

LaserTurn 1

Laser Machining System

Highly integrated linear/rotary motion platform

Pneumatically-actuated collet closer supports 0.1 mm to 7.9 mm O.D. materials with frictionless rotary union

Clear aperture for product feed-through

Standard front and rear tooling platforms

Direct-drive linear and rotary motor technology

Configure for wet or dry cutting



collet closer is designed to minimize axial tube motion during clamping operations by keeping the collet stationary and moving the tapered mating surface during collet open/close operation.

Direct-Drive Technology

The LaserTurn 1 series utilizes direct-drive noncontact motor and encoder technology for both the linear and rotary axes. Direct-drive motors exhibit significantly higher throughput and maintenance-free operation when compared to gear and screw-driven technology. Linear and rotary encoders coupled directly to the load have the highest level of system accuracy and repeatability over the operating lifetime of the stage.

Noncontacting Labyrinth Cover Design

The overlapping hard cover design protects the linear stage of the LaserTurn 1 from contact with fluids used in wet cutting processes. The sloped hard covers provide robust protection from fluid and machining byproduct ingress as well as incidental operator contact that may occur during part changeover.

Advanced Control Architecture

The LaserTurn 1 is available with 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. Aerotech's 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.

The LaserTurn® 1 cylindrical laser machining system supports material from 0.1 mm to 7.9 mm in diameter, making it an ideal platform for the manufacture of cardiovascular and neural stents. The system can be configured for wet or dry cutting and includes options for material advance and bushing alignment platforms. The integrated linear-rotary system combines automated material handling functionality with high performance direct-drive linear and rotary motion.

Integral Tooling Platform

The LaserTurn 1 includes standard front and rear tooling platforms with M4 mounting features. The tooling platforms are bolted directly to the base of the linear stage providing a stiff, monolithic, common inertial frame of reference. Fixtures such as bushing alignment assemblies, part collection, or automated material advance functions can be attached easily.

Automated Material Handling

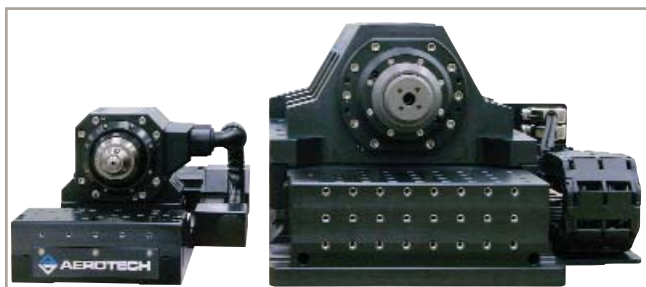
The LaserTurn 1 is a complete motion and material handling subsystem. The system includes an automated, pneumatically activated Type D collet closer. The collet closer has a clear aperture for product feed through and can support tubing diameters from 0.1 mm (0.0039 in) to 7.9 mm (0.3125 in) in dry cutting applications and up to 3 mm (0.118 in) when configured for wet cutting operation. The

LaserTurn 1 SPECIFICATIONS

LaserTurn 1		Linear Axis	Rotary Axis
Travel		100 mm	360° Continuous
Continuous Current, Stall	A _{pk}	3.10 A	2.0 A
	A _{rms}	2.19 A	1.4 A
Motor Type		BLMUC-111-A	S-76-35-A
Bus Voltage		80 VDC	
Maximum Speed ⁽¹⁾		300 mm/s	600 rpm
Collet Type ⁽²⁾		NA	Type D (Levin)
Maximum Aperture ⁽³⁾		NA	7.9 mm (Dry); 3 mm (Wet)
Accuracy		±2 µm (standard); ±0.5 µm (HALAR)	±25 arc sec
Repeatability		±0.2 µm	±4 arc sec
Straightness		±1 µm	NA
Flatness		±1 µm	NA
Pitch		5 arc sec	NA
Yaw		3 arc sec	NA
Pin/Collet Runout ⁽⁴⁾		NA	<30 µm
Max Load ⁽⁵⁾		2 kg (Axial); 0.5 kg (Radial); 0.75 N-m (Moment)	
Stage Mass		12 kg	
Minimum System Air Pressure ⁽⁶⁾		100 psig	
Finish		Black Hardcoat/Black Anodize (Stage/Body); Hardened 440C Stainless Steel/NiCoTef (Collet Chuck)	

