

ADRT Series

Mechanical-Bearing Direct-Drive Rotary Stage

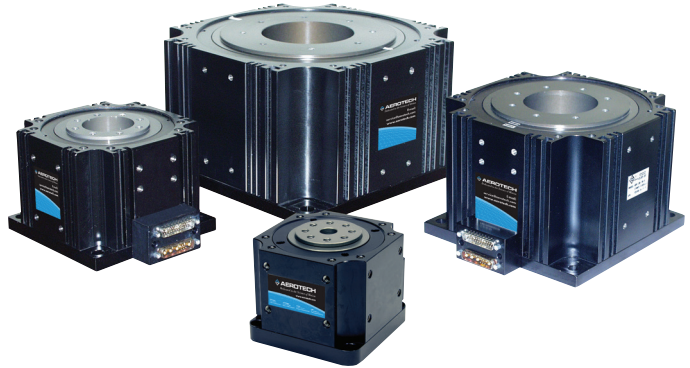
High torque output, direct-drive brushless servomotor

Cog-free design for outstanding velocity stability

Outstanding wobble and runout

Direct coupled, high-accuracy rotary encoder

Large diameter clear aperture



Aerotech's ADRT series direct-drive rotary stages provide superior angular positioning and velocity control. Applications range from indexing to high-speed laser machining to precision wafer inspection.

Superior Mechanical Design

Dual large-diameter bearings are used to maximize performance with respect to wobble, moment stiffness, and repeatability. The large diameter bearings permit large payloads without compromising performance.

Brushless Direct Drive

To maximize positioning performance, the ADRT 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.

With its low inherent inertia and optimized motor design, the ADRT is capable of speeds and accelerations that are significantly higher than other competing products. These stages have a lower height profile compared to competing products within given torque ranges.

The low inertia and zero backlash make the ADRT the ideal solution for applications requiring frequent directional changes.

Accurate Positioning

Line counts range from 3600 to 5400 lines per revolution. When coupled with Aerotech's MXH series resolution multipliers, resolutions can be as fine as 0.12 arc sec.

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.

Flexible Configurations

Options include a high-precision bearing for improved accuracy, smoothness, and run-out performance. Slip rings and rotary unions are available to ease integration of custom tooling, and a holding brake is available to limit movement of the stage during large impulse loads or when power is removed from the motor.

The ADRT is equipped with "T-slots" integrated into the exterior housing. These slots can be used to mount the table horizontally or to attach custom application specific fixtures.

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

ADRT Series SPECIFICATIONS

ADRT Series		ADRT100-85	ADRT100-135	ADRT150-115	ADRT150-135	ADRT150-180
Maximum Torque (Continuous)		0.48 N-m	1.6 N-m	2.85 N-m	5.06 N-m	9.29 N-m
Bus Voltage ⁽¹⁾		Up to 340 VDC				
Accuracy ^(2,3)	Uncalibrated	60 arc sec				
	Calibrated	5 arc sec				
Repeatability ⁽³⁾		3 arc sec				
Axial Error Motion		5 µm				
Radial Error Motion ⁽⁴⁾		5 µm				
Tilt Error Motion		10 arc sec				
Height		85 mm	135 mm	115 mm	135 mm	180 mm
Aperture		13 mm		50 mm		
Radial Load ⁽⁵⁾		10 kg		25 kg		
Axial Load		15 kg		30 kg		
Rated Speed		1500 rpm		600 rpm		
Inertia		0.00028 kg-m ²	0.00067 kg-m ²	0.003379 kg-m ²	0.004958 kg-m ²	0.008118 kg-m ²
Mass		2.0 kg	3.6 kg	5.3 kg	6.9 kg	10.2 kg
Finish	Table	Hardcoat				
	Stage	Black Anodize				

Notes:

- Bus voltage for ADRT100 with -25D connector is limited to 160 V.
- Calibrated accuracy requires -PL2 option and Aerotech controls.
- Repeatability and accuracy are dependent on encoder resolution. To achieve the listed specifications, encoder resolution must be 0.36 arc sec or less
- Specifications are for single-axis systems. Performance of multi-axis systems is payload and workpoint dependent. Consult factory for multi-axis or non-standard applications.
- Moment load based on 5 year continuous rotation at 250 rpm with maximum axial load applied. Larger moment loads possible for low speed and/or low duty cycle applications. Consult Aerotech for additional information.

ADRT Series		ADRT200-155	ADRT200-185	ADRT260-160	ADRT260-180
Maximum Torque (Continuous)		11.12 N-m	15.93 N-m	19.71 N-m	29.09 N-m
Bus Voltage		Up to 340 VDC			
Accuracy ^(1,2)	Uncalibrated	60 arc sec			
	Calibrated	5 arc sec			
Repeatability ⁽²⁾		3 arc sec			
Axial Error Motion		5 µm			
Radial Error Motion ⁽³⁾		5 µm			
Tilt Error Motion		10 arc sec			
Height		155 mm		160 mm	
Aperture		75 mm		100 mm	
Radial Load ⁽⁴⁾		80 kg		110 kg	
Axial Load		140 kg		170 kg	
Rated Speed		600 rpm		375 rpm	
Inertia		0.020991 kg-m ²	0.027666 kg-m ²	0.066488 kg-m ²	0.08566 kg-m ²
Mass		13.4 kg	16.7 kg	25.4 kg	30.6 kg
Finish	Table	Hardcoat			
	Stage	Black Anodize			

