

APPLICATION NOTE

PRECISE TEMPERATURE CONTROL FOR CLIMATE-FRIENDLY ENERGY TECHNOLOGY



Over 20 years of partnership: LAUDA process cooling systems in use at a leading energy technology group

A leading international energy technology service provider has relied on LAUDA process cooling systems for more than two decades for their reliability and precision. With a new framework agreement for over 100 systems, the company continues to rely on proven technology from Lauda-Königshofen – and on innovative net-zero solutions for more sustainable energy.

Long-standing partnership for sustainable energy solutions

The customer is one of the world's leading providers of energy technology services and an indispensable part of the global net-zero transformation chain. The company operates state-of-the-art production facilities at several sites in Germany, the Netherlands, the UK, and the USA.

Using highly efficient process technology, the group produces critical components for a sustainable energy supply world-wide that does not contribute to the greenhouse effect and the resulting global warming.

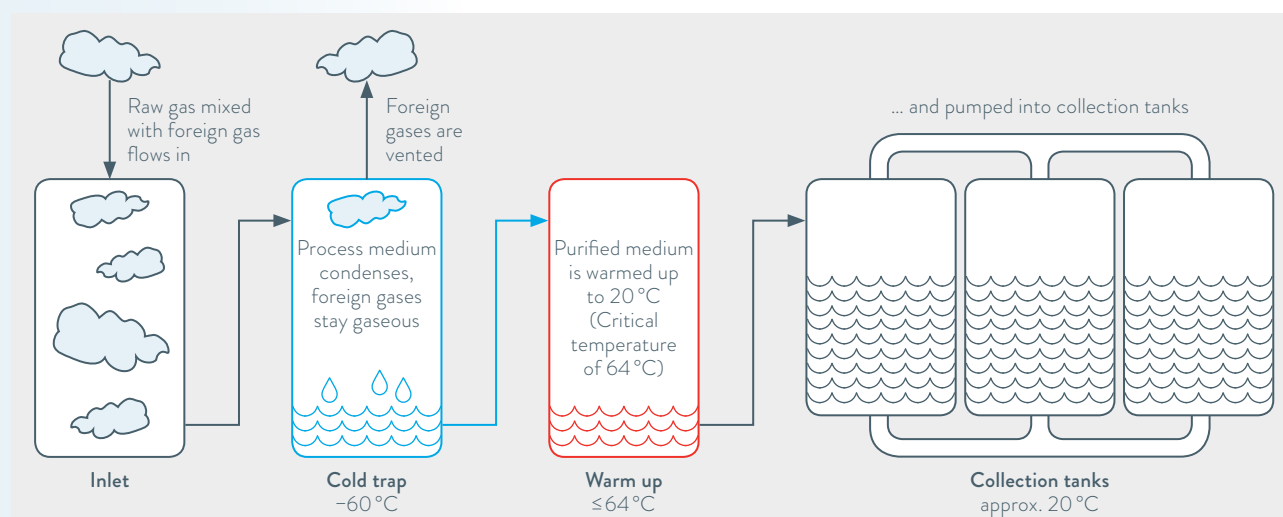
Since the early 2000s, several dozen LAUDA temperature control systems have been in use at the energy technology group. The process cooling systems have impressed with their exceptional reliability and durability – many of the systems originally installed have been running in continuous 24/7 operation for over 25 years. In addition to the gradual modernisation of its production facilities, the group is planning extensive capacity expansions at all its sites to meet the rising global demand for low-carbon energy generation. To this end, the company continues to rely on LAUDA as a trusted partner in temperature control.

Precision at extreme temperatures in continuous operation

The production of high-purity gases for energy generation places high demands on process temperature control. During the manufacturing process, gaseous process media must be purified of impurity gases such as nitrogen, oxygen and noble gases in order to achieve the required purity for further use in low-carbon energy generation.

This separation process takes place in so-called cold traps, which must be precisely and constantly maintained at -60°C . At this temperature, the process medium condenses on the walls of the cold trap and collects in liquid form at the bottom of the container, whilst the foreign gases remain in their gaseous state and can be vented. The purified medium is then reheated to room temperature and pumped into collection tanks.

Figure 1:
Gas separation process using a cold trap



Requirements for temperature control technology:

- **Temperature ranges:** Cooling to -60°C and heating to room temperature (approx. 20°C)
- **Temperature stability:** $\pm 1\text{ K}$ for consistent process results
- **24/7 continuous operation:** Running times of four to six months without interruption
- **Long operating times at partial load:** Constant temperature maintenance over several months
- **Process reliability:** High reliability to prevent production downtime
- **Safety aspect:** Limitation of the maximum heating temperature for safety reasons

The heating process is particularly relevant: for safety reasons, the temperature must not exceed the critical value of 64°C . At the same time, the systems must operate energy-efficiently and guarantee high availability over decades.



Figure 2:
LAUDA SUK
Process cooling unit with
ambient heating technology

The new LAUDA solution –

process cooling systems with efficient ambient heating technology for greater safety

LAUDA SUK process cooling systems are the central system for temperature control of the cold traps. They handle both precise cooling to -60°C and controlled heating to room temperature. A special feature of the systems developed for the customer is the ambient heating technology. Unlike conventional electric heating systems, heating here is energy-optimised via a finned heat exchanger through which ambient air circulates. This approach is not only energy-efficient but also ensures that the temperature can under no circumstances exceed the ambient temperature. Even in the event of a failure of safety mechanisms or other irregularities, this prevents the critical temperature of 64°C from being reached. This eliminates the need for the previously necessary and complex safety systems designed to prevent this critical limit from being exceeded. Fewer electrical heating components also mean a lower probability of failure. The SUK 150 systems developed for the customer also meet all other requirements for temperature stability, continuous operation and long service life.

Conclusion –

Trust built on decades of experience

The partnership between LAUDA and the company, spanning over twenty years, is impressive proof of the quality and reliability of LAUDA temperature control systems and of how technological excellence and continuous innovation lead to a lasting, successful collaboration. More than 300 systems, some of which have been running 24/7 for 25 years, speak for themselves. The new framework agreement for over 100 systems is not only a vote of confidence in proven LAUDA technology, but also a commitment to the future.

LAUDA demonstrates once again that precise temperature control is far more than just technology – it is the foundation for safe, efficient and sustainable production processes in demanding industrial sectors. This is entirely in line with the company's philosophy: ›Empowering Excellence. For a better future.«