COMPRESSOR SYSTEMS
MADE IN GERMANY

ALMiG
Compressor Systems

Clean compressed air

Bad Meinberger uses 100% oil-free, water-injected and water-cooled screw compressors from ALMiG in its mineral water production facilities.

In the food industry, every company has to ensure that the goods it produces aren't contaminated by compressed air containing oil. Staatlich Bad Meinberger, based in Horn-Bad Meinberg in Lippe, Germany therefore uses three identical 100% oil-free, water-injected ALMiG screw compressors with water cooling for the production of its mineral drinks. Each compressor is supplied with sufficient coolant for effective heat dissipation via a separate recooling unit installed on the roof of the technology building. The compressed air produced by the three compressors meets the "0" purity class defined in ISO 8573-1, the highest possible in terms of "oil content". The integrated speed control adapts to constant changes in load, thereby avoiding cost-intensive idling times. Bad Meinberger and its three systems are perfectly equipped for the growth it anticipates over the coming years.

'At the beginning of this month, anyone wanting to use the Meinberg mineral springs is free to do so as the construction work on them will be completed at this time' – this was the good news and also the go-ahead needed for spa businesses in Meinberg, as reported by Lippische Intelligenzblätter on 13 June 1767. The mineral water from deep within the Eggegebirge hills in the Teutoburg Forest soon became very popular. More and more people wanted to bathe in it and drink it, and not just locally. In 1770, bottling officially got started and it became available to people in other areas. But that was all a long time ago. "These days, we ensure that anyone wanting to drink our mineral water can do so," says Volker Schlingmann, Spokesman for Management and Manager of Production and Sales at Staatlich Bad Meinberger Mineralbrunnen GmbH & Co. KG. "In 2017, we filled just shy of 120 million bottles and the figure planned for this year is 135 million. This doesn't make us a huge player in the industry, but we aren't insignificant either," says Schlingmann of positive developments at the company. The company currently employs around 100 members of staff. Alongside mineral water, the manufacturer also supplies soft drinks based on mineral water, isotonic and vitamin drinks, sparkling apple juice, lemonade and orangeade. In total, the company's range covers around 70 products. The drinks are bottled into reusable glass and PET containers. "We also bottle products for other manufacturers," says Schlingmann. "For example, we also produce bitter lemonade for Berlin-based Thomas Henry."

"In fact, we use the medium everywhere"

Absolutely pure compressed air

Bad Meinberger is certified in line with the International Food Standard (IFS). "This means that our processes guarantee the required level of food safety," explains Schlingmann. "Over the past few years, we have consistently reached a high level. Out of a possible 100 percent, we are currently at 99.7 percent." Compressed air is key to this, as it can come into contact with the product. „We use it as operating power and as control air for valves and cylinders," says Karsten Kichelmann, who is responsible for maintenance and health and safety at Bad Meinberger. "In fact, we use the medium everywhere," he says, pointing to a system labelling the PET bottles. In this machine, compressed air drives around 30 pneumatic cylinders. They are permanently subjected to it. "There are numerous pneumatic components throughout the plant, for example in our robotic palletiser, or we use them as stoppers on the conveyor systems," he explains.

Compressed air is used throughout the plant. It is used as operating power and as control air for valves and cylinders.

For many years, the company used oil-lubricated compressors. Until a couple of years ago, one large compressor and two smaller ones handled supplies. To ensure that the compressed air attained the highest quality level possible at that time, it was prepared in advance in a process involving several sub-micro and active carbon filters - a very elaborate process. However, this also impacted on pressure losses and, as a result, increased energy costs and the costs of permanently replacing the filter elements as a preventative measure. On top of that, "If the large compressor was undergoing maintenance or if one system failed, we were not always able to ensure a sufficient supply of compressed air," says Kichelmann. The compressors had also reached the limits of what they were capable of. "But we were planning for more growth - as we still are today, so we needed the right equipment," he says. Would the company replace the compressors one at a time? In 2014, management decided on a different approach – a radical departure from the past. ►

Behind the grating: Even the robotic palletiser can't function without (compressed) air.

100% oil-free and water-injected

"We decided to look at various providers and, in light of our positive experiences, very quickly decided to continue working with our long-standing supplier and partner ALMiG Kompressoren GmbH from Köngen," says Kichelmann. Bad Meinberger had previously used ALMiG systems and was very happy with the quality of the machinery and the professional and competent factory customer service team. "We recommended our oil-free, water-injected screw compressors from the LENTO series," says Bernd Müller, the regional Head of Sales for Bad Meinberger. It was the principle of „washed compressed air" used in this series which won over the management team. The compressed air is cleaner than the fresh air drawn into the compressor, since foreign particles contained in the inlet air are effectively rinsed out by the cooling circuit water. „This has been confirmed by several independent well-known institutes in complex testing," stresses Bernd Müller. The series is available in 15 sizes of between 15 and 110 kilowatts. The management team opted for three LENTO 56 systems with a volume flow of 9.97 m³/min.

