ADRS Series

Mechanical-Bearing Rotary Stage

High torque output, direct-drive brushless servomotor

Cog-free slotless motor design for outstanding velocity stability

Direct coupled, high-accuracy rotary encoder

Ultra-low-profile minimizes working height

Aerotech's ADRS series with its direct-drive technology and low profile provide a superior alternative to belt- and worm-drive stages.

Compact Package

The design of the ADRS series direct-drive rotary stage was optimized to minimize stage height. The low profile of the stage reduces the effective working height of the system minimizing "stack-up" related errors. In addition to the low overall height, the ADRS series provides a clear aperture that can be used for product feed-through or laser beam delivery.

Brushless Direct-Drive

To maximize positioning performance, the ADRS series utilizes direct-drive brushless motor technology. Direct-drive technology is optimized for 24/7 production environments, as there are no brushes to replace and no gear trains or belts to maintain. Direct drive also provides quicker acceleration and higher top speeds than gear- or belt-driven mechanisms, yielding higher total overall throughput.

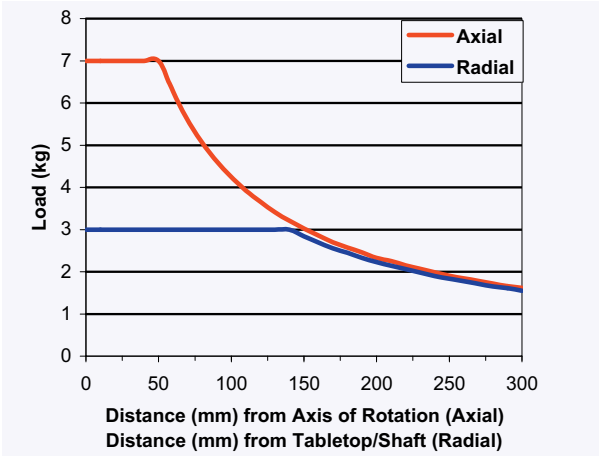
The low maintenance and high-throughput characteristics of the ADRS series provide a stage that yields the lowest total cost of ownership.

Slotless Motor

The ADRS series uses a slotless stator design that eliminates torque ripple. This motor technology provides ultra-smooth velocity stability comparable to a high-quality DC brush motor without all the DC motor's inherent maintenance requirements. Since the slotless motor is directly coupled to the tabletop, velocity disturbances created by toothed belt drives or worm gears are eliminated.

Multiple Configurations

The ADRS series is available in 100 mm, 150 mm, and 200 mm versions. Each stage has options for different motor windings to better match the stage to different operating conditions. The -B winding option provides the highest possible speed operation for a given available bus voltage, while the -A winding gives greater output torque for comparable current levels. Metric and "English" pattern tabletops are available and slotted mounting holes enable attachment to 25 mm and 1inch hole pattern breadboards. The tabletop of the ADRS series has a labyrinth seal that protects the bearings and encoder from contamination. An optional shaft end seal is available for applications where the bottom of the stage is exposed to contamination.



Axial and Radial Cantilevered Load Capability (ADRS100)

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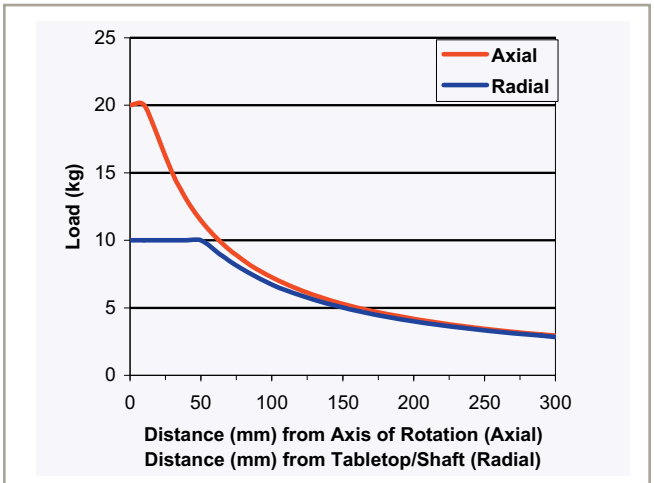
ADRS Series SPECIFICATIONS

