



Maintaining a constant flow of beer

„O'zapft is“ („It's tapped“): Control valve compensates pressure head automatically in festival tent beer tanks

An application report by Uwe Daebel and Helmut Ambros



Leading festival tent operators have converted to a central beer supply system at the Munich Oktoberfest. The pressure conditions prevailing at the bars and taps should be kept nearly constant at all times for trouble-free drawing despite changing pressure heads in the tanks and widely fluctuating beer sales. This is now achieved through the highly precise automatic control of the CO₂ pressure head using the aseptic right-angle valve of the series 6000 from Schubert & Salzer Control Systems.

Approx. 7,5 million litres of beer are served at the Oktoberfest. These amounts present major logistical challenges for the festival tent operators. In order to improve bar operations and to simplify delivery during the night, some breweries have changed over to large container facilities with several tanks, each with a capacity from 75,000 to 100,000 litres. This guarantees that, immediately after the first barrel is tapped, it will be possible to serve up to 12,000 litres per hour continuously and trouble-free. During this time, the barmen leave up to 13 taps per tent completely open. While pouring is taking place, the liquid level in the tanks is falling, also however changing the pressure at the bars. Up to now, the falling pressure has been compensated manually by raising the CO₂ pressure over the beer. To do so, whenever the need arose, the barmen had to turn to the technicians to adjust the pressure control valve manually. However, the pressure stability achieved in this manner was unsatisfactory and needed constant adjustment by barmen and technicians.

As a result, the Paulaner brewery searched for an automatic solution for their three large tents on the Oktoberfest - „Winzerer Fähndl“, „Hacker Festzelt“ and „Pschorr Bräurosl“. The intended aim is to keep the total pressure of the system constant - meaning the liquid plus the CO₂ overlay - by controlling the pressure of the CO₂. In any event, this control should have a maximum deviation from the setpoint value of just 0.05 bar.

A compact process valve provides extremely precise control

Schubert & Salzer Control Systems came up with a solution by using a right-angle valve of the 6000 series (Fig. 2) which more



Fig. 1 Uwe Daebel, Department Head for Filling and Packaging Technology at Paulaner, was keen on the idea of maintaining a constant pressure and was impressed by the precision with which the hygienic right-angle valve with a 8049 digital positioner was able to maintain pressure.

than meets this requirement, having a deviation of just 0.02 bar. The valve controls the CO₂ head pressure to between 1.15 and 1.18 bar. With a beer throughput of 4,000 litres per hour, the hygienic right-angle valve is open 28%, corresponding to a K_{vs} value of 1.6 on an equal percentage curve.

A digital positioner from the 8049 series ensures the exact positioning of the stroke actuation for this case. These 8049 positioners have proved to be ideal for innumerable applications due to their top-mounted design since they are located centrally over the valve actuator and consequently take up very little space needing no additional room for installation. Furthermore, its great compactness means that no moving parts are accessible, which maximises operational reliability.

The right-angle valves of the series 6000 are machined out of solid, pore-free stainless steel and are designed especially for applications requiring a high degree of hygiene. As a compact unit, the hygienic right-angle valve is completely enclosed and has no parts which are accessible from the outside. The 6000 right-angle valve range is offered in the nominal sizes DN 15 to 65 with PN 16 pressure level. Actuation and positioner bodies are optionally also available in stainless steel versions. IP 65 is standard.

This CO₂ control is employed for several years. During the night the beer containers are refilled from beer tanker trucks. The refilling is done using the gas displacement method, i.e. the gas flows from the tank back into the tank trailer while pumping the beer.

In the bar operation, the beer pressure at the tap is set at 1.6 bar and the report of setpoint and actual values in the technical monitor (Fig. 3) revealed an overlap in which the setpoint line was hiding behind the actual line. The technical specialists at Paulaner were so persuaded of the precision with which this pressure was maintained that after the first installation and commissioning an order was placed immediately for two further applications.

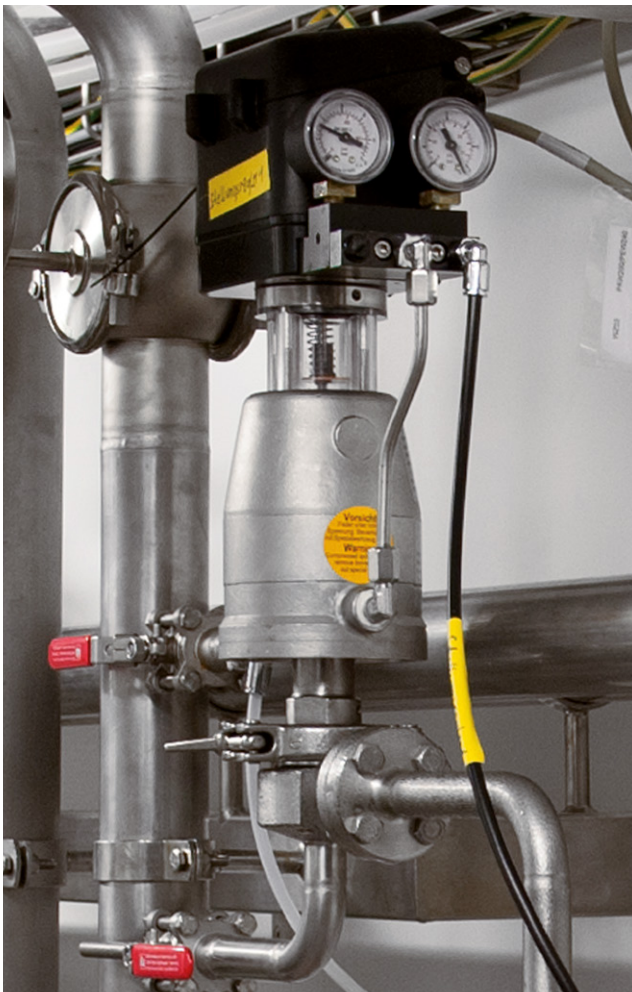


Fig. 2 The right-angle valve of the series 6000 from Schubert & Salzer Control Systems in the Okotberfest-container facility of Paulaner.



Fig. 3 The red actual line shows perfectly constant maintenance of the beer pressure at 1.6 bar. The setpoint line is hiding behind the actual line. The resolution of the display is adapted to the new conditions in the display.

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