Mechanical-Bearing
Direct-Drive Rotary Stages

ADRT

The World's Most Versatile High-Precision Direct Drive Rotary Stages

With dual large-diameter bearings and slotless, brushless torque motors, our ADRT series easily delivers ultra-smooth, high-speed motion for applications that require very precise rotary motion plus high torque, speed and payload-carrying capacity.

ADRT seamlessly integrates into multi-axis motion systems, subsystems and machines thanks to a range of features and options including continuous 360° travel, limited-travel and fail-safe holding brakes to mitigate against crash conditions and provide additional payload security.

Key Applications

ADRT stages are ideal for applications that require fine precision, smooth motion, rapid accelerations, high speeds, large payloads or any combination of these, including:

- Testing of sensors, MEMS and other devices
- Electro-optics testing and calibration
- Indexing and alignment
- Laser micromachining
- Angular tracking
- High-precision inspection of semiconductors, medical devices and other components

KEY FEATURES:

- Features **NINE MODELS** to meet any load capacity, torque and dimensional requirements
- Delivers **HIGH TORQUE OUTPUT** and smooth, stable motion with direct-drive, cog-free servo motor
- Achieves **EXCELLENT ACCURACY** and repeatability with high-resolution position feedback
- Supports **HIGH PAYLOADS** and provides exceptional stiffness
- Offers **INTEGRATION AND PROCESS FLEXIBILITY** with large-diameter clear aperture

ADRT 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				
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		0.000243 kg·m^2	0.000483 kg·m^2	0.002795 kg·m^2	0.005108 kg·m^2	0.006671 kg·m^2
Mass		2.0 kg	3.6 kg	6.1 kg	8.5 kg	11.9 kg
Finish	Table	Hardcoat				
	Stage	Black Anodize				

Notes:
1. Bus voltage for ADRT100 with -25D connector is limited to 160 V.
2. Calibrated accuracy requires -PL2 option and Aerotech controls.
3. Repeatability and accuracy are dependent on encoder resolution. To achieve the listed specifications, encoder resolution must be 0.36 arc sec or less
4. 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.
5. 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			
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		0.018899 kg·m^2	0.025062 kg·m^2	0.065934 kg·m^2	0.084950 kg·m^2
Mass		16.2 kg	20.3 kg	27.3 kg	33 kg
Finish	Table	Hardcoat			
	Stage	Black Anodize			

Notes:
1. Calibrated accuracy requires -PL2 option and Aerotech controls.
2. Repeatability and accuracy are dependent on encoder resolution. To achieve the listed specifications, encoder resolution must be 0.36 arc sec or less
3. 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.
4. 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 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

Feedback (Required)

-E6	Incremental encoder, 1 Vpp
-E7	Incremental encoder, digital RS422, electrical resolution 6.48 arc sec (ADRT100), 4.48 arc sec (ADRT150), or 2.91 arc sec (ADRT200, ADRT260)
-E8	Incremental encoder, digital RS422, electrical resolution 3.24 arc sec (ADRT100), 2.24 arc sec (ADRT150), or 1.45 arc sec (ADRT200, ADRT260)
-E9	Incremental encoder, digital RS422, electrical resolution 1.62 arc sec (ADRT100), 1.12 arc sec (ADRT150), or 0.73 arc sec (ADRT200, ADRT260)
-E10	Incremental encoder, digital RS422, electrical resolution 1.30 arc sec (ADRT100), 0.90 arc sec (ADRT150), or 0.58 arc sec (ADRT200, ADRT260)

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. The -CN1 option is the default. The -CN2 option should be used when the stage is part of a multi-axis assembly with cable management.

Rear Seal (Optional)

-SL	Rear seal

Note: Only available for ADRT100.

Air Purge (Optional)

-PR	Air-purge fitting

Note: Only available for ADRT100.

Brake (Optional)

-BK	Holding brake

Note: Only available for the ADRT150 and the ADRT200. Not available with limited travel option.

