

Compact by Design

Semiconductor Hollow Rod Cylinder

Custom Product for Clean room Application

Application Challenge

An OEM for semiconductor manufacturing needed an actuator to gently and quickly lift a wafer pedestal in and out of a process chamber while also acting as a sealed conduit for cooling lines, which run into the chamber and cool the pedestal. There were many challenges with the design of this product. First, the cylinder had to handle a 5-pound off-center load while maintaining a vibration-free stroke and tight tolerance of the rod alignment. Next, the cylinder required a hollow rod for a pass-through stationary conduit for the pedestal cooling lines. It also had to accommodate a rod-mounted bellows for sealing the chamber and the unit had to be competitively priced.

Project Solution

Compact modified an ARFHD3x12 cylinder with an oversized hollow rod, oversized hollow piston and provided internal stroke cushioning. Included in the design was chrome plating for clean room compliance, a "windows" pattern cut into the frame to allow access to attach the sealing bellows as well as a stroke clearance tolerance of .001" - .003" between the bushing and rod.

Customer Benefit

The customer has produced greater than 1,000 such tools since the initial application and their business was secured with one of our key distributors for years.

