




**UMBRA GROUP**

# ***INDUSTRIAL SOLUTIONS***

***Our Case History***





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



***BALL SCREWS  
FOR NEXT  
GENERATION  
OF SCARA  
ROBOTS***



## THE CHALLENGE

**UMBRA**GROUP participated in the development of a complex, high-performance component in collaboration with one of the leading worldwide manufacturers of **SCARA Robots**. It was the first **UMBRA**GROUP application in this sector.

## THE PROJECT

Through the Innovation Process and the power of Revolutionary thinking, which are both integral parts of **UMBRA**GROUP's DNA, we developed a new product with very strong component integration (shaft screw, bearings and anti-rotation) by using innovative production technologies.

## THE ACHIEVEMENTS

The system fully satisfied the Customer's expectations in terms of performance, costs, planning, schedules and execution.

**UMBRA**GROUP's solution obtained the qualification and is currently present on this series of **SCARA Robots** worldwide.



## THE CHALLENGE



In 2017 we began collaborating with a prestigious European client, a world leader in the production of **SCARA Robots**. The goal was to develop a system consisting of a ball screw with a rotating and anti-rotation nut, able to sustain dynamic performances not available on the market at the time. The customer's requirements were also very stringent in terms of weight, inertia, noise level and compactness.

This project represented **UMBRA GROUP's** first achievement in this highly technical market segment with a strategic focus on robotics. In particular, **UMBRA GROUP** designed and developed the assembly which is used in the vertical and rotary movement of robotic arms typical of the **SCARA** "pick and place" application.

**UMBRA GROUP** has matured since the 70's having acquired extensive experience in manufacturing ball screws with millions of assemblies in operation and customers located on all continents. Even so, this project still represents a great challenge today in terms of component integration and our technical skills.





The project represented an evolution from the manufacturer's previous generation of **SCARA Robots** and it developed by beginning with the not-modifiable, dimensional constraints imposed by the customer, and by the application's performance requirements. Substantial performance enhancements and a highly-defined perimeter added complexity to the project.

**UMBRA GROUP's** Engineering team, thanks to its experience in ball screw and bearing manufacturing, developed a cutting-edge solution. At the same time, our partner's knowledge of the application and the sector were decisive in the project's success.





**UMBRA**GROUP took the following actions in responding to the requirements:

- Implementation of UPS (Umbra Production System) and sharing ideas by brainstorming as a multifunctional Team.
- Introduction of innovative production systems with components made with Additive Manufacturing.
- Acquisition of dedicated machinery for the execution of the most critical processes.
- HALT Test carried out a highly-advanced testing room for prototype qualification.
- Continuous monitoring of strategic KPIs through Project Management logics [OTD, Design to Cost].



## THE ACHIEVEMENTS



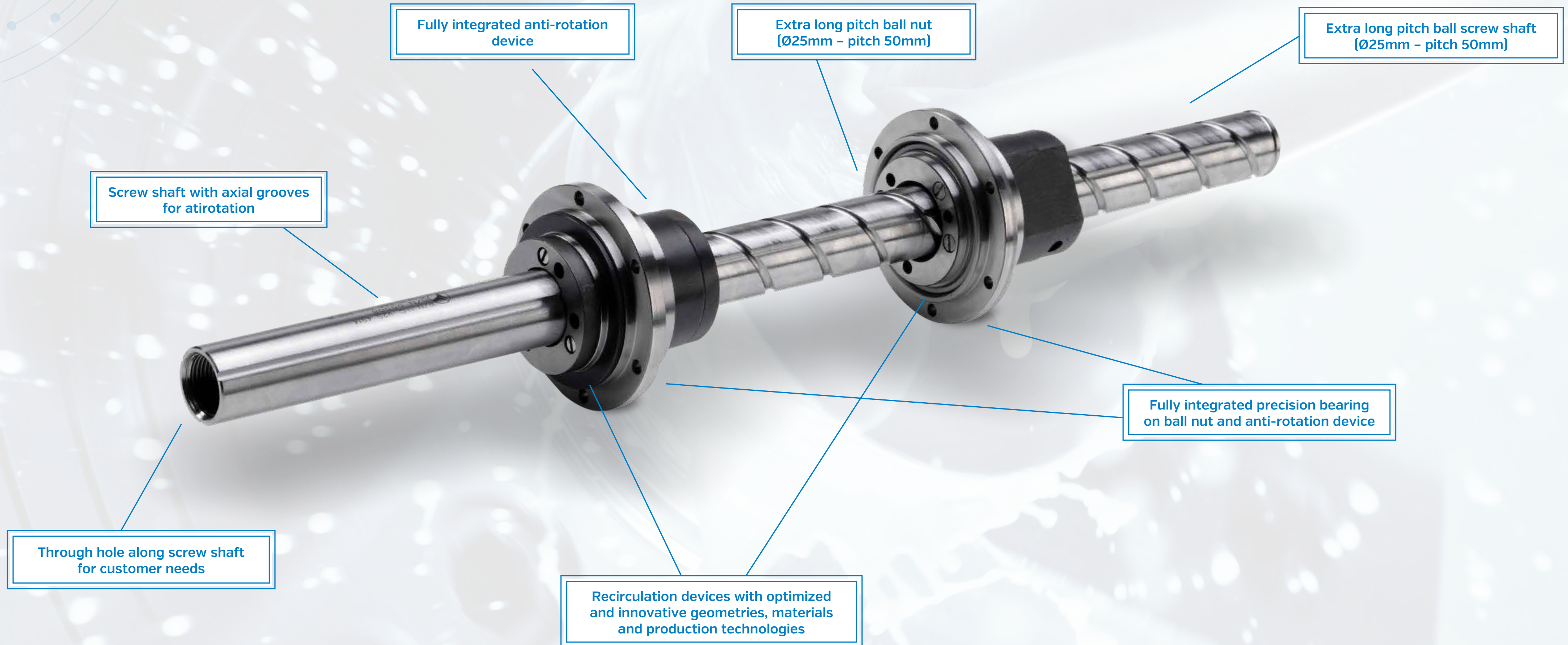
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**UMBRA GROUP** designed and developed the system which was qualified in 2019 after completing numerous tests at maximum performance in terms of speed, load and acceleration. Integrity checks conducted on the individual components at the end of the qualification showed no signs of wear abnormal or damaged.

