

LaserTurn1

Linear/Rotary Motion Platform

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



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 LaserTurn1 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 LaserTurn1 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 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 LaserTurn1 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 LaserTurn1 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 LaserTurn1 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.

LaserTurn1 SPECIFICATIONS

Mechanical Specifications		Linear Axis	Rotary Axis
Travel		100 mm	±360 deg. continuous
Accuracy		Calibrated: ±0.5 µm Standard: ±2 µm	±121 µrad (±25 arc sec)
Bidirectional Repeatability		±0.2 µm	±20 µrad (±4 arc sec)
Straightness		±1 µm	N/A
Flatness		±1 µm	N/A
Pitch		25 µrad (5 arc sec)	N/A
Yaw		15 µrad (3 arc sec)	N/A
Maximum Speed ⁽¹⁾		300 m/s	1000 rpm
Tube Capacity		N/A	7.9 mm (Dry Cut) 3.0 mm (Wet Cut) ⁽²⁾
Maximum Force (Continuous)		30.6 N	N/A
Maximum Torque (Continuous)		N/A	0.48 N·m
Load Capacity ⁽³⁾	Axial	2 kg	
	Radial	0.5 kg	
	Moment	0.75 N·m	
Moving Mass (Unloaded)		6 kg	N/A
Rotor Inertia (Unloaded)		N/A	0.0005 kg·m ²
Stage Mass with Tooling Platforms		12 kg	N/A
Collet Type ⁽⁴⁾		N/A	Type D (Levin)
Collet Runout ⁽⁵⁾		N/A	<30 µm
Minimum System Air Pressure ⁽⁶⁾		100 psig	
Material		Hardcoated Aluminum Stage Body; Stainless Steel Collet Chuck	
MTBF (Mean Time Between Failure)		10,000 Hours	

Notes:

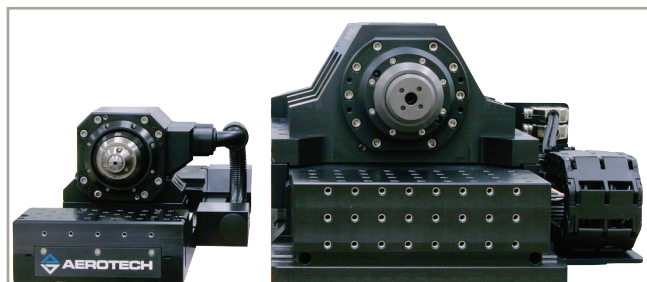
- Maximum speed based on stage capability. Requires selection of appropriate amplifier with sufficient voltage and current.
- Maximum tube diameter is reduced to 6.7 mm for dry cutting with the -WCRU (wet cut) option.
- Maximum loads are mutually exclusive. Loading limits are due to the collet chuck mechanism. Contact Aerotech if part load requirements exceed specifications.
- Collect chuck accepts Type D collets (Levin Lathe and Sons™).
- Measured TIR of precision gage pin chucked with an ultra-precision Type D collet 3 mm away from collet face at 80 psig applied air pressure and no load
- Collet chuck mechanism is normally-open. Collet mechanism required air to open collet chuck. Air supply must be dry and oil-less OR 99.99% pure nitrogen. Air or nitrogen must be filtered to 1 microns particle size or better.

Electrical Specifications

Drive System	Direct-drive servomotor
Feedback System	Non-contact optical encoder, 1 Vpp Sinusoidal output
Maximum Bus Voltage	340 VDC

Recommended Controller

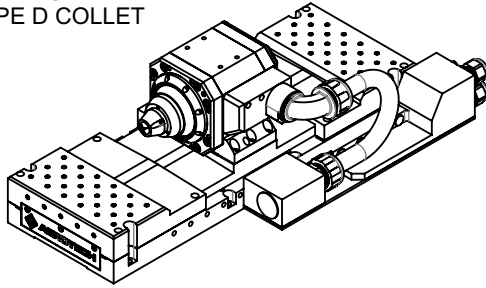
A3200	Npaq, Ndrive HLe, Ndrive HPe, Ndrive CP
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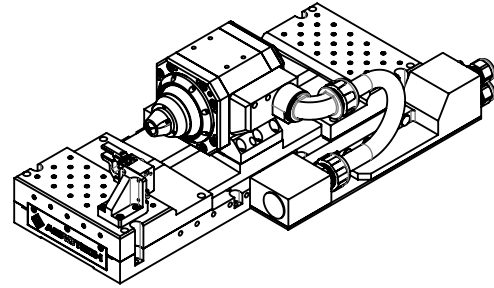
The low moving mass and stiff mechanical structure provide the highest throughput and dynamic tracking accuracy in the LaserTurn series.