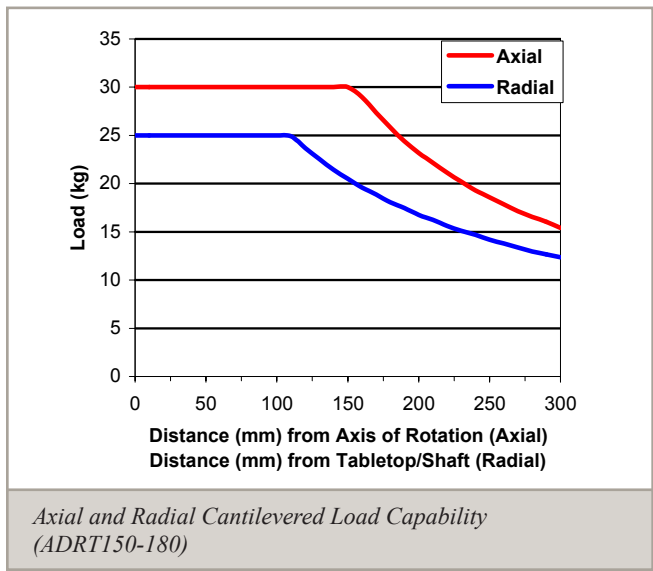
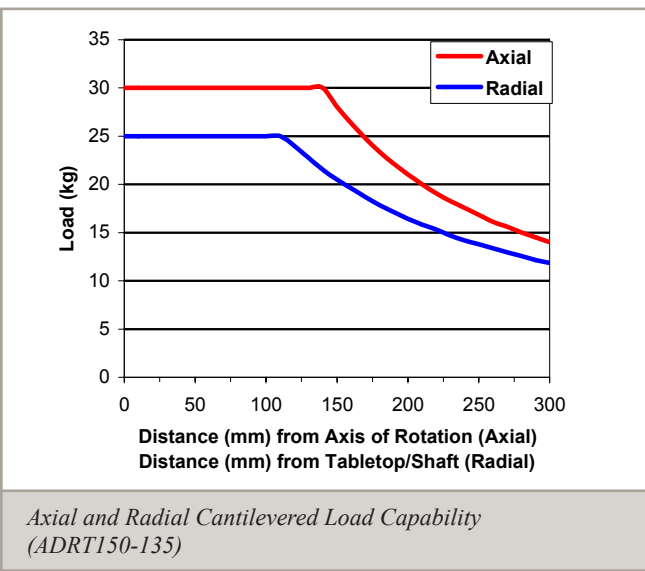
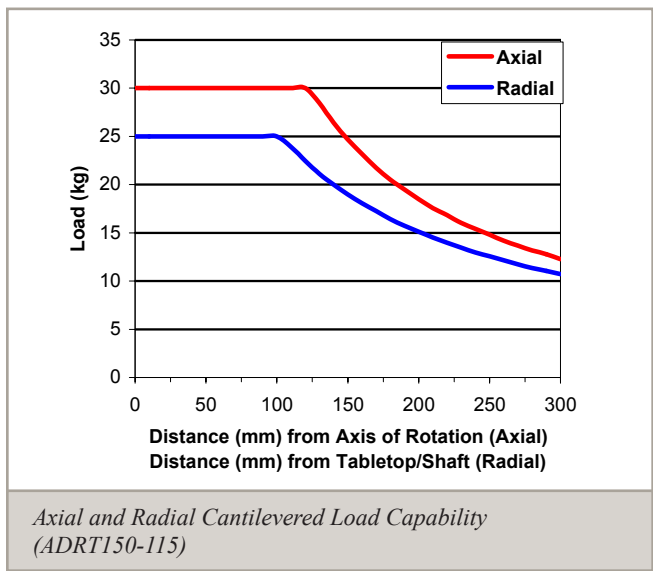
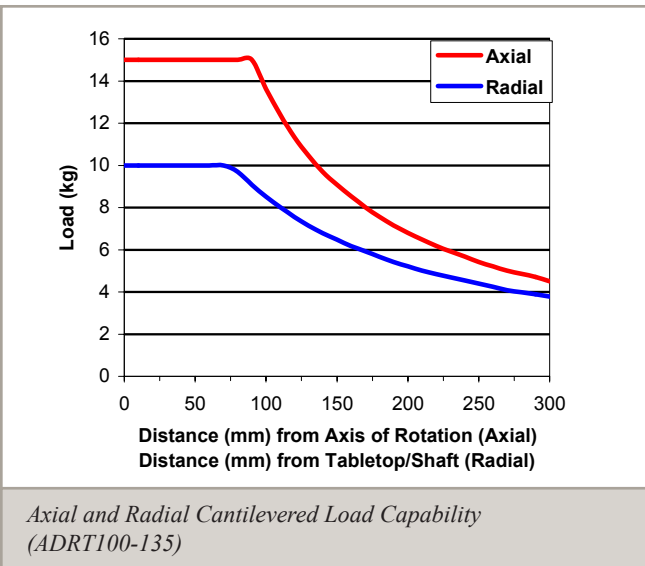
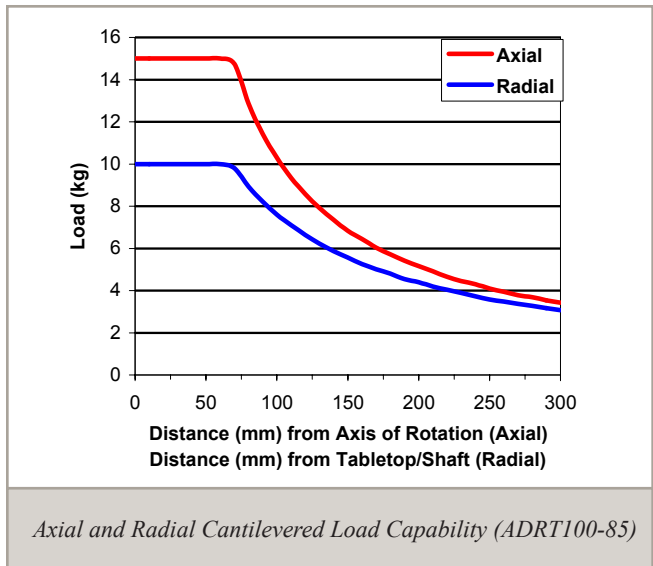
Notes:

