

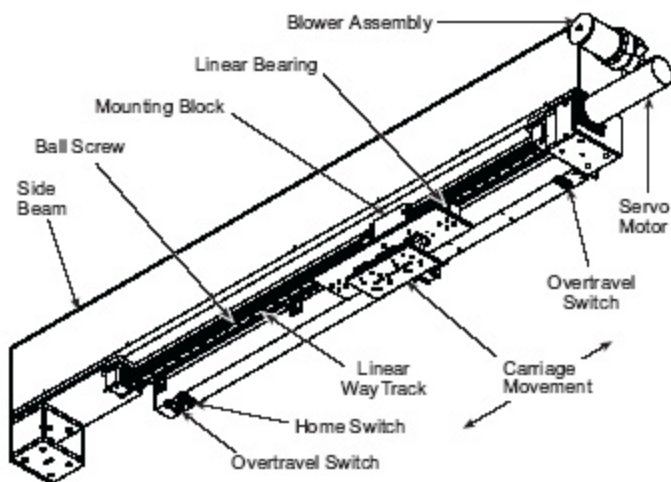
Tool Movement

Tool movement is accomplished using servo motors and ball screws (also called lead screws) in the cross beam, side beams, and z-axis assembly. These assemblies operate all in a similar fashion and they are all assembled together to produce the three planes of movement (x-, y-, and z-axes) of the high rail motion control system. The x-axis and the y-axis establish the work envelope of the high rail motion control system.

A ball screw is turned by a direct-coupled servomotor. Ball nut assemblies contain ball bearings that maintain the contact between the ball screw and the ball nut assemblies. The ball screw drives the ball nuts which move a carriage assembly along the axis. Linear bearings support the carriage and slide on linear way tracks. The carriage assembly is the mounting point for each beam assembly.

The length of the cross beam determines the x-axis of the high rail's work envelope.

The length of the side beams determine the y-axis of the high rail's work envelope.



Side beam assemblies

The side beams provide the front-to-rear of movement (y-axis) of the cross beam. The carriage assembly of each side beam supports an end of the cross beam. The primary side beam assembly initiates the y-axis movement; the secondary beam movement is slaved to the primary beam movement. The controller provides compensation to minimize the lag in the secondary side beam movement.

Cross beam assembly

The cross beam provides the side-to-side (x-axis) of movement of the z-axis assembly. The carriage assembly of the cross beam supports the z-axis assembly.

Z-Axis assembly

The z-axis assembly provides the up and down movement (z-axis) of the water tools. The z-axis is typically used to raise and lower the cutting tools for material installation and removal.

Blower assembly

Blowers supply filtered air to the cross beam and side beam enclosures. The positive pressure created inside the enclosures, along with a system of lip seals, and brush seals, helps keep dust and dirt away from the ball screw assemblies. Bellows protect the ball screws used in the z-axis and sub-z assemblies.