SIEMENS

Case Study

The chilled brewery heartbeat

Barnum Mechanical Inc.
Sanitary Process Systems
Design-Build and Installations
Loomis, CA

G&D Chillers Glycol Chilling
Eugene, OR

Russian River Brewing
Windsor, CA

Breweries are known to proudly display rows of shining brew kettles, pipes and fermentation tanks that transform malt, hops and yeast into IPAs, stouts and pilsners. Over the years, the equipment used to mash, lauter, boil and ferment secret beer recipes has grown in sophistication.

One of the most important pieces of brewing equipment, perhaps least visible and oftentimes located on the roof, is the chiller. The beer's fermentation temperature is critical. The heat generated by the yeast's fermentation process must be carefully controlled by the chiller. If the beer ferments too hot, the yeast can produce a wide array of unwanted flavors that will ruin the beer.

Oregon-based G&D Chillers President Justin Thomas puts it this way, "The chiller is the heartbeat of the brewery. Owners invest a great deal of money on the brewing equipment, as well as hours and days making the beer. But if the chiller goes down, all of that is out the window."

Partnering to keep up with growth

G&D Chillers products include a wide range of small portable glycol chillers and heaters as well as large custom chilling units. All of the company's units are Edison Testing Laboratories (ETL) approved in the United States and Canada.

Thomas says G&D Chillers growth over the past 15 years has been exponential. Continuing this success has required the company to look for new ways to stay ahead of customers' demands for reliable and leading-edge chiller options. For example, G&D Chillers recently partnered with control products technology leader Siemens and electrical products distributor WESCO Distribution to meet these demands and stay ahead of the competition.

"We are still a small manufacturing company, but large enough to produce some pretty technically advanced units," Thomas says. "We have always been service based and have stood behind our equipment, regardless of the issue. We are getting that same kind of support and service from Siemens that we give to our customers. A big reason we have been able to grow and succeed is because people in our industry are not used to getting that level of service."

One of G&D Chillers customers, Barnum Mechanical, Loomis, California, designs and builds sanitary process systems for the food and beverage, geothermal and specialty process industries, including craft breweries and leading-edge processing facilities.

Jared McClintock, Barnum Mechanical's business development engineer, shares Thomas' mantra of operating on the principle that its customers are partners. "We work with them to maximize process performance and efficiency," he says. "There is a special emphasis on sustainability. This includes reducing our customers' waste streams and water usage, as well as providing innovative solutions for recovering and reusing energy."

The Siemens controls used by Barnum Mechanical help the brewing process by regulating the chiller across a wide range of system and environmental conditions. Oftentimes, the cooling loads vary greatly and sometimes increase within a short period of time. McClintock says the control system produces a stable output even when the inputs are unstable. That ability to provide consistent output cooling fluid temperatures creates a controlled environment within the production facility.

"Barnum Mechanical works with a lot of equipment manufacturers to determine which is best for each application," McClintock says. "We are very selective and choose only those equipment manufacturers who deliver innovative and reliable solutions. As G&D's product offerings grew into larger, higher capacity systems, so did our ability to work with them on a regular basis. Now that G&D's product range spans across many industries and they can custom build large systems, they are our go-to refrigeration system supplier."

Standardizing production with Siemens controls

John McCoy, G&D Chillers general manager, says Siemens controls have been standardized across the company's line of vertical and horizontal chillers, for both large and small capacity applications. This includes G&D Chillers' standard package designs that have been field verified for more than 20 years.

Thomas says the company began the Siemens controls transition in 2017, when it first incorporated the supplier's drives into a chiller design. "That grew into adding enclosures and other components fairly quickly," he recalls. "In 2020, we took an across-the-board approach for Siemens control products."

However, G&D Chillers skilled and highly technical production team, most of who have been with the company for more than a decade, were skeptical. They had initial reservations about incorporating the Siemens infeed system into its already successful product lines.

They quickly found that individual circuit breakers, complete load feeders as well as compact starters were simply and quickly clicked into the infeed system. It did not take long to validate the decision to standardize.

"The control panel's infeed system using a tool-less link module "snap together" technology has cut our wiring time down by 25 percent," McCoy says. "This alone has saved us about 10 hours in wiring; time that we now spend making more chillers in our lean manufacturing operation."

