

VascuLathe® ACS/ASR Series

Cylindrical Laser Machining Systems

High integration linear/rotary motion platform

ER collet system for automated material clamping

Optional gripper assembly for tube advance

Advanced control architecture

Single or dual spindle configurations

Optional wet cutting



Patent No. 7,038,334
Patent No. 7,105,956
Patent No. 7,420,298

VascuLathe® represents a revolutionary approach to satisfying the demanding requirements of stent manufacturing applications. The fully integrated motion system couples automated material handling functionality and wet cutting operation with high performance direct-drive linear and rotary motion capability.

Integral Linear/Rotary

The integral linear-rotary design has much greater stiffness and lower moving mass resulting in an overall higher dynamic stiffness when compared to component-based systems. The resulting increased bandwidth provides throughput improvements on the order of two to five times when compared to traditional component-level manufacturing approaches, while still maintaining submicron tolerances on tight part geometries. The higher throughput of the VascuLathe® implies that fewer machines are required to produce an equivalent number of stents, resulting in lower total labor costs and reduced floor space requirements. Alternatively, the VascuLathe® can be used to meet increased product demand within the existing manufacturing space, saving the costs associated with facilities expansion.

Automated Material Handling

The VascuLathe® is a complete motion and material handling subsystem. The system includes an automated, pneumatically activated ER collet assembly as well as an optional combined bushing/tube advance mechanism that enables the sequential, unattended manufacture of multiple stents from a single length of tubing material. A wet cutting configuration is also available for applications that require

fluid delivery through the stent material during the manufacturing process.

Advanced Control Architecture

The VascuLathe® is coupled to Aerotech's advanced A3200 control system. The A3200 is a 100% digital system with high performance FireWire® networked drives. With this fully digital architecture, it is possible to optimize the current, velocity, and position servo loops for maximum performance. Advanced trajectory generation capabilities such as multi-block look ahead minimize geometry errors in tight profiles by transparently regulating cutting speed. While our Position Synchronized Laser Firing Output (PSO) functionality automatically adjusts the laser pulse frequency to match the current cutting speed to maintain optimal laser power coupling.



Optional gripper and bushing alignment platform for automated tube advance.

VascuLathe® ACS/ASR SPECIFICATIONS

VascuLathe® ACS Series		Linear Axis		Rotary Axis
Travel		200 mm	300 mm	360° Continuous
Maximum Speed		2 m/s		300 rpm
Collet Type ⁽¹⁾		ER25, ER40		
Tube Capacity	ER25	0.5 mm-16 mm (Dry Cut); 1.0 mm-12 mm (Wet Cut)		
	ER40	16 mm-30 mm		
Accuracy		±1.0 µm		±30.0 arc sec (standard); ±5.0 arc sec (HALAR) ⁽²⁾
Repeatability		±0.5 µm		±6.0 arc sec (standard); ±3.0 arc sec (HALAR) ⁽²⁾
Straightness		±2.0 µm	±3.0 µm	NA
Flatness		±2.0 µm	±3.0 µm	NA
Pitch		8.0 arc sec	10.0 arc sec	NA
Yaw		8.0 arc sec	10.0 arc sec	NA
Pin/Collet Runout ⁽³⁾		NA		<25 µm
Max Load ⁽⁴⁾	ER25	10 kg (Axial); 5 kg (Radial); 6 N-m (Moment)		
Max Load ⁽⁴⁾	ER40	15 kg (Axial); 10 kg (Radial); 12 N-m (Moment)		
Stage Mass		95 kg	100 kg	
Minimum System Air Pressure ⁽⁵⁾		100 psig		
Finish		Black Hardcoat/Black Anodize (Stage/Body); Hardened 440C Stainless Steel/NiCoTef (Collet Chuck); Hardened Stainless Steel (Waycovers)		

Note:

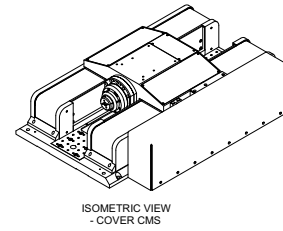
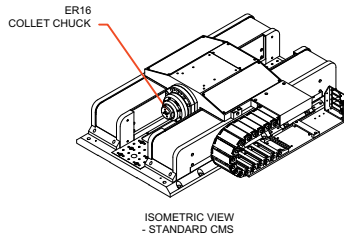
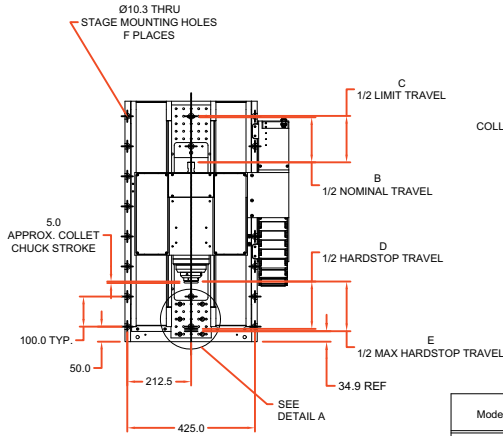
- VascuLathe collet chuck accepts Rego-Fix ER collets manufactured to DIN6499 specifications only. The collet type (ER25 or ER40) must be specified at the time of order.
- Requires HALAR and part programming as rotary axis.
- Measured TIR of precision gage pin chucked with an ultraprecision ER collet (DIN6499) 10 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.
- 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.

