

ACS Series

Mechanical-Bearing Rotary Stage

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 rotary union



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 cap 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. The ER25 also has an optional sealed "water-jacket" configuration that can be used for fluid delivery in wet laser cutting applications.

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



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

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.

ACS Series SPECIFICATIONS

ACS Series		ACS-100-85	ACS-100-135	ACS-150-115	ACS-150-135	ACS-150-180
Total Travel		±360° Continuous				
Gripper/Collet Option ⁽¹⁾		ER8		ER25, ER40, 3J-12		
Three-Jaw Gripper Travel		NA		10 mm, 16 mm		
Accuracy		±72.7 µrad (±15 arc sec)				
Repeatability		±29 µrad (±6 arc sec)				
Pin/Collet Runout (ER Collets) ⁽²⁾		<25 µm				
Grip Repeatability/Max Jaw Length (3 Jaw)		±20 µm/50 mm				
Aperture	ER8	5 mm		NA		
	ER25	NA		16 mm		
	ER40	NA		30 mm		
	3J-12	NA		12 mm		
Resolution		0.873-87.3 µrad (0.18-18 arc sec)				
Max Loads ⁽³⁾	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 ⁽⁴⁾		800 rpm			600 rpm	
Motor Type		S-76-35-A	S-76-85-A	S-130-39-A	S-130-60-A	S-130-81-A
Bus Voltage		Up to 320 VDC				
Continuous Current, Stall	A _{pk}	2	3.7	3.8	3.4	3.1
	A _{rms}	1.43	2.6	2.7	2.4	2.2
Finish	Table	Hardcoat				
	Stage	Black Anodize				

Note:

- Collet chuck accepts Rego-Fix ER collets manufactured to DIN6499 specifications only.
- Measured TIR of precision gage pin chucked with an ultraprecision ER collet (DIN6499) 6 mm away from collet face with no load.
- Maximum loads are mutually exclusive. Loading limits are due to the collet chuck mechanism. Contact Aerotech directly if part load requirement exceeds specifications.
- Maximum speed based on stage capability; maximum application velocity may be limited by system data rate, system resolution, and load.
- 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 0.25 micron particle size or better. With 3-jaw gripper, air or nitrogen should be filtered to 20 micron particle size or better.

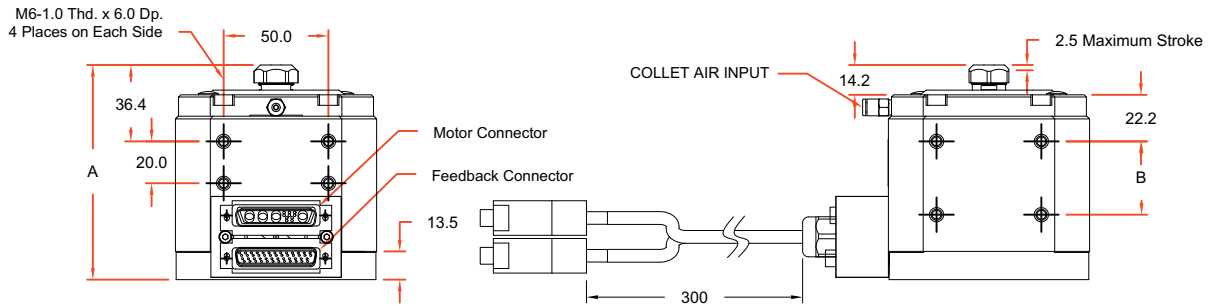
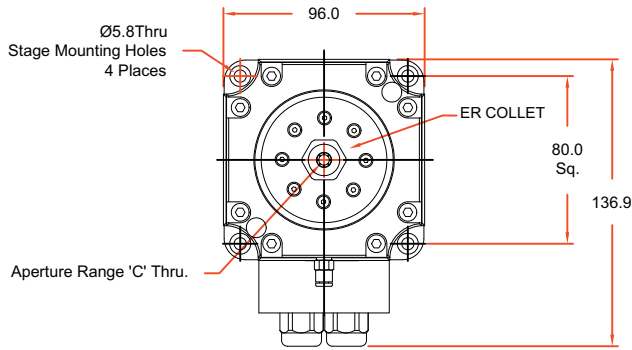
ACS Series		ACS-200-155	ACS-200-185
Total Travel		±360° Continuous	
Gripper/Collet Option		3J-12 ⁽¹⁾ ; 3J-25 ⁽²⁾	
3 Jaw Gripper Travel	3J-12	10 mm, 16 mm	
	3J-25	13 mm, 20 mm	
Accuracy		±72.7 µrad (±15 arc sec)	
Repeatability		±29 µrad (±6 arc sec)	
Grip Repeatability		±20 µm	
Max Jaw Length From Chuck Face		50 mm for 3J-12; 70 mm for 3J-25	
Aperture	3J-12	12 mm	
	3J-25	25 mm	
Resolution		0.582-58.2 µrad (0.12-12 arc sec)	
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		500 rpm	
Motor Type		S-180-69-A	S-180-94-A
Bus Voltage		Up to 320 VDC	
Continuous Current, Stall	A _{pk}	5.1	4.9
	A _{rms}	3.6	3.5
Finish	Table	Hardcoat	
	Stage	Black Anodize	

