

All Really Tight

Compressors are available in a wide range of sizes and performances and are used in practically all industrial applications. One characteristic they all have in common: They must be highly leak-proof. In order to guarantee the high quality standards of the compressors, Haug Sauer Kompressoren AG built its own leak testing system. For data acquisition, recording and visualization of the process, the company turned to the automation specialist SIGMATEK.



Andreas Leu

There are countless manufacturers of compressors worldwide. And despite this Haug Sauer Kompressoren AG, based in St. Gallen, is not just one of many, because its compressors are oil-free, dry-running and hermetically gas-tight. This gas-tightness ensures that toxic or

environmentally harmful gases are compressed in a way that is safe for people and the environment. The oil-free operation of the compressors in turn enables the compression of high-purity gases in the process gas industry, as well as in medical technology. Haug offers

piston compressors that provide the highest possible level of safety against contamination of the compressed gas, which, thanks to many years of experience, can be built in practically any desired special design.

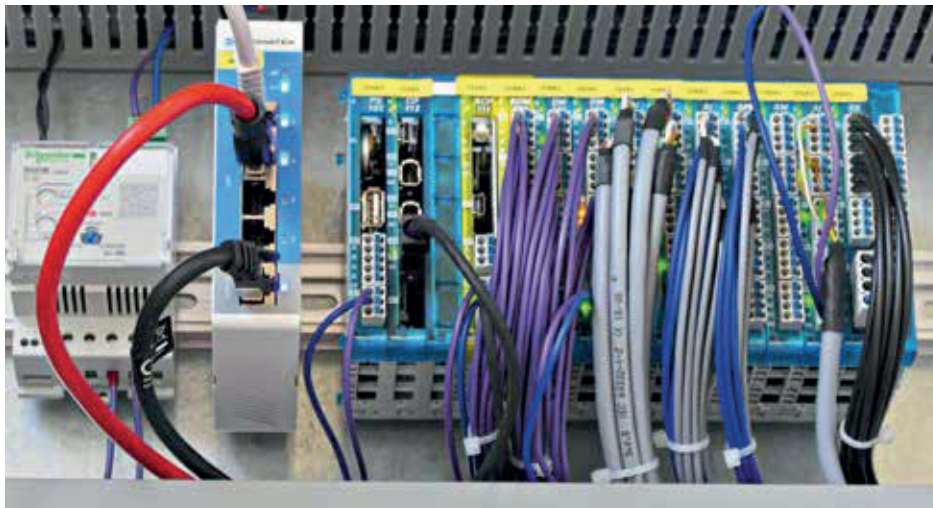
« For us as application engineers, secure remote access to our system via a VPN tunnel is very convenient. Customer requests can be dealt with comfortably in the office and we also save travel time. »

Peter Baumann, Sigmatek Schweiz AG



Picture: Andreas Leu

Peter Baumann, application engineer at SIGMATEK Switzerland: "Using the Remote Access Router I can securely access all the functions of an external control and make changes to them."



Picture: Andreas Leu

The SIGMATEK control system with integrated safety. To its left the RAR 2400 Remote Access Router.

To meet the high customer requirements in terms of tightness, Haug has designed and built its own test stand, which can be flexibly adapted to all compressor versions. This so-called FAT (Factory Acceptance Test) is carried out with nitrogen, as the customer's original medium cannot be used. Kurt Zeller has been with Haug for over 40 years and is responsible for the final assembly inspection. He explains the test procedure as follows: "The test station is designed and constructed so that all of the compressors we produce can be tested individually. Once the electrics and all sensors are connected, the process can be started. On the one hand, the tightness is checked for a possible pressure drop and via leak



Kurt Zeller, Final Assembly Inspection Manager, appreciates the freedom of movement with the portable wireless operating panel including safety.



Picture: Andreas Leu

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Yannick Descher, Head of Order Processing at Haug, in front of the test stand: "We, as Haug Saurer Kompressoren, are more of a niche supplier for special industries with highly complex applications."

detectors, and on the other hand, the vibrations on the compressor and on the shaft are detected and recorded. This is where the SIGMATEK control system comes into play."