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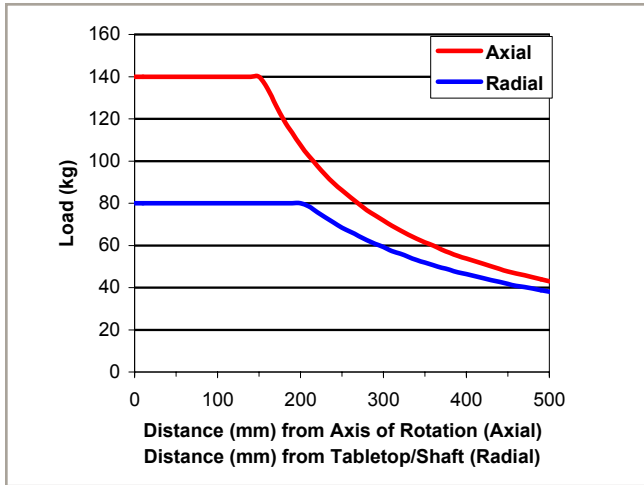
ADRT Maximum Speeds for Encoder Option

Encoder Option	ADRT100	ADRT150	ADRT200	ADRT260
-E1/-E2/-E3/-E4	1500 rpm	600 rpm	600 rpm	375 rpm
-E5	800 rpm	600 rpm	500 rpm	375 rpm