> *"Standardizing on Siemens has been a good thing for us from a quality and lean manufacturing standpoint."*
>
> Justin Thomas

Thomas adds, "We all feel confident that, from a circuit protection and motor starter standpoint, the infeed system provides a high level of robust protection, and fast and easy maintenance, reducing downtime."

The Siemens infeed system has also given G&D Chillers more room to work within the control panel. Thomas compares the panels to G&D Chillers efficient, clean and well-organized manufacturing floor.

"The footprint of the control panel gives us more room to add additional compact control components," says Cody Gibson, G&D Chillers production manager. "This has definitely cleaned up the panels a lot."

24/7 service and support leads to lean manufacturing

McCoy says G&D Chillers technicians have spent days, weeks and months with WESCO and Siemens experts developing the panels. He says this level of service has helped G&D Chillers operate with lean manufacturing and just in time inventory management principles.

Paul Johnson, G&D Chillers engineering manager adds that early in the relationship it was not unusual to have multiple calls per day with Siemens and WESCO product experts.

"By having access to those specialists at any given time, our personal knowledge as technicians has increased exponentially," Johnson says. He adds that Siemens and WESCO have solved most of the control issues that the company has experienced or has worked with them to develop solutions.

McCoy says, "When the panels are built and sized appropriately for our machines, all we have to do is call WESCO and say, 'Hey. I need a kit for a GD-70H-2C at 460 volts' and a box shows up with all of the electrical controls, drives and LOGO! controller. Anything we might need for that build is included. That eliminates stock that we would have had to carry with other suppliers."

Today, G&D Chillers remains in daily contact with WESCO, with visits to the manufacturing plant three times per week. Thomas says this mutually beneficial partnership allows G&D Chillers to confidently promote its own 24/7 technical support service.

"We could not do that without partners who back us up with that same type of service," Thomas says.

> *"In the future, Siemens and WESCO will play big roles in our commitment to improve and expand our emerging ultra-low temperature chillers."*
>
> Justin Thomas

McClintock says G&D was originally chosen as Barnum Mechanical's preferred chiller supplier because it was a leader in the craft beverage movement and has always understood that small, craft beverage companies require a variety of solutions that fit their budget.

"G&D works with clients to identify the best solution, which aligns exactly with our approach to project development," McClintock says. "To be successful within the craft beverage and process industries, you must be committed, honest, creative, and helpful. Barnum and G&D share these qualities, which is why working together is a win-win."

Committed to sustainability with Russian River Brewing

McClintock points to a recent project for award winning Russian River Brewing Company, Sonoma County, California, as an example of a successful customer partnership committed to sustainability. The brewery looked to Barnum Mechanical to supply its 85,000-square-foot facility with the most efficient and sustainable process solutions available.

Vinnie Cilurzo, Russian River Brewing Company's co-owner and brewmaster says, "We must adhere to our rigorous quality standards while cutting our carbon footprint. Sustainable production is really important to us. We want to ensure we remain conscious of our environmental impact as we grow and are committed to maintaining our independence and controlling our processes."

Barnum Mechanical recommended and installed a custom-designed G&D chiller with Siemens controls that would help reduce water consumption at Russian River's facility that produces 35,000 barrels annually, as well as seats 200 brewpub customers.

"Because Barnum had done so much brewery work, it was a benchmark for us," Cilurzo says. "It was evident how great the Barnum team was once they were here. I've seen hundreds of breweries, but never one built like this."

Utilizing an evaporative condenser, the Russian River chiller is a hybrid system. It uses both air and reclaimed water from the membrane bioreactor (MBR) installed by Barnum Mechanical that removes 99% of contaminates from industrial wastewater.

This allowed Russian River Brewing Company to recycle the water back into its other processes, including a clean-in-place (CIP) system.

The chiller has reduced Russian River's chiller energy up to 40 percent when compared to similarly sized systems. Easy on the environment, it also utilizes highly efficient screw compressors with class A refrigerant – one of the lowest global warming potential (GWP) refrigerants in the industry.

"The chiller's control system constantly economizes the evaporative condenser," McClintock says. "It has the difficult challenge of using as much free cooling from the Cambrian MBR water while still outputting the targeted temperature setpoint. The better the control system is at doing this, the greater amount of energy saved."

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