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

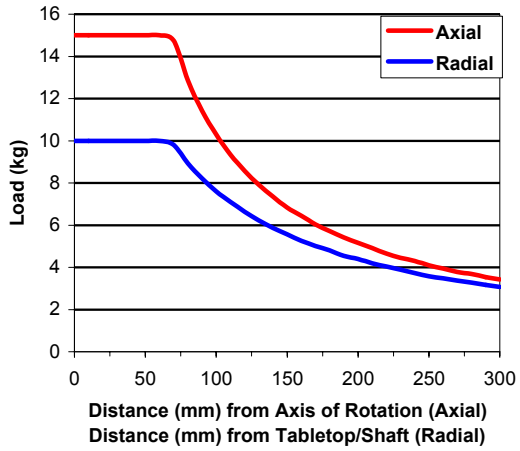
Integration (Required)

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.

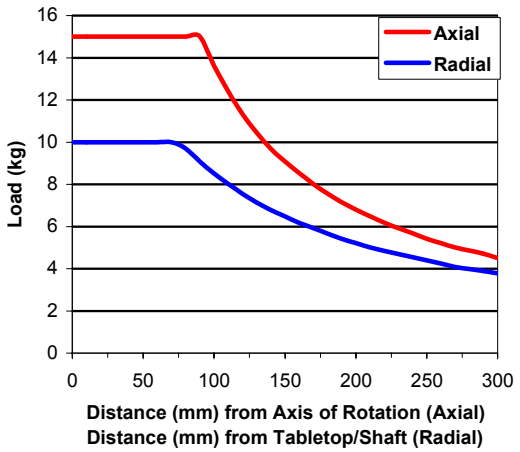
-TAS **Integration - Test as system**
Testing, integration, and documentation of a group of components as a complete system that will be used together (ex: drive, controller, and stage). This includes parameter file generation, system tuning, and documentation of the system configuration.

-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.

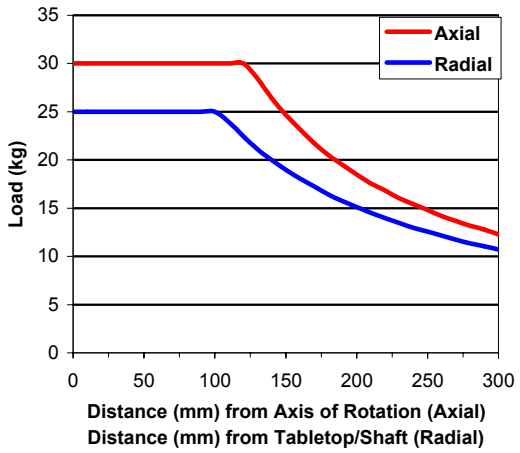
ADRT SPECIFICATIONS



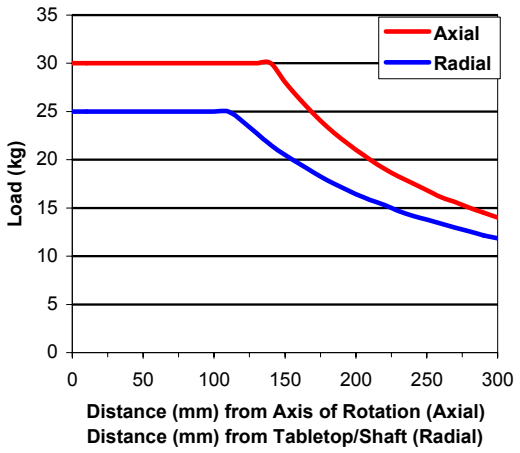
Axial and Radial Cantilevered Load Capability (ADRT100-85)



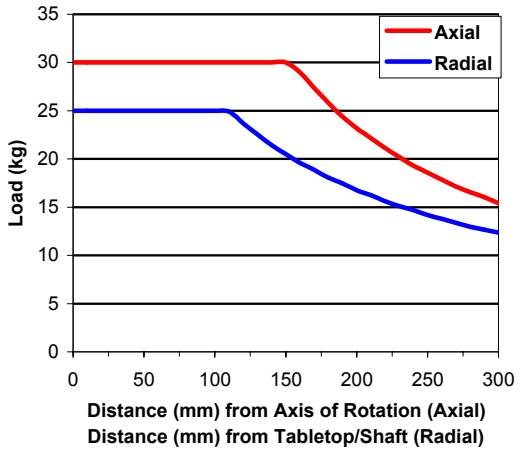
Axial and Radial Cantilevered Load Capability (ADRT100-135)



