

||Fig. 1: The market leader in system catering serves over 2.76 million guests every day in Germany.

5.5 million patties per day

Compressor management for production and maintenance

Intelligent compressor management systems reduce energy and maintenance costs and offer significant advantages for maintenance and production monitoring. OSI Food's Günzburg location shows this as an example: This is where the decision was made to use the Airleader system from WF Steuerungstechnik. On site, Norman Kloss and the LVT editorial team spoke to Maintenance Manager Thomas Schnitzler about the reference project. It is one of over 7,000 successful Airleader applications across Germany.

Today's global market leader in system catering opened its first restaurant in San Bernadino, California, in 1940. The first German branch followed in Munich in 1971. Today, more than 1,400 of the company's restaurants in Germany serve an average of 2.76 million guests every day. This requires meat products of reliable top quality in large quantities, especially for the meat patties that are included in all burger variations.

OSI Food

They come from the suppliers of the OSI Food group of companies. OSI Food employs more than 14,000 people worldwide in 47 production facilities, 23 of which work exclusively for the global system caterer. The group has three locations in Germany: the Duisburg location produces poultry meat, the Bad Iburg plant produces bacon and pork. The Günzburg plant in Bavarian Swabia is the headquarters of OSI Food Solutions Germany and specializes in beef and pork. The patties known as “patties” are also produced here for hamburgers, cheeseburgers and all other burger variations. The patty is a standardized slice of beef with a gross weight of 40 g and a fat content of 20%.

The rapid growth of the global system caterer is reflected in the development of productivity at OSI Food. While in 1971 there were 14,222 patties per day, today this number is around 5.5 million patties per day. This enormous productivity is now achieved by eight production lines at the Günzburg plant. Important steps towards this were the introduction of two high-performance lines in 1999, which produced up to 50,000 patties per hour. In 2010, the “New Concept Line” was added, which produces up to twice 85,000 patties per hour.

Compressed air for the Günzburg plant

Significant expansions of factory production took place in 2000 and 2010. In 2000, the expansion of the building management system and refrigeration technology with ammonia refrigeration machines was on the agenda. Accordingly, the demands on compressed air supply increased. Included

Oil-free compressed air was used in production in Günzburg very early on. Two compressed air networks supply the plant, each controlled, visualized and monitored in the event of an incident by an Airleader.

Since compressed air becomes more expensive the higher the pressure, OSI generates the comparatively lower 10 bar requirement through its own station. This is more energy efficient than running the entire network at this high pressure. The 10 bar compressed air network draws its air from a station with two 37 kW speed-controlled water-injected screw compressors (Compair). The station was installed by Uhl Drucklufttechnik in 2010.

The second compressed air network works with a lower working pressure of 8 bar and is supplied from two further, spatially distant compressed air stations, each of which is equipped with two 37 kW rotary tooth compressors (Atlas Copco) and two 55 kW piston compressors (Compair).

Thomas Schnitzler, Maintenance Manager at OSI Food Günzburg, explains factory production in an interview with mechanical engineer Norman Kloss (wf - control technology) and the LVT editorial team: “In Günzburg, OSI Food Solutions predominantly processes meat from Austria and Germany and here mainly from Bavaria,” says Thomas Schnitzler. The OSI Günzburg plant supplies the fast food world market leader's fast food restaurants in the Netherlands and Germany.

Given the highest demands on quality and production performance, preventive maintenance is the be-all and end-all. This is also reflected in the shift schedule, as Thomas Schnitzler confirms: "We run a three-shift operation, consisting of two production shifts and one cleaning shift. Up to 14 people

“We are busy with preventive maintenance at the weekend.”

Thomas Schnitzler and his team quickly learned to appreciate the advantages of the Airleader in the practice of operation, maintenance and optimization: Thomas Schnitzler cites a return on investment of less than two years as the most important parameter for investments in sustainable technology. When using an Airleader, this condition is met because the costs for load and idle kilowatt hours decrease immediately. Depending on the application, the Airleader pays for itself after just a few weeks or months.

Optimal combination of compressors

The Airleader always determines the ideal combination of compressors with the lowest loss of idle energy. Depending on the version, the powerful compressor management system can control up to 16 (Airleader Master Module) or 32 (Airleader CN) positive displacement compressors of all makes and types. Its eight-fold self-learning trend calculation depth dynamically adapts the compressors to the current compressed air consumption. Time windows of different sizes continuously calculate compressed air consumption and register changes in compressed air consumption. In the spirit of low wear, the system selects a particularly low switching frequency for the compressors and thus extends the service life of all mechanical components. This also means: There is no longer a fixed order of compressor activation. Production determines the right combination and compressors of the same performance receive the same operating hours.



||Fig. 2: The storage capacity of the Airleader Master is sufficient for a detailed condition history with statistical data over a period of more than six years of production time.



||Fig. 3: Norman Kloss, Hubert Wagner and Thomas Schnitzler (from left to right) in one of the three compressed air stations in Günzburg. After relevant training and daily practice, Hubert Wagner from OSI Food has familiarized himself with the necessary details about the Airleader.



||Fig. 4: Norman Kloss (left) and Thoma Schnitzler (right) in the compressed air station, in front of the airleader. The system combines powerful compressors and compressed air treatment components from a wide range of manufacturers to form an effective overall system.

