



HIGHER-ORDER CONTROL OPTIMIZES COMPRESSED AIR SUPPLY

“PURE RELAXATION”

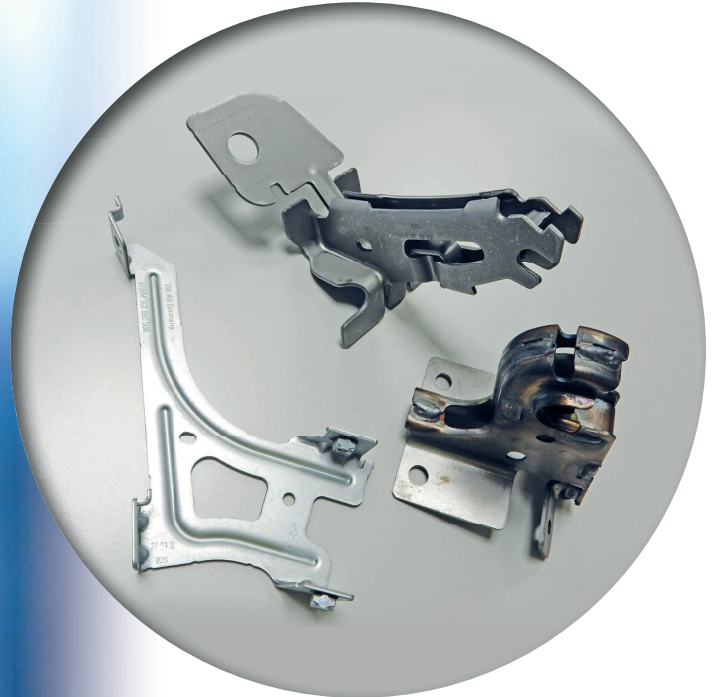
Seven compressors in four compressed air stations spread across the company premises, high idle rates, repeated failures and overall low energy efficiency - that was the situation at an automotive supplier. The installation of a higher-level control solved the problems. This means that the compressed air supply runs extremely efficiently, so that the investment pays for itself in a short time and provides relaxation for those responsible.

As part of the internationally operating voestalpine group, voestalpine Automotive Components Birkenfeld GmbH & Co. KG produces ready-to-install stamped and formed parts in steel and aluminum with further processing using all welding techniques, surface coatings and assembly techniques. “We produce sheet metal parts for the automotive industry – and preferably in large quantities,” says maintenance manager Rudolf Drehmer. Punching, pressing, welding, riveting, clinching, etc. – the manufacturing processes used are diverse and energetic.

intensive. Compressed air is required in various work steps. For example, clamps and grippers in the pressing and welding processes require expensive resources, but compressed air tools that are used for deburring are also compressed air consumers.

INEFFECTIVE DECENTRALIZED COMPRESSED AIR SUPPLY

The compressed air is generated decentrally in four container stations distributed across the company premises with a total of seven compressors from two different providers. The oldest devices have been in operation for 20 years, the youngest compressor was purchased in 2018. Four units work with speed control. There were high idle rates between 30 and 40 percent, as well as frequent failures and overall low energy efficiency. Rudolf Drehmer and his colleague Dominik Recktenwald, whose tasks include maintenance as well as energy management and ensuring the compressed air supply in the company, were dissatisfied with this situation.



Drehmer remembers: "As part of energy management, we considered how we could optimize the compressed air supply. It was clear to us that the decentralized arrangement had disadvantages. That's why we started at this point and, as a first step, connected the compressed air stations with the help of pipes." But this measure did not yet bring about a breakthrough. Drehmer and Recktenwald continued to think about it and finally came up with the idea of implementing a higher-level central compressor control system.

SMART COMPRESSOR MANAGEMENT PROVIDES A REMEDY

After two providers failed due to, among other things, the decentralized system structure, the different makes of compressors and the integration of the many frequency-controlled units, WF Steuerungstechnik finally came into play with its product Airleader Master II. "And then everything went really well

"quick," remembers Dominik Recktenwald, "it only took five months from the offer to implementation." The compressor management system was introduced in November 2019.

WF Steuerungstechnik specialist Norman Kloss explains: "Our Airleader system is characterised by

works across manufacturers. Since there were no cable routes, it was also an advantage that our Airleader system could be easily integrated into the company network using TCP/IP converters, thus allowing the decentralized compressor stations to be connected." The first hurdles had already been overcome.