VascuLathe® ASR Series		Linear Axis		Rotary Axis
Travel		200 mm	300 mm	360° Continuous
Maximum Speed		2 m/s		600 rpm
Collet Type ⁽¹⁾		ER16		
Maximum Aperture	ER16-Dry Cut	10.0 mm		
	ER16-Wet Cut	5.8 mm		
Accuracy		±1.0 µm		±15.0 arc sec
Repeatability		±0.5 µm		±3.0 arc sec
Straightness		±2.0 µm	±3.0 µm	NA
Flatness		±2.0 µm	±3.0 µm	NA
Pitch		8.0 arc sec	10.0 arc sec	NA
Yaw		8.0 arc sec	10.0 arc sec	NA
Pin/Collet Runout ⁽²⁾		NA		<25 µm
Max Load ⁽³⁾		3 kg (Axial); 2 kg (Radial); 3 N-m (Moment)		
Stage Mass		95 kg	100 kg	
Minimum System Air Pressure ⁽⁴⁾		100 psig		
Finish		Black Hardcoat/Black Anodize (Stage/Body); Hardened 440C Stainless Steel/NiCoTef (Collet Chuck); Hardened Stainless Steel (Waycovers)		

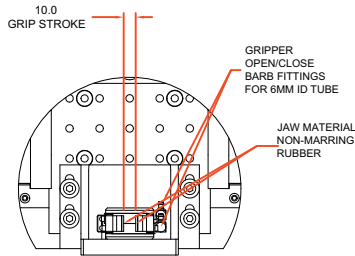
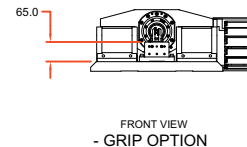
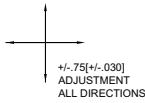
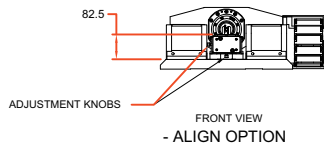
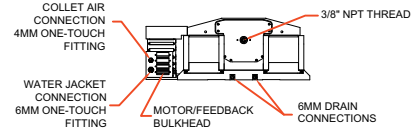
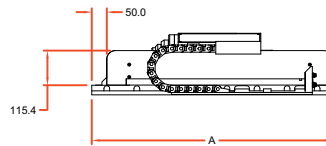
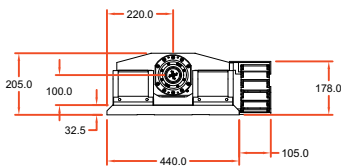
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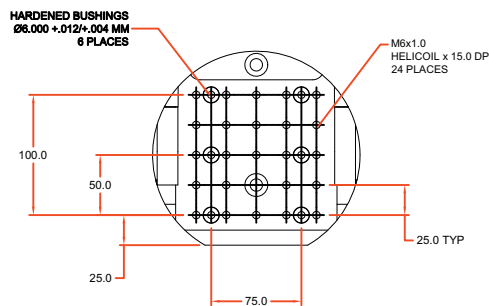
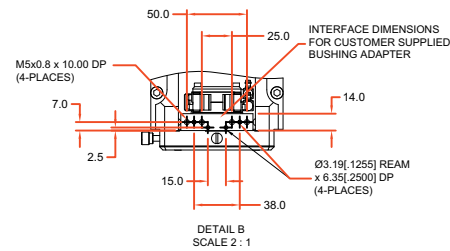
Vasculathe® ASR Series DIMENSIONS



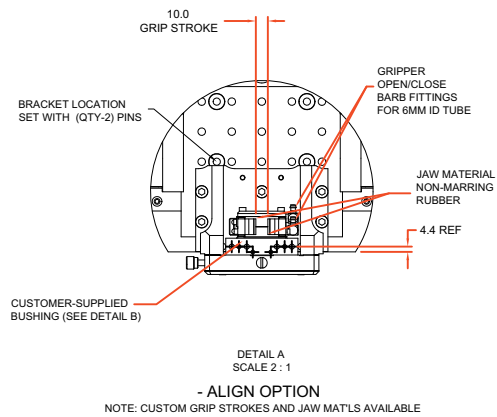
Model Name	Dimensions -Millimeters						
	Travel	A	B	C	D	E	F
VASCULATHE-ASR-200	200	700	100	104.5	107.5	115.2	20
VASCULATHE-ASR-300	300	800	150	154.5	157.5	165.2	22



