

ROTARY STAGES ACS SERIES



Aerotech's ACS series rotary stages with integrated ER collet chuck or 3-jaw gripper configuration provides automated material handling capability for a wide range of materials and applications.

High Precision ER Collet

The collet chuck on the ACS-150 accepts either ER25 or ER40 series collets. These collets are readily available from machine-tool component suppliers in sizes that support tube diameters from 0.5 mm to 30 mm. ER collets provide excellent run-out characteristics for applications requiring high-precision gripping of tubular material. The collet is retained with a threaded retaining nut enabling quick-changeover. It is configured in a "fail-safe" normally-closed mode where full clamping force is applied when no air pressure is present.

Flexible 3-Jaw Gripper

Both the ACS-150 and ACS-200 support three-jaw grippers with clear apertures for product feed-through. All gripper assemblies are configurable as either normally-open or normally-closed with various jaw strokes to support a wide range of material sizes. The gripper can be fitted with custom jaws for the handling of materials with non-round profiles such as square or hexagonal bar stock. The normally-open and -closed options also provide the ability to grip either the O.D. or I.D. of the material.

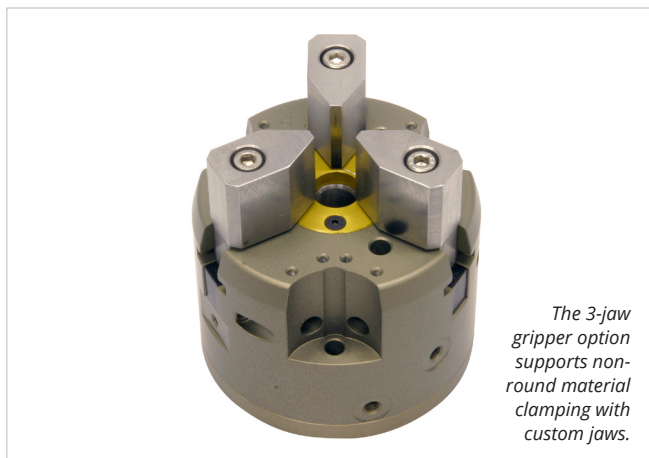
Integral Rotary Union

Air is delivered to the collet or gripper assembly through an integral rotary union. The 3-jaw grippers use a seal-based rotary union design while the ER collet option uses a seal-less, frictionless design. This 100% noncontact rotary union design ensures a lifetime of maintenance-free operation. The combination collet chuck or gripper and rotary union assembly also have significantly less friction and inertia than external assemblies created from discrete parts. This reduced inertia improves system performance by allowing higher peak acceleration and reducing position error during laser machining operations.

Brushless Direct-Drive

To maximize positioning performance the ACS 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, which yields higher total overall throughput.

The low maintenance, high throughput characteristics of the ACS coupled with the integral material handling capability provide the lowest total cost of ownership when compared to component-level solutions.



The 3-jaw gripper option supports non-round material clamping with custom jaws.

