



Case Study

Full Automatic Rotor Assembly Line

#Automotive #Rotor #Assembly #Precision #Automation





HAHN Automation Group develops high-precision Rotor Assembly Line

HAHN Automation Group delivers cutting-edge automation solutions that combine precision, speed, and global coordination – empowering customers to master complex assembly challenges with confidence.

- ✓ Fully automated assembly line
- ✓ High article variance
- ✓ Precise joining processes



Challenge

Developing a fully automated assembly line for rotors weighing up to 30 kg demanded more than just engineering expertise. The system needed to handle a wide range of article variants, manage force-sensitive joining processes, and ensure 100% accuracy in magnet placement. While the process development took place in Germany, the line had to be assembled and commissioned in Mexico – adding logistical and coordination complexity across continents.

Developing a Solution

HAHN acted as general contractor, managing all sub-suppliers and ensuring seamless integration of systems such as magnetizing equipment, balancing units, and injection molding machines. To meet the strict cycle time, duplicated SCARA robot stations perform magnet insertion in less than 1.7 seconds.

A sensor array with approximately 60 interchangeable Hall sensors checks the magnetization of each rotor, ensuring all magnets are correctly placed and undamaged. Throughout the assembly process, magnetic fixtures are avoided, and adaptive joining methods – including oiling, inductive heating, and nitrogen cooling – are used to enable precise, damage-free handling of all product variants.



Core Technologies

- 1 Magnet Feeding & Assembly
- 2 Pressing Processes
- 3 Injection Molding
- 4 Magnetizing

Cycle time: 41 seconds per part.



Results

The project resulted in a fully automated rotor assembly line with high-speed, variant-flexible processes, precise magnet placement verification, and globally coordinated implementation. HAHN delivered a turnkey solution that meets demanding cycle times and quality standards across international sites.



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