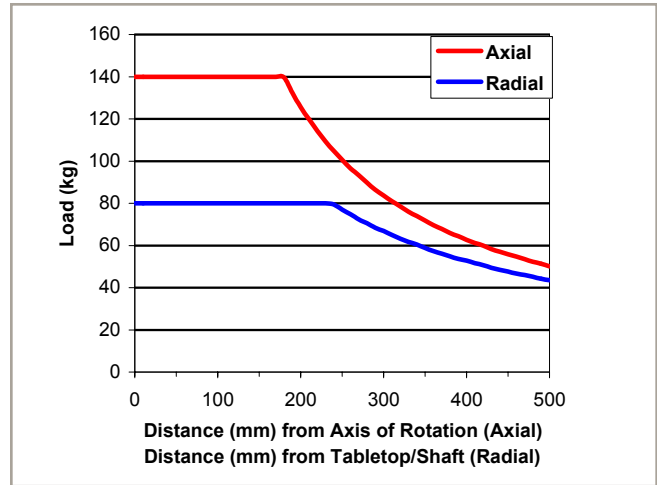
ADRT Series SPECIFICATIONS



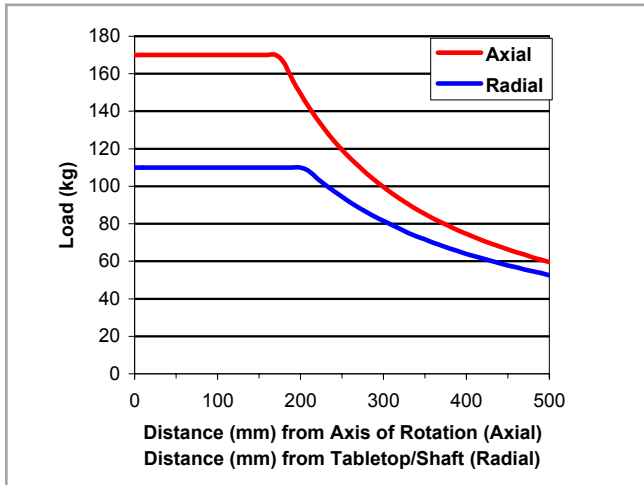
ADRT Series SPECIFICATIONS



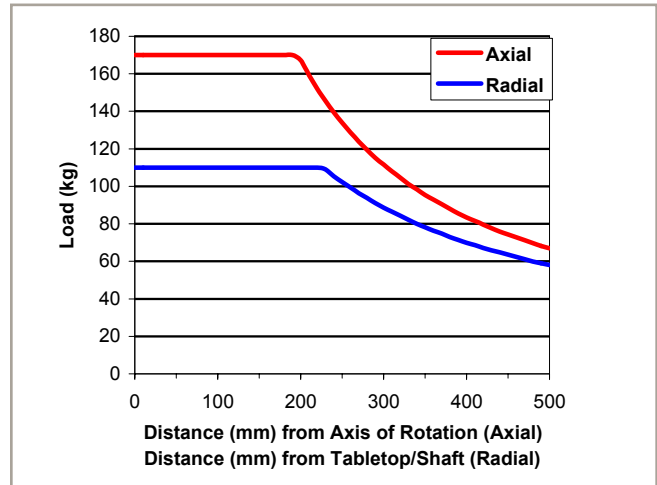
Axial and Radial Cantilevered Load Capability (ADRT200-155)



Axial and Radial Cantilevered Load Capability (ADRT200-185)



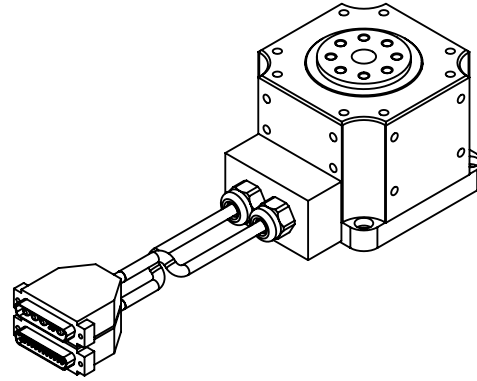
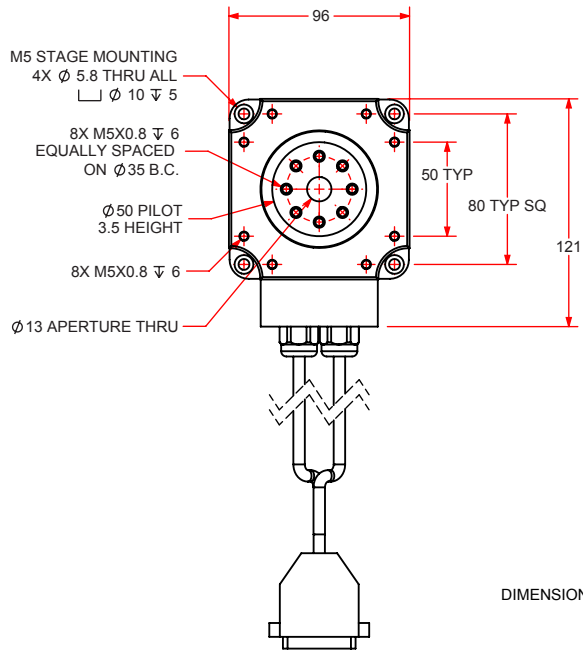
Axial and Radial Cantilevered Load Capability (ADRT260-160)



Axial and Radial Cantilevered Load Capability (ADRT260-180)

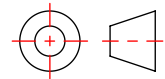
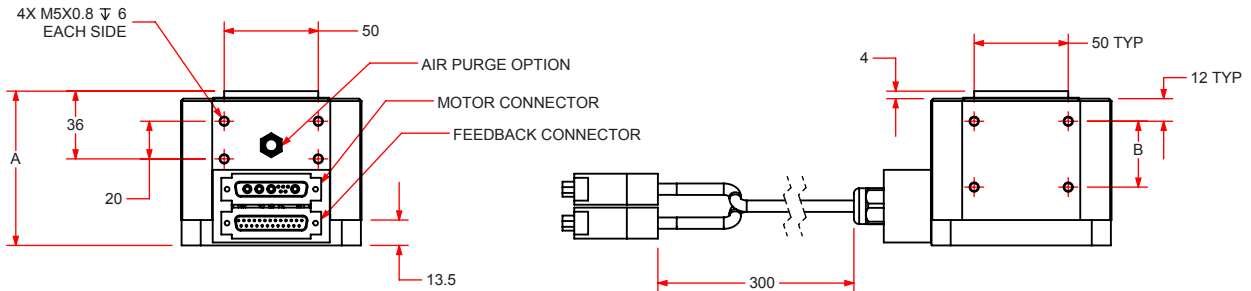
ADRT Series DIMENSIONS

ADRT100



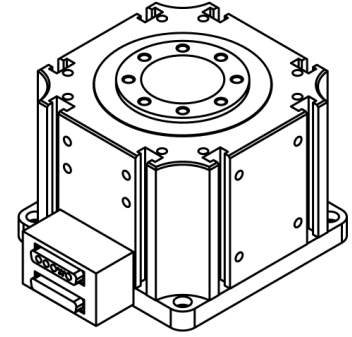
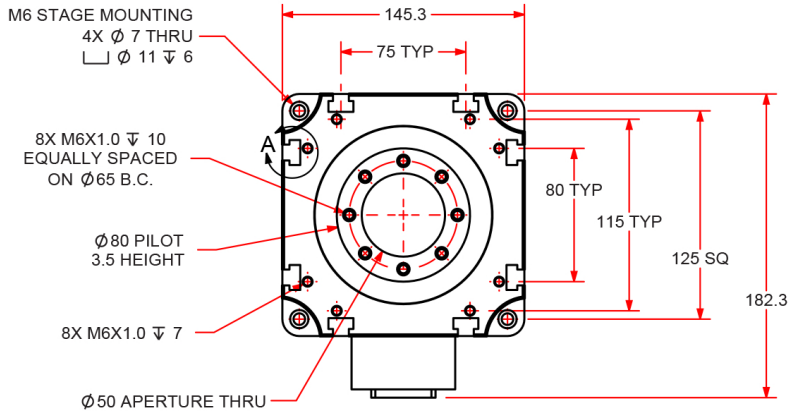
DIMENSIONS: MILLIMETERS

