**MEDSCI-003**

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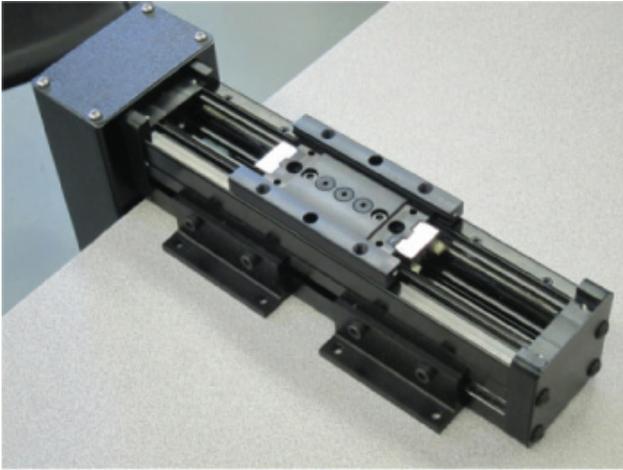<tr><td>**APPLICATION SOLUTION:**</td><td>**X-Ray**</td></tr>
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**Product Family:** Electric
**Product Used:** B3S Screw Drive Actuator
**Product Type:** Custom Engineered

**Application Requirements:**
**Stroke:** 4 inches
**Speed:** 0.5 in/sec.
**Load:** 15 lb payload = 30 lb axia load
**Moments:** 10 ft-lb pitch and yaw
**Motion Profile:** Move slightly, hold steady

**Application Description:**
Control energy range of electron beam in high-resolution X-ray device

**Challenge:**
A new piece of machinery was being developed to provide the highest resolution and brightest X-ray light source for advanced research in nanomaterials and molecular electronics. The customer was looking for a way to control the tungsten blades that would monitor an "energy slit" or energy range of an electron beam used to generate the ultra-high resolution X-ray light source. The solution required tolerance of intense gamma ray radiation (capable of disintegrating any polymer load bearing components), shielding of all magnetic components and fields, low backlash positioning, along with moment and axial loading. In addition, position must be maintained even in a power loss situation with vacuum loading. A compact package with ease of use was desired.

**Tolomatic Solution:**
A custom engineered B3S electric screw drive actuator with a ball screw was selected to control the tungsten blades for this application based on the load and level of precision requirements. Stainless-steel components were used for the load bearings and instead of a belt/pulley combination in the reverse parallel motor mounting configuration, stainless-steel gears were employed. The actuator's sealing band and sensor magnets were removed to eliminate sources of magnetic interference. The reverse parallel mounting shields the stepper motor and brake from gamma rays and the electron beam from the motor and brake's magnetic fields. Tolomatic also assembled the actuator with a radiation compatible grease supplied by the customer.

**Customer Benefit:**
• Cost-effective, customized solution
• Eliminated any source of magnetic interference for accurate performance