Note:

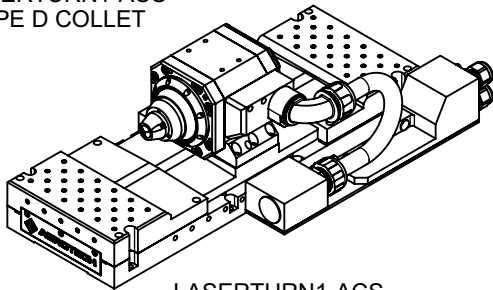
- Maximum speed is based on stage capability. Actual speed may be limited by system data rate, resolution, or amplifier selection.
- LaserTurn 1 accepts Type D collets (Levin Lathe and Sons™).
- Maximum tube diameter is reduced to 6.7 mm for dry cutting with the -WCRU option.
- Measured TIR of a precision gage pin with an ultra precision Type D collet 3 mm away from the collet face at 80 psig applied air pressure and 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-open. Collet mechanism requires air to close 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.



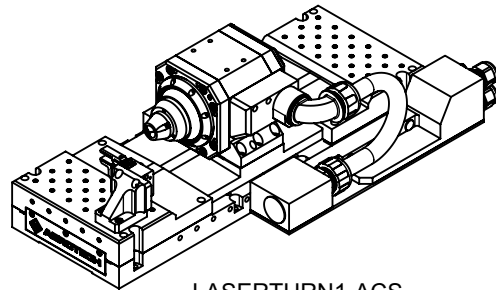
The low moving mass and stiff mechanical structure provide the highest throughput and dynamic tracking accuracy in the LaserTurn series.

LaserTurn 1 DIMENSIONS

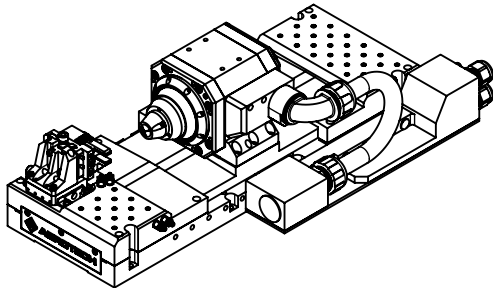
LASERTURN1-ACS
-TYPE D COLLET



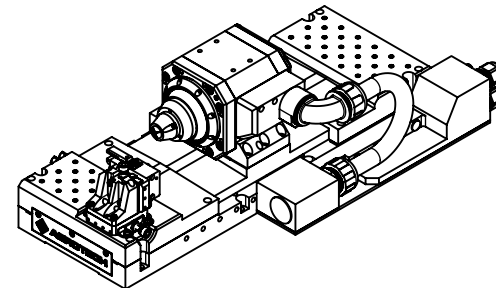
LASERTURN1-ACS
FRONT & REAR TOOLING PLATE