DIMENSIONS (MM)		
BASIC MODEL	A	B
ADRT100-85	82	35
ADRT100-135	132	85

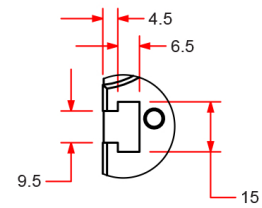


ADRT Series DIMENSIONS

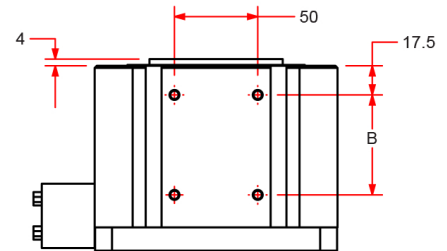
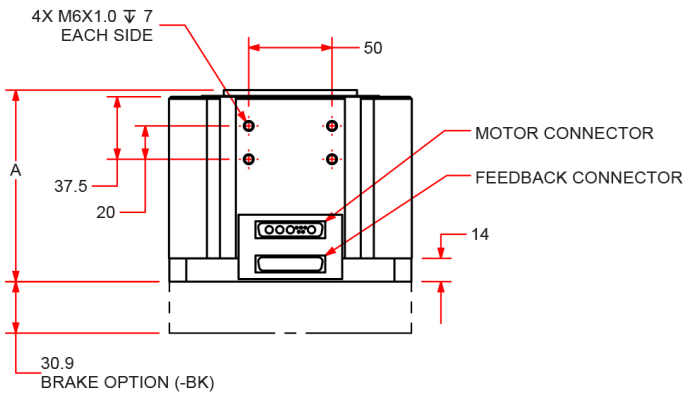
ADRT150



DIMENSIONS		
BASIC MODEL	A	B
ADRT150-115	115	60
ADRT150-135	136	80
ADRT150-180	178	120

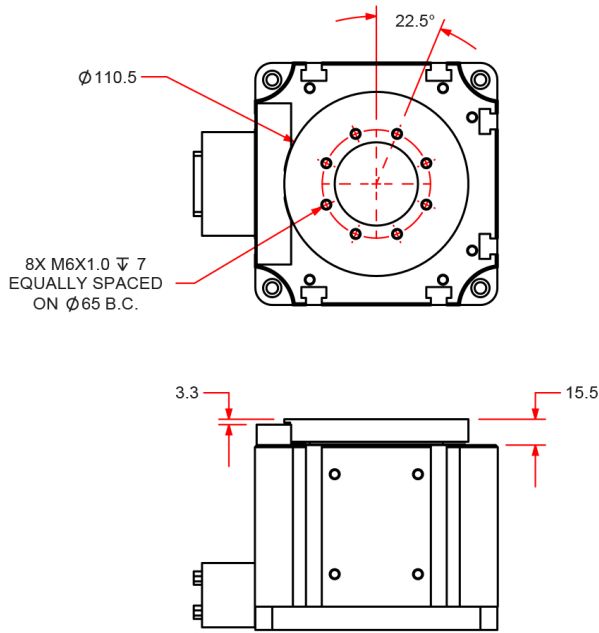


DETAIL A
T-SLOT, TYPICAL 8 PLACES



DIMENSIONS: MILLIMETERS

ADRT150 Limits/Hardstops

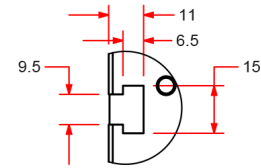
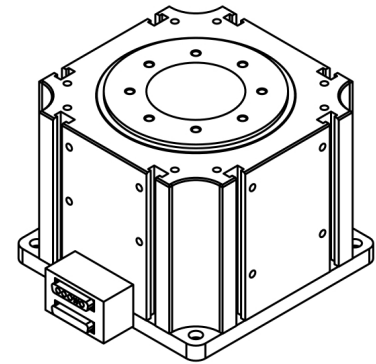
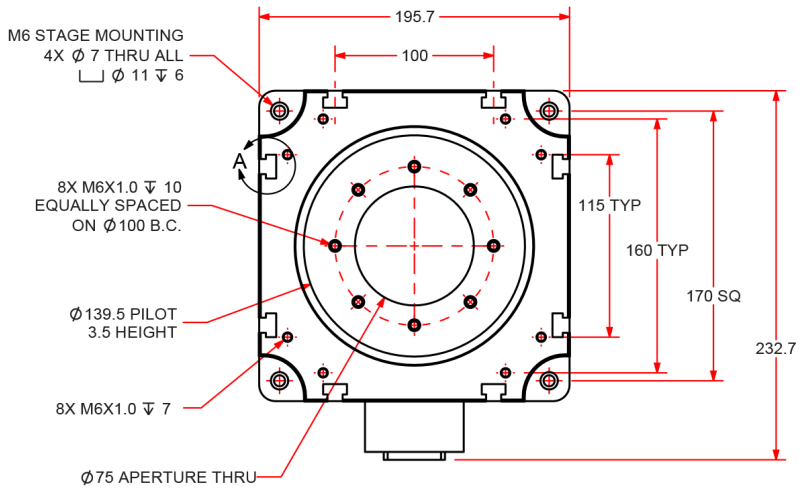


