




UMBRA GROUP

INDUSTRIAL SOLUTIONS

Our Case History



***THE EVOLUTION:
FROM A COMPONENT
MANUFACTURER
TO A PRODUCER
OF COMPLEX SYSTEMS***

***FULL-ELECTRIC
PRESS BRAKE***

THE CHALLENGE

UMBRAGROUP supported a World leading customer in the sheet metal industry, contributing to the realization of a full-electric machine that uses internal-use, direct drive actuators for the main axis movement of bending machines.

THE PROJECT

The Customer needed to increase efficiency, precision, compactness, rigidity and to reduce the environmental impact by replacing all the hydraulic circuit components with a technologically advanced solution which was developed, produced and tested in **UMBRA**GROUP.

THE ACHIEVEMENTS

UMBRAGROUP's proposal resulted in a compact electromechanical actuator that is fast, silent and able to sustain itself during important axial thrusts and burdensome work cycles.

All enhanced with benefits resulting from a full-electric architecture and a high level of reliability in operation for the entire life cycle of the machine.



The electrification path for a range of machines aimed at sheet metal bending began in 2009 with a European customer, a global leader in the sector. The request for collaboration arose from the manufacturer's need to offer the market a new line of press brakes that, compared to the competition, could focus on greater performance in terms of speed, stiffness and precision, without neglecting power, reliability and safety.

Some of the project requirements were particularly challenging. To ensure high performance in relatively small, overall dimensions, an extremely compact solution was developed based on the thorough integration of different components.

Over the years the product has continued to develop to meet the needs of the market. In its latest evolution, an innovative electromagnetic brake was introduced, also designed and built by **UMBRA GROUP** to meet the safety requirements imposed by current legislation.



In an application dominated by hydraulics, **UMBRA**GROUP has materialized the customer's need to revolutionize the sheet metal bending sector by creating a completely full-electric solution. A common design path led to the development of an electromechanical system that integrates in a single assembly:

- High-load ball screws with innovative "low-noise" recirculation system.
- Combination of roller and ball bearings to support radial and axial loads.
- Direct drive torque motor.
- Aluminum alloy housing with fins to improve the disposal of the heat with natural convection.
- Absolute multi-turn encoder for shaft tip management over the entire stroke.
- Electromagnetic braking system completely developed by **UMBRA**GROUP.
- Lubrication for ball screw and bearings.

THE ACHIEVEMENTS



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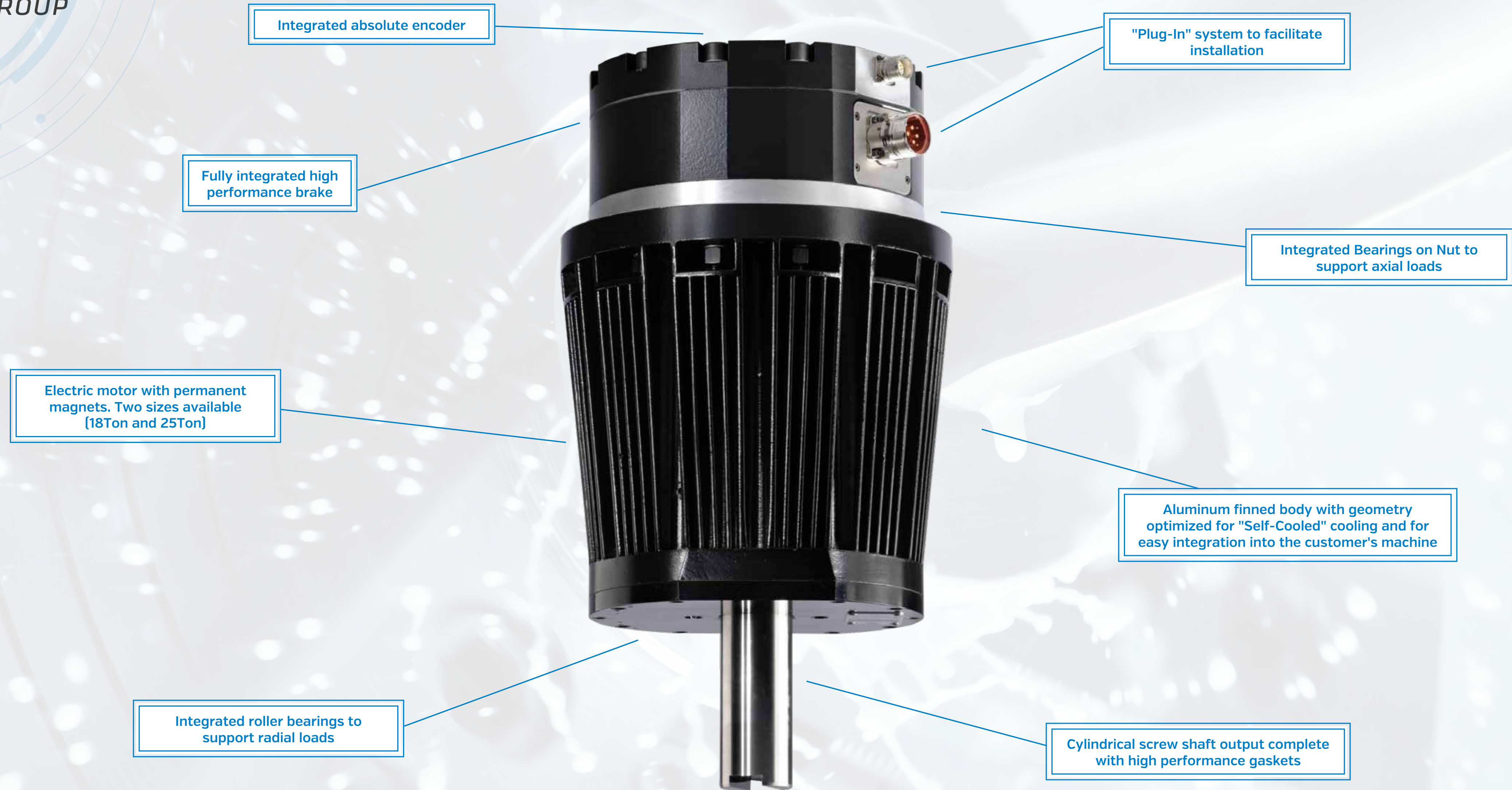
UMBRA GROUP, in addition to having designed and built the assembly, has pushed forward to qualify the system for performance and reliability.

