Cooling systems

Cooling systems are an important element in many companies in Switzerland. Cooling capacity failure or decrease generally has an immediate effect on production, quality and storage – for manufacturing and chemical processes, food processing and logistics. At the same time, cold generation is an energy-intensive process with complex, expensive refrigeration networks and cooling units using sensitive substances (refrigerants).

This makes it all the more important to design the cooling system to the temperature level actually necessary and to operate it as required. Oversized units and cheap, inefficient components may prove expensive for operators, as many cooling systems run round the clock, 365 days a year. Measuring and evaluating daily, weekly and yearly cycles provide the basis for the optimisation or replacement of cooling systems. Load-regulated cold generation with efficient, frequency converter-driven motors offers the flexibility, to optimally meet varying requirements while ensuring energy-optimised operation.

Choosing the right compressor technology for a specific use is just as important as determining the driving motor. In Switzerland, IE3 motors (0.75 kW to 375 kW) are now required by law. The higher efficiency of an IE4 motor results in CHF 1280 of energy savings per year (example: 160 kW motor, 2 poles, efficiency class IE4 (96.3% efficiency) instead of IE3 (95.6%), operating hours 8 760 h/a, electricity price 12 Rp./kWh, full load). The payback of the additional cost of an IE4 motor is less than 4 years. Investing in more efficient components pays off as a rule, and the additional costs are recovered in just a few years' time.

It is, however, important to view the cooling system as a whole and to achieve the highest possible COP (Coefficient of Performance). Depending on the manufacturer, energy efficiency in this field can vary by ± 20%. Top priority remains to determine needs and compare offers afterwards. It is usual to have the manufacturer guarantee important key data of the plant and to check their achievement during the acceptance procedure. Every deviation costs the operator money – during every operating hour, over the entire operating lifetime of the system.

Industrial cooling system

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