ADRT150 LIMITED TRAVEL OPTIONS, UNITS: DEGREES		
OPTION	NOMINAL TRAVEL	HARDSTOP TRAVEL
-TR010	+/- 5	+/- 10
-TR020	+/- 10	+/- 15
-TR040	+/- 20	+/- 25
-TR060	+/- 30	+/- 35
-TR080	+/- 40	+/- 45
-TR090	+/- 45	+/- 50
-TR100	+/- 50	+/- 55
-TR120	+/- 60	+/- 65
-TR140	+/- 70	+/- 75
-TR160	+/- 80	+/- 85
-TR180	+/- 90	+/- 95
-TR200	+/- 100	+/- 105
-TR220	+/- 110	+/- 115
-TR240	+/- 120	+/- 125
-TR260	+/- 130	+/- 135

DIMENSIONS: MILLIMETERS

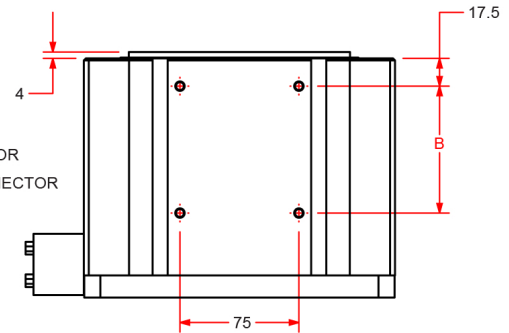
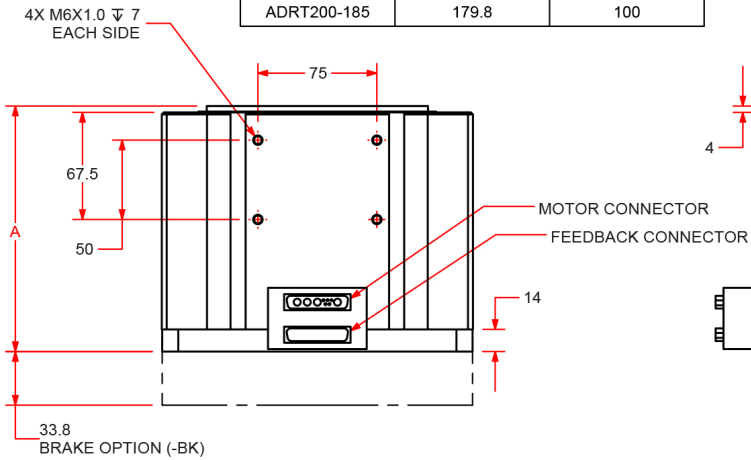
ADRT Series DIMENSIONS