Bad Meinberger relies on oil-free water-injected screw compressors of the LENTO series from ALMiG.

Fresh water on tap

A refrigeration dryer is integrated in the LENTO system. This is a key element of water treatment and serves primarily as a 'producer of fresh water'. The condensate produced is collected in the refrigeration dryer's condensate drain and is returned to the internal water and cooling cycle as fresh water. "During installation the compressor is filled with ordinary tap water and from then on generates its own fresh water continuously," explains Bernd Müller. All the water is exchanged in this way once a shift on average, which means that the system always works with fresh water. The complex process of installing water treatment is totally bypassed, meaning that the fresh water is also free of calcium. "Viruses, bacteria and algae don't stand a chance. The excess water can be discharged to the sewer system without any treatment," says Bernd Müller.

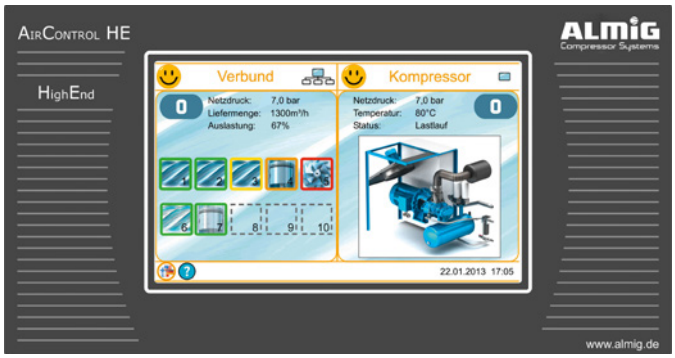
The compression process is undertaken close to isothermal compression, ensuring better efficiency and therefore great economic viability,"

The three systems have now been in use since December 2014. They have greatly reduced maintenance costs compared with alternative technologies such as dry-running screw compressors. This is mainly the result of their simple set-up. The compressor stages in water-injected machines operate at a speed four to five times slower than oil-free, dry-running compressors. This contributes to longer bearing life and thus also to operational reliability. Compared with oil, water also has a much better thermal absorption capacity. „These compressors have very low final compression temperatures well below 60°C. The compression process is undertaken close to isothermal compression, ensuring better efficiency and therefore great economic viability," explains Bernd Müller.

Taking energy efficiency into account

Depending on the time of year, Bad Meinberger runs a two- or three-shift operation with constantly changing compressed air requirements. The speed control integrated in all three compressors and the consumption-dependent control ALMiG Air Control HE enable the operator to enjoy the best possible energy and cost savings. The operating pressure remains virtually constant and can be reduced to the lowest pressure level possible (+/- 1 bar = +/- 7 percent in energy costs). The annual operating hours are spread virtually equally across all three compressors even though just two compressors are usually needed at any one time. This allows Bad Meinberger to not only extend the lives of the individual compressors but also to perform maintenance at the stipulated intervals and to do so without interrupting production and covering any bottlenecks in compressed air supplies. There is also sufficient redundancy built in and further growth can be accommodated for the foreseeable future.

The HE controls from ALMiG are fitted with a balancing monitoring system as standard. "This station also has a web server, which allows all relevant data to be read online," says Bernd Müller. Service technicians can follow the performance of the last few days or weeks of operation and see to what extent the compressors are being utilised, when servicing is due and whether there are still reserves remaining. "If we notice that operating circumstances have changed considerably, the Bad Meinberger technicians can react immediately," says Müller



The ALMIG Air Control HE controls two compressors in combination. This allows the energy advantages of speed control to be fully exploited.

Smooth operation

ALMiG supplied the systems while a competent specialist and partner company handled installation. "The whole thing was

completed over the course of one Saturday. During the assembly work, we had two of the old systems running in parallel in emergency mode," says Schlingmann. "The project was certainly complex, but we had planned well in advance and ALMiG is a very reliable partner." The Bad Meinberger management team was highly satisfied. "We don't need to worry about compressed air for maintenance work or our future plans, which is very reassuring," says Volker Schlingmann. "Next up, we need to eliminate the leaks we have in our compressed air network. This is the only area where savings can still be made. The compressors are running perfectly."

Bad Meinberger supplies mineral water and soft drinks based on mineral water. The required food safety levels must be guaranteed during all production processes.

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