Once the prototype phase was completed, the strong working relationship established between the two partners allowed integration of latest generation components. Today, the solution has achieved peak performance in terms of weight, inertia and quiet operation.

Finally, Quality Management's support was invaluable in aligning the testing procedure with customer. This allows the system to arrive with a "free pass" on the production line which can then be assembled by the customer himself.







# TECHNICAL SPECIFICATIONS

## ADDITIONAL BENEFITS



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- > Extreme Compactness
- > Optimized inertia and weight
- > Through Hole Along the Tree
- > Integrated Anti-rotation System
- > Recirculation Geometries Optimized for High Speeds
- > Quiet operation
- > High Precision Screw and Bearing Geometries





## WHY THEY CHOSE UMBRAGROUP

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**UMBRA GROUP** is committed to finding solutions for the next generation of robots. Our engineers designed multidisciplinary solutions for the SCARA Robots which had to excel in a variety of areas, including: endurance, efficiency, acceleration, inertia, operating quietness as well as costs.

**UMBRA GROUP** has always been committed to innovation and forward-looking technologies. We apply our know-how and extensive experience to produce high-performance products which are used by our sophisticated customers.

**UMBRA GROUP** experts have learned a lot by collaborating with our customers' technicians and by evaluating their feedback on product performance results. Additionally, our customers recognize us as a skilled and professional stakeholder always available to respond to their feedback.

In the end, our customers have selected **UMBRA GROUP** as a premium partner in accomplishing achievements and facing future challenges. **UMBRA GROUP** has shown stability, flexibility and reliability year after year as a truly Intelligent Partner.



## OUR COMMITMENT TO THE CUSTOMER

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*"The customer was searching for a reliable supplier for a complex, high-performance component and they found UMBRAGROUP.*

*During the first meetings when we were developing the screws for the new generation of SCARA robots, there were many critical issues: high speed, reduced weights and inertias, noiselessness, limited overall dimensions and clearly a price target that kept the business viable.*

*Design and development processes followed an interactive path that, in a short time, led to qualification tests; prototypes, with an advanced integration of different components thanks to the use of innovative production technologies met the customer's requirements.*

*The continuous dialogue between the technical and quality Teams of UMBRAGROUP and the customer was crucial for the success of the project. Once the prototype phase was completed, the industrialization phase followed. This made possible to meet the needs of the market in terms of reliable delivery dates and compliance with the customer's quality standards.*

*From concept, through development, up to delivery of the product, UMBRAGROUP is the ideal Partner to meet the needs of demanding customers in complex and customized applications."*

**Giacomo Rossetti**

*Manager Design and Development Industrial*

**Davide Scerna**

*Manager Production and Assembly Industrial*



*“UMBRA GROUP is an Intelligent Partner, that focuses on three fundamental guidelines: the quality of each of its processes and products, its specialized Team, and the creation of the most innovative solutions to meet the needs of a constantly evolving market. Through our work we are always at the customer's side to guarantee a high-quality, sustainable product, designed to offer an ever-greater competitive advantage.”*

**Matteo Notarangelo**

CEO UMBRA GROUP







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