AEROTECH In Motion

Dedicated to the Science of Motion — *March 18, 2008*

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AEROTECH QUICK LINKS

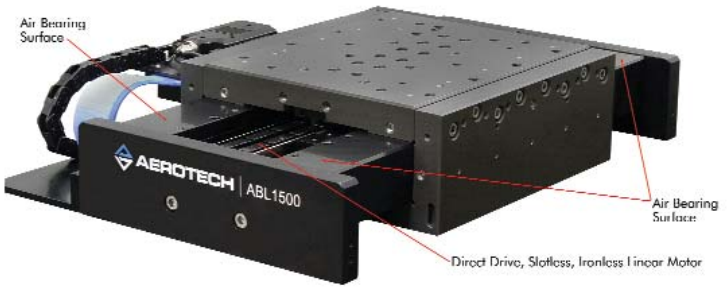
Knowledge Base - FAQs
Engineering Reference
Software & Manual Downloads
CAD Downloads
Career Listings

How to Select and Install Air Bearing Stages

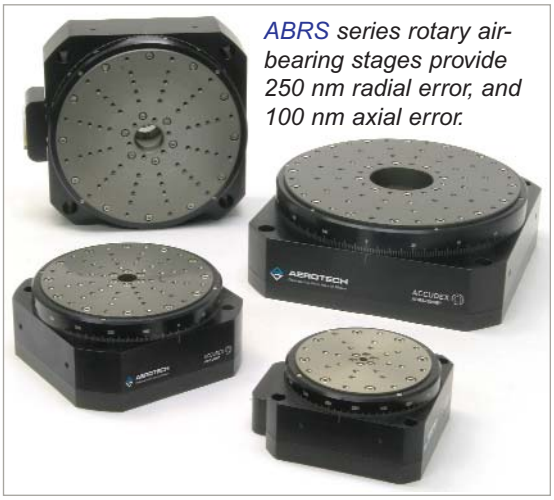
Air bearing stages are noted for their smooth, frictionless motion. A few tips and techniques will ensure you benefit from their advantages.

High-precision test, measurement, and manufacturing operations often require smooth, frictionless, low-maintenance motion control systems. In many cases, the best choice is a linear or rotary stage that uses an air bearing for guidance, coupled to a direct-drive motor, high-resolution position encoder, and digital control system to create a complete motion subsystem. This article will review the fundamental operation of air bearings, discuss their advantages and disadvantages, and provide some guidance for selecting, installing, and operating these systems at the highest possible performance.

Aerotech's ABL1500 series air-bearing linear stages feature our own brushless linear servomotors.



What are the Typical Characteristics of Air Bearings?



ABRS series rotary air-bearing stages provide 250 nm radial error, and 100 nm axial error.

Air bearings support a load through a thin film of pressurized air between the fixed and moving elements. They are more properly referred to as aerostatic bearings, because a source of pressure (rather than relative motion) is used to create the film of air. There is no mechanical contact between the surfaces, such as with mechanical bearings, and so there is no need for lubrication, no particulate generation, and no wear on the surfaces. When supplied with contaminant-free air, the bearing lifetime is unlimited. Friction is extremely low, generated only by the viscous shearing of the air film between the surfaces. In most cases (with surface speeds of 5 m/s or less) the friction force can be approximated as zero. Rotational travel is unlimited and linear travel is limited only by the ability to manufacture the components in the needed lengths.

Please go HERE to read the rest of the article, or go HERE to discuss your application with an Aerotech Application Engineer.

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Updated Laser and Medical Automation Solutions Brochure Available in *German*

Aerotech is now offering its completely updated and redesigned brochure titled ***Automation Solutions for Laser Processing, Medical Device Manufacturing, and Life Sciences*** in German. The brochure features our latest advanced systems and components used in laser processing and medical applications, including the LaserTurn™ 1, 2, and 5, as well as systems for laser cutting, welding, ablation, and marking. Of course, we've also included an expansive line of motion systems and components specifically designed for the medical industry, including those for stent, guidewire, catheter, cannulae, hypotube, and endoscope manufacturing, hermetic seam welding, IOL and contact lens manufacturing, DNA and proteomics research, and much more.

Please GO HERE if you would like a hard copy of this brochure.

Please GO HERE for a downloadable pdf, or simply view the pdf online.

Latest Software Releases

This section lists the latest revisions of Aerotech software, providing a handy method of checking to see that your Aerotech software, and hence your Aerotech system, is working at peak efficiency. All Aerotech software is available for instant download from our website — just click the software title! An entry in red means the software has been updated since our last newsletter.

Software	Version	Description
A3200 Digital Automation Platform	Version 2.19	Nmotion® SMC Libraries and Utilities, Ncontrol® Software Developers Kit, Nview® HMI, Windows Help Files
Soloist Single-Axis Controller	Version 2.09.002	Development Tools, Libraries, Help Files, and Manuals
Ensemble Multi-Axis Controller	Version 1.01.002	Development Tools, Libraries, Help Files, and Manuals
U600 HMI	Version 6.00.136	Windows® HMI
U600 SDK	Version 6.00.136	U600 Software Developers Kit
U600 LIB	Version 6.00.136	Windows® Help File, U600 Libraries and Utilities
U500 PC-Bus-Based Controller	Version 5.22	Windows® HMI and Windows® Help File
U511 Stand-Alone Controller	Version 5.22	Interface Software and Windows® Help File

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Motion Control and Positioning Library

This resource provides a short summary and a link to articles, tutorials, white papers, and other materials that discuss problems and solutions involving motion control and positioning equipment and systems.

Articles

How to Select and Install Air Bearing Stages

High-precision test, measurement, and manufacturing operations often require smooth, frictionless, low-maintenance motion control systems. An excellent choice for a complete motion subsystem is a linear or rotary stage that uses an air bearing for guidance, coupled to a direct-drive motor, a high-resolution position encoder, and a digital controller. Read the full article HERE.

Micropositioning Meets Mechatronics

Compared to traditional methods, the mechatronic design approach is more of a holistic approach to product design, where the tradeoffs between different functional components (software, hardware, user interface, etc.) are carefully considered for their impact on overall performance. Read the full article HERE.

Motion Control Requirements for Hermetic Seam Welding

A discussion of the motion control platform in regard to hermetic seam welding of sophisticated electronic devices implanted in the human body. Read the full article HERE.

Digitizing a Century of Astronomical Images

Aerotech's ABL9000 air-bearing stage is put to use to efficiently digitize more than 500,000 photonegatives. For more information on this article, click HERE.

Two-Photon Polymerization: A New Approach to Micromachining

Femtosecond lasers enable microfabrication with resolution beyond the diffraction limit. Read the full article HERE.

Aerotech Pushes Mechatronics Envelope with Motion Systems

An interview with Dr. Robert Novotnak discussing how mechatronics is employed in high-precision motion control. Read the full interview HERE.

Precise Triggering of External Events Based on Axis Position

An axis-based trigger in the controller can significantly improve part quality, reduce cycle time, and eliminate processing problems. This article discusses Aerotech's unique PSO (Position Synchronized Output) option. Read the full article HERE.

Linear Motors Application Guide

A tutorial guide to the history, design, and application of linear motors. Get the PDF HERE.

Applications Dictate Gimbal Selection

The choice between direct-drive and gear-driven gimbals and optical mounts presents an opportunity for a comparison of the pros and cons for each. Read the full article HERE.

Search the Aerotech Article Archive

Standards Organizations

1394 Trade Association
http://www.1394ta.org

ISA, the International Society for Measurement and Control
http://www.isa.org

IEC
http://www.iec.ch

ISO
http://www.iso.org