

Invisible building automation in Nardini's "Bolle"

Art designs inspired by bubbles in grappa distillation process

When Italian grappa distiller Nardini wanted to build a customer center and research lab at its headquarters in Bassano del Grappa, the company commissioned the celebrated architects Massimiliano and Doriana Fuksas. The "Bolle", which is what the Fuksas called their glass structures because they remind the viewer of bubbles that rise during the grappa distillation process, reflects the company's strong tradition of grappa production, paired with a culture of innovation. To maintain indoor climate and ensure that the lighting and multimedia systems are truly state-of-the-art, systems integrator SAE implemented a system based on Beckhoff building automation components.



The bubbles that rise during the distillation process inspired the "Bolle" designed by architect duo Massimiliano and Dorina Fuksas.

Nardini's roots go back to the year 1779, when Bortolo Nardini began commercial production of "aquavite de vinaccia", a distillation made from "pomace", which includes the skins, pulp and seeds of grapes after the pressing for wine. To celebrate the company's 225th anniversary, Nardini commissioned Italian star architects Massimiliano and Doriana Fuksas, who are known for their futuristic designs, to build a new customer center. The "Bolle" are two ellipsoids consisting of concave and convex multi-layered glass shapes. These are inspired by the bubbles that rise during the grappa distillation process. "Balanced" on three-meter and six-meter stilts, the "Bolle" are reflected in the surface of the pond below. Another surprise is the underground structure connecting the "floating" glass bodies. It houses a research lab, Nardini's quality control department and meeting rooms, as well as an auditorium that is used for cultural events, and a receiving area for customers and visitors.

Technology stays behind the scenes

"Unusual architecture requires special building automation systems," explains Giovanni Cavallin, the general director of SAE. "With the exception of two switches at the entrances, the solution we implemented is invisible and perfectly integrated into the transparent architecture," adds Riccardo Marin, software development lead.

The controls are based on four BC9000 Ethernet Bus Terminal Controllers spread across the two "Bolle", the thermal power supply and the underground auditorium. They operate as dedicated controllers that receive signals and send the respective commands via four different communication protocols: DALI for running the points of light, an ASi interface for controlling the projection screen and the curtains behind the stage, an RS485 serial interface for controlling the seating areas, and Modbus TCP/IP for the audio/video controls and the HMI.

Each "Bolle" has roughly 80 points of light that are linked via DALI and can be dimmed and controlled individually or in groups. To minimize any interference with the design, all wires were concealed in the structural components.

Easy to add features in the future with open control system

The transparent architecture provides visitors with a 360-degree view of the mountains surrounding Bassano del Grappa. Unfortunately, the architects had not considered how hot the "Bolle" would get during days of intense sunlight, which is why they had to be retrofitted with sun shields. "This is where the modular control platform with its DALI interface provided a huge advantage, because adding the sun shields was no problem at all. Since the controller automatically perceives the electric motors of the shields as DALI devices, they could be easily integrated into the overall system and are now controlled via software to meet all requirements. The graphical user interface (GUI) provides both continuous and impulse-controlled settings.

The lighting and HVAC systems are controlled via the touchscreen in the control room, and the sun shields are controlled from a laptop or tablet via Wi-Fi. Each of the BC9000 controllers in the glass "Bolle" features seven DALI modules, to which roughly 100 luminaire and sun shield addresses are assigned.

The entrance to the "Bolle" is located under the pond's surface; it provides access to various rooms for meetings, receptions and conferences. One of these is a 108-seat auditorium, which is also controlled via a Bus Terminal Controller.

Various lighting scenarios for video screenings, conferences and other activities have been preprogrammed and can be called up on demand. All systems and drives can also be controlled separately. For example, the seating areas can be opened and closed in groups or row-by-row. In addition, the auditorium can be partially illuminated or darkened by controlling individual groups.

Simple and flexible operation

"The best words to describe our building automation solution are simplicity and flexibility," explains Giovanni Cavallin. "The control architecture is extremely lean, almost minimalist, which matches the building's structure perfectly. The flexibility and modularity of the Beckhoff control concept, and its openness with regard to various communication protocols, made integrating the different components easy. In addition, the use of standard software solutions instead of proprietary hardware and protocols provides a solid foundation for future expansion. It also keeps risks and costs low when integrating third-party maintenance services, for example."



A view of the auditorium, which can seat 108 people. The room is controlled via a Bus Terminal Controller. Predefined light scenarios for various event types can be called up easily.

Further information:

www.nardini.it

www.saeimpianti.it

www.beckhoff.it