Statistics and condition history

The Airleader's storage capacity is particularly interesting for production managers when it comes to comparing the current status of their production with previous time windows, e.g.. energy consumption. The storage capacity of one gigabyte of the Master Module version is sufficient for a detailed status history and statistical data over a period of more than six years. The Airleader CN scores points with a storage capacity of 20 GB for data collection for over 20 years. “The Airleader offers the practitioner something that other systems cannot do,” says Norman Kloss and continues: “Some control manufacturers explicitly advertise that their compressor controls can store production data for up to 12 months. As a result, this means that I cannot even completely compare the current month with the corresponding month of the previous year or that of two years.”

Systematic development

The current third generation of Airleader controls incorporated over two decades of development, project and application experience from Werner Weidner's team at WF Steuerungstechnik in Wiernsheim. Today Airleaders have an OPC server and communicate with building management systems, e.g.. with visualization systems such as WinCC. The Ethernet connection via

A standard web server brings significant advantages for the staff and their tasks in maintenance and quality assurance.

The connection to the web server in particular makes work easier, which Norman Kloss believes is still not used enough in practice: “The information via a web server enables notifications on your own PC, notebook, cell phone or smartphone via SMS, email or fax. “You don’t have to wait for the next tour, but you immediately receive information about what needs to be done and where - whether for maintenance, servicing or quality assurance,” says Norman Kloss.

For mobile measurements to determine any potential energy savings on site, WF Steuerungstechnik offers an analogue measuring case with an autonomous power supply. The measurement data collected serves as the basis for a manufacturer-neutral simulation of which compressors the station uses to operate in the most energy-efficient manner. Other parameters such as flow, temperature or dew point can also be checked. The company's services include training (appointments and topics at www.airleader.biz/schulung/index.html) and compressed-air energy audits.

Variable and open system

Airleader programming is easy because after entering the essential parameters, the system takes care of everything else itself. The compressed air management system can be connected to any compressed air component via preconfigured analog and digital ports of a universal connection module. This makes it possible to connect a wide variety of brands without any problems. Dryers, filters, condensate drains, etc. can be connected to the digital inputs of the connection modules.

Alarm when limit values are exceeded

Pressure dew point, temperature, flow and other sensors with analog output are also easily connected to the Airleader for monitoring purposes. This is how they can be done

Easily determine, total and bill compressed air quantities for individual departments. Each analog input is assigned a digital output that triggers an alarm if the limit value is exceeded. This means that practitioners in production can be informed promptly about humidity in the compressed air, differential pressure on filters or the temperatures in the compressor room.

Tip for maintenance workers

Bearing failure is a major cause of costly compressor damage. Bearings that develop play reduce the gap between the rotors and housings. If the damage progresses, the clutch, gearbox, belt or motor can be attacked; in extreme cases, a system fire or even a production stoppage can occur.

A new bearing or an AT stage only costs a fraction of a compressor stage that has been scrapped. But when should you start re-storing in good time? There is an unpredictable time range: a base-load compressor can have a service life that is up to five times longer than a peak-load compressor that switches frequently. A new Airleader option saves money by re-storing the compressor exactly when it needs to is actually required. The Airleader bearing monitoring continuously records the vibrations and a special algorithm in the Web Server Plus visualization evaluates the vibration speed. If an adjustable warning threshold is exceeded, the Airleader informs the operator by email, SMS or fax and the operator gains valuable reaction time.

The new module can be retrofitted inexpensively. As a result, the risk of failure decreases and production reliability and running times increase. Condition-based maintenance leads to lower costs through utilization of downtime and cheaper new storage instead of purchasing new compressor stages.

Cost savings

When asked about the cost-effectiveness of compressors in compressed air stations in practice, Norman Kloss says: "The absolute price of a compressor determines many investment decisions. The operating costs are not always taken into account.

That's why we find technician machines and purchasing machines in practice. The latter neglect ongoing operating costs, which add up over the years of operation and ultimately The purchase costs for the compressor can be many times higher."

Compressed air costs consist of the cost blocks for investment, energy, service, motor and compressor bearing wear, valve and regulator damage and compressed air leakage. Surveys by WF Steuerungstechnik showed: Over longer periods of time, the Airleader achieves cost savings of around 35%. This block consists of cost reductions for load operation (savings of 25%), idle (savings of 99%), service (savings of 30%) and wear and tear (savings of 50%).

In Günzburg, data analysis identified weak points and provided starting points for optimizing the compressed air supply in the factory. During the course of the implementation, the energy efficiency of the site's compressed air supply took a huge leap forward. Significant leaks, e.g.. in the packaging area, could be closed. For these and other savings measures, the company was honored with an eco-profit award from the Günzburg regional marketing in 2011. “By sealing identified leaks and replacing a compressed air compressor” (in conjunction with the use of Airleader, editor’s note) “the meat and poultry specialist will save €19,203 in costs annually in the future. From an ecological point of view, this has an energy saving potential of approx. 75,000 kWh,” reports Regionalmarkting Günzburg GbR Wirtschaft und Tourismus about the award ceremony.



||Fig. 5: Pressure dew point sensor at OSI Food Solutions, Günzburg.

Conclu sion

The Airleader makes a decisive contribution to the data transparency and economical operation of the OSI Food Solutions compressed air stations: Regardless of the make and manufacturer, it combines powerful individual components into efficient overall systems that, in addition to reducing costs for energy, service and maintenance, provide significant relief for daily maintenance and monitoring tasks. Norman Kloss is not familiar with technical barriers based on brand: “We work very well with a wide variety of brands, compressed air dealers and compressor manufacturers,” he says. The sales specialists of the compressor manufacturers are often also aware of the strengths of the Airleader when it comes to combining different makes of a compressed air station into a successful system.

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