— PRODUCT HIGHLIGHTS —

Integral pneumatic ER collet chuck or 3-jaw gripper

Clear aperture for product feed-through

Normally-closed or -open gripper options

Low-inertia shaft for maximum acceleration

Direct-drive brushless motor and encoder

Integral frictionless rotary union

Follows the 2011/65/EU RoHS 2 Directive

ACS Series Specifications

Specifications		ACS100-85	ACS100-135	ACS150-115	ACS150-135	ACS150-180
Total Travel		±360° Continuous				
Gripper/Collet Option ¹		ER8		ER25, ER40, 3J-12		
Three-Jaw Gripper Travel		N/A		10 mm, 16 mm		
Maximum Torque (Continuous)		0.48 N·m	1.6 N·m	2.85 N·m	5.06 N·m	9.29 N·m
Accuracy ²		Calibrated: ±73 µrad (±15 arc sec); Uncalibrated: ±146 µrad (±30 arc sec)				
Repeatability ²		±29 µrad (±6 arc sec)				
Pin-Collet Runout (ER Collets) ³		<25 µm				
Grip Repeatability/Max Jaw Length (3 Jaw)		±20 µm/50 mm				
Analog Outputs	ER8	5 mm		N/A		
	ER25	N/A		16 mm		
	ER40	N/A		30 mm		
	3J-12	N/A		12 mm		
Max Load ⁴	ER8	1.5 kg (Axial); 0.5 kg (Radial); 0.75 N·m (Moment)				
	ER25	10 kg (Axial); 5 kg (Radial); 6 N·m (Moment)				
	ER40	15 kg (Axial); 10 kg (Radial); 12 N·m (Moment)				
	3J-12	20 kg (Axial); 11 kg (Radial); 6 N·m (Moment)				
Rated Speed ⁵		800 rpm		600 rpm		
Bus Voltage		Up to 340 VDC				
Finish	Table	Hardcoat				
	Stage	Black Anodize				

1 Collet chuck accepts Rego-Fix ER collets manufactured to DIN6499 specifications only.

2 Repeatability and accuracy are dependent on encoder resolution. To achieve the listed specifications, encoder resolution must be 1.2 arc sec or less.

3 Measured TIR of precision gage pin chucked with an ultraprecision ER collet (DIN6499) 6 mm away from collet face with no load.

4 Maximum loads are mutually exclusive. Loading limits are due to the collet chuck mechanism. Contact Aerotech directly if part load requirement exceeds specifications.

5 Maximum speed based on stage capability; maximum application velocity may be limited by system data rate, system resolution, and load.

6 Collet chuck mechanism is normally-closed. Collet mechanism requires air to open collet chuck. Air supply must be dry (0°F dew point) oil-less air OR 99.99% pure nitrogen. Air or nitrogen must be filtered to 1 micron particle size or better. With 3-jaw gripper, air or nitrogen should be filtered to 20 micron particle size or better.

Specifications		ACS200-155	ACS200-185
Total Travel		±360° Continuous	
Gripper/Collet Option		-3J1 through -3J8 (see ordering options)	
Maximum Torque (Continuous)		11.12 N·m	15.93 N·m
Accuracy ¹		Calibrated: ±73 µrad (±15 arc sec); Uncalibrated: ±146 µrad (±30 arc sec)	
Repeatability ¹		±29 µrad (±6 arc sec)	
Grip Repeatability ²		±20 µm/50 mm	
Max Jaw Length From Chuck Face		50 mm for 3J-12; 70 mm for 3J-25	
Aperature	3J-12	12 mm	
	3J-25	25 mm	
Max Load ³	3J-12	20 kg (Axial); 11 kg (Radial); 6 N·m (Moment)	
	3J-25	30 kg (Axial); 18 kg (Radial); 13 N·m (Moment)	
Rated Speed ⁴		600 rpm	
Bus Voltage		Up to 340 VDC	
Finish	Table	Hardcoat	
	Stage	Black Anodize	

1 Repeatability and accuracy are dependent on encoder resolution. To achieve the listed specifications, encoder resolution must be 1.2 arc sec or less.