LaserTurn 1 DIMENSIONS

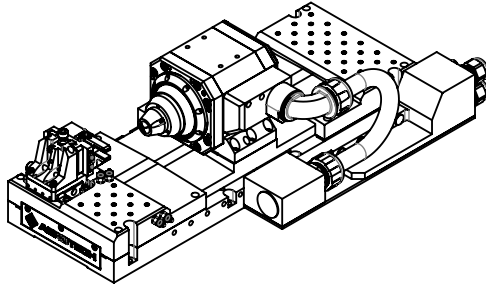
LASERTURN1
-TYPE D COLLET



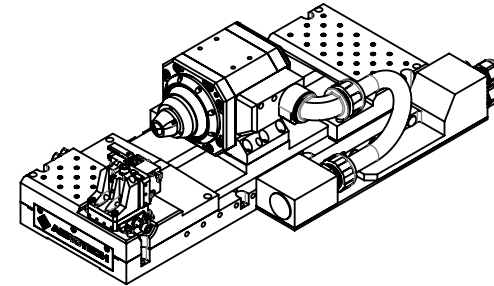
FRONT TOOLING PLATFORM (-FT1)



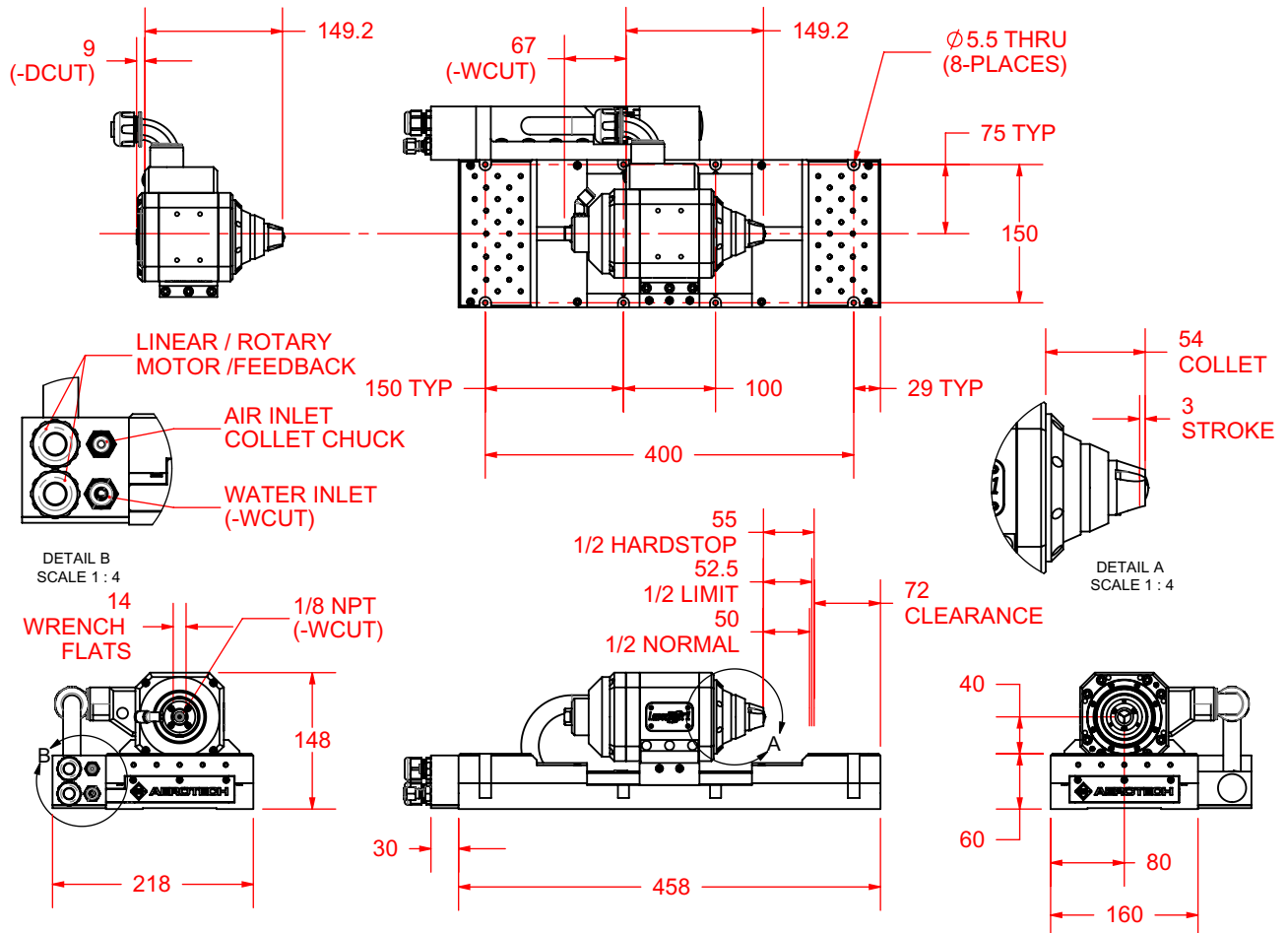
FRONT TOOLING PLATFORM
WITH GRIPPER (-FT2)