ADRT200



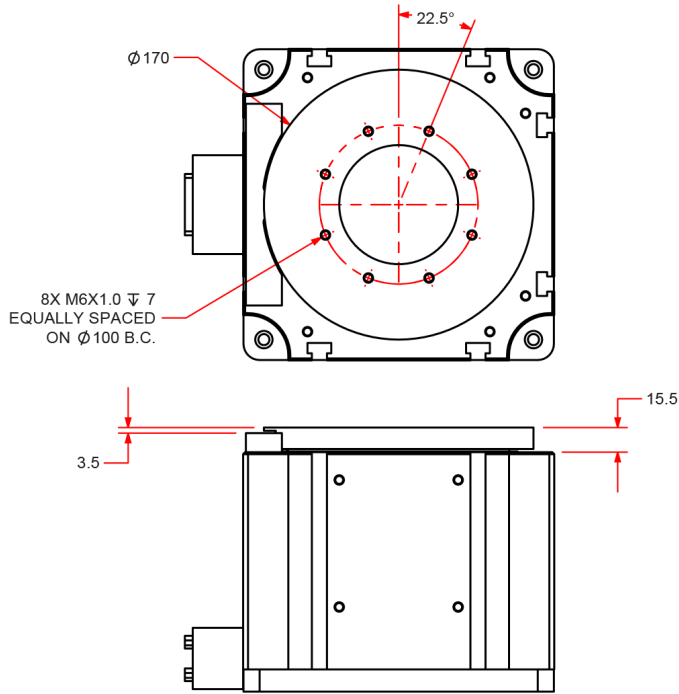
DETAIL A
T-SLOT, TYPICAL 8 PLACES

DIMENSIONS		
BASIC MODEL	A	B
ADRT200-155	154.8	80
ADRT200-185	179.8	100



DIMENSIONS: MILLIMETERS

ADRT200 Limits/Hardstops

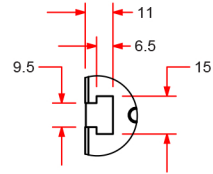
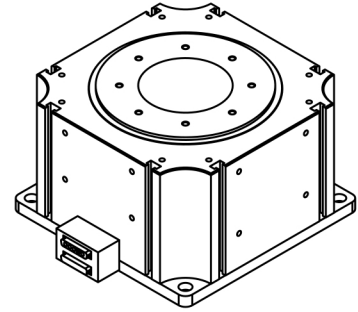
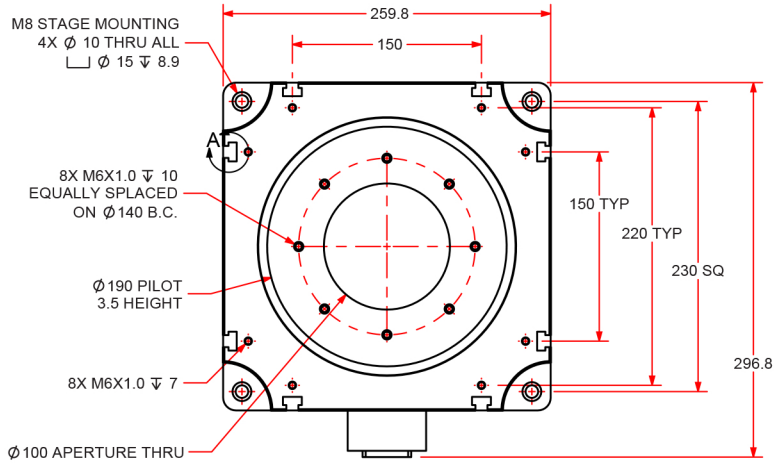


ADRT200 LIMITED TRAVEL OPTIONS, UNITS: DEGREES		
OPTION	NOMINAL TRAVEL	HARDSTOP TRAVEL
-TR010	+/- 5	+/- 10
-TR020	+/- 10	+/- 15
-TR040	+/- 20	+/- 25
-TR060	+/- 30	+/- 35
-TR080	+/- 40	+/- 45
-TR090	+/- 45	+/- 50
-TR100	+/- 50	+/- 55
-TR120	+/- 60	+/- 65
-TR140	+/- 70	+/- 75
-TR160	+/- 80	+/- 85
-TR180	+/- 90	+/- 95
-TR200	+/- 100	+/- 105
-TR220	+/- 110	+/- 115
-TR240	+/- 120	+/- 125
-TR260	+/- 130	+/- 135
-TR270	+/- 135	+/- 140
-TR280	+/- 140	+/- 145
-TR300	+/- 150	+/- 155

DIMENSIONS: MILLIMETERS

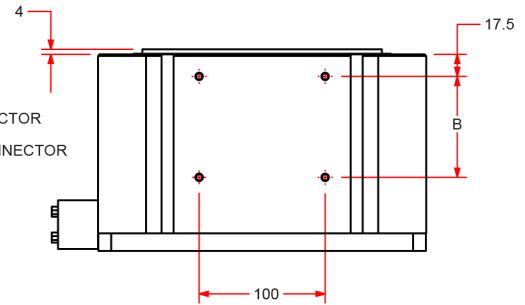
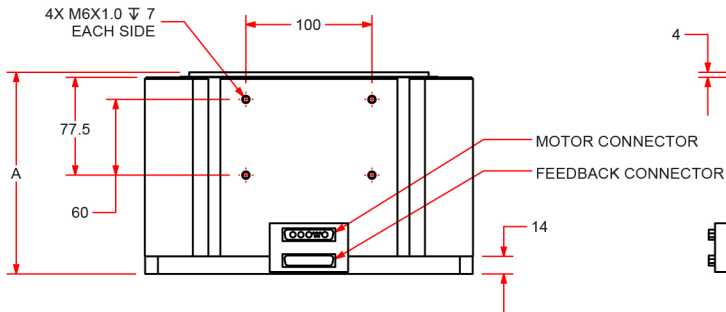
ADRT Series DIMENSIONS