Axial and Radial Cantilevered Load Capability (ADRT150-115)

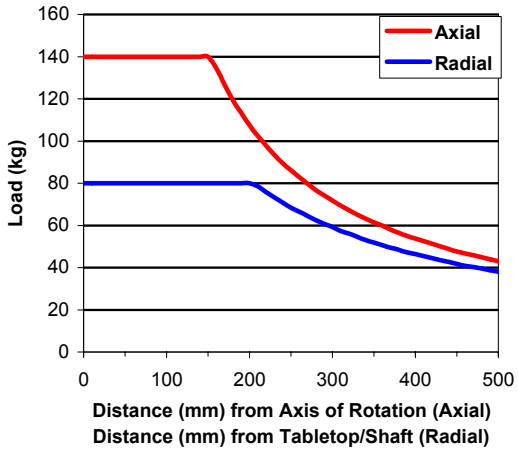


Axial and Radial Cantilevered Load Capability (ADRT150-135)

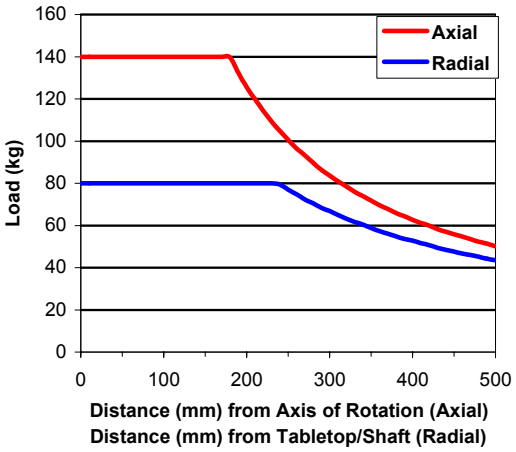


Axial and Radial Cantilevered Load Capability (ADRT150-180)

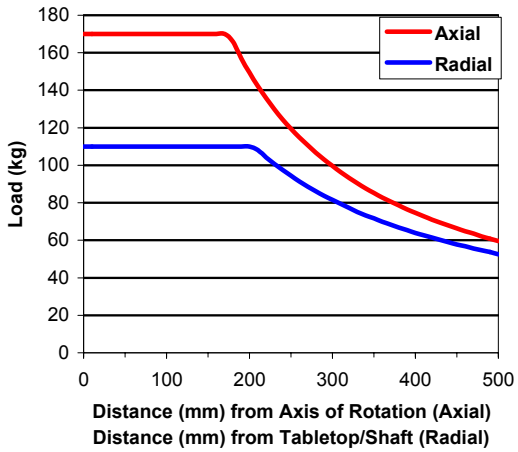
ADRT Series SPECIFICATIONS



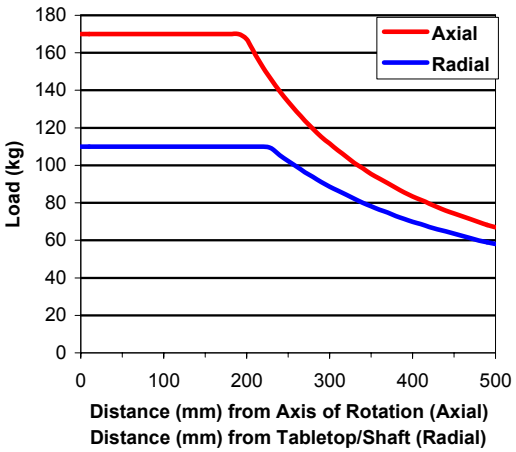
Axial and Radial Cantilevered Load Capability (ADRT200-155)



Axial and Radial Cantilevered Load Capability (ADRT200-185)