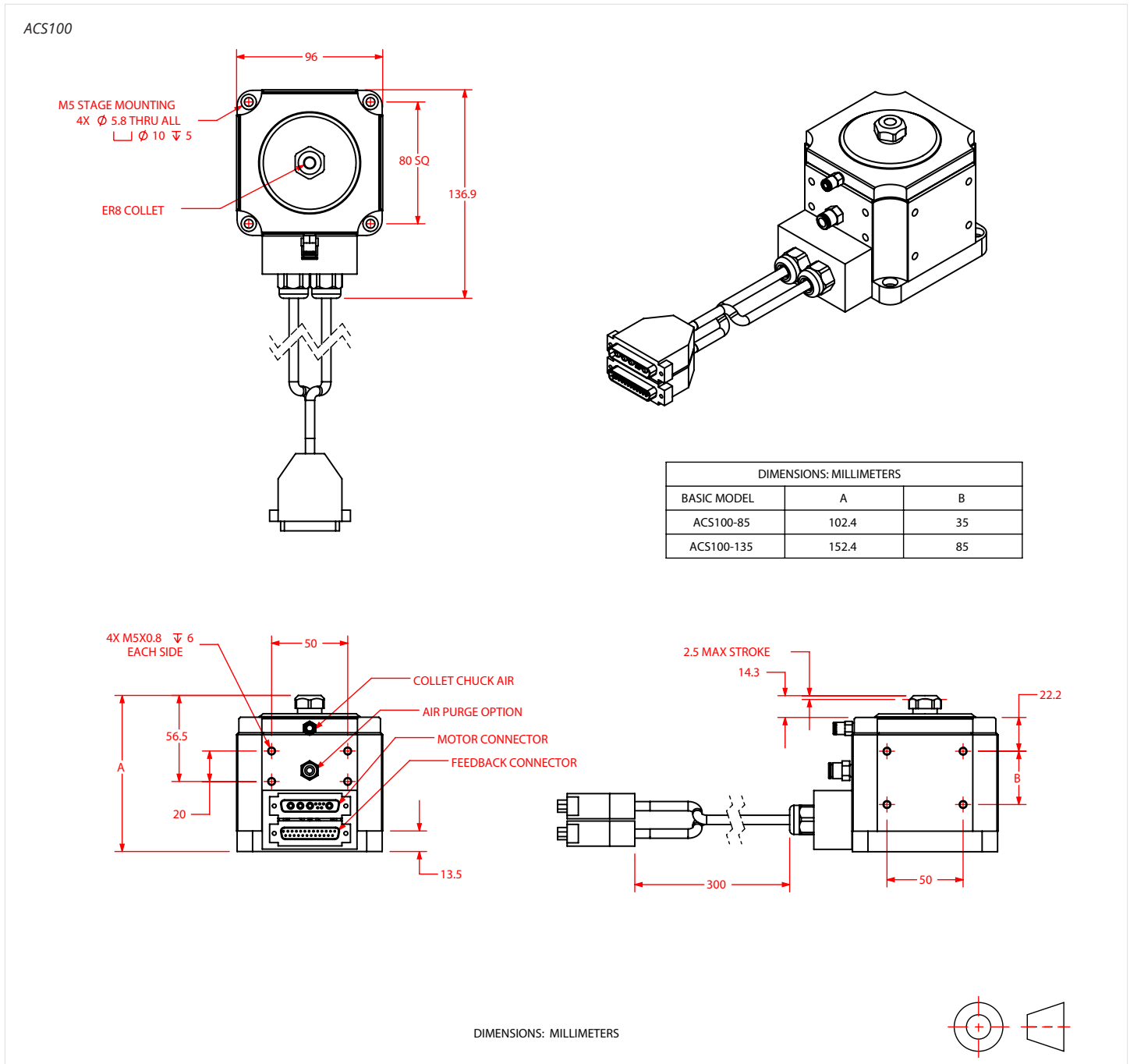
2 Measured TIR of precision gage pin 10 mm away from gripper face with no load.

3 Maximum loads are mutually exclusive. Loading limits are due to the collet chuck mechanism. Contact Aerotech directly if part load requirement exceeds specifications.

4 Maximum speed based on stage capability; maximum application velocity may be limited by system data rate, system resolution, and load.

5 Collet chuck mechanism is normally-closed. Collet mechanism requires air to open collet chuck. Air supply must be dry (0° F dew point) oil-less air OR 99.99% pure nitrogen. Air or nitrogen must be filtered to 1 micron particle size or better. With 3-jaw gripper, air or nitrogen should be filtered to 20 micron particle size or better.

