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Swiss Rotary Table Technology

NEWSLETTER

Attractive training: Machine with CNC and handwheel control

EA-510



Pascal Greber, Head of Mechanics at Ruag: «In addition, we wanted a modern CNC machine with modern control, but one that could also be converted to manual handwheel operation. This allows the young tradespeople to learn both in manual mode and with the new control system.» (Images: Ruag)

The repair and maintenance of engines requires a high degree of versatility and flexibility on the part of both human and machine.

To ensure the attractiveness and high quality of employee training, Ruag AG in Stans, Switzerland has invested in a tool milling machine from Avia. The machine is equipped with both a handwheel and modern control.

At Ruag's location in Stans, jet and helicopter engines are maintained and repaired for the Swiss Air Force. For this purpose, the engine components are disassembled into their individual parts. Only then is a decision made on exactly how much machining and which machining operations need to be performed for a repair. «We repair and maintain many different engine systems. Since we never know exactly what work will be required, we have to be very flexible,» reports Pascal Greber, Head of Mechanics at Ruag in Stans. The engine systems consist of



EA-510 rotary table from pL LEHMANN. (Image: pL LEHMANN)

many very different individual parts, each of which places completely different demands on machining. Ruag's machinery is correspondingly versatile: Various turning and machining centers of different sizes are in use. Even grinding expertise is covered in-house.

A characteristic feature of engine repair is that the amount of work involved varies and cannot be planned. «When the engines are disassembled, there are always big peaks in the workload. Besides, we never know in advance exactly what work will be involved. After the peaks, there are also regular downturns that we have to compensate for,» Greber continues. During these down phases when no repairs are required, the machines are used to produce fixtures and aids for machining the engine components as well as tools such as holding devices and locking devices for assembly.

But not only does the machinery have to be geared to the specific requirements at Ruag, the employees also have to be suitably qualified and competent. The industrial training is correspondingly important. «We have to be highly flexible. That's why our employees are also trained in various areas of activity,» reports Greber, adding: «In the field of polymechanics, we're training six apprentices in the 3rd and 4th year in Stans alone. We employ apprentices in their 1st and 2nd year at the training workshop in Alpnach. In addition, we train future specialists in logistics, design, plant and equipment engineering, and electronics at the Stans site.»

Training on modern machines with modern control

Greber's philosophy is that training ought to take place on modern machines. Accordingly, an older machine should be replaced. He says, «We wanted to make a replacement purchase to bring our machinery up to date and train employees and apprentices using the latest technology.» The choice was made in favor of the manually and CNC-operated FNE40 N tool milling machine from Polish machine tool manufacturer Avia FOP. The machine has already been in use since early summer 2022. Avia machines are distributed in Switzerland exclusively by Catalano Werkzeugmaschinen AG, based in Reiden. «Originally, Catalano was known to us from the used machinery trade. We took a closer look and found out that they sell a portfolio of new machines that is of interest to us,» reports Greber. Alessandro Catalano, Managing Director at Catalano, is pleased at this development. «We are very happy and we support Ruag in using modern machines for training. Nothing is more off-putting to young tradespeople than apprentice workshops where everything is green,» he reports, alluding to the green color scheme of machine tools from the early days of CNC control over 40 years ago.

Avia's original 3-axis machine is equipped with the pL LEHMANN table, making it suitable for 4-axis simultaneous machining. «We had a clearly defined set of specifications. The new machine should at least replace the capabilities of the previous machine. This applies above all to the path control, the travel paths, and the fact that stability and high precision are guaranteed,» reports Greber. He adds: «In addition, we wanted a modern CNC machine with modern control, but one that could



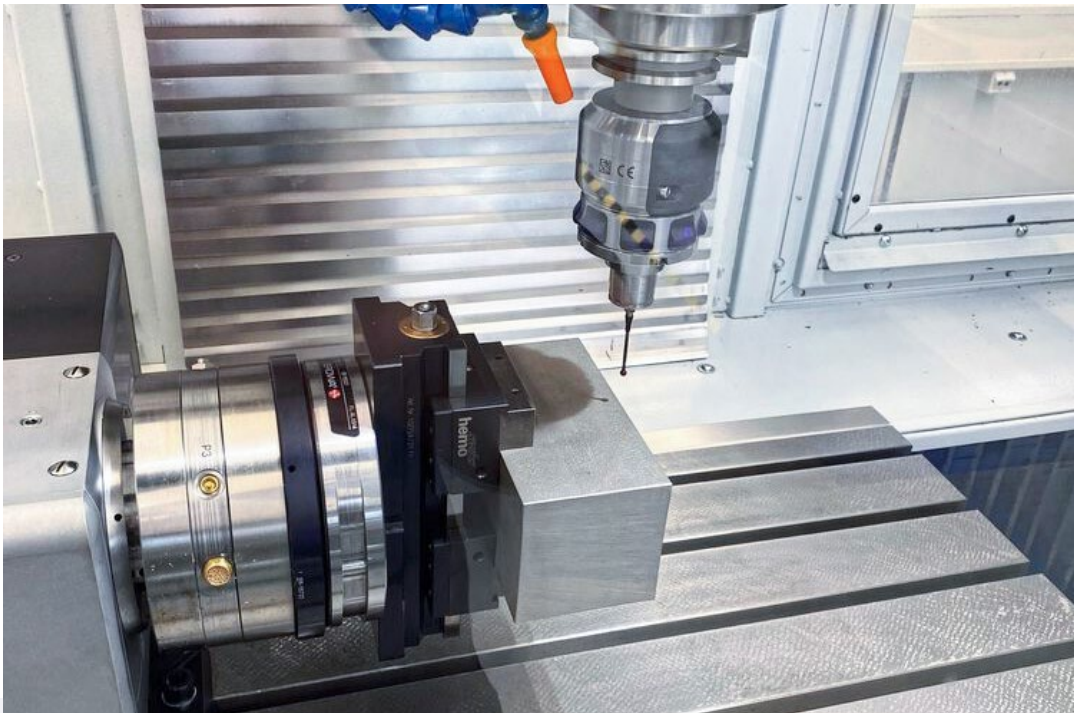
The manually and CNC operated Avia FNE40 N tool milling machine is equipped with an up-to-date Heidenhain TNC620 HSCI control system.