Note:

- Measured TIR of precision gage pin 10 mm away from gripper face with no load.
- Maximum loads are mutually exclusive. Loading limits are due to the collet chuck mechanism. Contact Aerotech directly if part load requirement exceeds specifications.
- Collet chuck mechanism is normally-closed. Gripper mechanism requires air to open. Air supply must be dry (0° F dew point) oil-less air OR 99.99% pure nitrogen. For 3-jaw gripper, air or nitrogen must be filtered to 20 micron particle size or better.

ACS Series DIMENSIONS

ACS-100



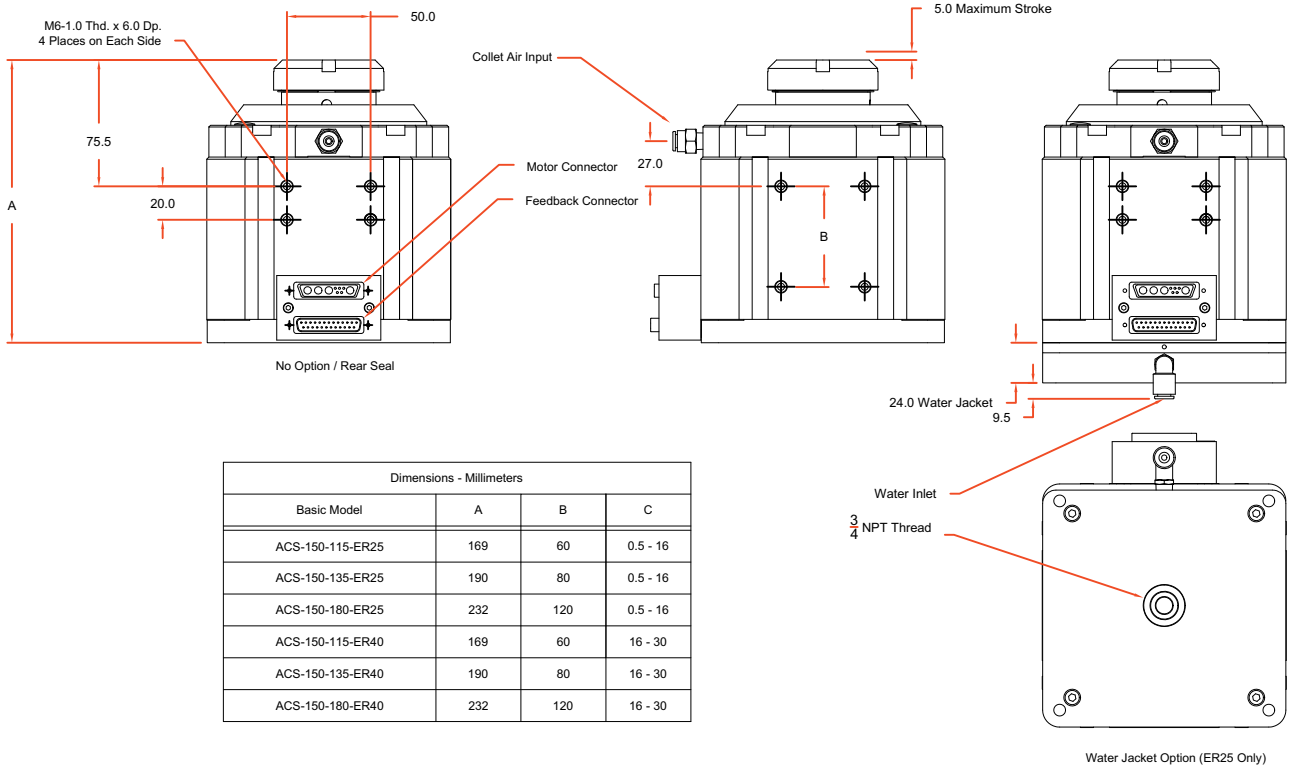
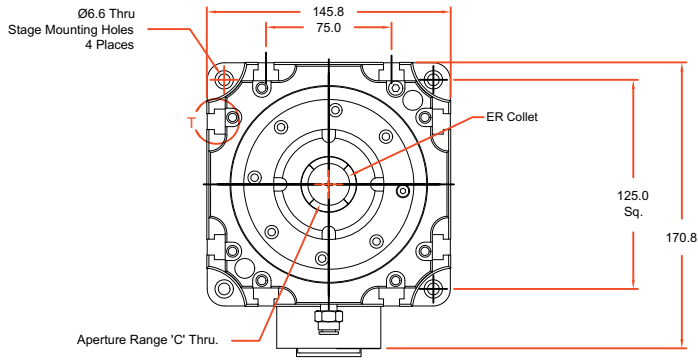
Dimensions - Millimeters			
Basic Model	A	B	C
ACS-100-85-ER8	102.4	35	0.7 - 5
ACS-100-135-ER8	152.4	85	0.7 - 5