FRONT TOOLING PLATFORM
WITH RIGHT HAND ALIGNMENT GRIPPER (-FT3)

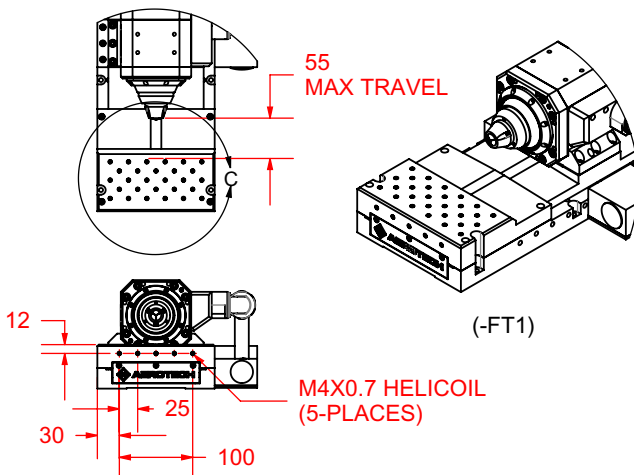
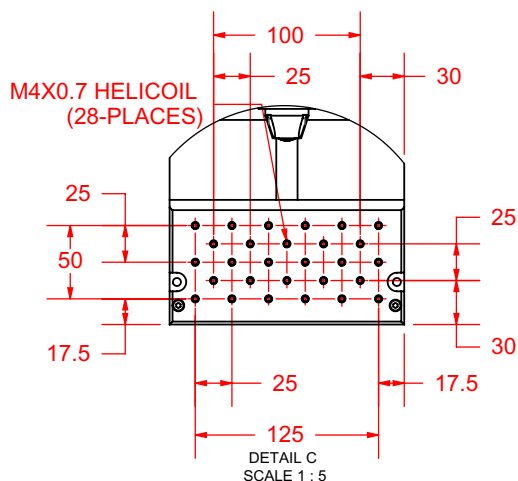


FRONT TOOLING PLATFORM
WITH LEFT HAND ALIGNMENT GRIPPER (-FT4)

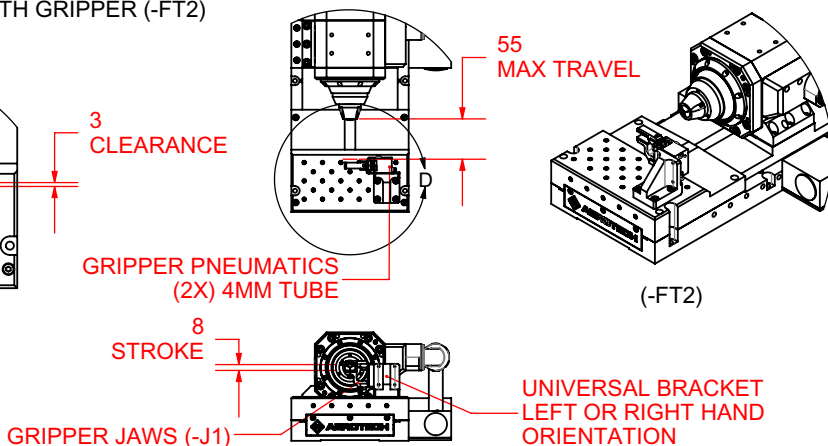
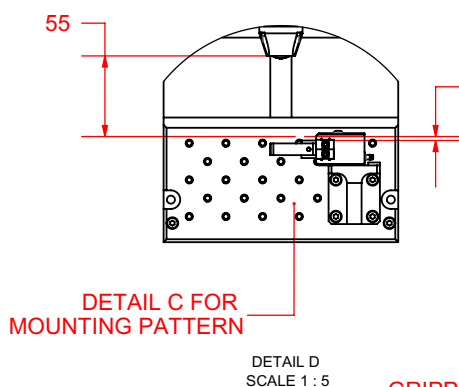


