

CASE STUDY

ENSURING SYSTEM RELIABILITY FOR LARGE-SCALE COOLERS WITH INNOVATIVE ICPs

GTH GEORGE T. HALL
COMPANY

THE CHALLENGE

Ensuring reliable control of large-scale custom coolers and cold rooms to protect millions of dollars of inventory and raw materials for companies in a variety of industries.

THE SOLUTION

Ace Coolers partnered with George T. Hall (GTH) to develop a custom industrial control panel (ICP) that provides real-time visibility into cooler / cold room operations, alarming, and system redundancy to ensure continuous, reliable cooler operation.

Large-scale, temperature-stable cooling systems are critical infrastructure for many companies in industries ranging from food and beverage to pharmaceutical. These large-scale coolers or cold rooms do not just need to stay cold though. Oftentimes, the temperature must be heavily regulated and kept within ± 3 degrees of a carefully calculated set point or millions of dollars of final product or raw materials could spoil, which would likely be catastrophic for most companies.

For more than 35 years, Ace Coolers has built and installed highly reliable custom cooling solutions that can meet these precise cooling needs for customers such as Sigma Millipore, Celgene Pharmaceuticals, Sherpa Clinical, Inova Diagnostic, and Saint Archer Brewery. And, throughout the last two decades GTH has supplied a variety of process control systems and components to Ace Coolers to power the custom cooling solutions these customers rely on.

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Several years ago, Ace Coolers started to see a trend that they were receiving requests to develop more systems for end users in the pharmaceutical industry. For these companies, reliability is paramount as there is a lot at stake, even if just a brief failure occurs. While pharmaceutical companies require a failsafe control system, they also need an industrial control panel (ICP) that

provides continuous real-time system visibility for operators to quickly identify if a problem does occur. Beyond these technical capabilities, pharmaceutical companies also generally want a control system that has a clean and modern look and does not take up too much space.

As the demand for these highly reliable cooler solutions continued to increase for Ace Coolers, especially from pharmaceutical companies, the company started to evaluate options for a new industrial control panel (ICP) that could better meet the visibility and aesthetic needs of this industry. They also wanted the new control system to be easy to reproduce to keep up with the anticipated demand for these large-scale cooling solutions from the pharmaceutical industry, yet flexible enough to make the slight variations to meet each end user's specific needs.

During their evaluation period for a new ICP solution, Ace Coolers quickly realized an off-the-shelf panel could not cost-effectively meet all their needs. Since they had a long-standing relationship with GTH as a supplier of other components for their systems, they started discussing a custom ICP solution with us.

Building a Reliable and Flexible Custom Cooling System ICP

To meet the needs of Ace Cooler's end users, especially in the pharmaceutical industry, we set out to build a control system with a touchscreen that would allow end users real-time visibility into the control system's operations. This also included quick access to control setpoints, hysteresis, and alarms for the cold rooms. Since any mechanical component will likely break at some point, another key requirement for the ICP was that it needed logic built-in to trigger the redundant back-up system to kick on if the first unit experiences a failure and cannot



Figure 1. The image on the left shows the old system and the image on the right shows the new system.

meet the setpoint or triggers an alarm for any other reason. Some of the ICPs end users also had requirements for datalogging and trending to ensure their product is being kept within the tolerances required to guarantee quality.

Ace Coolers selected GTH to build initial ICPs with single-loop controllers, such as standalone temperature controllers, and created a fairly complicated scheme for alarming and alternating between the lead and lag systems to share the load. As the end user's needs became more advanced, this first panel-mount controller iteration started to get kind of complicated when using single-loop controllers though. Therefore, we suggested to Ace Coolers that we switch to a smart controller that could be programmed and could handle more than one loop, and we added a human-machine interface (HMI) to the system (Figure 1).

These changes not only increased controller functionality, we also were able to reduce the size of the enclosure and made the panel more aesthetically pleasing, features that are also important for the pharmaceutical industry. Additionally, by making this shift to using a smart controller, we modernized the control system, yet kept the price for Ace Coolers the same. This was possible because we reduced the materials needed for the

ICP such as wiring and control components and we were able to use smaller enclosures and HMIs. With this second ICP iteration, we provided more value for both Ace Coolers and their end users.

As we have worked together on more systems, we have continued to make changes that benefit the panel's end users while also helping Ace Coolers scale. We have reduced engineering and development costs for Ace Coolers as they scale by reusing engineering they have already invested in and incorporating some smarter manufacturing techniques and strategies. For example, one method we are now using is calibration capabilities from the HMI to validate the connected sensors. Our ultimate goal with this feature is to have all options loaded into the system and to activate only those that are required for a given system.

While this system was working well for Ace Coolers, in 2021, we had to make yet another iteration on the ICP that involved quickly pivoting and re-engineering the system to change the smart controller manufacturer we were using due to supply chain issues. By changing to this new controller, we actually removed some of the mechanical relays, which meant we upgraded system functionality again, yet kept costs steady.

Our Partnership Approach to Successful Development

Beyond our technical capabilities, the relationship we have with and the support we provide to Ace Coolers, and all our customers, are key reasons why our projects are so successful. It is our company policy that we take ownership of the scope of work and make sure that the development process is as smooth as possible for all parties. This is a big part of the reason why Ace Coolers has selected GTH to deliver more than 60 highly reliable ICPs over the past several years.

In general, when a company chooses to work with GTH, we make it a point to be responsive, our goal is to solve problems, and we try to be ahead of the curve in terms of innovation and presenting new products or options to our customers that will make their systems better – all while keeping costs in mind. For Ace Coolers, we embraced this philosophy throughout the recent material shortages. During this difficult time, we have been in constant contact with Ace Coolers so they can keep their end users updated. And, as mentioned, in the middle of a few recent ICP projects, we had to switch to a new controller. By having the agility to make this change quickly, we helped save these projects for Ace Coolers and their customers, and we did it while minimizing delivery delays.

Providing World-Class ICPs by Remaining Agile

While a lot of companies live by the motto that “this is the way we have always done it,” this is quite the opposite of how we operate at GTH. Every panel we provide has our name on it, so we want to be absolutely sure it is optimized to meet every stakeholder’s needs. As a result, throughout our years of work with Ace Coolers, our flexibility, innovation, and solutions-first approach have been paramount in driving this successful long-term relationship and we look forward to many years of successful panel development.

Contact a GTH engineer today to learn how we can help with your company’s specific industrial control panel needs.

CONTACT