Beckhoff — AL Linear Motors

AL2024-0001-0000



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The **AL2024-0001-0000** is a coil unit from the Beckhoff AL Linear Motors series. As part of a linear servo motor system, the mover converts drive current directly into translational force along a magnet track mounted on an iron backing. Electromagnetic thrust eliminates the need for ball screws or belts, providing smooth, backlash-free motion for pick-and-place heads, palletizing portals, and synchronized multi-axis transport systems. The reduced number of mechanical transmission components supports fast operating cycles and limits wear in industrial automation equipment.

For proper operation, the coil must maintain an air gap of **0.5 mm** from the magnet rail to preserve field uniformity and prevent contact. During continuous operation, it can produce a thrust of **800 N** while the phases draw **17.20 A**. The electromagnetic design can also produce a peak thrust of **1800 N** when the drive supplies a peak current of **52.0 A**. The continuous and peak values provide the operating limits needed to select a compatible drive and properly sized guideways for high-speed indexing. Adequate thermal management is required when the motor operates near its continuous load for extended periods.

The motor has a motor constant of **1520 N²/W** and a force constant of **46.5 N/A**, relating generated thrust to power loss and phase current. Heat from the copper losses passes through the housing, which has a thermal resistance of **0.12 °C/W**. A thermal time constant of **77 s** indicates how quickly the coil assembly responds to changes in thermal load. The assembly uses 24 coils arranged on a 24 mm pole pitch and produces 3400 N of magnetic attraction, requiring rigid bearings to control the mover. Its electrical characteristics include an inductance of 6.8 mH and a

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resistance of 0.92 ?, which affect current response and ripple during drive operation. The coil unit measures 80 mm in width and has a mass of 5.2 kg, allowing installation on compact carriages. It is supplied without connectors and does not include water-cooling components.

Specifications

Air Gap:	0.5 mm	**Coil Unit Weight:**	5.2 kg	**Connection:**	Without Connectors
Continuous Current:	17.20 A	**Continuous Force (air):**	800 N	**Continuous Power Loss:**	600 W
Magnetic Attraction:	3400 N	**Motor Constant:**	1520 N²/W	**Num. of Coils:**	24
Peak Current:	52.0 A	**Peak Force:**	1800 N	**Pole Pitch:**	24 mm
Power Constant:	46.5 N/A	**Product Range:**	Linear servo motors	**Thermal Resistance:**	0.12 °C/W
Thermal Time Constant:	77 s	**Voltage Constant:**	26.87 V/m/s	**Water Cooling:**	Without Water Cooling
Width:	80 mm	**Winding:**	Speed Winding	**Winding Inductance:**	6.8 mH
Winding Resistance:	0.92 ?	**Last Verified:**	11/22/2026 5:55 PM		

Contact Us

1620 Old Apex Road, Cary, NC 27513, USA

Toll Free: 1-888-551-3082

International: 1-919-443-0207

Fax: 1-919-867-6204

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