ADRS Series		ADRS-100		ADRS-150		ADRS-200	
Tabletop Diameter		95 mm		140 mm		190 mm	
Aperture		6 mm		15 mm		25 mm	
Motor (-A/-B)		S-76-35-A	S-76-35-B	S-130-39-A	S-130-39-B	S-180-44-A	S-180-44-B
Continuous Current, Stall	A_{pk}	2	4	3.8	7.6	2.7	5.3
	A_{rms}	1.4	2.8	2.7	5.4	1.9	3.8
Bus Voltage		320	160	320	160	320	160
Resolution		0.87-87.3 µrad (0.18-18 arc sec)		0.315-31.5 µrad (0.065-6.5 arc sec)			
Max Speed[1]		1500 rpm		600 rpm		400 rpm	
Accuracy	Uncalibrated	388 µrad (80 arc sec)					
	Calibrated[2]	29.1 µrad (6 arc sec)		48.5 µrad (10 arc sec)		48.5 µrad (10 arc sec)	
Repeatability		14.6 µrad (3 arc sec)		19.4 µrad (4 arc sec)		19.4 µrad (4 arc sec)	
Max Load[3]	Axial	7 kg		20 kg		40 kg	
	Radial	3 kg		10 kg		20 kg	
Axial Error Motion[4]		2 µm		5 µm		5 µm	
Radial Error Motion[4]		3 µm		5 µm		5 µm	
Tilt Error Motion		48.5 µrad (10 arc sec)		97 µrad (20 arc sec)		97 µrad (20 arc sec)	
Inertia	Unloaded	0.00038 kg-m^2		0.00242 kg-m^2		0.00843 kg-m^2	
Total Mass		2.0 kg		4.3 kg		7.6 kg	
Finish	Tabletop	Hardcoat					
	Stage	Black Anodize					

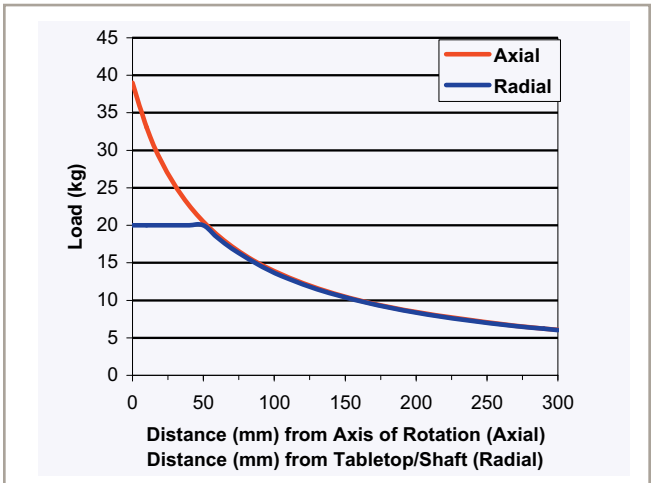
Notes:
1. Maximum speed is based on stage capability. Actual speed may depend on encoder resolution, load, amplifier bus voltage, and motor. See the S-series rotary motor for more information.
2. With HALAR.
3. Maximum loads are mutually exclusive.
4. For the ADRS-100, error motion specifications are below 700 rpm. Above 700 rpm, the max radial error is 5 microns. Errors measured 50 mm (2 in) above the tabletop.

ADRS Maximum Encoder Frequency

Resolution-Speed	ADRS-100	ADRS-150	ADRS-200
AS/X5/X10	1500 rpm	600 rpm	600 rpm
X25	1067 rpm	384 rpm	384 rpm
X50	533 rpm	192 rpm	192 rpm



Axial and Radial Cantilevered Load Capability (ADRS150)



Axial and Radial Cantilevered Load Capability (ADRS200)