ACS Maximum Encoder Frequency

Resolution-Speed	ACS-100	ACS-150	ACS-200
AS/X5/X10	1500 rpm	600 rpm	600 rpm
X25	1000 rpm	380 rpm	380 rpm
X50	530 rpm	190 rpm	102 rpm

ACS Series DIMENSIONS

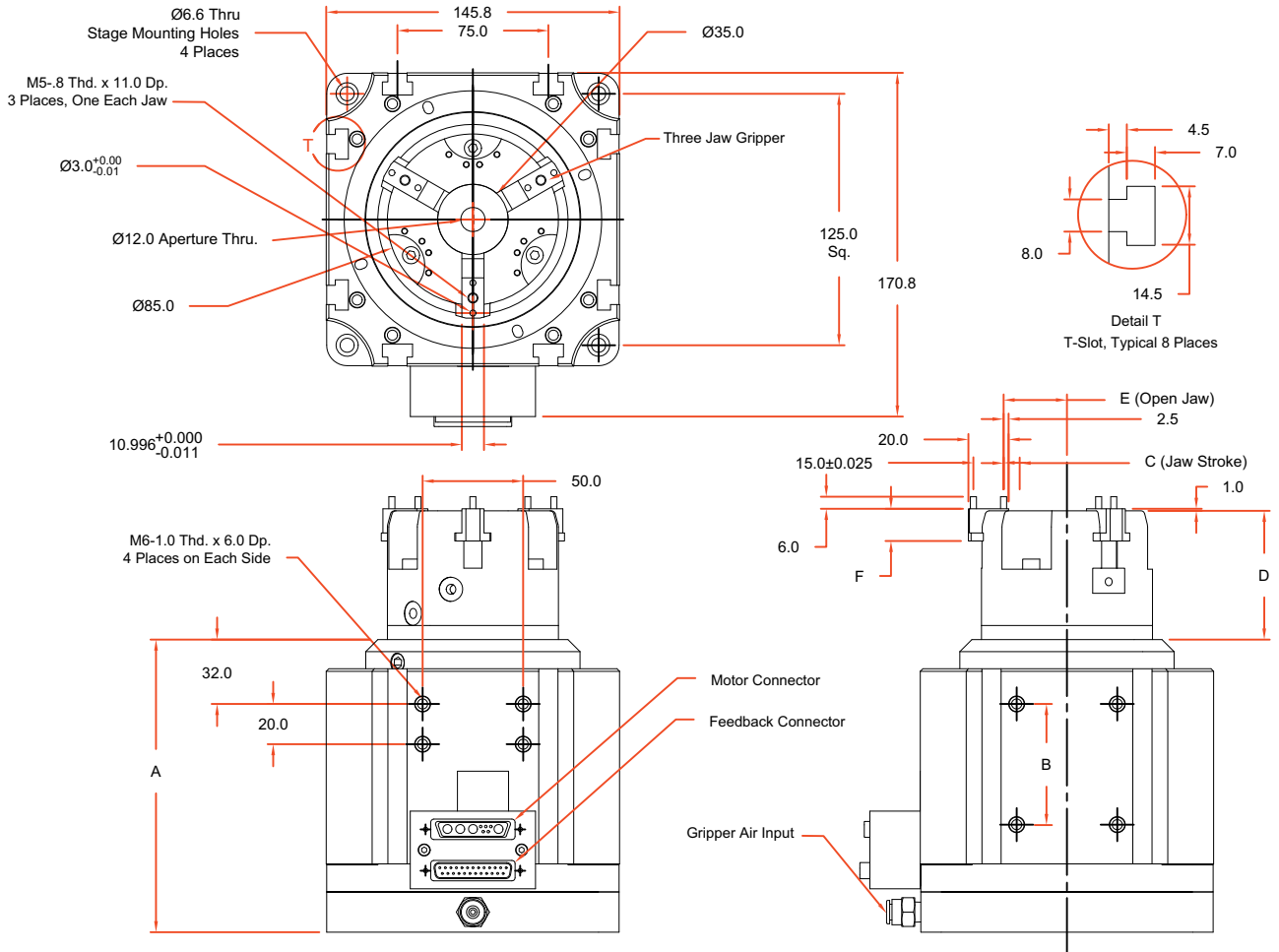
ACS-150-ER



Dimensions - Millimeters			
Basic Model	A	B	C
ACS-150-115-ER25	169	60	0.5 - 16
ACS-150-135-ER25	190	80	0.5 - 16
ACS-150-180-ER25	232	120	0.5 - 16
ACS-150-115-ER40	169	60	16 - 30
ACS-150-135-ER40	190	80	16 - 30
ACS-150-180-ER40	232	120	16 - 30