ACS Series Dimensions



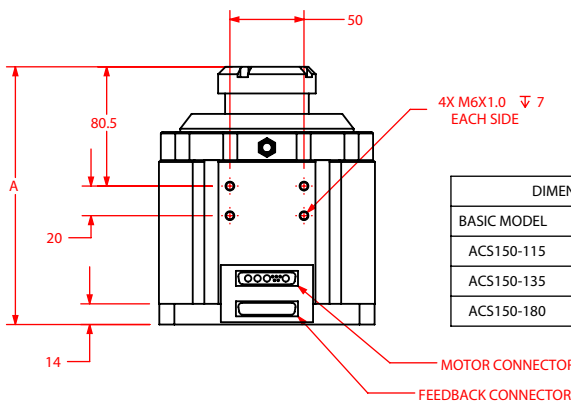
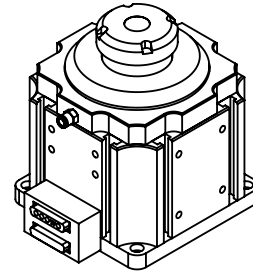
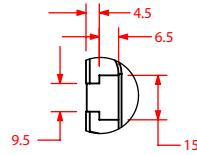
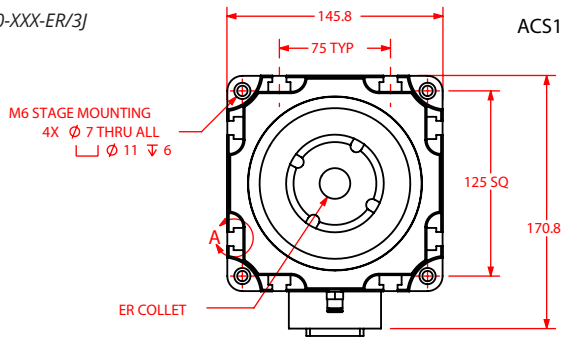
ACS Maximum Speeds for Encoder Option

Encoder Option	ACS100	ACS150	ACS200
-AS/-X5/-X10/-X25	800 rpm	600 rpm	600 rpm
-X50	800 rpm	600 rpm	500 rpm

