

Application Notes

Automated assembly line for industrial valves



Industry Insights

In industrial automation, assembling components for fluid management calls for high standards of precision, repeatability, and flexibility.

When a single line has to handle different variants of the same product, the ability to adapt quickly to format changes becomes a decisive factor in ensuring productivity and efficiency.

In this project, developed by **Nexus Automation** in collaboration with **SINTA**, the goal was to build an automated line for assembling a valve made up of four elements, available in different size configurations, while maintaining a single, highly reliable production process.

Handled Parts



The automated line assembles an industrial valve.

During system development, the most effective feeding solution was identified for each component.

The **valve bodies** feature different geometries and represent the most critical component of the process.

They are handled by two FlexiBowl® units.

The Configuration



FlexiBowl® 500
Standard Mode

The solution developed by Nexus Automation and SINTA integrates:

- **2 backlit FlexiBowl® 500 units**, dedicated to feeding the valve bodies;
- **2 Epson robots** (4 kg payload, 600 mm working radius);
- **Epson vision system**;
- dedicated systems for feeding springs and o-rings.

The vision system identifies the position and orientation of the valve bodies in 2D. Based on the model detected, the robot automatically adjusts the gripping angle to optimize picking.

Next, the gripping system performs a self-centering operation that compensates for residual error, ensuring the precision required during assembly.

Results

- throughput of approximately **8 ppm** for the entire valve;
- automatic handling of different variants of the same valve;
- high precision in positioning and assembly;
- automatic robot adaptation to different component geometries;
- automatic compensation of residual errors thanks to the self-centering system;
- high production flexibility without the need for complex format changeovers.

Key Points



Metals



EPSON Robot



Assembly Process



8 ppm