Thanks to the partnership undertaken with the customer, it was possible to conduct endurance tests on the entire machine, as well as test their magnetic compatibility and noise performance by utilizing the innovative test laboratory equipped with a semi-anechoic chamber.

These tests have certified the actuator's reliability which, in the field, has proven to be equal to the life cycle of the machine and much higher than the hydraulic version. In addition, the replacement of hydraulics through a full-electric solution has generated significant benefits for the customer in terms of environmental protection and energy efficiency.

The combination of precision and rigidity, typical of a solution with ball screws, has optimized the work cycle thanks to the management of the axis by an electric drive. Overall dimensions and weights have been minimized to reduce the operating and maintenance costs typical of equivalent hydraulic solutions.

TECHNICAL SPECIFICATIONS





WHY THEY CHOSE UMBRAGROUP



**INDUSTRIAL
SOLUTIONS**

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UMBRA GROUP was the perfect partner to support an industry leader in such a revolutionary project.

Our responsiveness, flexibility and competence convinced the customer to choose us. **UMBRA GROUP** immediately demonstrated a level of innovation which guaranteed a consistent advantage over the competition. It is no coincidence that even today, after more than ten years, the solution represents a benchmark for the entire sector.

UMBRA GROUP's collaborative approach is unprecedented in a project involving this application. The client found professionals with a high level of technical preparation backed by a solid brand which is highly-recognized by the market after years of experience in the Industrial and Aerospace sectors.

BALL SCREW



The deep experience gained on VRS in the industrial and aerospace fields allowed the development of an innovative, compact and integrated device.

INTEGRATED BRAKE



Integrated electromagnetic, high-torque brake.

ELECTRIC MOTOR



Permanent magnet motor with high power density.

BEARING



Optimized bearings thanks to the deep experience and product knowledge, part of **UMBRA**GROUP since its birth.

“When we started designing the new actuator we felt we were establishing a new era. In order to replace the hydraulic actuator with an electromechanical one, we accepted a multiple challenge: build a step ahead device in terms of precision, controllability, environmental friendly, fastness, robustness and safety. Working together with our customer, we did it! We developed a new future!”

Ing. Luciano Pizzoni

Director Design Aerospace – HDO
Engineering and R&D
UMBRA GROUP S.p.A.

“ A stimulating challenge for the UMBRAGROUP Team, which has allowed us to achieve significant results in terms of Innovation.

A project carried out proactively, oriented towards solving problems, which allowed the customer to achieve product leadership in its business sector, redefining the standards of that market.”

Matteo Notarangelo

CEO UMBRAGROUP





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