

ONE PROVIDER – TOTAL FLEXIBILITY

Fully automated storage cellar at Doppelu brewery

400 double-seat valves and 4 000 running meters of support tubing are just a couple of the basic parameters taken from Kieselmann Anlagenbau's latest project. The fluid technology specialists out of Knittling, Germany, built a fully automated storage facility in 18 months for the Doppelu Brauwerkstatt in Winterthur, Switzerland. The Swiss brewers, whose top-fermented craft beer brand "Chopfab" took off like a racehorse after launching an aggressive marketing campaign in 2012, were out of the gate well ahead of the competition.



The heart of the matter: the line, three of the eight valve nodes and the ceiling-mounted tanks in the storage cellar

Care for a "cool blond", or perhaps a red, a black or a wheat beer? Whichever you choose, Doppelu brewery's Chopfab beers are stronger and slightly more exotic in taste than what you're used to. In fact, what makes these craft beers so special and unique is that they are all top fermented. The brewery's technical management team, Philipp Wagner

Marcel Kohn

Marketing, Kieselmann GmbH

and Patrick Thomi, are the ones responsible. By 2015, the demand for these beers was so great that an additional brewhouse and a new bottling plant had to be installed and brought on line.

Transparent showcase project

The fully automated storage cellar, completed in spring of 2017, is a prime example of a system without boundaries. "Doppelu

currently produces 15 different beers with several different yeast strains. The plant processes all these different beers and strains fully automatically – and is also designed to adapt to further brews," says Christian Ernst, Senior Project Manager for large-scale brewing projects at Kieselmann Anlagenbau. Mr. Ernst has already managed numerous large-scale projects, but calls the storage cellar in Winterthur the "most complete brewery project of the Kieselmann Fluid Process Group" to date. For Ralf Haas, senior mechanic at Kieselmann Anlagenbau, the fully glazed, automated storage cellar is unique in Switzerland: "Even in Germany, you'd have to search far and wide to find a system that is as flexible and has a comparable degree of automation. We're talking about a plant that's fully automated, requiring just one employee for a maximum of two hours daily. As a rule, one to two operators are employed full time on conventional systems with electronic or hose-and-valve technology."

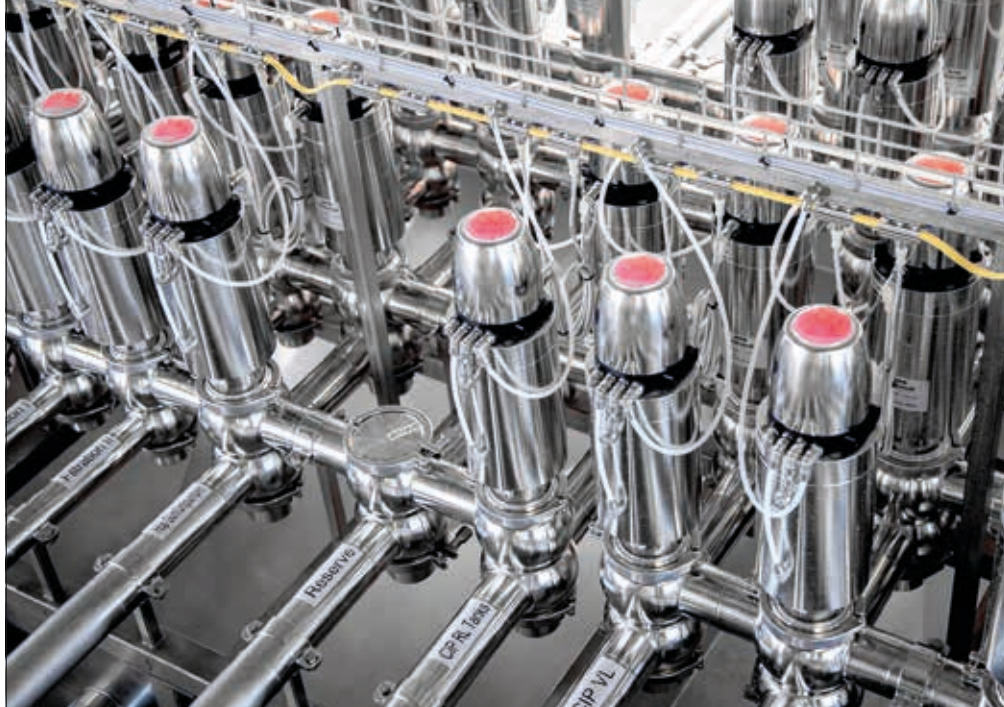
Under one umbrella

Kieselmann Anlagenbau, together with Kieselmann Fluid Process Group, acted as general contractor on this project. Assembly was carried out by four of the corporation's eleven companies: Kieselmann GmbH produced the valves and

pipes, Rieger Behälterbau supplied the tanks, AquaDuna equipped the tanks with the cleaning assemblage and the Kieselmann Anlagenbau team designed and managed the entire project.