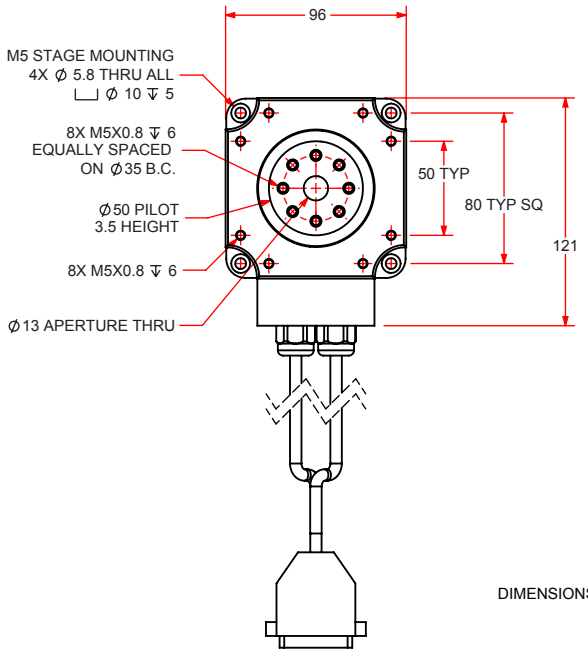
Axial and Radial Cantilevered Load Capability (ADRT260-160)

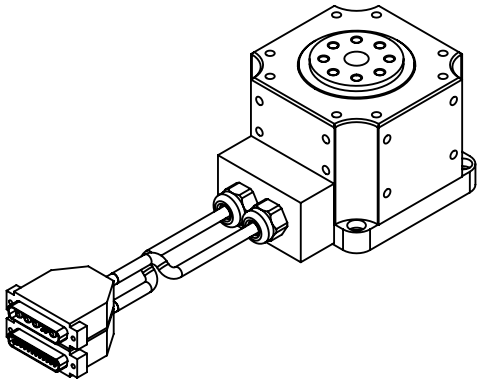


Axial and Radial Cantilevered Load Capability (ADRT260-180)