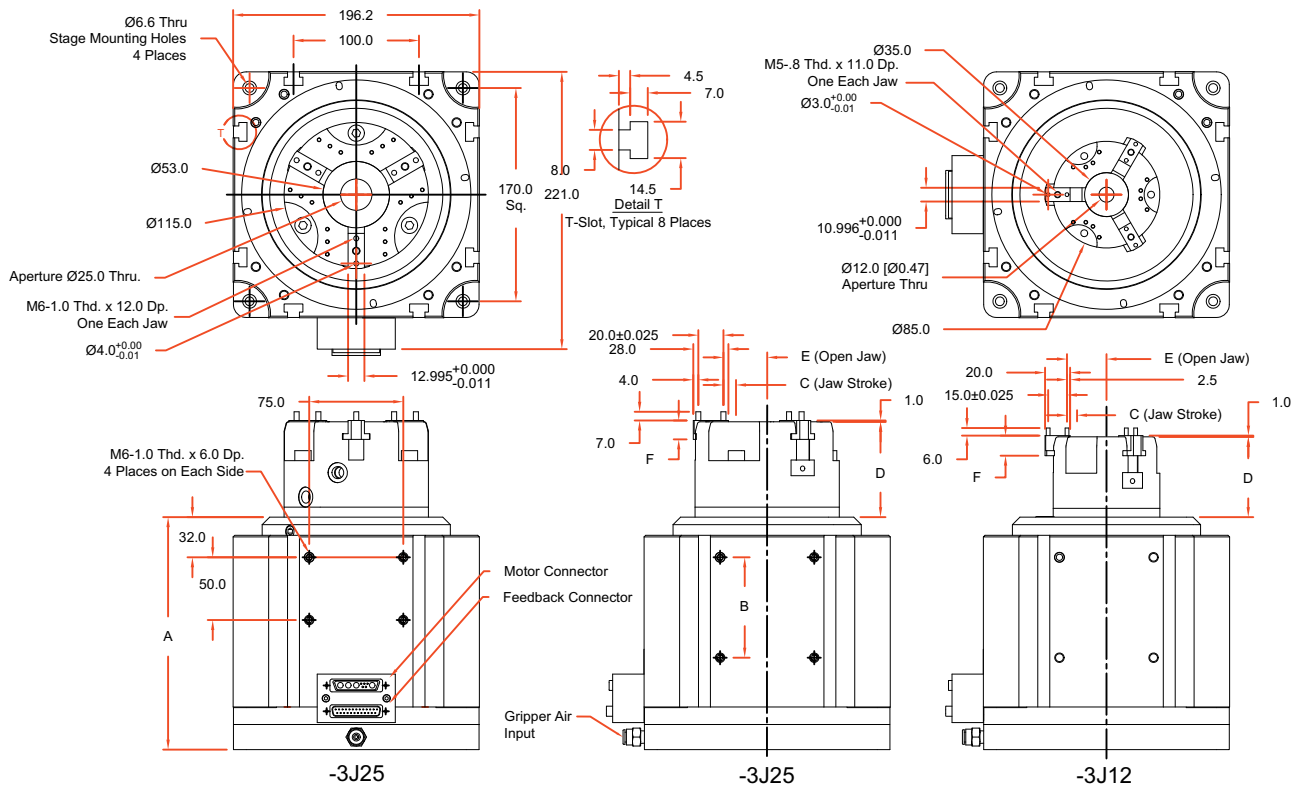
ACS Series DIMENSIONS

ACS-150-3J



Dimensions - Millimeters						
Basic Model	A	B	C	D	E	F
ACS-150-115-3J12-10	145.5	60	5	65	25.5	16
ACS-150-135-3J12-10	166.5	80	5	65	25.5	16
ACS-150-180-3J12-10	208.5	120	5	65	25.5	16
ACS-150-115-3J12-16	145.5	60	8	69	31.5	20
ACS-150-134-3J12-16	166.5	80	8	69	31.5	20
ACS-150-180-3J12-16	208.5	120	8	69	31.5	20

ACS-200-3J



Dimensions - Millimeters						
Base Model	A	B	C	D	E	F
ACS-200-155-3J12-10	185.3	80	5	65	25.5	16
ACS-200-155-3J12-16	185.3	80	8	69	31.5	20
ACS-200-155-3J25-13	185.3	80	6.5	76	37.5	15
ACS-200-155-3J25-20	185.3	80	10	81	44.5	20
ACS-200-185-3J12-10	210.3	100	5	65	25.5	16
ACS-200-185-3J12-16	210.3	100	8	69	31.5	20
ACS-200-185-3J25-13	210.3	100	6.5	76	37.5	15
ACS-200-185-3J25-20	210.3	100	10	81	44.5	20

ACS Series ORDERING INFORMATION

Ordering Example

ACS	-150-115	-ER25	-AS	-NO-10	-W	-1.5-2.5MM	-2.25MM	-WRENCH	-AP	-HPD
Series	Frame Size	Fixture Type	Position Transducer	Gripper Options	Seal Options	Collet Size	Water Jacket Seal	Tooling	Air Purge	Connector Option for ACS-100-xx
	-100-85									
	-100-135	-ER8	-AS							
	-150-115	-ER25	-X5	NO/NC-10	-NS					
	-150-135	-ER40	-X10	NO/NC-13	-S	-X.X-Y.Y MM	-XX.XMM	-WRENCH	-AP	-HPD
	-150-180	-3J-12	-X25	NO/NC-16	-W					-25D
	-200-155	-3J-25	-X50	NO/NC-20						
	-200-185									

ACS Series Direct Drive Rotary Stage

ACS Direct-drive rotary stage with integral pneumatic collet chuck or 3 jaw gripper and rotary union.