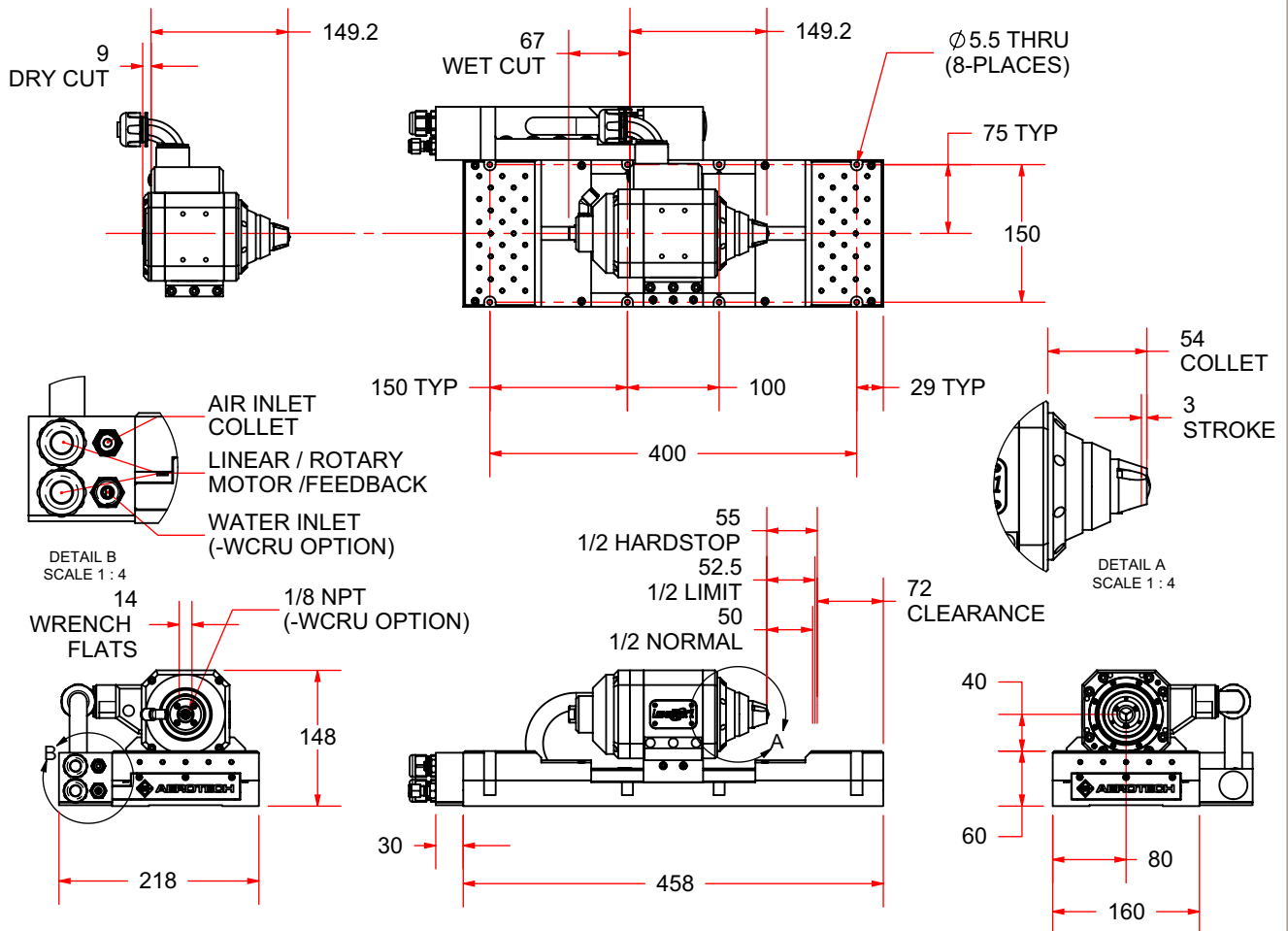
LASERTURN1-ACS
FRONT & REAR TOOLING PLATE
WITH UNIVERSAL GRIPPER



LASERTURN1-ACS
FRONT & REAR TOOLING PLATE