ADRT DIMENSIONS

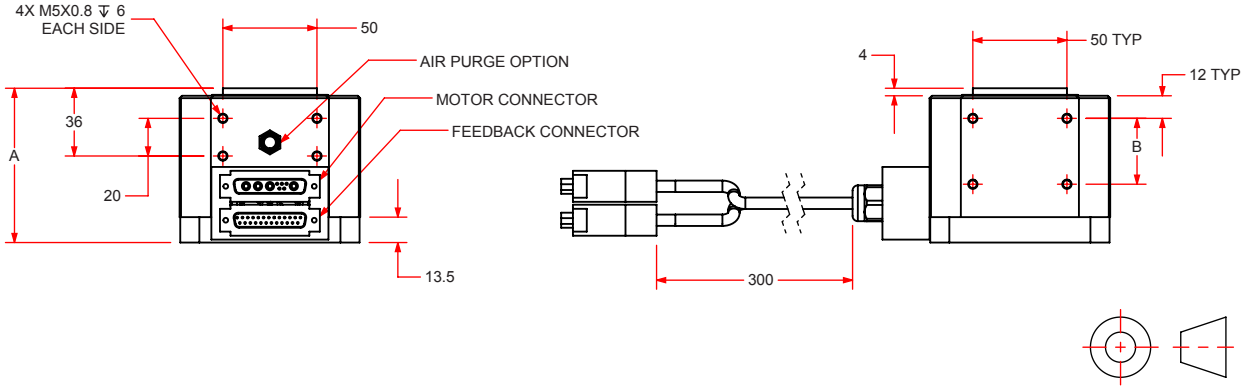
ADRT100





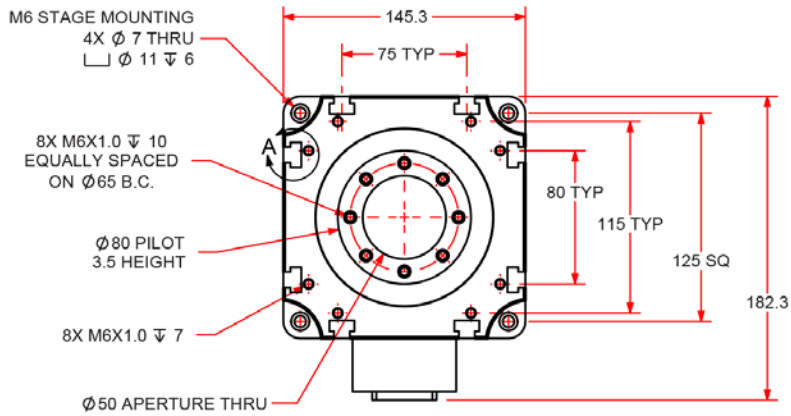
DIMENSIONS: MILLIMETERS

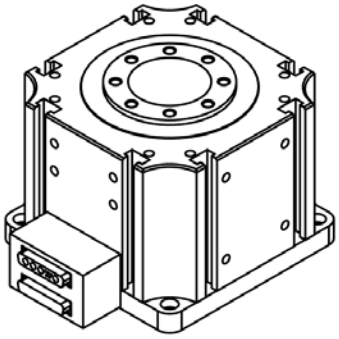
DIMENSIONS (MM)		
BASIC MODEL	**A**	**B**
ADRT100-85	82	35
ADRT100-135	132	85