Frame Size

-100-85	100 mm diameter direct drive rotary stage with 0.4 N-m continuous torque and integral rotary union
-100-135	100 mm diameter direct drive rotary stage with 1.9 N-m continuous torque and integral rotary union
-150-115	150 mm diameter direct drive rotary stage with 3.6 N-m continuous torque and integral rotary union
-150-135	150 mm diameter direct drive rotary stage with 6.5 N-m continuous torque and integral rotary union
-150-180	150 mm diameter direct drive rotary stage with 11.4 N-m continuous torque and integral rotary union
-200-155	200 mm diameter direct drive rotary stage with 16.9 N-m continuous torque and integral rotary union
-200-185	200 mm diameter direct drive rotary stage with 24.9 N-m continuous torque and integral rotary union

Fixture Type

-ER8	Air-actuated ER8 collet holder, normally closed, supports tube diameters from 0.7 mm to 5 mm; only available on ACS-100-XXX
-ER25	Air-actuated ER25 collet holder, normally closed, supports tube diameters from 0.5 mm to 16 mm; only available on ACS-150-XXX
-ER40	Air-actuated ER40 collet holder, normally closed, supports tube diameters from 15.5 mm to 30 mm; only available on ACS-150-XXX
-3J-12	Air-actuated 3-jaw gripper with 12 mm clear aperture, ± 20 micron repeatability; available on ACS-150 and ACS-200
-3J-25	Air-actuated 3-jaw gripper with 25 mm clear aperture, ± 20 micron repeatability; only available on ACS-200

Position Transducer

-AS	1 Vpp sine wave output; 360 arc-sec resolution on ACS-150 and 240 arc-sec resolution on ACS-200
-X5	Square wave digital output; 18 arc-sec resolution on ACS-150 and 12 arc-sec resolution on ACS-200
-X10	Square wave digital output; 9 arc-sec resolution on ACS-150 and 6 arc-sec resolution on ACS-200
-X25	Square wave digital output; 3.6 arc-sec resolution on ACS-150 and 2.4 arc-sec resolution on ACS-200
-X50	Square wave digital output; 1.8 arc-sec resolution on ACS-150 and 1.2 arc-sec resolution on ACS-200

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.

Gripper Options

NC-10	Normally closed 3J-12 gripper with 10mm jaw stroke, 240 N (52 lb) peak grip force
NO-10	Normally open 3J-12 gripper with 10mm jaw stroke, 240 N (52 lb) peak grip force
NC-13	Normally closed 3J-25 gripper with 13mm jaw stroke, 450 N (102 lb) peak grip force
NO-13	Normally open 3J-25 gripper with 13mm jaw stroke, 450 N (102 lb) peak grip force
NC-16	Normally closed 3J-12 gripper with 16mm jaw stroke, 150 N (33 lb) peak grip force
NO-16	Normally open 3J-12 gripper with 16mm jaw stroke, 150 N (33 lb) peak grip force
NC-20	Normally closed 3J-25 gripper with 20mm jaw stroke, 270 N (60 lb) peak grip force
NO-20	Normally open 3J-25 gripper with 20mm jaw stroke, 270 N (60 lb) peak grip force

ACS Series ORDERING INFORMATION

ER Collet Seal Options

-NS	No rear seal (standard)
-S	Rear shaft seal
-W	Water jacket assembly for wet cutting applications; seal diameter specified with Water Jacket Seal option; only available with ER25 collet configuration.

ER Collet Size

-XX-YYMM	Electro-polished DIN6499AA ER style collet. Supports tube diameters from XX to YY mm
----------	--

Water Jacket Seal

-X.XXMM	Water jacket seal assembly for nominal tube diameter X.XX mm; consult factory for available sizes
---------	---

Tooling

-WRENCH	Spanner wrench set for changing ER collet
---------	---

Air Purge

-AP	Air purge fitting to positive pressurize ACS stage to limit ingress of airborne particulates
-----	--

Connector Options for ACS-100-xx

-HPD	4 pin D-style motor power and 25 pin D-style feedback
-25D	25 pin D-style motor power and 25 pin D-style feedback