

AEROSPACE - SENSING

3-AXIS MOTION IN WIND TUNNEL



MULTI-AXIS



CUSTOMIZABLE SOLUTION



LONG LIFE



EASE OF INSTALLATION

Expertly designed actuation system extends the capabilities of the calibration unit in a custom-built wind tunnel.

One of the leaders in the custom wind tunnel industry was tasked with designing and delivering a wind tunnel for university research and education.

The wind tunnel must include a system for calibration, which involves moving a sensor probe in three axes through the air stream. This calibration process is critical to performing accurate wind tunnel studies.

CHALLENGE

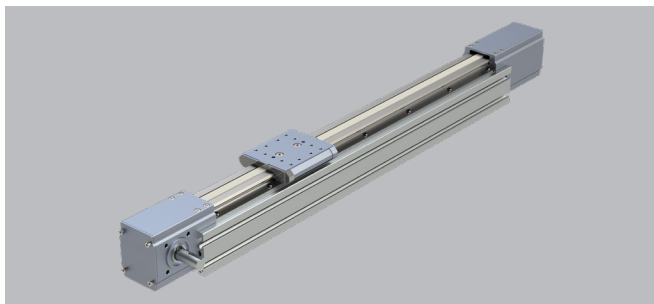
PROVIDE ROBUST, MULTI-AXIS ACTUATION

The wind tunnel calibration sensor must travel to several points in an area approximately 5 x 5 x 3 ft. For such a task, the wind tunnel engineers construct custom multi-axis systems using linear actuators.

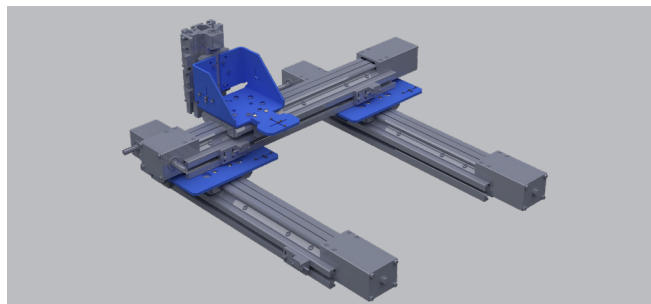
Though the sensor itself is lightweight, it may be exposed to external wind forces when extended into the tunnel. Additionally, the actuators at the base (the "X" axis) must be able to carry the linear actuators for the other two axes. The

typical screw-driven actuators that the OEM uses for these systems were not capable of the loads and lengths required for this application.

The manufacturer and their customers required a robust, industrial-grade multi-axis actuated system. Furthermore, to free the wind tunnel specialists to focus on the rest of the project, the system needed to be easy to assemble and backed by experts in custom motion system design.



LoPro® Linear Actuators are available with belt, chain, lead screw, or ball screw drives.



LoPro® Gantry Kits enable fast, simple, and strong connection of several actuators using pre-configured brackets or plates - with all hardware included.

SOLUTION

MOTION EXPERTS ASSIST IN CUSTOM DESIGN USING DURABLE LINEAR ACTUATORS

The motion system experts at Bishop-Wisecarver worked closely with the OEM to design a robust multi-axis system capable of satisfying the project requirements. In this system, two LoPro® linear actuators are coupled in parallel to form the X axis with approximately 6' of travel. Each has a pair of wheel plate assemblies that move together to carry a Y axis actuator and an additional transverse support beam (also offering about 6' of travel). Both the support beam and Y axis actuator act to support the over 3' long Z axis.

All four LoPro® actuators employ belt drives to accommodate the longer travel lengths and aluminum T-slot beams to keep the system lightweight and easy to assemble. The system comes with the X axis coupler and mounting kits for the remaining axes (four plates to mount the Y actuator and transverse beam, one plate to mount the Z actuator, and a complete set of stainless steel hardware).

CHALLENGE SOLVED

A ROBUST MULTI-AXIS MOTION SYSTEM... MADE EASIER THAN EVER

Application engineers and local representatives from Bishop-Wisecarver helped size and select the right actuators and the right custom configuration for the job.

Belt-driven LoPro® actuators enable self-supporting multi-axis motion that meet the wind tunnel manufacturer's load and length requirements. By replacing the previous actuators, the entire system is now notably more robust.

Moreover, the preconfigured LoPro Gantry Kits are designed to make assembly easier. For many OEMs, saving time on installation and assembly can mean shorter lead times to the customer or more time for R&D on the equipment's core technology.

QUANTIFIABLE RESULTS

DESIGN MEETS CUSTOM REQUIREMENTS AND ENSURES ACCURACY

As a result, the manufacturer now has a unique design well suited for wind tunnel research. The system will provide periodic calibration to ensure accurate experiments well into the future.