Beckhoff — AL Linear Motors

AL2009-0000-0001



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The **AL2009-0000-0001** linear coil unit is manufactured by Beckhoff within the AL Linear Motors series. As a moving primary component, it interacts with a pre-magnetized secondary track to generate direct thrust for positioning stages, gantry axes, and pick-and-place modules in industrial automation. The linear motor connects with TwinCAT motion control systems and delivers force without belts, screws, or gearboxes. This direct-drive arrangement reduces mechanical compliance, backlash, and the maintenance associated with conventional transmission components.

The coil stack is separated from the magnets by an air gap of **0.5 mm**; maintaining this spacing prevents mechanical contact while stabilizing magnetic flux. During steady operation, the motor supplies **300 N** of continuous force in ambient air when energized by a drive that can deliver **2.14 A** of continuous phase current. The normal winding uses nine individual coils and a 24 mm pole pitch to support smooth, cog-free motion. The unit has a phase inductance of **162 mH** and a phase resistance of **21.6 ?**, which influence current rise time, voltage demand, and thermal loading. A motor constant of 570 N²/W and a force constant of 140 N/A indicate how the electrical input produces linear force. The 80 mm module width and integrated M23 and D-Sub connectors simplify mounting and cabling.

For short acceleration periods, the coil can generate a peak thrust of **675 N** when the drive supplies up to **13.1 A** per phase. Magnetic coupling with the secondary track produces an attraction force of **1325 N**, which must be considered when designing the mechanical rail and bearing arrangement. Internal losses under nominal load reach

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225 W. Because the unit does not use water cooling, this heat must be removed through airflow or a conductive path in the machine frame. Adequate heat transfer helps prevent excessive winding temperatures during sustained operation. The mounting structure must also remain rigid enough to maintain the required spacing between the primary coil unit and the secondary magnetic track.

Specifications

Air Gap:	0.5 mm	**Attraction Force:**	1325 N	**Connection:**	With M23 and D-Sub Connectors
Continuous Current:	2.14 A	**Continuous Force (air):**	300 N	**Continuous Power Loss:**	225 W
Motor Constant:	570 N²/W	**Num. of Coils:**	9	**Peak Current:**	13.1 A
Peak Force:	675 N	**Pole Pitch:**	24 mm	**Power Constant:**	140 N/A
Product Range:	Linear servo motors	**Water Cooling:**	Without Water Cooling	**Width:**	80 mm
Winding:	Normal Winding	**Winding Inductance:**	162 mH	**Winding Resistance:**	21.6 ?
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