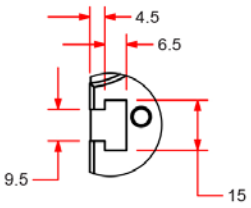
ADRT DIMENSIONS

ADRT150

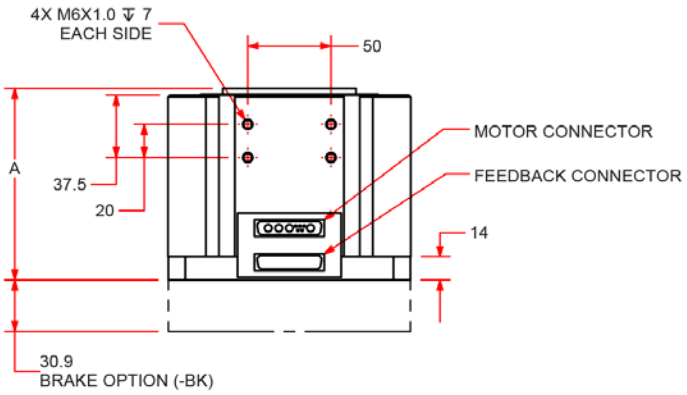


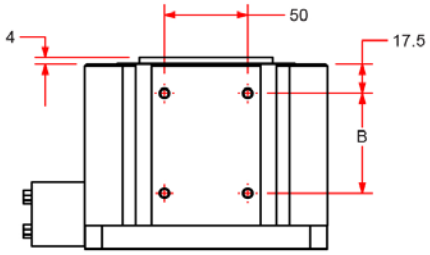


DIMENSIONS		
BASIC MODEL	**A**	**B**
ADRT150-115	115	60
ADRT150-135	136	80
ADRT150-180	178	120



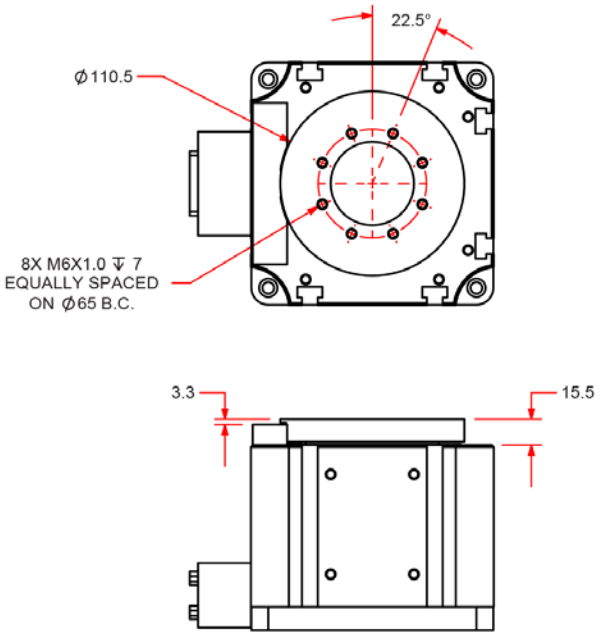
DETAIL A
T-SLOT, TYPICAL 8 PLACES





ADRT DIMENSIONS

ADRT150 LIMITS/HARDSTOPS

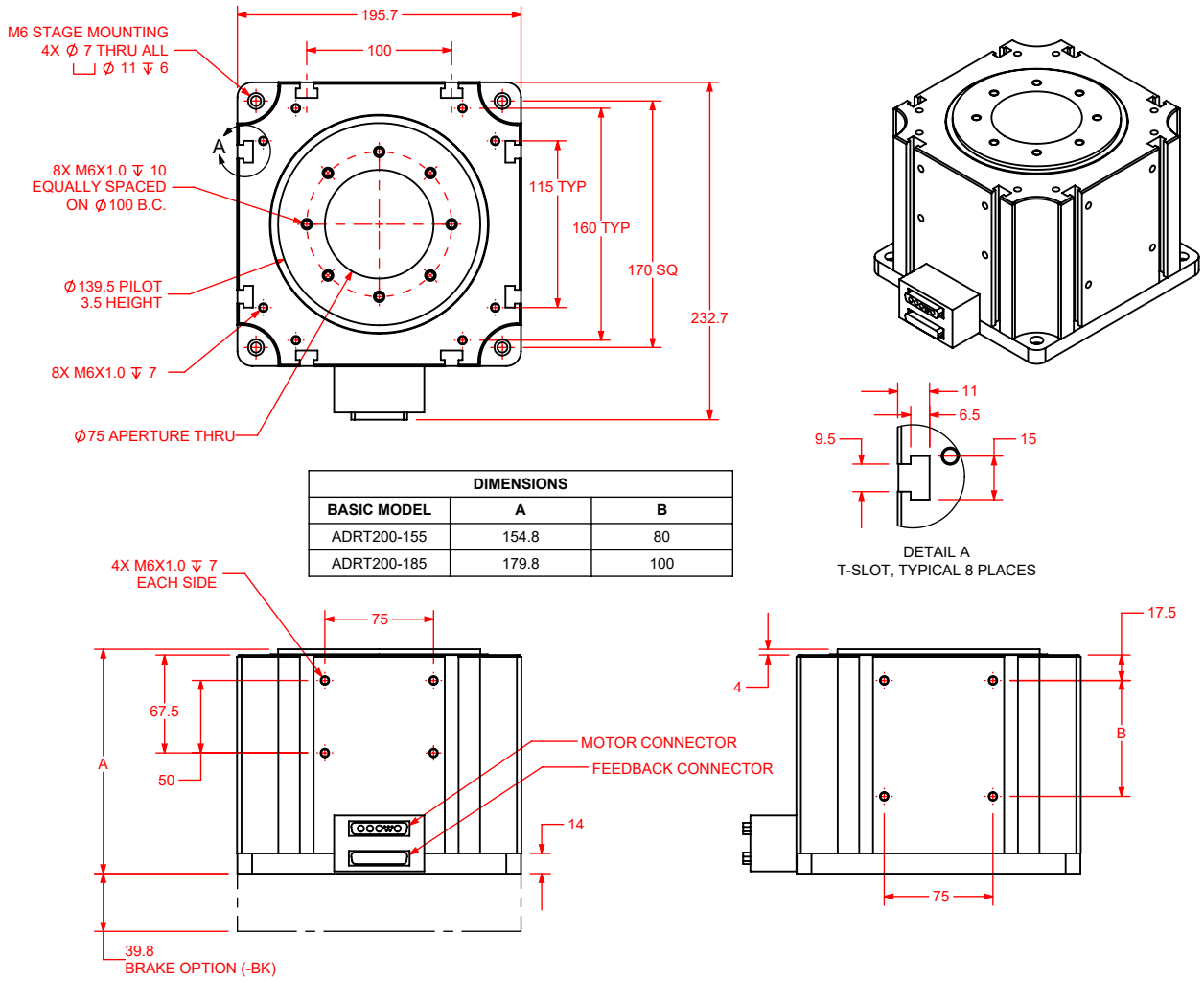


ADRT150 LIMITED TRAVEL OPTIONS, UNITS: DEGREES		
OPTION	NOMINAL TRAVEL	HARDSTOP TRAVEL
-TR010	+/- 5	+/- 10
-TR020	+/- 10	+/- 15
-TR040	+/- 20	+/- 25
-TR060	+/- 30	+/- 35
-TR080	+/- 40	+/- 45
-TR090	+/- 45	+/- 50
-TR100	+/- 50	+/- 55
-TR120	+/- 60	+/- 65
-TR140	+/- 70	+/- 75
-TR160	+/- 80	+/- 85
-TR180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

