ASR2000 Series

High-Speed, Air Bearing Spindle

- Low-loss brushless servomotor
- Instrument-grade precision
- Noncontact air-bearing
- Balanced to ISO 1940 G 0.4
- Sub-arc-second resolution at high speed
- Custom configurations available
- Ideally suited for data storage, wafer processing, diamond turning, and imaging

Velocity
Runout
AEROTECH CERTIFIED

Aerotech's ABS series direct-drive air-bearing spindles were designed to provide superior angular positioning and velocity control for applications including data storage, wafer processing, diamond turning, and imaging.

Superior Mechanical Design

The ABS2000 utilizes a precision ground air-bearing to provide exceptional rotational accuracy with an extremely high stiffness. This design allows for a large load capacity and superior performance over a wide range of operation speeds. The ABS2000 is balanced to ISO 1940 G 0.4 tolerances.

Low Loss, Non-Influencing Direct-Drive Motor

Aerotech's custom designed, low-loss motor produces >0.25 N-m (38 oz-in) of continuous torque with negligible motor losses, eliminating the need for cooling fins and/or external cooling. The non-influencing motor design minimizes parasitic forces in the motor, providing the exceptionally high level of error motion performance.

These motors have all the advantages of a brushless direct-drive motor — no brushes to wear, and high acceleration and high speeds.

Accurate Positioning

With a velocity ripple of <0.1%, an asynchronous error motion ≤20 nm, and total error motion <100 nm, the Aerotech spindle offers superior performance for high accuracy applications. The high performance motor and rotary encoder are directly coupled to a common shaft. When used with the Aerotech A3200 controller and Npaq®drive rack the spindle resolution can be as high as 0.05 arc sec with no speed trade-offs. This makes the spindle ideal for applications requiring both spindle operation and stage operation.

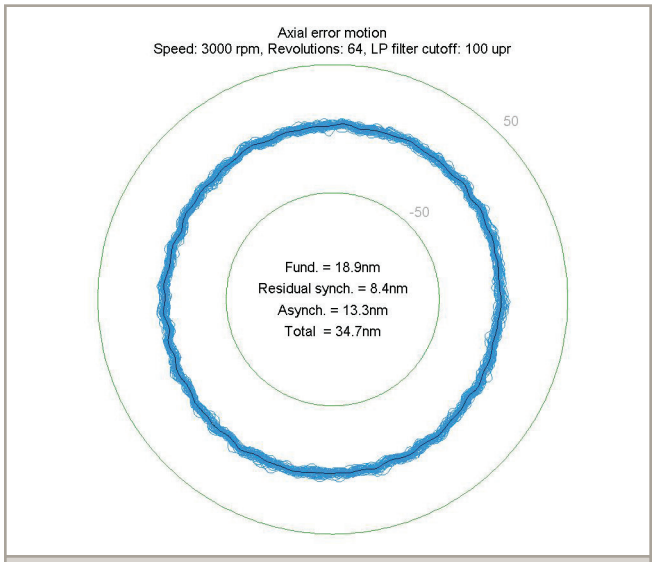
Flexible Configurations

A variety of encoder resolutions, as well as an optional rotary union for a vacuum supply, are available. Other options include mechanical or vacuum chuck configurations, grounding ball, and optics mounting. Alternative higher torque motors are available. Aerotech manufactures a wide range of servo amplifiers and advanced controllers to provide a complete, integrated motion package.

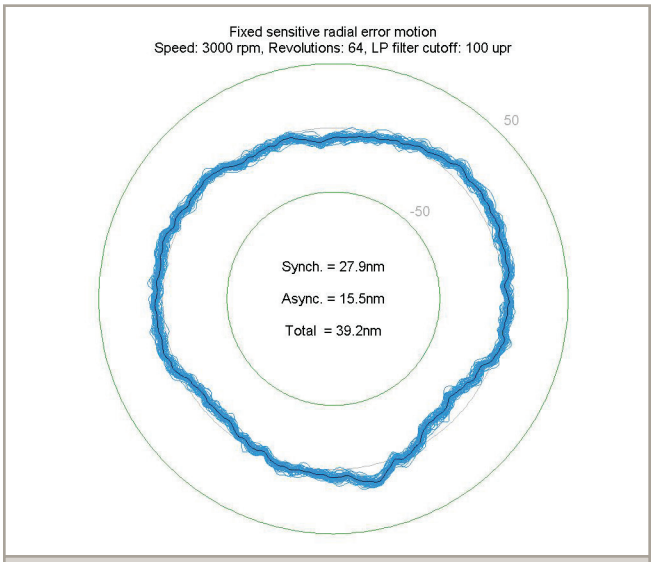
ABS2000 Series SPECIFICATIONS

Basic Model		ABS2000 Spindle
Model		SF75-21-2X
Continuous Current, Stall	A_{pk}	2.25 A
	A_{rms}	1.6 A
Feedback		Directly-Coupled Rotary Encoder
Resolution		256-2048 lines/rev - other line counts available
Rated Speed[1]		6000 rpm
Maximum Load	Radial	66 N (15 lb)
	Axial	178 N (40 lb)
Inertia (Unloaded)		.0015 kg-m_2
Synchronous Error Motion[2]	Radial	<100 nm
	Axial	<100 nm
Asynchronous Error Motion[2]	Radial	20 nm
	Axial	20 nm
Velocity Ripple		<0.1% at 6000 rpm
Balance Grade[3]		ISO 1940 G 0.4
Bearing Rigidity	Radial	50 N/µm
	Axial	140 N/µm
Mass		6.0 kg
Operating Pressure[4]		120 psi
Air Consumption[5]		<2 scfm
Material	Shaft	Steel
	Housing	Aluminum (Steel Available)
Finish		Electroless Nickel Plating or Black Hardcoat Available

Notes:
1. Maximum speed based on stage capability; maximum application velocity may be limited by system data rate and system resolution.
2. Consult Aerotech regarding error motions for the ABS2000 with rotary union option.
3. Per ISO 1940, “Mechanical vibration - balancing quality requirements of rigid rotors”.
4. An in-line pressure switch tied to the motion controller is recommended to protect the air bearing against under-pressure.
5. Air supply must be clean, dry to 0°F dew point, and filtered to 0.25 µm or better. Recommend nitrogen at 99.9% purity.

