



**R.A.M. Service**  
REVISIONE ASSISTENZA MACCHINE

**RENISHAW**   
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Case study: Precision manufacturing

## R.A.M. Service retrofits a classic grinding machine with FORTiS™ linear encoder scales



### Background:

R.A.M. Service, with over 30 years in the machine tool industry, specialises in retrofits and technical services. By collaborating with Renishaw, the company enhanced its retrofit service with advanced position and motion control solutions.



### Challenge:

Euro Tecno Tool's old Studer S30 grinding machine faced production limitations due to outdated electronics and manual-operation. The machine needed modernising to meet the customer's high-quality standards and handle specific shapes, which required a redesign of the electronics and mechanical parts.



### Solution:

R.A.M. Service installed Renishaw's FORTiS linear encoder scales on the Studer S30 retrofit. The FORTiS™ scales provide micron-level precision and easy installation, significantly improving the machine's accuracy and ability to grind complex shapes.



**The decision to use Renishaw FORTiS sealed linear encoders was driven by the need for a robust and resilient, easy-to-install measurement system that offers high-precision metrology.**

R.A.M. Service (Italy)





**R.A.M. Service, a company with over 30 years' experience in the machine tool industry, specialises in technical services and retrofits for machine tools. They pride themselves on their ability to customise machines to meet specific client needs, often developing prototypes for unique applications. R.A.M. Service collaborated with Renishaw to enhance its retrofit service by specifying advanced position and motion control systems from Renishaw.**

R.A.M. Service operations rely on quick turnaround and high project completion rates. They have a diverse client base of machine shops. The decision to use Renishaw FORTiS sealed linear encoders was driven by the need for a robust and resilient, easy-to-install measurement system that offers high-precision metrology. R.A.M. Service also uses Renishaw's QC20 ballbar for machine tool verification and validation (V&V) and its TRS2 broken tool detection system.

Mr Andrea Monica, Co-owner and Sales Manager at R.A.M. Service, explains:

**“ We are a company of almost 30 people and have three main divisions — technical, retrofitting and spindle repair. We see a lot of demand for rebuilding old machines, not only to improve sustainability but also cost efficiency compared to buying new. ”**



Mr Andrea Monica – Co-owner and Sales Manager at R.A.M. Service



Rocco Mancini – General Manager of Euro Tecno Tool

Euro Tecno Tool s.r.l., a customer of R.A.M. Service, owned an old Studer S30 grinding machine that faced production limitations with its outdated electronic system. “The Studer S30 is an old but great grinding machine,” Mr Monica says.

The axes were manually operated, which led to suboptimal precision and reliability, restricting the machine’s capacity to meet the high-quality standards required for metal packaging. The machine’s control panel had also deteriorated over 30 years of use and needed modernising.

Additionally, the customer needed to grind a specific shape that the machine was not originally designed to support. The challenge was to redesign and rebuild the electrical and mechanical parts, ensuring the machine could meet modern precision standards and handle the required shape.

Rocco Mancini, General Manager of Euro Tecno Tool, explains how they decided to retrofit their machine:

**“ We were at a crossroads, choosing between scrapping the machine or embarking on a major retrofitting project. The first meeting with R.A.M. Service clarified our options and allowed us to make an informed decision. ”**



FORTiS scales were chosen for their ease of installation and set-up, as well as their accuracy. R.A.M. Service technicians were able to install them quickly and precisely, even if they were previously unfamiliar with the scales. The ADTa-100 Advanced Diagnostic Tool streamlines the installation process, using multi-colour LED indicators to guide and verify optimal set-up.

Fabio Corradini, a technician at R.A.M. Service, expands on what impressed him about the FORTiS encoder:

“One reason for using FORTiS scales on a grinding machine is to achieve micron-level precision – essential for grinding. The installation of the FORTiS encoder went very well. It was easy, especially when using the ADTa-100 diagnostic tool to adjust the readhead. This diagnostic tool provides a signal health check of the encoder to confirm that set-up has been successful.”