DIMENSIONS: MILLIMETERS

ADRT DIMENSIONS

ADRT200

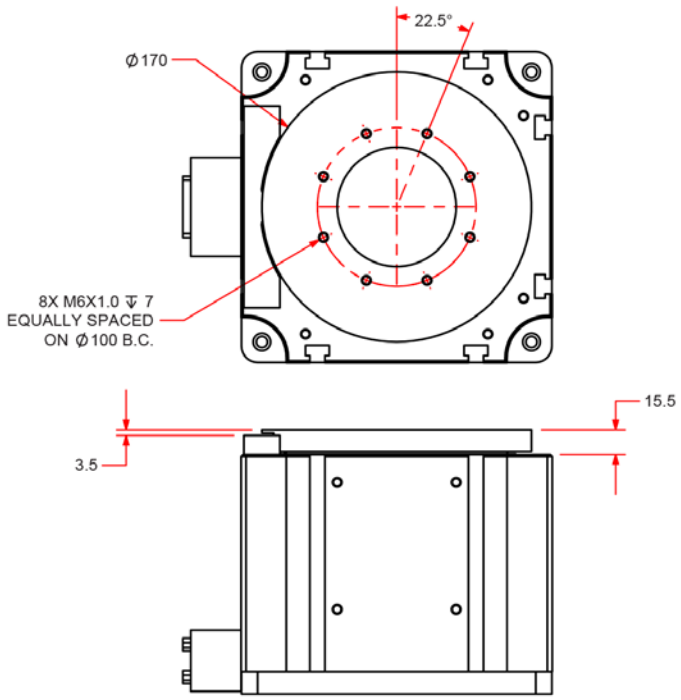


DIMENSIONS		
BASIC MODEL	**A**	**B**
ADRT200-155	154.8	80
ADRT200-185	179.8	100

DIMENSIONS: MILLIMETERS

ADRT DIMENSIONS

ADRT200 LIMITS/HARDSTOPS

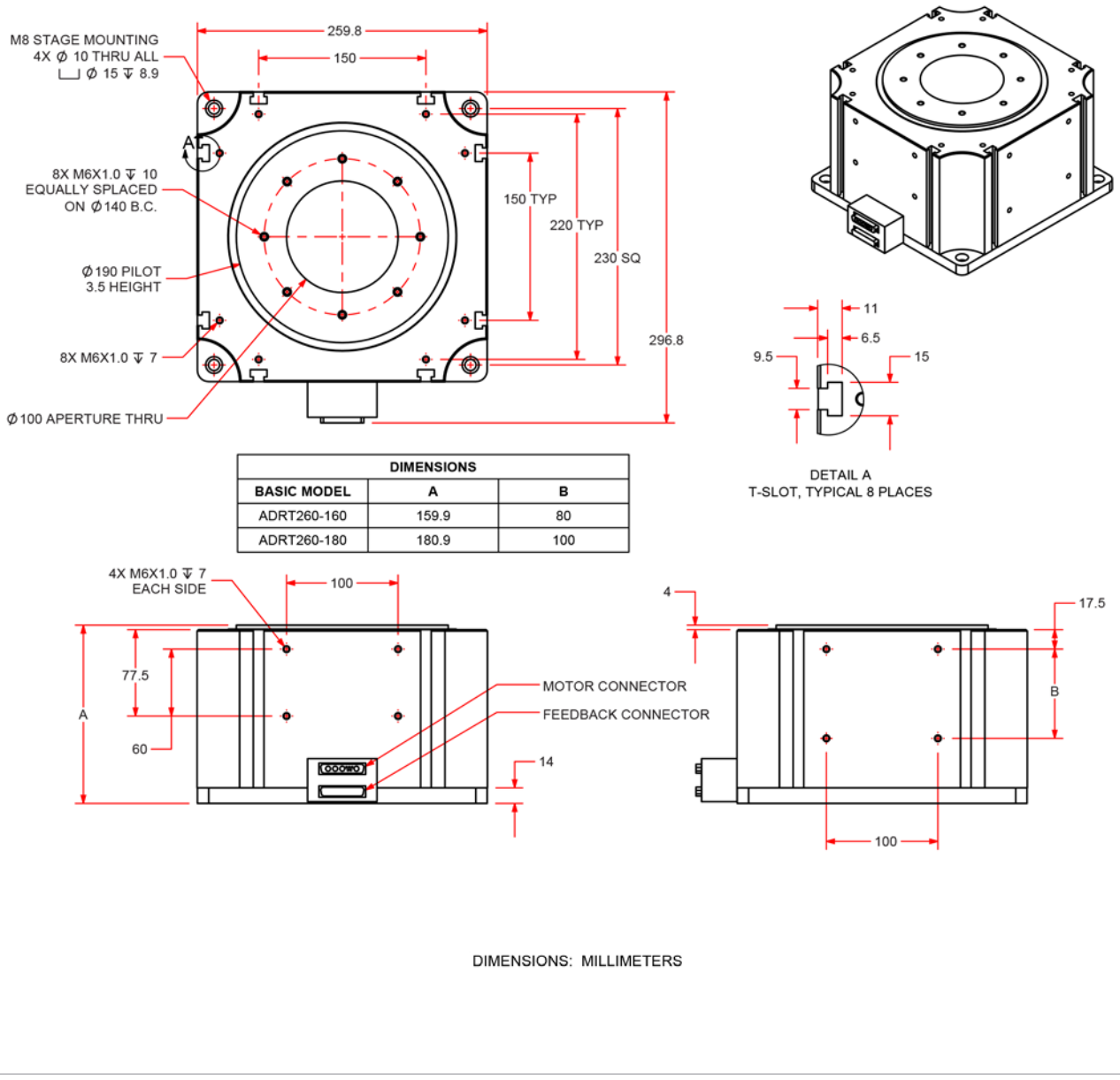


ADRT200 LIMITED TRAVEL OPTIONS, UNITS: DEGREES		
OPTION	NOMINAL TRAVEL	HARDSTOP TRAVEL
-TR010	+/- 5	+/- 10
-TR020	+/- 10	+/- 15
-TR040	+/- 20	+/- 25
