

SUCCESS STORY



RETROFIT OF A FULL-PALLET HIGH-BAY WAREHOUSE IN A DEEP-FREEZE FACILITY

Quality Automation GmbH successfully completed the retrofit of two full-pallet high-bay warehouses for bofrost*, the European market leader in direct sales of ice cream and frozen foods, at their central site in Straelen. The project involved overcoming the demanding challenges posed by temperatures as low as -24°C in order to implement a future-proof storage solution. For bofrost*, maintaining uninterrupted delivery capability and supply security for the approximately 2.1 million customers served by 114 branches across Germany was of the utmost importance. After all, delivering top quality and excellent service has always been central to the company's philosophy.

Challenges of the Cold – Retrofit Under Extreme Conditions

The retrofitted bofrost* deep-freeze warehouse spans two separate storage zones, distributed over four levels, and offers capacity for approximately 4,500 pallets. Thanks to state-of-the-art conveyor technology, bofrost* can now automatically transport, relocate, and retrieve pallets. QA's task was to modernize the entire control system, replace the frequency converters for the drives, renew around 80 terminal boxes distributed throughout the warehouse, and update all supply lines – all within the

shortest possible downtime. Ensuring delivery capability and supply security for the 2.1 million customers served from 114 locations throughout Germany remained a top priority for bofrost*, and the targeted modernization ensures this will continue to be the case in the future.

A particular challenge was the extreme cold inside the bofrost* deep-freeze warehouse. To guarantee the consistent quality of its extensive range of frozen products, bofrost* maintains a closed cold chain all the way to the customer's doorstep. This includes cooling its cen-

CUSTOMER

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tral and regional warehouses, as well as specially equipped delivery vehicles, to temperatures as low as -24°C . All components and cables therefore had to be designed specifically for operation in these extreme conditions. Moreover, laying the cables was especially challenging, as conventional materials tend to become brittle at such low temperatures. As a result, special drag chain-compatible cables were used throughout the installation.

Step-by-Step Modernization Through Precise Preparation

The retrofit began with the smaller of the two warehouses, where 31 terminal boxes were replaced. To facilitate the work, bofrost* had proactively redistributed the goods stored in this area to other deep-freeze facilities on site, allowing the temperature in the unit to be raised to -10°C for the duration of the work. First, all outdated components were dismantled and replaced with modern hardware. Following the successful hardware installation, commissioning took place using the newly

updated software. The entire retrofit of this section took approximately three weeks.

Next came the larger full-pallet warehouse, whose retrofit was carried out in December 2024. Despite the complexity of the task, QA had only twelve days—between December 19 and December 31, 2024—to complete the project. This was the only available window for bofrosth to maintain uninterrupted delivery capability to its 114 locations across Germany and, in turn, to all its customers. Therefore, extensive preparations were made in advance while operations continued at a constant -24°C . These included:

All 48 newly installed terminal boxes were mounted and wired in parallel to the existing ones. During the design phase of the terminal boxes—as well as for all other components and supply lines—special attention was given to using plug-in connectors. This eliminated the need for manual wiring work with gloves under challenging conditions.

A new main control cabinet housing all components was also installed on an additional level. This strategic preparation enabled a rapid and efficient switchover to the new system within the limited retrofit timeframe.

Technical Implementation – Automation at the Highest Level

To realize this extensive project within the tight timeframe, QA deployed a strong on-site team: 2 mechanical designers, 4 software developers, and 8 electricians worked together on the implementation. Since the entire control system was replaced, our software team also had to migrate and optimize the complex existing software. A Siemens CPU was selected as the main control unit, while Bosch Rexroth devices were chosen for the drive inverters. Thanks to the experience of our programmers, these different systems were seamlessly integrated.

Safety and Specialized Equipment for Cold-Storage Operations

In addition to the technical execution,



safety played a central role throughout the project. Each terminal box was equipped with a smoke detector. QA staff worked with specialized clothing and gear designed for extreme cold, selected in consultation with bofrosth, whose deep-freeze expertise proved invaluable in ensuring safe and effective working conditions at -24°C .

Thanks to these comprehensive measures, Quality Automation was able to sustainably optimize warehouse logistics. As a result, both retrofitted full-pallet warehouses at bofrosth are now equipped with modern and future-proof control technology.

Celebrating Project Success – Joint Closing Dinner

Following the successful completion of the retrofit, all project participants came together for a joint closing dinner. In a relaxed atmosphere, the team celebrated the excellent collaboration and the challenges they had successfully overcome. The event provided a chance to reflect on the intense weeks of cooperation and to express mutual appreciation for the work accomplished. This informal gathering not only strengthened team spirit but also highlighted the strong partnership between Quality Automation and bofrosth — a fitting conclusion to a demanding and rewarding project.



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