also be converted to manual handwheel operation. This allows the young tradespeople to learn both in manual mode and with the new control system.»

The FNE40 N tool milling machine from Avia can be operated using the state-of-the-art and proven Heidenhain TNC620 HCSI control system and is equipped with digitalized drives. A stable cast construction ensures maximum stability and accuracy of the components to be machined. Thanks to horizontal and vertical spindles, a movable quill and a swiveling milling head, the machine can be used universally. The spindle speed and feed rates are infinitely variable and, together with separate, stepless motors, enable the optimum machining parameters to be set. The feed process is carried out by backlash-free, precision-ground recirculating ball screws. Furthermore, the machines of the FNE series are equipped with generously sized flat guides. All installed electrical parts are CE-compliant and come from well-known European manufacturers. To meet Ruag's requirements for 4-axis simultaneous machining, the machine was additionally equipped with an EA-510-M3 rotary table from Peter Lehmann. In addition, the Power Chuck P pneumatic zero point clamping system from Erowa AG is used for a quick change of clamping devices. The Hemo Optima 80 x 200 centering vise from Hemo AG is used for precise and flexible clamping of workpieces in both the first and second operations.



The new Avia machine is equipped with a hydraulically operated tool unclamping system for SK40 69871 A tool holders.



Interior view of the Avia FNE40 N: The machine is equipped with generously sized flat guides. Pictured here is the measurement of the component using the Heidenhain TS460 measuring probe.



The originally 3-axis Avia machine is equipped with an EA-510-M3 rotary table from Peter Lehmann. This enables 4-axis simultaneous machining with Hypermill programming.

the market. One important aspect is to have a reliable contact person here in Switzerland. And the whole process is crucial. Together with the customer, we looked for solutions to meet the requirements optimally. In this industry, we don't always have the right solution right away. You have to talk about it and communicate properly.»

Positive: Spare parts strategy guarantees fast procurement

The basic decision for the new machine was made on the basis of technical criteria in accordance with the specifications. But in the end, it was a team decision. «All the employees who work with the new machine looked at the offers. Thus, the criteria of the individual employees were sometimes based on very different aspects. In the end, we decided on Avia because soft factors also played a role,» reports Greber. One of the reasons that spoke in favor of the Avia machine is the company's spare parts strategy. Catalano is building up a spare parts warehouse for all machines ordered. The Avia machine concept is a great help. «The machine concept at Avia is very well thought out. As a result, the same components are always installed in machining centers of different sizes. Thanks to consistent Y and Z travel paths, we can even stock recirculating ball screws in-house. This is very helpful in ensuring good inventory management and rapid spare parts procurement,» Catalano emphasizes.

The entire process of handling of the investment was also very positively received at Ruag. «Catalano works hard to maintain a very good, intensive and transparent interaction style, which is the focus for us. They are solution-oriented, provide timely responses and have an open communication style. I can definitely recommend working with Catalano,» Greber reports. Catalano adds, «There is an abundance of good machines on

pL LEHMANN ...

... the Swiss manufacturer of CNC rotary tables and other components for metal machining, is an experienced machine construction company whose rotary and tilting axes have proven their value in production for over 40 years. In addition to these products, which often make three-axis drilling and milling machines into more productive four- or five-axis machining centers, you can also find a variety of workpiece clamping systems in the product line.

CNC rotary tables with Swiss quality

Founded in 1960 strictly as a contract manufacturer, pL LEHMANN has been developing and producing CNC rotary tables for over 40 years. With innovations and Swiss quality, the family-owned company in the Swiss town of Bärau (Emmental) succeeded in opening up new opportunities for its customers and developing lean machining solutions characterized by high productivity through use of additional NC axes. One of the highlights of the company's history is the powerful and flexible Series 500 developed in 2009, which is ideal for the most demanding tasks thanks to its modular design. With the backlash-free, preloaded PGD gear unit developed in 2014, pL LEHMANN reached another milestone. In 2017, the company introduced innovations such as the new pL-iBox generation, which makes its rotary tables ready for Industry 4.0 and digitalized production. This was followed in 2019 by the introduction of the Series 900 DD (Direct Drive) rotary tables with speeds of up to 5,450 rpm. An additional new product, the AM-LOCK system, a special zero-point clamping system for 3-D printing, including pre-machining and post-machining, was presented for the first time in 2019.

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