

High performance integral linear actuators for “all electric” plastic injection molding machines

- ✓ Thrust range 2,000 to 200,000 N
- ✓ Speed up to 1 m/sec
- ✓ High energy brushless permanent magnet servo motor
- ✓ Integral high load ball lead screw, up to 80,000 N
- ✓ Integral lead screw, high duty satellite roller type above 80,000 N
- ✓ Built in absolute multiturn encoder

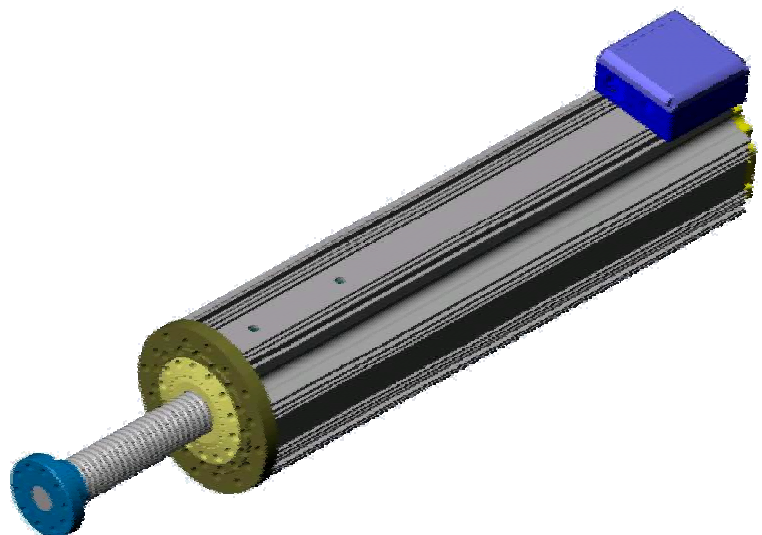


The range of integral linear actuators developed by Phase Motion Control for various linear positioning applications, and specifically to ease the replacement of hydraulic cylinders in plastic injection molding machines, delivers a complete functionality packaged in a single engineered unit. The actuator consists of:

A high performance, rare earth PM servo motor derived from the Ultract range, with a hollow shaft, which can take the fully retracted lead screw;

A special front end with a high axial load bearing system (oblique

contact ball bearing fin small units, barrel type conical roller bearings in the larger units) which houses the rotary nut



of the lead screw, and which is driven by the motor part;



In the back of the actuator, a multiturn absolute encoder which is used for electronic control of the electric piston across the stroke.

The actuators thus realized are endowed with exceptional stiffness and accuracy, travel speed up to 1 m/sec, can be controlled both in thrust and position, with repeatability better than 1/100 mm. All issues of screw lubrication, assembly, alignment, as well as the related drive train, are optimized and designed inside the unit.

The use of direct drive on the rotary nut affords the highest possible control bandwidth and removes all the drawbacks of drive gears.

For maintenance purposes, the lead screw and the nut can be removed and replaced from the front side without disassembling the motor part.

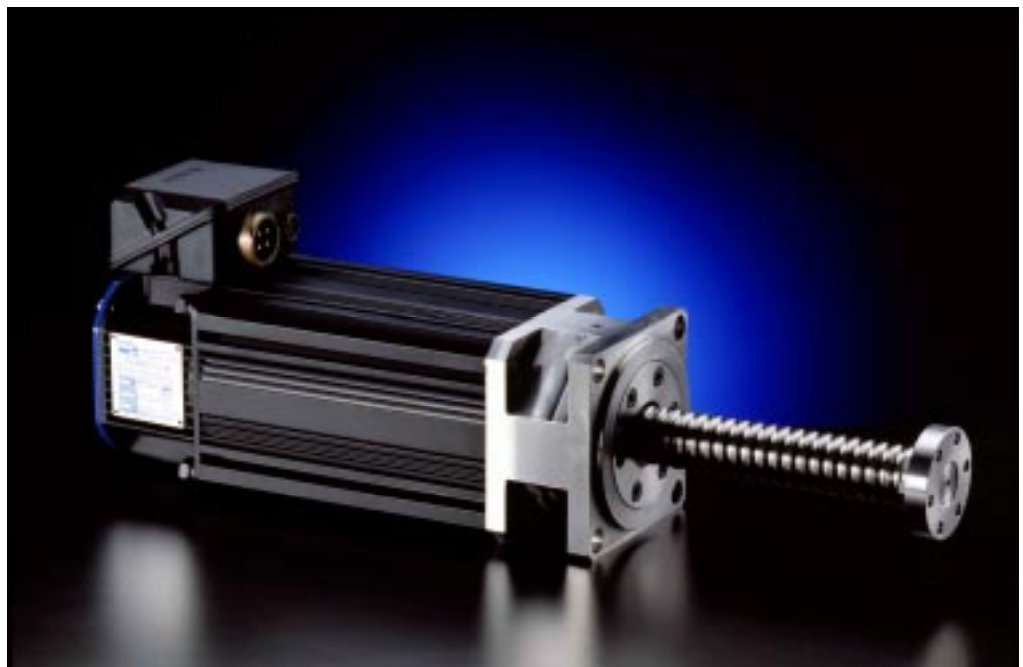
The actuators are protected to grade IP 65 and are generally for 400 Vac operation.

Both high load ball screw and satellite roller screws are used according to the thrust - speed - lifetime requirement.

At the time being, the Phase Motion Control production range spans actuators based on the Ultract 7, 10 and 13 size servo motors, with motor ratings from 8 to 450 Nm. Lead screws used are 40, 60 and 80 mm diameter respectively.

The actuators are supplied with custom choice of stroke up to 600 mm, screw technology (ball and roller), preload and pitch.

A number of Phase Motion Control electropistons is used in plastic molding machines to control all injection phases thus replacing hydraulic systems entirely.



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