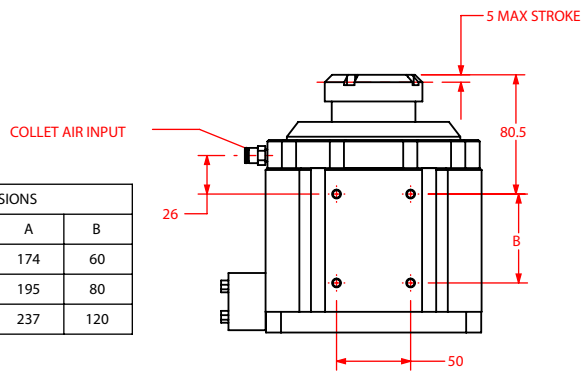
ACS Series Dimensions

ACS150-XXX-ER/3J

ACS150 WITH -ER25 OR -ER40

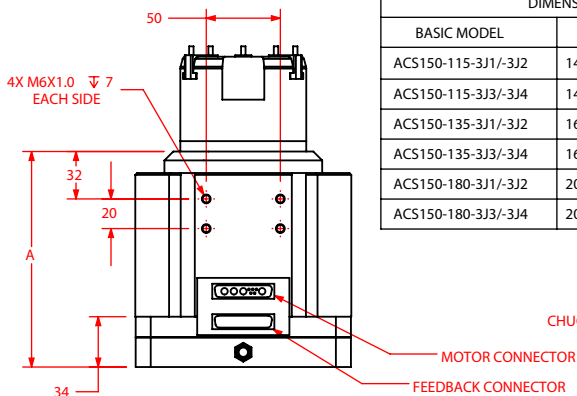
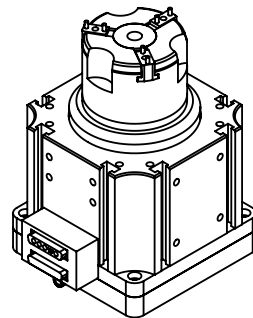
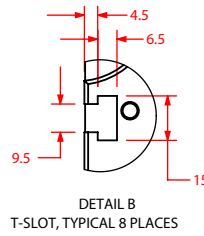
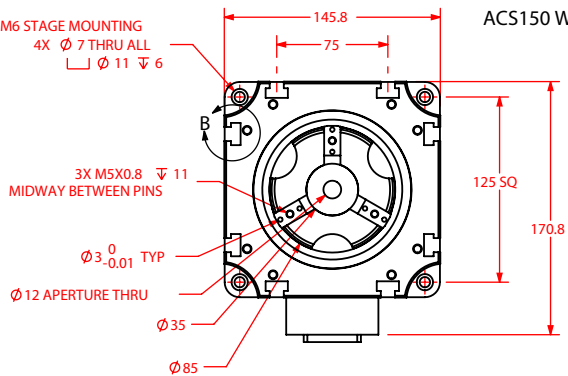


DIMENSIONS		
BASIC MODEL	A	B
ACS150-115	174	60
ACS150-135	195	80
ACS150-180	237	120

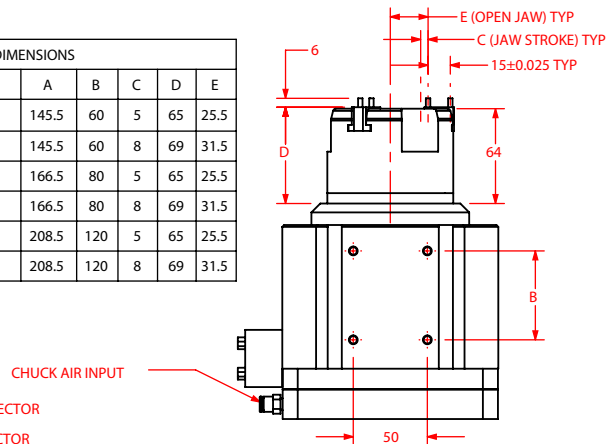


M6 STAGE MOUNTING
4X Ø 7 THRU ALL
└─┘ Ø 11 ▽ 6

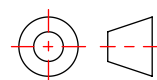
ACS150 WITH -3J1, -3J2, -3J3, OR -3J4



DIMENSIONS					
BASIC MODEL	A	B	C	D	E
ACS150-115-3J1/-3J2	145.5	60	5	65	25.5
ACS150-115-3J3/-3J4	145.5	60	8	69	31.5
ACS150-135-3J1/-3J2	166.5	80	5	65	25.5
ACS150-135-3J3/-3J4	166.5	80	8	69	31.5
ACS150-180-3J1/-3J2	208.5	120	5	65	25.5
ACS150-180-3J3/-3J4	208.5	120	8	69	31.5

