The advantages of Eaton’s electro-hydraulic synergy for Pietro Carnaghi

Greater reliability and drastic reduction of machine manufacturing time: the results of the SmartWire-DT implementation

Location:
Villa Cortese, Milan, Italy

Challenge:
Expand the implementation of the SmartWire-DT solution with the HDPP connectors and the variable speed starter to the hydraulic power units provided for all the machine tools produced by the Pietro Carnaghi company.

Solution:
Eaton’s electro-hydraulic synergy developed a solution applied to the entire range of Pietro Carnaghi, in particular for diagnostic purposes, in order to simplify and rationalize the systems.

Results:
The extension of the application of the SmartWire-DT solution has resulted in a considerable reduction of the wiring, in particular thanks to the HDPP connectors for the solenoid valves, a reduction in the times for the realization of the hydraulic power unit and the commissioning of the machines, enabling remote diagnostics.

“When we decided to implement the SmartWire-DT technology on all our machines, after the important results obtained for our new hydraulic power units, the electro-hydraulic synergy was one of the key factors in our choice.”

Giorgio Mazzola, direttore tecnico di Pietro Carnaghi

Background:
Pietro Carnaghi is an Italian manufacturer of high performance machine tools, such as large vertical lathes, milling machines and Gantry systems. Main application fields are energy production, aerospace, mining equipment and earthmoving. A well known leader in the production of large vertical lathes, Carnaghi also provide advance machining technologies to aid the customers production needs.

Challenge:
In a world increasingly dominated by the imperative need for better, faster, more economical business operations, manufacturers are facing increasingly complex challenges compared to the past and need reliable and innovative partners to support them in the digital transformation to remain competitive. In particular, Pietro Carnaghi turned to Eaton to accelerate the process of assembling the machines and commissioning the hydraulic power units, which previously required a long wiring process and verification, consequently impacting the delivery times of the machines. The two companies worked together to develop a smart and revolutionary solution with the aim of improving the performance of the hydraulic system, reducing the costs and time of diagnosis and intervention. Eaton not only represented the ideal partner for Pietro Carnaghi’s deep knowledge of the business and the strategic collaboration established over the years, but also for the ability to realize electro-hydraulic synergies resulting from the experience and leadership gained in both sectors - these synergies are increasing in demand compared to traditional solutions.
The solution:

Starting from the tangible benefits previously generated for Pietro Carnaghi by the adoption of the SmartWire-DT solution, Eaton has chosen to apply the same technology to all the other areas of the machine control system design, to be able to benefit from the electro-hydraulic synergy and consequently, reduce wiring costs and assembly time of electrical components.

“The dialogue between the electrical and the hydraulic part has guaranteed a better synergy. The choice of Eaton allows us to have the two souls - hydraulic and electric - supplied by the same company and therefore to be able to take advantage of an autonomous product and to receive a unique assistance. In fact, often the systems of different companies have a completely different DNA, and this complicates the integration. Not only that, this would have meant delegating part of the work to a third company whereas now we have a finished Hydraulic Power Unit as an integrated solution and above all, a complete system,” stated Ing. Giorgio Mazzola, technical director of Pietro Carnaghi.

The possibility of offering its customers integrated turnkey electrohydraulic solutions ranging from the loose component to the complete design and supply of Hydraulic Power Units is undoubtedly one of the strengths that led Pietro Carnaghi to choose Eaton. The synergy allows the business to make maximum use of the plant with precision and repeatedly at the highest levels supported by the Eaton hydraulic components. These two necessary characteristics are guaranteed in every single phase of the production process, namely precision in the control and continuous operation.
The result:
Eaton integrated systems provide a complete solution for a more energy efficient, reliable and quieter system than previously possible. Furthermore, the wide range of Eaton components used for integrated electro-hydraulic solutions, offers a variety of additional possibilities and enables further innovative processes.

The results obtained with the adoption of SmartWire-DT are different and tangible: the first aspect is the impact on the wiring. Wire cabling has reduced from 672 meters to 170 meters with a reduction of 75% space inside the control cabinet - also a reduction in the overall machine footprint - with opportunities to identify errors and problems. Furthermore, less cables means a faster and more reliable cabling system that allows more data to be collected in less time.

Lastly, the replacement of traditional valve connectors with the new HDPP SmartWire-DT allowed an increase of the diagnostics on the valves, in particular in cases of overcurrent, which were not previously detected. The Power XL DE1, a variable speed starter, was placed between the simple motor starter and the inverter, combining the advantages - the ease of use of a motor starter and the variable speed control of an inverter - in a single unit, which is therefore an easy-to-use, economical and extremely reliable alternative.

“SmartWire-DT technology guarantees important improvements concerning the greater reliability and the possibility of performing remote diagnostics. We have succeeded in moving from a traditional to an innovative and very competitive production process. Above all, this technology has allowed us to optimize the construction times of the machines and reduce the testing time by 50%, an essential requirement to remain competitive as the market leader. In addition, we are structuring a global service department, a service enabled by SmartWire-DT that allows us to immediately identify the type of intervention needed and to understand how to proceed, or if it is sufficient to send spare parts or if a technician is required. Furthermore, it is now possible to make this diagnosis remotely in any situation and even via a mobile phone, with internet connection. This is a strategic initiative that has allowed us to reduce interventions by 60%, with significant economic repercussions that have contributed to consolidating our position as market leader,” added Roberto Massara, Automation Manager of Pietro Carnaghi.

PowerXL DE1 variable speed starter. An easy-to-use, economical and extremely reliable alternative to a traditional Variable Frequency Drives.