The Zurich brewers and the Swabian assemblers work well together. "We're constantly creating new beers – at least two a year so far. Therefore, it was crucial for us that the system is extremely flexible. In our first conversation with Christian Ernst it became instantly clear that we had found the perfect partner for this project: Kieselmann," says Doppelleu master brewer Patrick Thomi, regarding the relationship.

The Kieselmann Anlagenbau team specializes in outfitting breweries, which makes up more than 80 percent of all projects that the company handles. "For us it was great to have a central contact person in Christian Ernst, who consulted with us throughout the entire project, from the purchasing phase to the commissioning. This simplified communications during all construction phases, minimized



Extendable valve clusters: It only takes a few seconds to insert additional double-seat valves into the dummy housings. All necessary connections for the additional valves are already installed.

our coordination efforts and optimized the entire project management cycle," says Patrick Thomi. Doppelleu's technical management team delivered clear, ambitious specifications for the plant: They

wanted a modular, standardized production plant in the cold-aseptic area that featured standardized sterilization procedures in tanks, pipelines and other equipment. Optimizing yeast management



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View from the outside: the new fermentation and maturation cellar at Doppelleu

in the areas of pure breeding, propagation and strain storage was also a priority.

Efficient planning

At the end of 2015, fine-tuning of the fully automated storage cellar was begun. After three months of intensive planning and design, the components were manufactured at the Kieselmann headquarters in Knittlingen and delivered to Winterthur, which represented the start of the nine-month, on-site assembly phase. A nine-member team from Kieselmann Anlagenbau coordinated the individual project steps and monitored the assembly by the Fluid Process Group.

“Coordinating individual procedures and making sure they merged seamlessly with one another was demanding. Every little detail affects the success of the project: from basic things like access roads, insulation work, supply and installation of valve manifolds to electrical cabling – all completed on a tight schedule,” says Thomas Haas.

Fully automated for continuing success

The sheer numbers connected to this project are impressive for a brewery: 24 cylindroconical tanks with 400 hectoliters gross volume each, four yeast tanks with 50 hectoliters gross volume each and seven CIP tanks with 50 hectoliters per container.

The fewest possible operators was the main criterion for choosing the automated double-seat valve technology. A total of 400 double-seat valves with control heads were installed on eight valve nodes. 300 pneumatic disc valves with control heads complete the stainless steel valve technology from Kieselmann. In order to operate and monitor the plant, Kieselmann selected ProLeiT’s “brewmaxx” process control system.

The process control system offers several advantages over pure visualization. In addition to the principle of “parameterization instead of programming,” logistics, technological functionality and a uniform user interface throughout the entire production area are key components. In addition, a process control system is a much more open system than individually programmed software, as Gerhard Noel said, who is responsible for MSR at Kieselmann Anlagenbau.

The entire cellar can be controlled directly on site as well as from the brewery office located in the main building. The control system itself is a classic design: The central main control cabinet in the basement contains the complete power unit as well as the PLC. It is connected to the decentralized control cabinets via Profibus DP. Each of the six valve nodes with the associated four ZKLs is equipped with its own control cabinet. Each of these contain an ET200M module and an ASI bus master, which handles individual valve control. This clear, highly coordinated distribution of control cabinets ensures an

optimal maintenance process. The use of Kieselmann control heads with ASI bus connection reduced cabling and tubing of the double seat valves to a minimum. For each double-seat valve, the plant engineers placed only one branch line for the ASI bus and one for the control air. The complete electrical connection technology at the control heads as well as on the installed measuring technology is equipped with M12 plugs. Each line is just half a meter long. The control air outlets are integrated into a square frame, which serves as the control air distributor. In a conventional drive – in the absence of a control head with bus connection – three air hoses and two initiator cables would have been required at each double-seat valve.

External and internal piping of the plant involves 5,340 meters of built-in beverage lines, of which 900 meters are pre-insulated. Assembly of the mechanical and electrical components as well as proper insulation and commissioning ate up 18,800 working hours on site.

The fully glazed new building stands freely – about 90 meters distant from the older, existing buildings. Kieselmann erected a 120-meter-long pipe bridge made of stainless steel, connecting the new storage cellar to supply tanks and coordination facilities in the old building.

Repeat performance

The multi-tasking-capable facility went on line in early 2017. Wort transfer and the pumping of beer to the filter can take place simultaneously, for example. The stationary cleaning of tanks using the CIP process can take place during ongoing production. The fully automated storage cellar is already running at full capacity and a further expansion phase is planned, so what’s next for the plant engineers from Knittlingen? A successor project, of course! The Kieselmann Fluid Process Group team was subsequently awarded a follow-up contract: to deliver a new water house. As with the first project, everything went according to plan and the facility was commissioned in the summer of 2017 – right on schedule. □