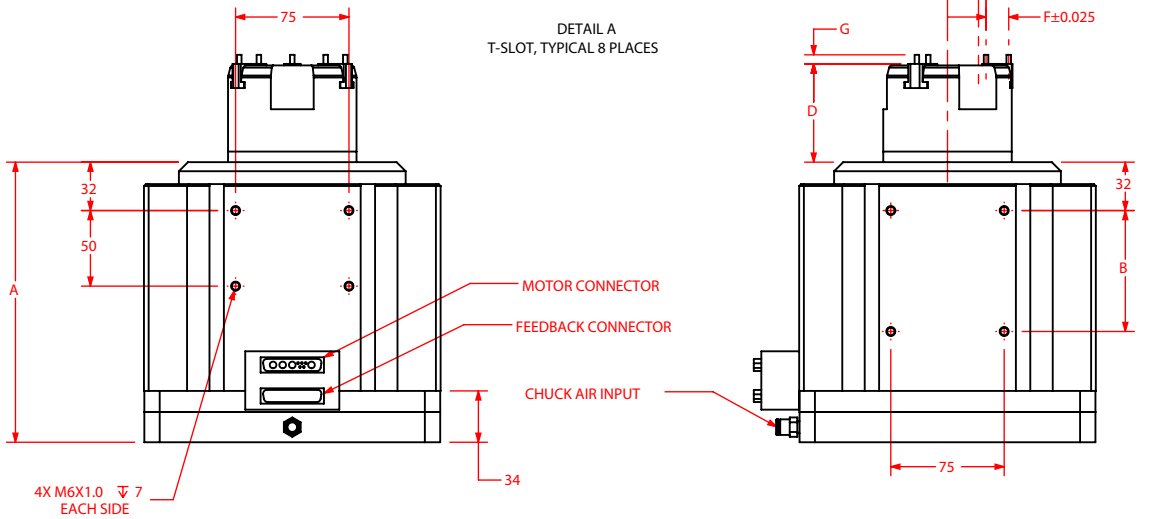
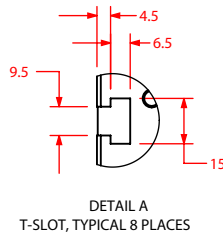
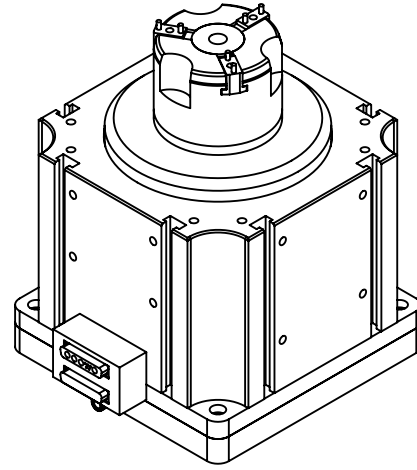
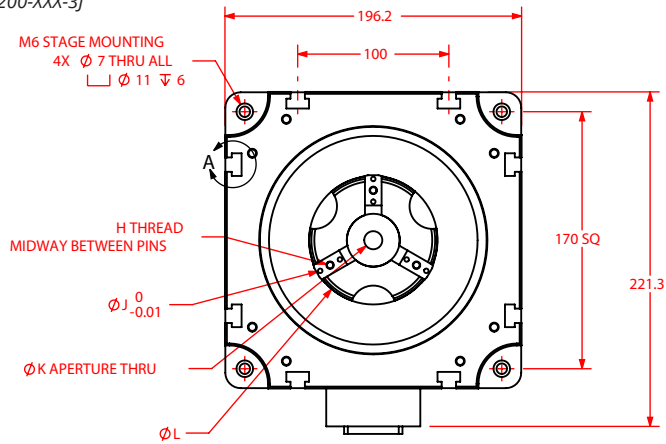


DIMENSIONS: MILLIMETERS



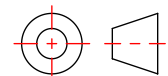
ACS Series Dimensions

ACS200-XXX-3J



DIMENSIONS											
BASIC MODEL	A	B	C	D	E	F	G	H	J	K	L
ACS200-155-3J1/-3J2	185.3	80	5	65	25.5	15	6	M5X0.8 11	3	12	85
ACS200-155-3J3/-3J4	185.3	80	8	69	31.5	15	6	M5X0.8 11	3	12	85
ACS200-155-3J5/-3J6	185.3	80	6.5	77	37.5	20	7	M6X1.0 12	4	25	115
ACS200-155-3J7/-3J8	185.3	80	10	82	44.5	20	7	M6X1.0 12	4	25	115
ACS200-185-3J1/-3J2	210.3	100	5	65	25.5	15	6	M5X0.8 11	3	12	85
ACS200-185-3J3/-3J4	210.3	100	8	69	31.5	15	6	M5X0.8 11	3	12	85
ACS200-185-3J5/-3J6	210.3	100	6.5	77	37.5	20	7	M6X1.0 12	4	25	115
ACS200-185-3J7/-3J8	210.3	100	10	82	44.5	20	7	M6X1.0 12	4	25	115