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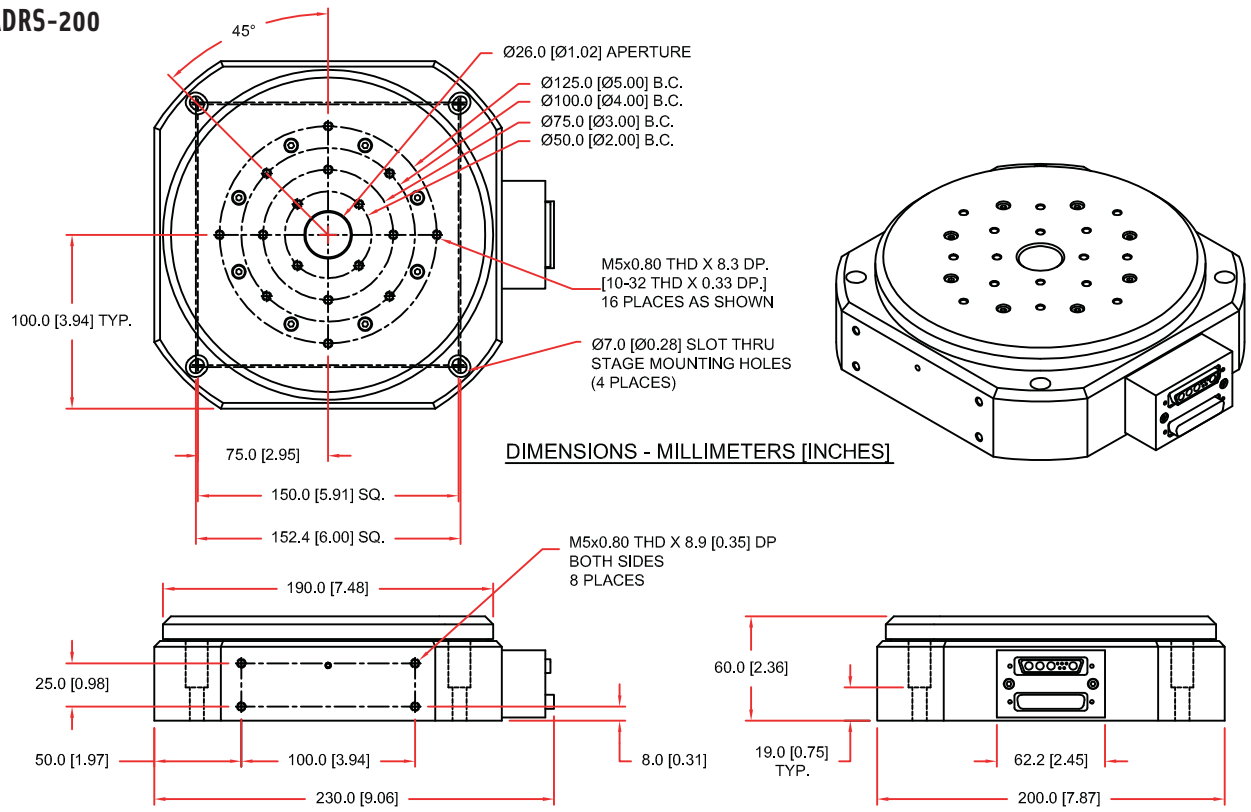
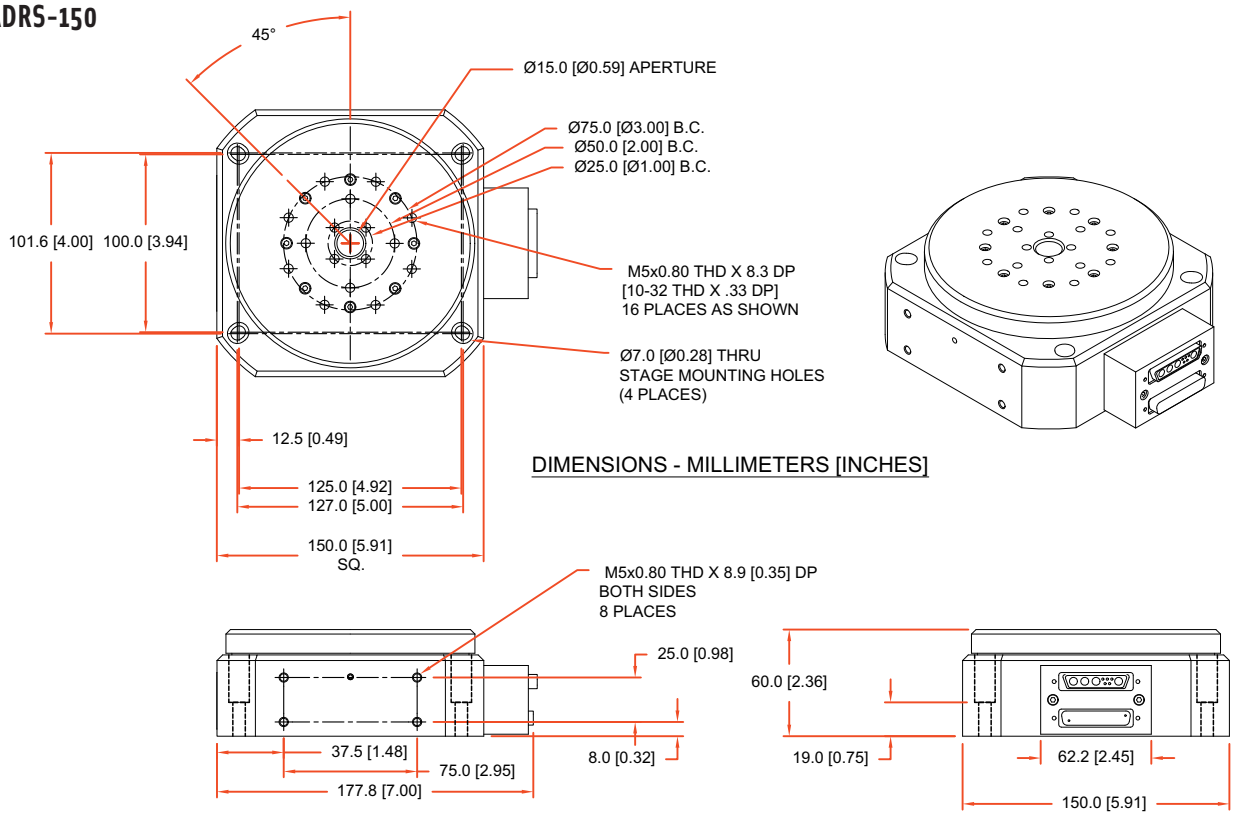
ADRS Series DIMENSIONS