ADRT260



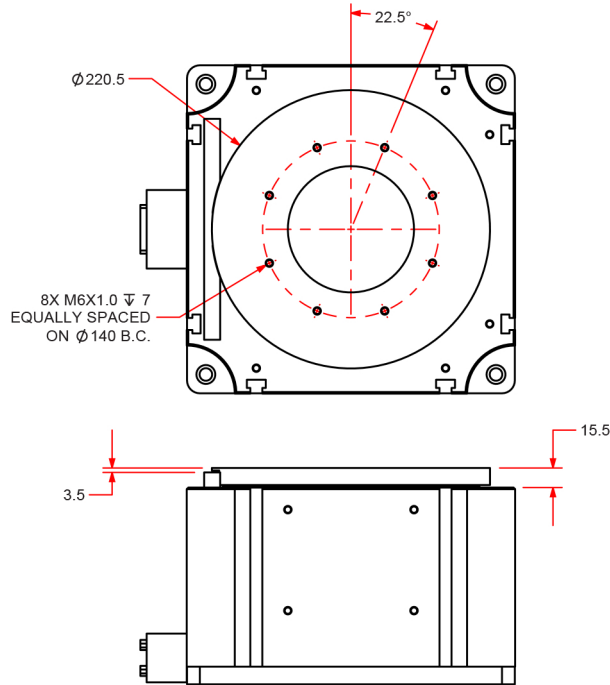
DETAIL A
T-SLOT, TYPICAL 8 PLACES

DIMENSIONS		
BASIC MODEL	A	B
ADRT260-160	159.9	80
ADRT260-180	180.9	100



DIMENSIONS: MILLIMETERS

ADRT260 Limits/Hardstops



ADRT260 LIMITED TRAVEL OPTIONS, UNITS: DEGREES		
OPTION	NOMINAL TRAVEL	HARDSTOP TRAVEL
-TR010	+/- 5	+/- 10
-TR020	+/- 10	+/- 15
-TR040	+/- 20	+/- 25
-TR060	+/- 30	+/- 35
-TR080	+/- 40	+/- 45
-TR090	+/- 45	+/- 50
-TR100	+/- 50	+/- 55
-TR120	+/- 60	+/- 65
-TR140	+/- 70	+/- 75
-TR160	+/- 80	+/- 85
-TR180	+/- 90	+/- 95
-TR200	+/- 100	+/- 105
-TR220	+/- 110	+/- 115
-TR240	+/- 120	+/- 125
-TR260	+/- 130	+/- 135
-TR270	+/- 135	+/- 140
-TR280	+/- 140	+/- 145
-TR300	+/- 150	+/- 155

DIMENSIONS: MILLIMETERS

ADRT Series ORDERING INFORMATION

ADRT Mechanical-Bearing Direct-Drive Rotary Stage

ADRT100	ADRT100 mechanical-bearing direct-drive rotary stage
ADRT150	ADRT150 mechanical-bearing direct-drive rotary stage
ADRT200	ADRT200 mechanical-bearing direct-drive rotary stage
ADRT260	ADRT260 mechanical-bearing direct-drive rotary stage

Stage Height (Required)

-85	85 mm stage height - Only available for ADRT100
-115	115 mm stage height - Only available for ADRT150
-135	135 mm stage height - Only available for ADRT100 and ADRT150
-155	155 mm stage height - Only available for ADRT200
-160	160 mm stage height - Only available for ADRT260
-180	180 mm stage height - Only available for ADRT150 and ADRT 260
-185	185 mm stage height - Only available for ADRT200

Motor (Required)

-M1	Low current, -A winding
-M2	Low voltage, -B winding

Note: Only available for ADRT260.

Feedback (Required)

-E1	Incremental encoder, 1 Vpp
-E2	Incremental encoder, TTL, x5 interpolation
-E3	Incremental encoder, TTL, x10 interpolation
-E4	Incremental encoder, TTL, x25 interpolation
-E5	Incremental encoder, TTL, x50 interpolation

Connector (Required)

-CN1	4-pin HPD motor and 25-pin D Fbk connectors
-CN2	25-pin D motor and 25-pin D Fbk connectors

Note: Only available for ADRT100.

Rear Seal (Optional)

-SL	Rear seal
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Note: Only available for ADRT100.

Air Purge (Optional)

-PR	Air-purge fitting
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Note: Only available for ADRT100.

Brake (Optional)

-BK	Holding brake
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Note: Only available for the ADRT150 and the ADRT200. Not available with limited travel option.

ADRT Series ORDERING INFORMATION

Limited Travel (Optional)

-TR010	Limited travel, +/- 5 degrees
-TR020	Limited travel, +/- 10 degrees
-TR040	Limited travel, +/- 20 degrees
-TR060	Limited travel, +/- 30 degrees
-TR080	Limited travel, +/- 40 degrees
-TR090	Limited travel, +/- 45 degrees
-TR100	Limited travel, +/- 50 degrees
-TR120	Limited travel, +/- 60 degrees
-TR140	Limited travel, +/- 70 degrees
-TR160	Limited travel, +/- 80 degrees
-TR180	Limited travel, +/- 90 degrees
-TR200	Limited travel, +/- 100 degrees
-TR220	Limited travel, +/- 110 degrees
-TR240	Limited travel, +/- 120 degrees
-TR260	Limited travel, +/- 130 degrees
-TR270	Limited travel, +/- 135 degrees - Only available on ADRT200 and ADRT260
-TR280	Limited travel, +/- 140 degrees - Only available on ADRT200 and ADRT260
-TR300	Limited travel, +/- 150 degrees - Only available on ADRT200 and ADRT260

Note: Not available with ADRT100. Not available with brake option.

-TRxxx options include electrical limits and mechanical hardstops. There are an extra 1.5 degrees per side between the nominal travel and the electrical limits, and an extra 5 degrees per side between the nominal travel and mechanical hardstops. (Ex: TR90 has +/- 45 degrees of nominal travel, with +/- 46.5 degrees of travel between electrical limits and +/- 50 degrees of travel between mechanical hardstops.)

Metrology (Required)

-PL0	No metrology performance plots
-PL1	Metrology, uncalibrated with performance plots
-PL2	Metrology, calibrated (HALAR) with performance plots

Integration (Required)

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.