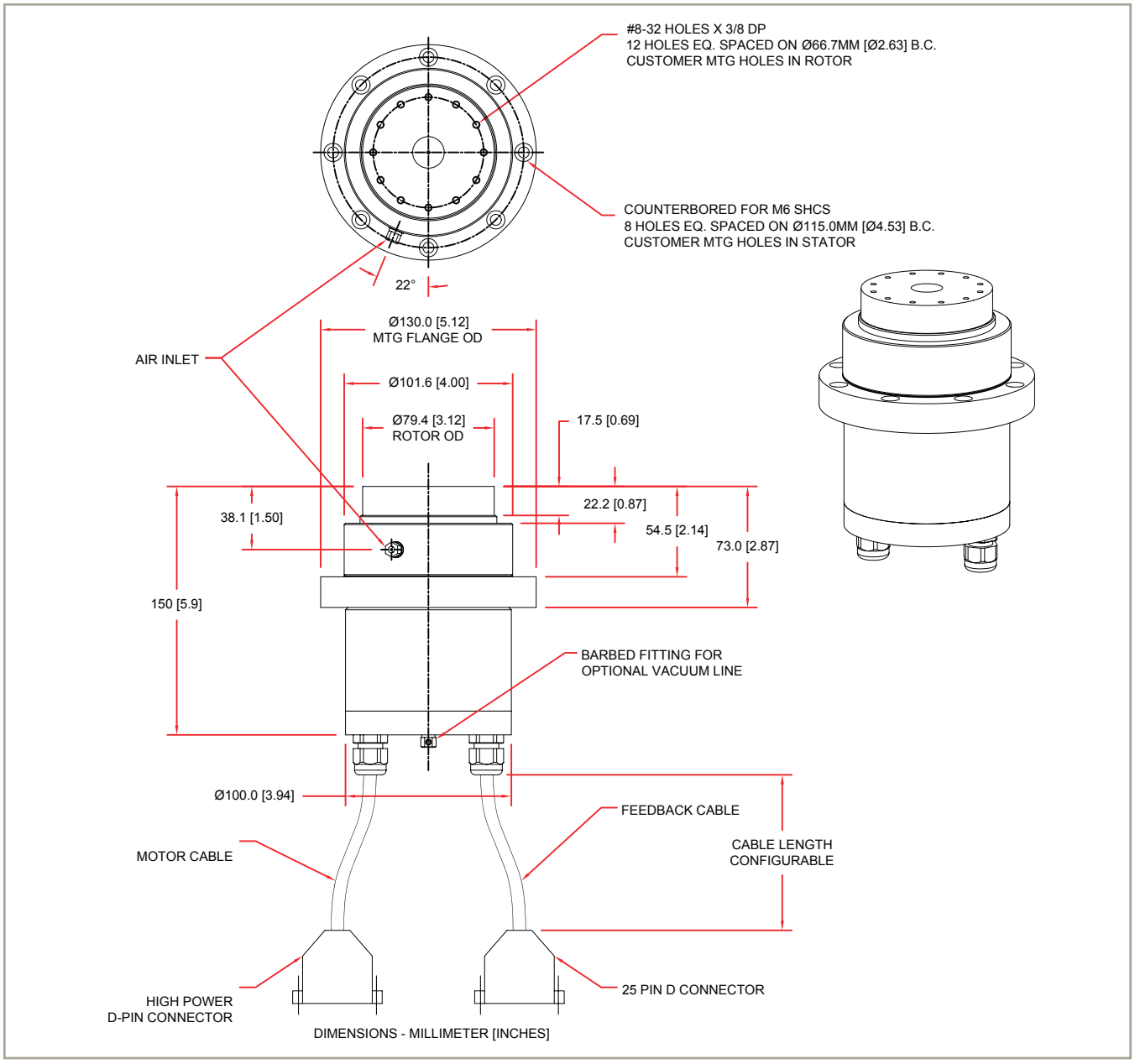


Axial error motion for the ABS2000.



Radial error motion for the ABS2000.

ABS2000 Series DIMENSIONS



ABS2000 Series ORDERING INFORMATION

Position Transducer Options

-E1	256 lines/rev directly-coupled rotary encoder
-E2	512 lines/rev directly-coupled rotary encoder
-E3	1000 lines/rev directly-coupled rotary encoder
-E4	1024 lines/rev directly-coupled rotary encoder
-E5	2000 lines/rev directly-coupled rotary encoder
-E6	2048 lines/rev directly-coupled rotary encoder

Other Options

-RU1	Single port rotary union

Integration

Aerotech offers both standard and custom integration services to help you get your system fully operational as quickly as possible. The following standard integration options are available for this system. Please consult Aerotech if you are unsure what level of integration is required, or if you desire custom integration support with your system.

-TAS	Integration - Test as system Testing, integration, and documentation of a group of components as a complete system that will be used together (ex: drive, controller, and stage). This includes parameter file generation, system tuning, and documentation of the system configuration.
-TAC	Integration - Test as components Testing and integration of individual items as discrete components that ship together. This is typically used for spare parts, replacement parts, or items that will not be used together. These components may or may not be part of a larger system.