maintenance costs”). In other words, the operating costs decreased so greatly that the modernisation costs amortised after only four years. This is especially apparent due to the energy efficiency of the chiller during partial load which at half-year could be run at only 100 kW.

Why ENGIE Refrigeration?

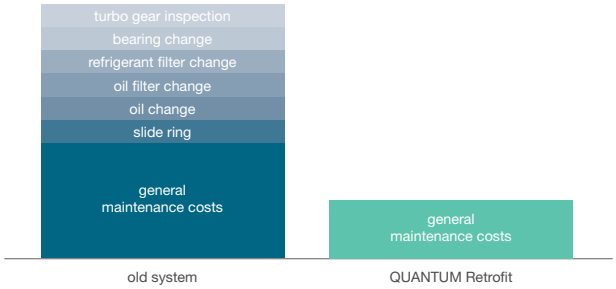
An alternative would have been to purchase a cold water unit. However, the QUANTUM-Retrofit offer was so convincing. Not only were low operating costs expected, but the existing hydraulics could also be saved.

Best COP-Values during partial load



QUANTUM’s energy efficiency during facility cooling in comparison to other compressor types. Up to 50 % better COP values (left) and about 50 % less generating costs (right). Data based on a four-month study of an actual system (cold water 13/7 °C, cool water 28/33 °C).

Maintenance costs before and after QUANTUM-Retrofit



The general maintenance costs are halved after modernising with QUANTUM-Retrofit. Due to the turbo compressor’s magnetic bearing, all other maintenance costs can be droped.

DRV-system with new turbo compressor.

DRV´s modern refrigeration control cabinet.

Customer

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Location

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