-TR060	+/- 30	+/- 35
-TR080	+/- 40	+/- 45
-TR090	+/- 45	+/- 50
-TR100	+/- 50	+/- 55
-TR120	+/- 60	+/- 65
-TR140	+/- 70	+/- 75
-TR160	+/- 80	+/- 85
-TR180	+/- 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 DIMENSIONS

ADRT260

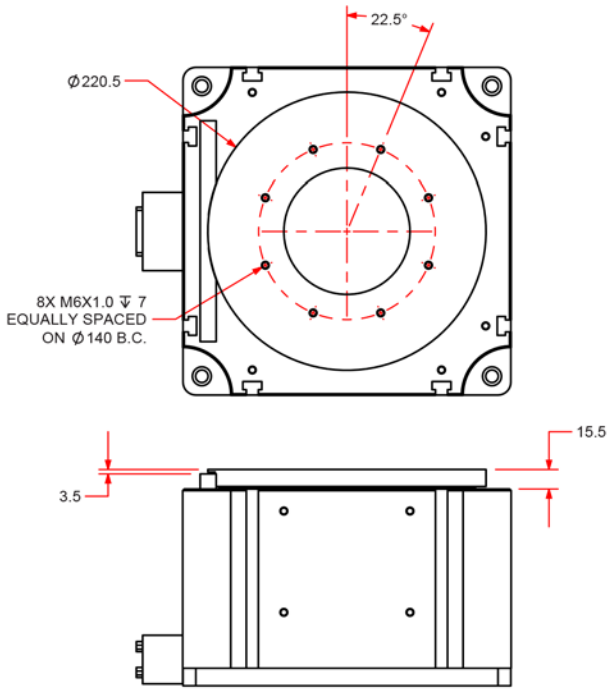


DIMENSIONS		
BASIC MODEL	**A**	**B**
ADRT260-160	159.9	80
ADRT260-180	180.9	100

DIMENSIONS: MILLIMETERS

ADRT DIMENSIONS

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