Convincing All-In-One Solution

In the evaluation process for the automation of the test stand, SIGMATEK prevailed over its competitors due to two decisive factors. Firstly, the control solution was convincing. With the SIGMATEK automation system, all the necessary requirements regarding sensor signal acquisition and, in particular, safety were available as standard. For example, the AI 040 analog input module already existed, which can be used to directly record vibration sensors with an IEPE interface. Secondly, a portable wireless operating panel was important for Haug in order to guarantee the operator the greatest possible freedom of movement. With the HGW 1033 mobile Wireless panel, SIGMATEK not only offered an elegant component, it is also available with all safety functions via WLAN (SIL 3, PL e). Haug saw another major advantage of the SIGMATEK solution in the fact that it included both the hardware and the programming of the system. Peter Baumann, application engineer at SIGMATEK Switzerland, explains the most important features of the automation solution: "In principle, the degree of automation of the system is not very high and is not crucial for Haug. The process takes several hours and is controlled manually by the operator. Although the compressors are standard

devices, they are customized for each customer. Haug placed particular importance on the fact that the operator can move freely around the system with the mobile panel and is supported in recording data from the various sensors." The user simply enters the machine type and customer name via the WLAN operating panel. A button is used to start and stop the recording of data during the test cycle. At the end of the process, he simply sends the recorded measurement data

with a time stamp as a CSV file to an e-mail address via the gateway integrated in the SIGMATEK BWH 001 base station. A video camera is also connected via the SIGMATEK Remote Access Platform. This enables Haug's customers to follow the testing process from any location. Remote maintenance is also integrated into this system, which has already been used several times by Peter Baumann for adjustments and extensions to the application. This of course saves time and money, as there is no need to travel to and from the site.



The wireless panel's oscilloscope function allows the operator to monitor a signal in real time to detect any anomalies.

Engineering Made Easy

Peter Baumann is an experienced software engineer at SIGMATEK Switzerland and therefore just needed 60 hours for the control program and visualization. "Our user-friendly, intuitive and OOP-based engineering tool LASAL supports us as programmers enormously in software development and the creation of user interfaces," he explains. "It provides various templates and modules, such as for the integrated oscilloscope to display the vibration sensor or for sending e-mails. I only developed about three templates, such as the display of the process, specifically for Haug. I also was able to use ready-made function blocks for alarm handling which only needed to be customized." The mobile operating panel also features an emergency stop button is also integrated into the mobile control panel. In addition to the process data, the HGW 1033-3 wireless operating panel can also be used to transmit the safety

Picture: Andreas Leu



All compressors produced by Haug are tested on this test stand.

signal of the emergency stop wirelessly. All variants of the wireless panels in the HGW series are TÜV-certified and meet the highest safety requirements with SIL 3/PL e. The SPC 111 safety CPU module in combination with the SDM 081 safety digital mix input/output module is used for other safety-relevant functions such as the service switch. It has six safe digital inputs and two safe digital outputs as well as a doubled clock output and also complies with the SIL 3/PL e, Cat. 4 standard. Peter Baumann appreciates that the RAR 2400 Remote Access Router

is available for remote maintenance. "This module allows me secure access via a VPN tunnel and I can access everything as if I were on site. Customer requests for extensions were made in the office and, when the system is not in use, I install the adapted program on the controller. The configuration for this module is really very simple."

Customers Expect High Quality

Yannick Descher, Head of Order Processing at Haug, emphasizes the importance of the test stand for the production process of a compressor: "For our customers worldwide, it is essential that the device is tested for both functionality and tightness before delivery. Our compressors are mainly used in the pharmaceutical, chemical, oil and gas industries – in other words, wherever technical gases are used. We are more of a niche supplier for highly complex applications. These industries usually require special solutions and that is where we at Haug come in with our oil-free compressors. In such applications, a properly documented FAT is of great importance in order to exclude the possible dangers from toxic gas leaks." About the SIGMATEK solution Yannick Descher adds: "The test stand works absolutely smoothly and our customers are delighted when they see live on site at the FAT how seriously we carry out our quality testing and what data quality they receive."

About Haug Sauer

Haug Sauer can look back on almost 130 years of history. Since 2016, known as Haug Sauer Kompressoren AG, it has been part of the internationally active Sauer Compressors Group, which has branches on four continents from its headquarters in Kiel and is represented with its piston compressors on five continents and the world's oceans. Haug Sauer is the expert for oil-free compression of process gases with special compressors that are built to customer specifications. Almost 50 employees at the St. Gallen site develop, sell, manufacture, build and offer worldwide service.