DIMENSIONS: MILLIMETERS



ACS Series **Ordering Information**

ACS100 Mechanical-Bearing Direct-Drive Rotary Collet Stage

Stage Size (Required)

-85	85 mm stage height
-135	135 mm stage height

Chuck Style (Required)

-ER8	ER8 ultra-precision collet
-ER8MB	ER8 micro-bore collet

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

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.

Rear Seal (Optional)

-SL	Rear seal
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Connector (Required)

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

Wrench (Optional)

-WR	Wrench for changing collet
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Air Purge (Optional)

-PR	Air purge
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Metrology (Required)

-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. This is typically used for spare parts, replacement parts, or items that will not be used or shipped together (ex: stage only). These components may or may not be part of a larger system.

Accessories (To Be Ordered As Separate Line Item)

Collet-ER8-CLTxx	ER8 DIN6499AA electropolished collet, 0.5 mm to 5 mm part diameter sizes available
Collet-ER8MB-CLTxx	ER8 DIN6499AA electropolished micro-bore collet, 0.2 mm to 0.9 mm part diameter available
CGF	Collet and gripper filtration kit

ACS Series **Ordering Information**

ACS150 Mechanical-Bearing Direct-Drive Rotary Collet Stage

Stage Size (Required)

-115	115 mm stage height
-135	135 mm stage height
-180	180 mm stage height

Chuck Style (Required)

-ER25	ER25 ultra-precision collet
-ER40	ER40 ultra-precision collet
-3J1	3-jaw gripper, 10 mm stroke, normally closed
-3J2	3-jaw gripper, 10 mm stroke, normally open
-3J3	3-jaw gripper, 16 mm stroke, normally closed
-3J4	3-jaw gripper, 16 mm stroke, normally open

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

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.

Rear Seal (Optional)

-SL	Rear seal
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Wrench (Optional)

-WR	Wrench for changing collet
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Metrology (Required)

-PL1	Metrology, uncalibrated with performance plots
-PL2	Metrology, calibrated (HALAR) with performance plots

Integration (Required)

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Accessories (To Be Ordered As Separate Line Item)

Collet-ER25-CLTxx	ER25 DIN6499AA electropolished collet, 0.5 mm to 15 mm part holding sizes available
Collet-ER40-CLTxx	ER40 DIN6499AA electropolished collet, 15.5 mm to 25 mm part holding sizes available

Note: ER40 collet sizes below 15.5 mm diameter are not supported. Use the ER25 collet chuck if these sizes are required.

CGF	Collet and gripper filtration kit
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ACS Series **Ordering Information**

ACS200 Mechanical-Bearing Direct-Drive Rotary Collet Stage

Stage Size (Required)

-155	155 mm stage height
-185	185 mm stage height

Chuck Style (Required)

-3J1	3-jaw gripper with 12 mm clear aperture, 10 mm stroke, normally closed
-3J2	3-jaw gripper with 12 mm clear aperture, 10 mm stroke, normally open
-3J3	3-jaw gripper with 12 mm clear aperture, 16 mm stroke, normally closed
-3J4	3-jaw gripper with 12 mm clear aperture, 16 mm stroke, normally open
-3J5	3-jaw gripper with 25 mm clear aperture, 13 mm stroke, normally closed
-3J6	3-jaw gripper with 25 mm clear aperture, 13 mm stroke, normally open
-3J7	3-jaw gripper with 25 mm clear aperture, 20 mm stroke, normally closed
-3J8	3-jaw gripper with 25 mm clear aperture, 20 mm stroke, normally open

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

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.

Metrology (Required)

-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.

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Accessories (To Be Ordered As Separate Line Item)

CGF	Collet and gripper filtration kit
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