Beckhoff — AL Linear Motors

AL2012-0001-0000



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The **AL2012-0001-0000** is a coil unit from the AL Linear Motors series manufactured by Beckhoff for use in linear servo stages that demand direct thrust without mechanical transmissions. Installed on the moving side of a magnet track, it converts drive current into axial force for positioning tasks in packaging machines, pick-and-place modules, and gantry axes within industrial automation. As part of Beckhoff's range of linear servo motors, the unit functions as a moving coil element and directly influences the dynamic performance of the complete linear motor system.

The coil can deliver a continuous thrust of **400 N** while drawing a phase current of **8.60 A**. Heat generated under this load results in a continuous power loss of 300 W. A motor constant of **760 N²/W** relates force production to heat dissipation and supports duty-cycle calculations. The magnetic circuit operates across an air gap of **0.5 mm**, and the force-generating section has a pole pitch of **24 mm**. Twelve coils use a speed-winding arrangement that provides 14 mH of inductance, 1.8 ? of resistance, and a voltage constant of 26.87 V·s/m. The unit does not use water cooling, so heat leaves the 2.6 kg coil through natural convection. Its overall width is 80 mm, and the cables are supplied without connectors for direct entry into the machine wiring system.

During acceleration or short operating bursts, the unit reaches a peak thrust of **900 N** and accepts a phase current of up to **26.2 A**. Linear speeds as high as **7 m/s** are attainable when the coil is paired with a compatible drive and magnet track. An attraction force of 1,700 N acts between the coil assembly and the steel track, which must be considered when selecting guides and support components. A thermal resistance of **0.24 °C/W** and a thermal time constant of 77 seconds characterize the temperature rise during overload events. The permanent magnetic field

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interacts with the energized windings to produce controlled linear motion without gears, belts, or ball screws.

Specifications

Air Gap:	0.5 mm	**Coil Unit Weight:**	2.6 kg	**Connection:**	Without Connectors
Continuous Current:	8.60 A	**Continuous Force (air):**	400 N	**Continuous Power Loss:**	300 W
Magnetic Attraction Force:	1700 N	**Max Speed:**	7 m/s	**Motor Constant:**	760 N²/W
Num. of Coils:	12	**Peak Current:**	26.2 A	**Peak Force:**	900 N
Pole Pitch:	24 mm	**Product Range:**	Linear servo motors	**Thermal Resistance:**	0.24 °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:**	14 mH
Winding Resistance:	1.8 ?	**Last Verified:**	11/22/2026 5:00 AM		

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