WITH RIGHT HAND ALIGNMENT GRIPPER

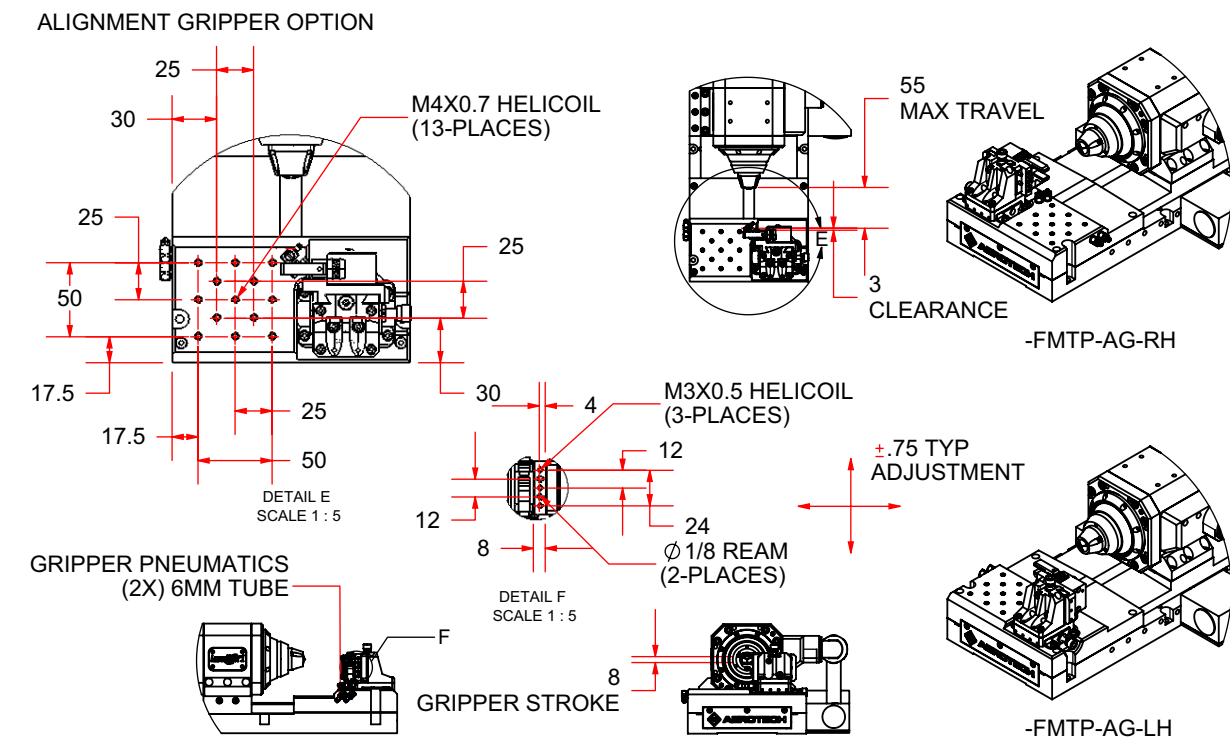
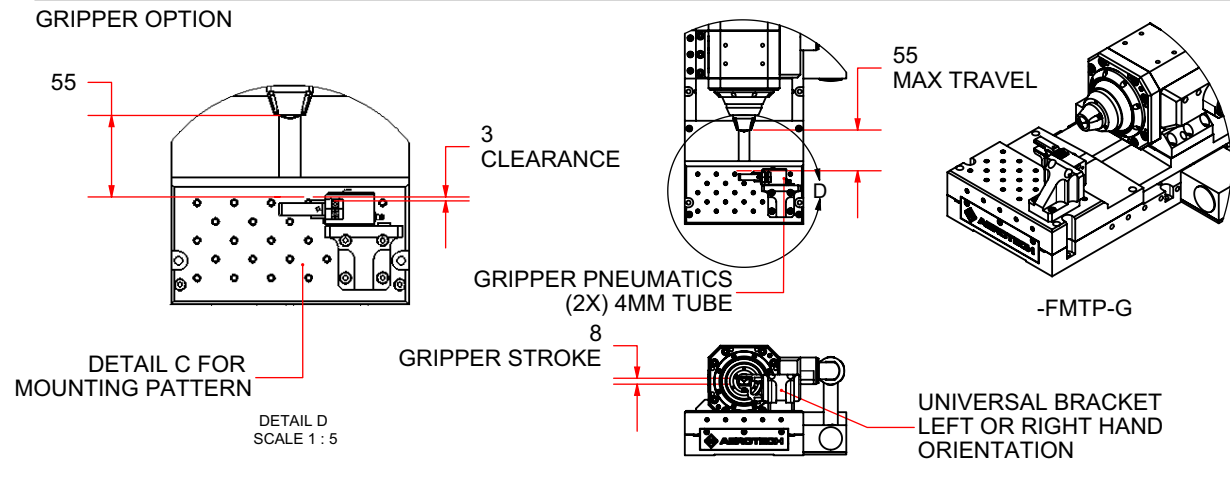
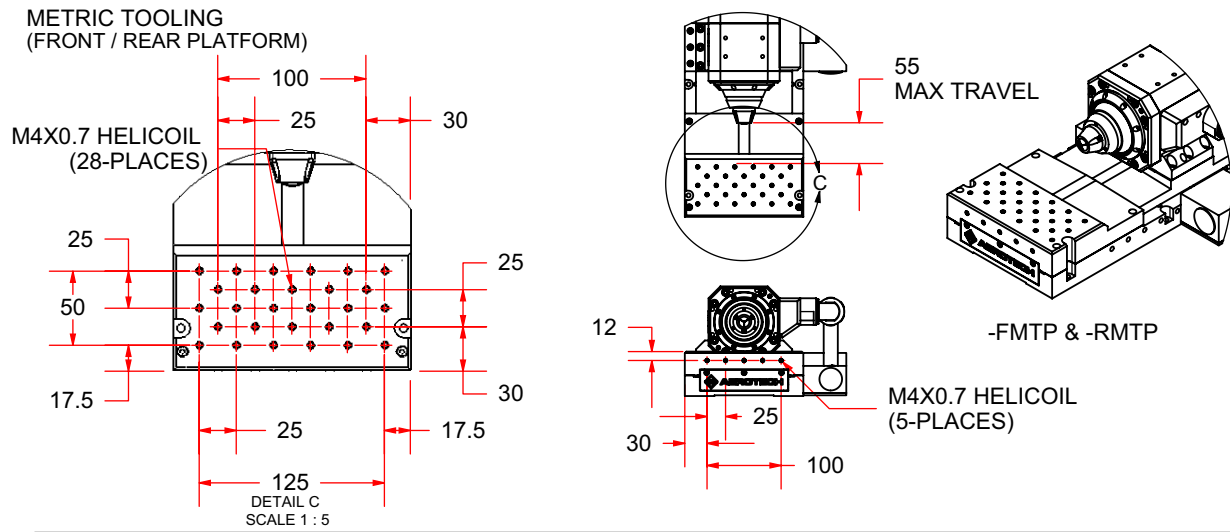


