

Success story

Efficient cooling
for CO₂-neutral energy concept

ewz relies on Endress+Hauser
measuring technology in the
Swiss Life Arena



Executive Summary

The Swiss Life Arena in Zurich is a multifunctional sports and event arena. It is considered one of the most advanced ice hockey rinks in Europe. This is also evident in the innovative energy concept, which, among other things, exploits synergies between cooling and the resulting waste heat. The central component is the cold generation. To monitor its efficiency, the energy service provider ewz relies on measuring technology from Endress+Hauser.





View into the energy center in the basement of the arena. Here, the cold for the ice rink, the air-conditioning cold for the dehumidification of the room air and the cold for surrounding office buildings are generated.

The customer requirement

The energy center in the basement produces the cold for the ice, the airconditioning cold for dehumidifying the room air, and the cold for surrounding office buildings. Ammonia is used as a natural refrigerant. The waste heat from the refrigeration systems is used for heating the arena and, in conjunction with a heat pump, for domestic hot water. The excess heat is transferred to the energy network Altstetten. For ewz, the efficiency of the system is of utmost importance. To determine the Energy Efficiency Ratio (EER), the ratio of the cooling capacity to the electrical power used by the compressor, exact and reliable measured values for the cooling capacity are required.



Matthias Eckerle

Project manager, ewz Swiss Life Arena

ewz plans, finances, builds and operates technical energy systems in the areas of heating, cooling, photovoltaics and electromobility for complex site and large-scale projects as well as for neighborhood and community energy networks throughout Switzerland. In the Swiss Life Arena project, ewz is responsible for the holistic, integrated energy solution.

“For us, one of the big challenges is coordinating and optimally aligning the building technology components whilst integrating the arena into the Altstetten energy network. During 30 years, we are ensuring the optimum operation of the building equipment. For this purpose, we need highly accurate measured values for cooling capacity and have found the ideal partner in Endress+Hauser.”

Our solution

Endress+Hauser offers a complete package for determining the efficiency of the chiller: In the gaseous phase between the evaporator and the compressor, the mass flow rate is measured using Proline Promass F 300. The Coriolis flowmeter convinces with its highly accuracy even when assessing demanding fluids and higher pressures. In addition, Cerabar PMP51B is used to measure the absolute pressure at two points: directly upstream of Promass F, and downstream of the compressor, on the high-pressure side. In the liquid phase between condenser and evaporator, the temperature is also determined using the TR15 resistance thermometer. The Memograph M RSG45 energy and data manager calculates the cooling capacity from the measured values and transmits it to the control system of the energy center via the Modbus TCP communication protocol. For this purpose, the mathematical data package supplied by Endress+Hauser and the formulas stored in it are used in the Memograph M RSG45.

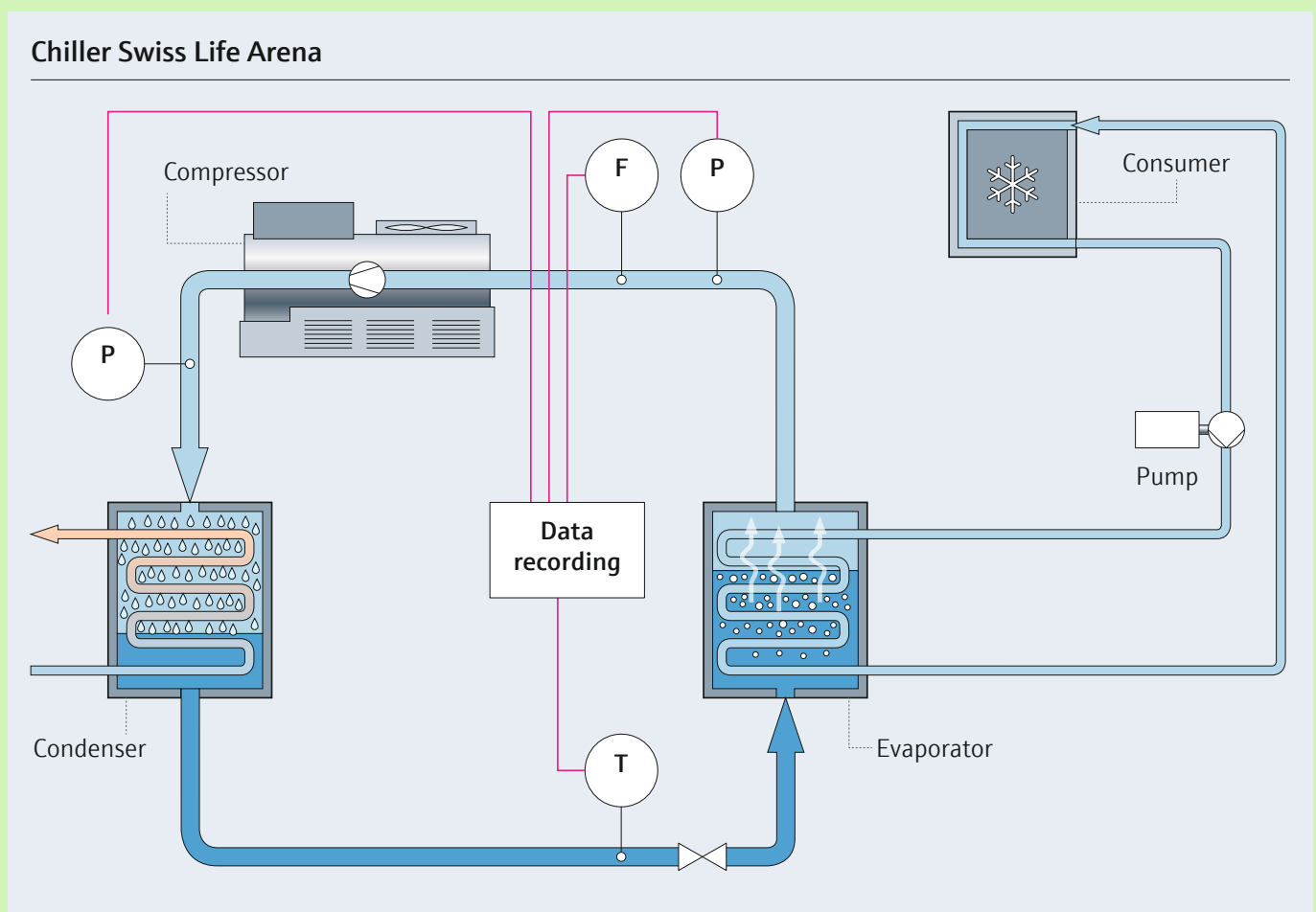


Measuring technology used: Proline Promass F 300, Cerabar PMP51B, Memograph M RSG45 and Resistance thermometer TR15 (from left to right)

The result

Highly accurate and reliable monitoring of cooling capacity for greater energy efficiency and optimized use of resources, thanks to robust technology from Endress+Hauser, which:

- is immune to fluctuating ambient conditions as well as high process pressures
- features a compact design and enables space-saving installation without inlet and outlet runs
- enables complex calculations and transfers the results to higher-level systems



Measuring point F: Proline Promass F 300; measuring points P: Cerabar PMP51B; measuring point T: Resistance thermometer TR15; "Data recording": Memograph M RSG45

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