DETAIL A SCALE 2:1 - GRIP OPTION
NOTE: CUSTOM GRIP STROKES AND JAW MATLS AVAILABLE



DETAIL A SCALE 2:1 FRONT TOOLING PLATFORM



VascuLathe® ACS/ASR Series ORDERING INFORMATION

Ordering Example

VascuLathe	-ACS	-300S	-ER25	-PNG	-J24-34	-2.25MM	-Npaq
Series	Spindle Configuration	Travel Options	Collet Type	Configuration Options	Gripper Options	Water Jacket Seal	Controller Options
	-ACS	-200S	-NC	-WC	-J0-10		
	-ASR	-200C	-ER16	-AG	-J8-18		-Ndrive HP
	-ASR-L	-300S	-ER25	-G	-J16-26	-XX.XMM	-Ndrive HL
		-300C	-ER40	-PN	-J24-34		-Npaq
				-PNG	-J32-40		

VascuLathe® ACS/ASR Series

VascuLathe® Direct-drive cylindrical laser machining system with integrated material handling system

Rotary Axis Configuration

-ACS	ACS based rotary stage with support for ER25 or ER40 collet configurations
-ASR	ASR based rotary stage with support for ER16 collet configuration
-ASR-L	ASR based rotary stage with support for ER16 collet configuration with cable tray on the left side (as viewed from the front)

Travel Options

-200S	200 mm (7.87 in) linear axis travel
-200C	200 mm (7.87 in) linear axis travel; protective CMS cover
-300S	300 mm (11.81 in) linear axis travel
-300C	300 mm (11.81 in) linear axis travel; protective CMS cover

Chuck Options

-NC-ER16	Normally-closed ER16 collet closer; supports tube sizes from 0.5 mm to 10 mm (ASR, ACS)
-ER25	ER25 collet closer; supports tube sizes from 0.5 mm to 16 mm (ACS only)
-ER40	ER40 collet closer; supports tube sizes from 15.5 mm to 30 mm (ACS only)

Configuration Options

-WC	Wet cutting option; rated for 100 psi fluid pressure; includes internal seal and water jacket/pressure vessel connection at rear of spindle assembly (only available with the VascuLathe®-ACS-ER25 and VascuLathe®-ASR)
-AG	Bushing alignment assembly with manual Y/Z adjustment and pneumatic activated integral tube clamp/advance mechanism
-G	Pneumatic activated tube clamp/advance mechanism
-PN	Pneumatics assembly for VascuLathe w/o gripper; includes filter, drier, pneumatic hosing, and solenoid valve and solid state relay to actuate ER collet
-PNG	Pneumatics assembly for VascuLathe w/o gripper; includes filter, drier, pneumatic hosing, and solenoid valves and solid state relays to actuate ER collet and gripper
-FD	Pneumatics assembly that includes a filter and dryer assembly for conditioning of incoming air

Gripper Jaw Options

-J0-10	Gripper jaws with offsets to grip from 0-10 mm tube diameter
-J8-18	Gripper jaws with offsets to grip from 8-18 mm tube diameter
-J16-26	Gripper jaws with offsets to grip from 16-26 mm tube diameter
-J24-34	Gripper jaws with offsets to grip from 24-34 mm tube diameter
-J32-40	Gripper jaws with offsets to grip from 32-40 mm tube diameter

Water Jacket Seal

Consult factory for range of supported tube diameters for water jacket seal assemblies

ER Collets⁽¹⁾

Consult factory for range of available ER collets

⁽¹⁾Requires Rego-Fix electropolished collet for correct operation.

Controller Options

-Ndrive HP	Two-axis A3200 control system with Nview MMI and Ndrive HP-IOPSO-DUALPSO-AUXPWR-MXH panel-mount digital networked drives; includes all motor power and feedback cabling
-Ndrive HL	Two-axis A3200 control system with Nview MMI and Ndrive HL-IOPSO-DUALPSO-AUXPWR-MXH panel-mount digital networked drives; includes all motor power and feedback cabling
-Npaq	Two-axis A3200 control system with Nview MMI and Npaq-DL4010-MXR2-DUALPSO-ESTOP1 19 inch rack-mount digital networked drive chassis; includes all motor power and feedback cabling

Note: See A3200 product documentation for additional information on controller and drives.