LASERTURN1-ACS
FRONT & REAR TOOLING PLATE
WITH LEFT HAND ALIGNMENT GRIPPER



DIMENSIONS: MILLIMETERS

LaserTurn 1 DIMENSIONS



LaserTurn 1 ORDERING INFORMATION

Ordering Example

LaserTurn 1-ACS	-100	-NC	-D-NO	-DC	-FMTP-G	-RMTP	-J0-8	-PNG	-LT1-D-XXXX
Series	Travel	Limit	Collet Option	Cutting Option	Front Tooling Options	Rear Tooling Option	Gripper Jaws Option	Pneumatic Options	Accessories
	-100	-NC	-D-NO	-DC -WCRU	-FMTP -FMTP-G -FMTP-AG-RH -FMTP-AG-LH	-RMTP	-J0-8	-PNG -PN -FD	-LT1-SEAL-XXXX -LT1-D-XXXX

LaserTurn 1 Laser Machining System

LaserTurn 1-ACS Direct-drive cylindrical laser machining system with integrated material handling and tooling platform

Travel

-100 100 mm (3.93 in) linear axis travel

Limit Configuration

-NC Normally-closed end of travel limit switches

Collet Configuration Option

-D-NO Levin D-style normally-open collet chuck

Cutting Configuration Option

-DC Dry cutting
-WCRU Wet cutting rotary union; also requires a wet-cut seal with O-ring size matched to a specific tube diameter

Front Tooling Options

-FMTP Front metric tooling platform
-FMTP-G Front metric tooling platform with universal gripper
-FMTP-AG-RH Front metric tooling platform with right-handed alignment gripper
-FMTP-AG-LH Front metric tooling platform with left-handed alignment gripper

Rear Tooling Option

-RMTP Rear metric tooling platform

Gripper Jaws Option

-J0-8 Gripper jaws for 0 mm to 8 mm tube size

Pneumatics Options

-PNG Solenoid valves and relays for gripper and collet chuck actuation
-PN Solenoid valves and relays for collet chuck actuation
-FD Filter drier assembly to ensure clean dry air to the collet chuck

Accessories (ordered as separate items)

-LT1-SEAL-XXXX Wet cut seal sized for XXXX diameter tubing; consult Aerotech for the available sizes
-LT1-D-XXXX Levin D-style collets sized for XXXX diameter tubing (0.1 mm to 7.9 mm); consult Aerotech for the available sizes