ADRS-200



ADRS-150



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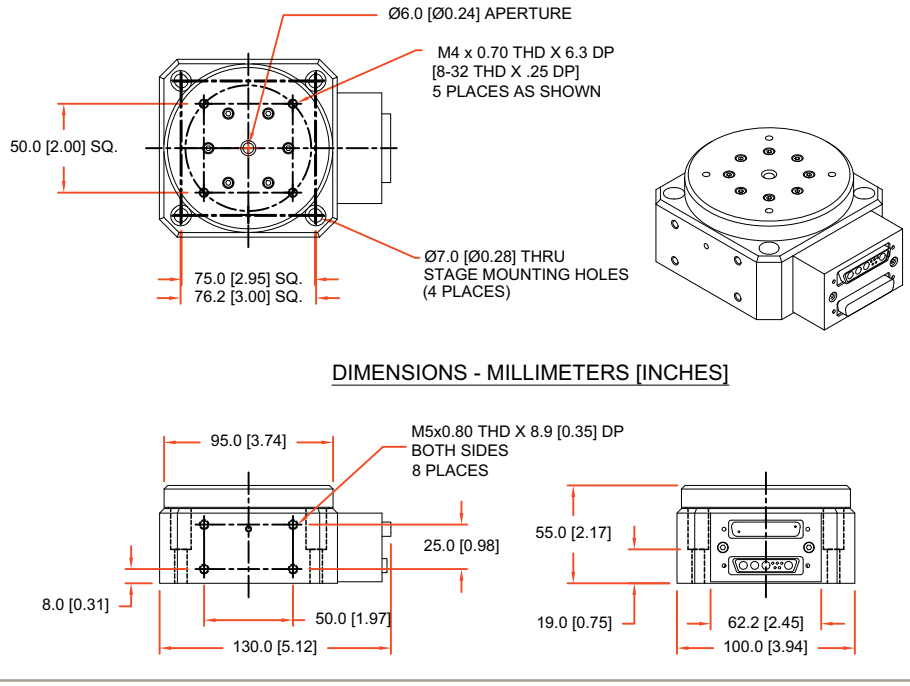
ADRS Series DIMENSIONS and ORDERING INFORMATION

ADRS-100



Ordering Example

ADRS	-200	-M	-A	-AS	-S
Series	Width (mm)	Mounting Pattern	Winding Option	Position Transducer	Construction Options
	-100 -150 -200	-M -U	-A -B	-AS -X	-S

ADRS Series Direct-Drive Rotary Stage

ADRS-100	100 mm wide direct-drive rotary stage with 1.8 N-m peak torque output
ADRS-150	150 mm wide direct-drive rotary stage with 11.7 N-m peak torque output
ADRS-200	200 mm wide direct-drive rotary stage with 30 N-m peak torque output

Mounting Pattern

-M	Metric-dimension mounting pattern and holes
-U	English-dimension mounting pattern and holes

Winding Options

-A	Low speed, high torque-constant winding option
-B	High speed, low torque-constant winding option

Position Transducer

-AS	Standard feedback device, 1 Vpp sine wave output, 10,000 cycles per rev on ADRS-200/150, 3600 cycles per rev on ADRS-100
-X5	Square wave digital output, 50,000 cycles per rev on ADRS-200/150 and 18,000 cycles per rev on ADRS-100
-X10	Square wave digital output, 100,000 cycles per rev on ADRS-200/150 and 36,000 cycles per rev on ADRS-100
-X25	Square wave digital output, 250,000 cycles per rev on ADRS-200/150 and 90,000 cycles per rev on ADRS-100
-X50	Square wave digital output, 500,000 cycles per rev on ADRS-200/150 and 180,000 cycles per rev on ADRS-100

Note: Digital output encoder signals are synthesized with a 16 MHz clock. Care must be taken to ensure that the encoder sample rate on the controller is at least 16 MHz or higher. Slower clock rates are available on request.

Construction Options (ADRS 150 & 200)

-S	Bottom shaft seal (not available on ADRS-100; ADRS-100 has an integral bottom labyrinth seal)
-NS	No bottom shaft seal

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