FORTIS-N™ sealed linear encoder



## Studer S30 machine retrofit

R.A.M. Service redesigned the Studer machine's electrical and mechanical parts, installing a new FANUC CNC system and the FORTiS scales. The result was a significant improvement in precision and the ability to machine complex shapes, meeting the client's needs effectively.

Mr Mancini details the impact of choosing FORTiS encoders:

“The Studer machine has always been a cornerstone in our strategy for pursuing quality and precision. After 30 years, wear and tear had affected the control panel, leading us to retrofit the machine with a modern CNC controller and motorised axes.

Our customers are producers of metal packaging with a need for precision and very high-quality because they work with very thin sheets at high speed. For our needs, the reliable position measurement of the FORTiS enclosed encoder is fundamental because it allows us to work in a very wide dimensional range with excellent results.

The FORTiS encoder helps overcome the previous limits introduced by the ballscrew encoder, both in the precision of the linear position and to the diamond shaping process. We immediately noticed how using FORTiS linear scales has eliminated possible errors in reading and precision, allowing us to perfectly shape grinding wheels – even those with complex profiles.”



Studer S30 grinding machine prior to retrofitting



Retrofitted Studer S30 machine



Fabio Corradini – R.A.M Service Technician

Renishaw provided extensive support during the initial installations, ensuring that R.A.M. Service technicians were well-equipped to handle future projects independently. This partnership was instrumental in achieving the desired outcomes for R.A.M. Service and their clients.

As Mr Corradini, R.A.M Service Technician, says: “A Renishaw engineer came down for a day to help us resolve an installation issue on the Studer machine. We used a computer application [ADT View] to see the encoder reading in real-time to many decimal places, which enabled us to make the correct adjustments. Our first installation of a FORTiS encoder went very well; it was intuitive, fast, and manageable.”

Mr Monica continues: “We worked together with the customer to install a new CNC control system. We chose FORTiS scales because they work very well in dirty and wet environments and are easy to install. The QC20 ballbar is one of our best tools as it ensures that we give the customer precision. We have done a lot of applications with the TRS2 system for tool integrity, and many customers were very happy about that feature.”

The installation of the FORTiS scale significantly reduced set-up times and improved the overall precision and repeatability of the Studer S30 grinding machine. R.A.M saw a number of benefits:

- Speed of installation: The FORTiS scales allowed for quick and easy installation, which was crucial for meeting the project deadlines. The ADTa-100 diagnostic tool ensures that even challenging installations are completed swiftly.
- Improved precision: The new scales provided modern machine tool precision, giving the machine a new life with high performance.
- Client satisfaction: Euro Tecno Tool was pleased with the quick modernisation process and the improved capabilities of their machine.



Mr Corradini says: “Thanks to the quality of the FORTiS scale and the ADTa-100 diagnostic tool, we were able to guarantee precision that can only be found in modern machine tools. The Renishaw engineer was very supportive; we installed the first scale with their assistance, and the second one by ourselves – the result was great both times. Their ability to work alongside us on the machine and adjust the scale was very helpful. Grinding machines naturally require a lot of water, and the Studer S30 was not designed to allow the use of modern precision scales, so protection of the new scales with housings is impossible. For this reason, we were looking for a linear scale that could work with no issues in dirty and wet environments. Renishaw could guarantee this with the FORTiS encoder.”

Euro Tecno Tool noted a significant improvement in production pace and precision of its Studer S30, which is now capable of delivering micron precision and excellent surface finishes. The machine can grind the specific shape required by the client with high accuracy, matching the standards of modern grinding machines. The enhanced accuracy also helps with routine tasks such as precision spring grinding.

ADTa-100 Advanced Diagnostic Tool and the FORTiS-N encoder (foreground)





R.A.M. Service's relationship with Renishaw has been highly successful, enabling efficient, high-precision retrofits with innovative metrology solutions and dependable technical support. The FORTiS linear scales and other Renishaw products have proven to be valuable additions to R.A.M. Service's toolkit, enhancing its reputation for quality service.

Mr Monica concludes: "Renishaw always gave us the support and consultancy that we needed. So, we are very happy about the relationship with Renishaw."



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Part no.: H-3000-5836-01-A