



VVVF Elevator Hoist Motors

- **Designed Right, Built Right**

Lincoln high acceleration torque, low current draw, VVVF elevator hoist motors are available at 1200 RPM and 900 RPM. Features include responsive, low slip, ratings from 7.5 HP through 75 HP, constant torque to zero speed, 200, 230/460 and 575 Volt ratings, 60, 40 and 30 Hertz designs, open drip proof enclosures, rugged steel frame construction, foot or face mounted, elevator shaft end play, regreasable ball bearings with grease fittings and automatic grease relief, enhanced Class F insulation, normally closed thermostats, encoders mounted or provision for mounting encoders only, for operation in a 40° C ambient, CSA and CE Listed. 30 Hertz designs draw appreciably lower full load and acceleration current due to improved power factor and reduced eddy current and hysteresis losses. The following description applies to motors in frames 280-440 with 250 frames having the same or similar features.

- **Enhanced Class F Insulation System**

Today's VVVF elevator hoist motors are IGBT inverter powered and installed relatively close to the drive. Wave front voltages and dvdt levels are then the major factors effecting insulation life, not heat. Motors used on typical elevators applications, will have a Class B temperature rise or less. Many Class F materials have a higher dielectric strength than Class H materials and thus are a better choice for elevator applications. The elevator motor insulation system is a combination of F and H materials. The inverter duty copper magnet wire is rated for 200° C operating temperature. The phase insulation, slot liners and wedges are high dielectric strength Class F materials. A two component, 100% reactive, solventless polyester resin Class H varnish is used to impregnate Lincoln hoist motor stators. This varnish provides superior protection and strength along with the added benefit of being in compliance with industrial environmental regulations. Lincoln's insulation system exceeds the requirements for inverter-fed motors per NEMA MG1, Part 31.

- **Machine "In-Slot Wound"**

This unique winding process provides higher quality windings than can be obtained by hand insertion methods along with reduced costs, as a result of the machine wound stator. Coils are not forced into slots nor are end turns stretched. The "in-slot winding" process allows Lincoln Motors to produce windings in which the first turn and the end turn are separated from one another. This eliminates the point between adjacent turns, where voltage potential is high and thus reduces the chance of corona degradation.

- **Rugged Steel Frame Construction with Cast Iron End Brackets**

Rigid, low noise, low vibration construction features make this steel frame motor ideal for foot or flange mounted elevator applications. Heavy cast steel, full length feet with gussets are welded to each side of the frame. The motors are provided with cast iron end brackets and oversized regreasable ball bearings. Grease fittings and automatic grease reliefs are standard. Two pre-loading bearing washers insure quiet bearing operation, centering of the rotor and allow for elevator shaft end play. The motors can be used with rigid or flexible couplings. A one inch diameter stub shaft for encoder mounting, is machined as an integral part of the AISI 1045 hot rolled, medium carbon steel shaft, as standard (not a press in or bolt on piece that may require alignment). Staggered, eight sided stator lamination stacks, provide better heat dissipation and longer life. Air is drawn into the motor at both ends, circulated over and around the entire lamination stack and then exhausted through the sides. Skewed rotor designs help assure low noise and smooth operation.

- **Dynamic Balance**

Lincoln motors are manufactured in accordance with vibration limits stated in NEMA MG1, Part 7. Per current NEMA specifications, the unfiltered vibration velocity is no more than 0.15 inches per second peak for 1200 RPM machines and no more than 0.12 inches per second peak for 900 RPM machines. This assures smooth, vibration free, car operation.

- **Motor Tests**

All Lincoln motors are ground tested at the winding stage, surge and ground tested before final assembly, and then given a commercial test per NEMA MG1-12.55.2. This test consists of measuring winding resistance, no load current, locked rotor current, a high potential test and bearing inspection. Motors are also checked for correct nameplate, noise, conduit box position, correct accessories, etc.

- **Lincoln has been a Supplier of Motors to the Elevator Industry since 1908. Member NAEC**

Building quality motors for industrial applications since 1895