The next challenge was the intelligent integration of the four frequency-controlled compressors. "Here we were able to use our Airleader system with the new "FU Control" function for the first time. This makes it possible to actively integrate speed-controlled machines from different makes," says Norman Kloss. FU-Control detects when speed-controlled compressors are in an uneconomical range



» SIGNIFICANT SAVINGS

Before Airleader we had maintenance costs of around 21,000 euros per year, after the introduction it is only 5,000 euros. That's remarkable!

Dominik Recktenwald, voestalpine Automotive Components Birkenfeld



01 One of four compressed-air stations across the site.



02 Installing the Airleader master controller brought several benefits.



03 Rudolf Drehmer, Dominik Recktenwald and Norman Kloss (left to right). The project took just five months from planning to commissioning.

only 5,000 euros left! "That's remarkable," says Dominik Recktenwald. In addition, due to the greatly reduced operating times of the individual compressors, purchasing replacements is not an issue: "Without Airleader, we would certainly have had to replace some units," Rudolf Drehmer is certain.

Idle times were also significantly reduced thanks to the higher-level control system. "Here we are now at two to three percent instead of the previous 30 to 40 percent," says Reck

LOWER COMPRESSOR RUNNING HOURS MEAN REPLACEMENT UNITS ARE NO LONGER AN ISSUE

tenwald. Further positive effects can be seen in the system pressure: instead of the strongly fluctuating value between 7.5 and 9 bar caused by the constant load-idle cycle changes, the pressure is now constantly at 7.6 to 7.7 bar.

"We also use Airleader to control the use of waste heat from the compressors. We use this to specifically influence which compressors run preferentially in winter in order to use waste heat effectively. We support this with the waste heat

then the heating and make a positive contribution to the CO₂ balance," explains Rudolf Drehmer.

All numbers that Airleader determines are also used for energy management and fed into SAP. Drehmer: "Savings in the compressed air sector can be proven sustainably using SAP." And so he knows that thanks to the hugely reduced maintenance costs combined with the energy savings, the control system has paid for itself in less than a year.

run and actively provides remedial action. "It worked straight away: arming the Airleader brought calm and effectiveness to the interaction of the entire system," says Kloss happily.

HUGE EFFECTS NOT ONLY ON MAINTENANCE COSTS

"Before we introduced Airleader, there were five or even

"Six of the existing seven compressors are permanent, now it is enough for two devices to be in operation to ensure the compressed air supply for production," confirms Dominik Recktenwald. This means less wear and tear, as the running times of the individual compressors are drastically reduced due to the alternating operation that is now possible. And that has an enormous impact on maintenance costs: "Before Airleader we had maintenance costs of around 21,000 euros per year, after the introduction it is

PLANT SHUTDOWNS ARE A THING OF THE PAST

After three years of experience operating with the Airleader control system, Drehmer and Recktenwald speak of "pure relaxation". "We can no longer imagine that we would come into production in the morning and everything would be at a standstill because the compressed air system failed," they emphasize.

Thanks to the standard Airleader visualization on a screen in the control room, the compressors are always in view. In the event of error messages, a message that cannot be overlooked immediately pops up. In addition, email notifications and phone calls are triggered to those responsible. The control also monitors peripheral devices such as

Condensate separator and refrigeration dryer. And if production is scheduled to come to a standstill, the compressed air system can be easily switched off using a key switch.

OUTLOOK

With their successes in optimizing the compressed air supply, Rudolf Drehmer and Dominik Recktenwald can also score points with CO2UNTDOWN TO ZERO. The parent company voestalpine launched this initiative in 2021 for its Metal Forming Division with the aim of reducing CO2 emissions from production to zero percent by 2035. In Birkenfeld, we are on the right track, among other things, thanks to our activities in producing compressed air.

"Next, we want to tackle the issue of compressed air leaks more intensively," reveals Dominik Recktenwald. "And then I would like to delve even deeper into the possibilities of Airleader. Because there are certainly functions that I am not aware of, but that could be used for further optimization."

Images: voestalpine, Martina Laun

www.airleader.de

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PRACTICE TIP

By default, the Airleader communicates Master module with the compressors via bus cable. The RS485 bus technology has made it even easier to travel far (up to...

1,200 m) distant compressors can be integrated into the Airleader control system. If pulling a bus cable is difficult or impossible

possible, but an Ethernet connection for a PC network or similar already exists

It is possible to route the RS485 signal into the existing company Ethernet and to decouple it again at the desired location and feed it to the RS485 bus modules.

This is in addition to the Airleader's standard delivery scope for each decentralized location

a coupling module is required.