

Kollmorgen Helps Salvagnini Build More Energy-Efficient Metal-Bending Machines

Innovation, competency, service. Through 60 years in business, these three commitments have helped the Salvagnini Group achieve global leadership in the field of sheet-metal processing equipment. As the #1 worldwide supplier of panel benders, and one of the top five for all sheet-metal tools, Salvagnini has five manufacturing plants, 25 branches, more than 2,000 employees, and over 7,000 installations in 79 countries. With such a large and influential presence, Salvagnini understands how important it is to contribute to a more productive and sustainable world.

“Kollmorgen’s insight into our industry’s needs and our company’s goals for this project, along with their collaborative engineering expertise, have led to a strong and productive relationship between our two teams.”

— Wolfgang Kunze, CTO
Salvagnini Maschinenbau

Challenge

The same commitments that have made Salvagnini successful — innovation, competency and service — animate the company’s ethical values. Beyond manufacturing and marketing innovative machines, Salvagnini wants to help customers achieve higher productivity, greater energy efficiency, and a better working experience for users.

Compared to a press brake, the company’s panel-bending machines produce more accurate and efficient bends without requiring a highly trained operator to guide the material through a series of bends. Instead, the panel-bending machine automatically manipulates the sheet into a precise position, clamps it in place with a blank holder, applies a fixed counter blade at the bend location, and moves the bending blade against the material to produce a bend. The piece is then manipulated into a new position and the process is repeated as needed to complete the form.

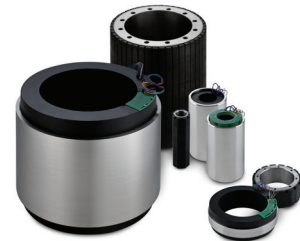
This process involves highly coordinated and powerful servo motion. Substantial energy consumption would normally be required, but Salvagnini wanted to reduce energy needs to the greatest extent possible for a more sustainable machine as well as to achieve a more ergonomic machine that’s easier to build, use and maintain.

Solution

Working with the Salvagnini team, Kollmorgen collaboratively engineered a new modular drive series: the MKD multi-axis slice drive. These compact, high-performance drives offer smart energy management through the ability to capture braking energy, store it using Kollmorgen's newly patented DC current regulator with supercapacitor, and release it during the next acceleration command. The system can also limit the peak power the machine can take from the main power supply network. The drive's compact, modular form factor significantly reduces installation effort and panel space in machines with multiple axes.

AKD-N decentralized servo drives are used to further reduce cabinet space, simplify assembly and maintenance, and reduce overall cabling requirements by up to 80%. Decentralization also minimizes or eliminates the need for derating so that smaller, more energy-efficient drive and motor combinations can be used.

Kollmorgen KBM direct-drive motors complete the solution. Directly embedded into the machine, these frameless motors offer ultra-precise motion while eliminating the need for complex, backlash-prone and maintenance-intensive transmission components. In Salvagnini's panel-bending machine, the direct-drive solution reduces the rotator duty cycle by 25%. Communications between controller and drives are handled by the EtherCAT fieldbus for superior accuracy and throughput with minimal CPU load.



Results

By enabling the recuperation of braking energy via the patented DC current regulator with supercapacitor, the Kollmorgen motion solution reduces energy consumption by 4.6%. Over the course of a year, this saves approximately 1 MWh of energy while significantly reducing dissipated heat.

The solution also reduces peak power requirements by 79% while greatly stabilizing the DC bus. This helps prolong component life and enables installation in electrical environments where peak power is limited or where excessive EMI noise would otherwise be a problem.

Thanks to smart energy management, the system can also keep the machine running for minutes when line power is lost, helping to dramatically reduce machine downtime.

The panel-bending machine is more energy-efficient and durable, meeting Salvagnini's sustainability goals. And it's also more dependable, productive and easier to maintain, meeting the company's goals to better serve its worldwide customers.

1 MWh
of energy saving yearly

About Kollmorgen

Kollmorgen, a Regal Rexnord Brand, has more than 100 years of motion experience, proven in the industry's highest-performing, most reliable motors, drives, linear actuators, AGV control solutions and automation platforms. We deliver breakthrough solutions that are unmatched in performance, reliability and ease of use, giving machine builders an irrefutable marketplace advantage.