Matrix® International
An Altra Industrial Motion Company

Application Profile

Product Modified 1EB Brakes

Application **Industrial Robots**

Highlights

- Custom spring-applied, electrically released brakes
- Power-off holding and stopping functionality
- Low inertia/high torque
- Low backlash
- Special plating and friction materials
- Extensive in-house life cycle and backlash testing

A leading global industrial robotics manufacturer contacted Matrix to provide servo motor brakes for a new series of robots used in material handling and process applications. The robots often operate 16 to 24 hours/day performing rapid repetitive programmed functions.

The power-off brakes needed to maintain torque during static/holding operations and occasional E-stop dynamic/stopping engagements if a power failure occurred. Minimum backlash was also required to prevent the robotic arms from "bouncing" or "drifting" during precision movements and stops. Less than 1 degree of backlash movement could cause the robot's arm to significantly miss its target location, causing productivity problems and possible damage.

To meet the challenging application requirements, Matrix engineers developed various sizes of modified spring-applied, electromagnetically-released 1EB Series servo motor brakes. A special friction material that does not absorb moisture was designed specifically for this application. The number and type of springs, plating options, and composite friction materials with low wear rates were evaluated and selected to achieve the specified braking torque and temperature levels for each motor/brake size.

Extensive testing, with accurate data capture, was conducted in-house on multiple custom-built, computer-controlled test stands to validate the required performance characteristics. Per customer request, brake life testing was performed to ensure brake life would exceed the life expectancy of the robot.

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