

GENERATION QUANTUM. THE NEW INDUSTRIAL REFRIGERATION STANDARD.

10 QUANTUM-Arguments to Your Advantage.

1. BEST ENERGY EFFICIENCY

- QUANTUM has shown COP values proving excellent energy efficiency. This degree of effectiveness especially during partial load offers a huge cost-saving potential.

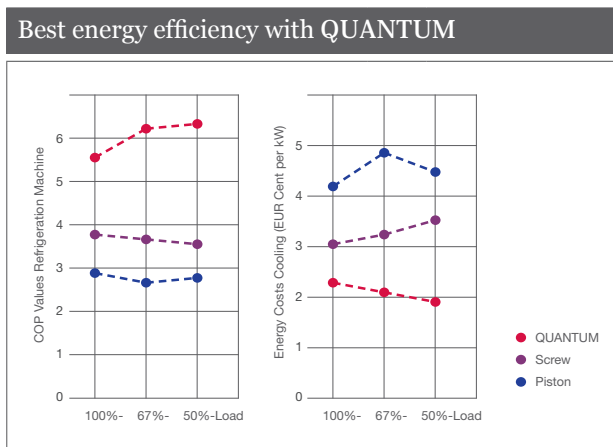


Diagram 1: Up to 50% better COP-values (left) and 50% less to generate cooling (right). Data based on a 4 month study of a real plant (cold water 13/7 °C, cooling water 28/33 °C).

2. CONTINUOUSLY VARIABLE CONTROL

- Ideal performance can be achieved through the stepless variable speed control. The individual compressors are separately turned on or off depending on the optimal COP.
- A wide power range allows for small proportions of storage which reduces the number of compressor motor starts.
- The exact maintenance of the cold water setpoint temperature enables a stable consumer network.

3. OIL-FREE COMPRESSOR WITH NON-CONTACT MAGNETIC BEARING

- Oil-related compressor components for circulation, cooling and filtration are unnecessary.
- No wear on the magnetic bearing. The degree of efficiency stays optimal. Service and maintenance costs are reduced with no need to change bearing.

4. GENTLE START UP

- The compressor starts gently and gradually. Start up needs 5 A at the most.
- The electrical supply remains stable, because the input power of the chiller increases steadily.
- A gentle start allows for small proportions of electrical storage and minimal safeguards.

No electrical peaks with QUANTUM

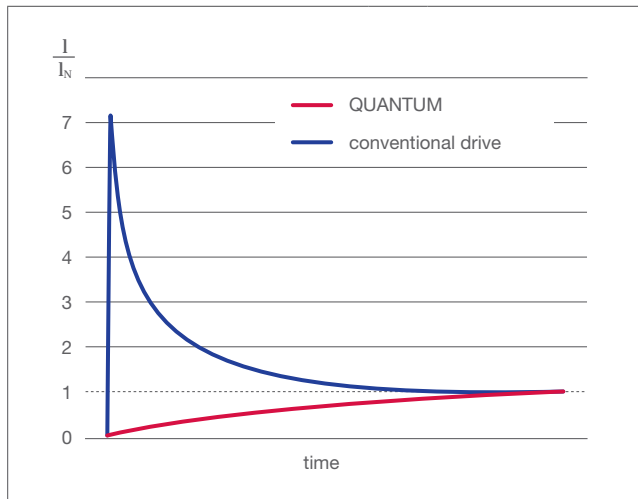


Diagram 2: Comparison of the electricity used between a conventional compressor and QUANTUM. No electrical peaks appear when QUANTUM starts.

5. MINIMAL NOISE AND VIBRATION

- The minimal noise level and practically vibration-free operation require no further reduction measures.
- There is no danger of refrigerant leakage or component damage due to vibration.

6. REDUCED CO₂ EMISSION

- Over 15 years, a QUANTUM compressor with a cooling capacity of 1,400kw will emit about 500 tons less CO₂ than a comparable aggregate. That would result in a yearly energy savings of 53,700kw. Better results can also be reached depending on application and model.

Minimal noise

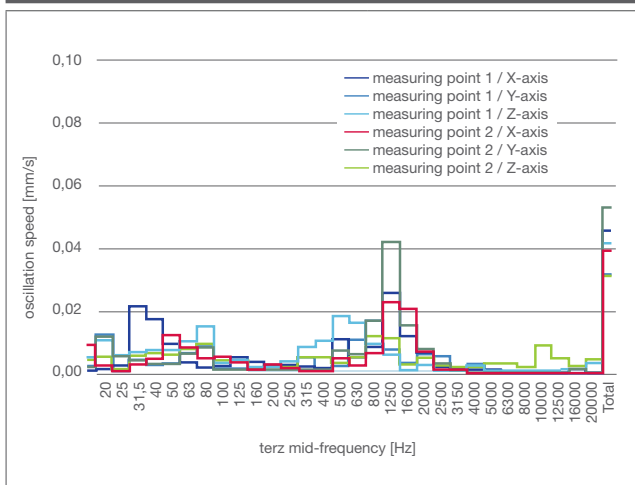


Diagram 3: Oscillation speed during function at mid-frequency. The VDI Regulation for normal operation is 4mm/s. QUANTUM measures at 0.04 mm/s, far below.

7. NO IDLE CURRENT COMPENSATION

- QUANTUM has a high performance factor ($\cos(\varphi)$ 0.98) and experiences almost no idle current. Expensive idle current compensation is not necessary. Conventional refrigeration machines performance decreases dramatically during partial load (<0.5 possible).

8. DEPENDABLE OPERATION

- The availability of a chiller with multiple compressors is considerably higher.
- In case of a compressor defect, the entire aggregate continues to operate.
- Compressor replacement is a simple process.

9. HEAT RECOVERY

- Due to high efficiency during partial load, heat recovery can be reduced. That saves electricity and water which reduces overall heat recovery operating costs.

10. SERVICE AND MAINTENANCE

- Not only electrical costs are minimal during operation. The easy servicing of a smooth running, oil-free system results in minimal maintenance costs.
- The simple construction allows for easy access to every component which makes service uncomplicated.

Total cost comparison after two years

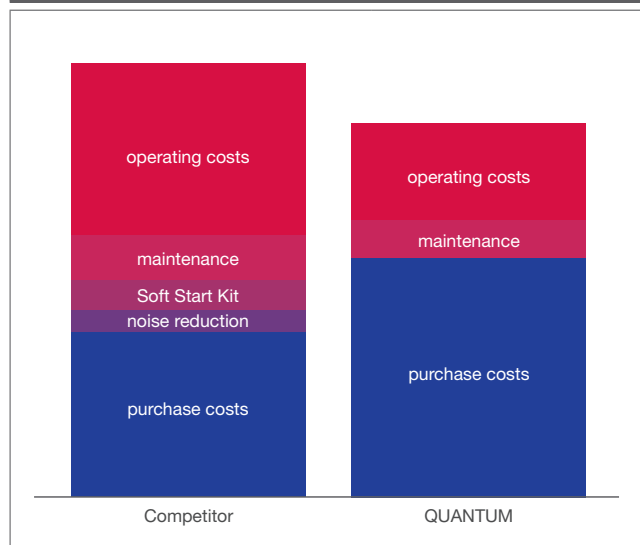


Diagram 4: In a comparison of QUANTUM and an equal product, the initial purchase cost of QUANTUM is higher. But after two years, QUANTUM's total costs are distinctly lower than the competitor (dependent on electricity costs and application).