

ADR160 Series

Mechanical-Bearing Rotary Stage

Direct-drive brushless servomotor

Cog-free design for outstanding velocity stability

Outstanding wobble and runout

Direct coupled, high-accuracy rotary encoder

High-accuracy angular contact bearings



Aerotech's ADR series direct-drive rotary stages provide superior angular positioning and velocity control. These stages have higher accuracy and repeatability than competing models. The design has been optimized to provide higher acceleration capability for a given stage profile and inertia is significantly lower than competing products, delivering more torque and acceleration to the payload. Applications for the ADR160 include photonic component alignment, high-speed laser machining, and precision wafer inspection.

Superior Mechanical Design

Angular contact bearings are used to maximize performance with respect to wobble, moment stiffness, and rotating friction. A thick-walled, precision-ground shaft further minimizes wobble. The design incorporates integral connections that minimize cable issues. The ADR160 works especially well in applications that require 360° continuous motion but have limited space. The stage is 100 mm tall and provides smooth motion without travel restrictions.

Brushless Direct-Drive

To maximize positioning performance, the ADR series utilizes Aerotech's S-series brushless, slotless motor. This motor has all the advantages of a brushless direct-drive motor — no brushes to wear, no gear trains to maintain, and

high acceleration and high speeds. Since it is a slotless, ironless design, there is zero cogging, meaning that there is absolutely no torque ripple. This makes the ADR ideal for applications requiring outstanding contoured motion, smooth scan velocity, or precise incremental steps.

With its low inherent inertia and high power output, the ADR is capable of speeds and accelerations that are an order of magnitude greater than typical direct-drive devices or worm-driven stages. The low inertia and zero backlash make the ADR the ideal solution for applications requiring frequent directional changes.

Accurate Positioning

Performance is assured with a 23,600 lines per revolution encoder that results in 0.027 arc-sec resolution. The motor and high-performance rotary encoder are directly coupled to a common shaft. The absence of gear trains and mechanical couplings means no position errors caused by hysteresis, windup, or backlash. As a result, accuracy of ± 5 arc sec is attainable.

Flexible Configurations

Aerotech manufactures a wide range of servo amplifiers and advanced controllers to provide a complete, integrated package.

ADR160 Series SPECIFICATIONS

ADR160 Series		ADR160-12	ADR160-21
Motor		S-130-39-A	S-130-60-A
Continuous Current, Stall	A _{pk}	3.8	3.4
	A _{rms}	2.7	2.4
Bus Voltage		Up to 320 VDC	
Table Diameter		160 mm (6.3 in)	
Aperture		50 mm	
Total Travel		±360° Continuous	
Feedback		23,600 line count/revolution	
Resolution		0.13-13.1 μrad (0.027-2.7 arc sec)	
Accuracy ⁽¹⁾		±24.3 μrad (±5 arc sec)	
Repeatability		±4.9 μrad (±1 arc sec)	
Maximum Rotary Speed		800 rpm	
Maximum Load	Axial	30 kg	
	Radial	25 kg	
Tilt Error Motion		14.6 μrad (3 arc sec)	
Error Motion	Axial	2.0 μm (80 μin)	
	Radial ⁽²⁾	2.0 μm (80 μin)	
Nominal Stage Weight		9.5 kg (21 lb)	10.8 kg (23.8 lb)
Finish	Table	Hardcoat	
	Stage	Black Anodize	

Notes:

- Value with Aerotech controls and HAL option.
- Measured 50 mm (2 in) above the tabletop.