DIMENSIONS: MILLIMETERS

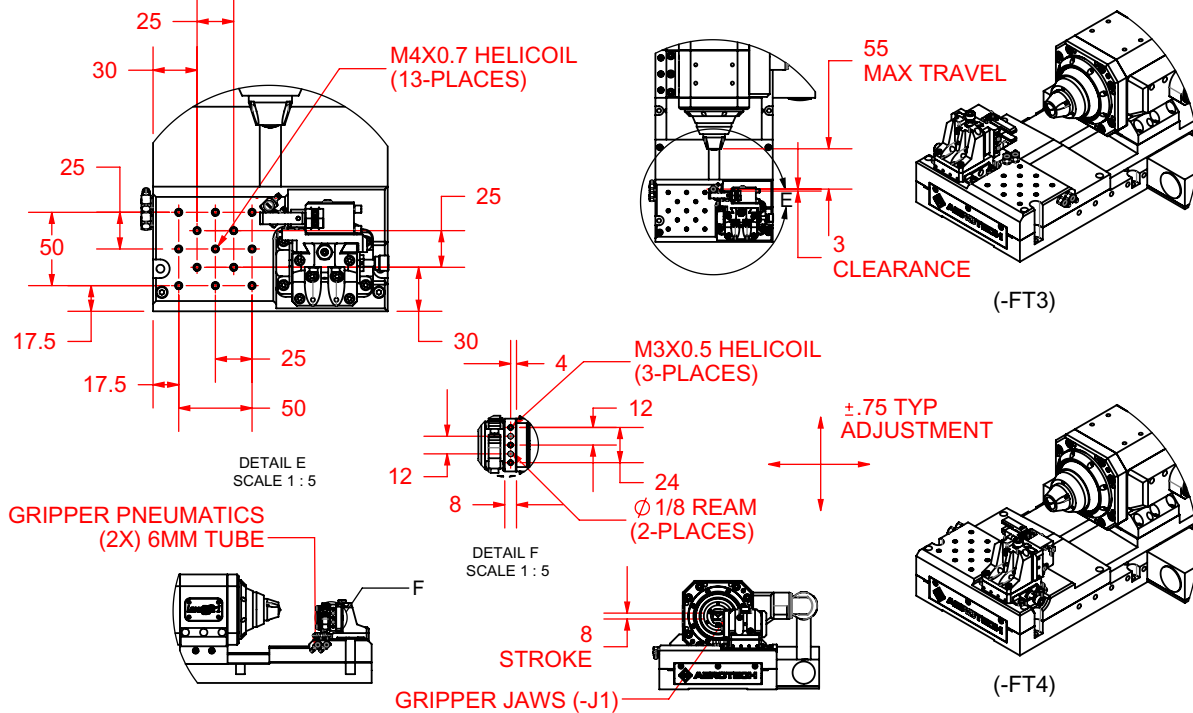
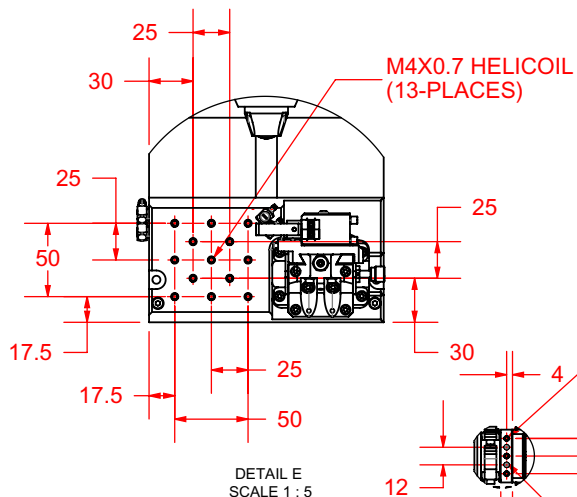
FRONT TOOLING PLATFORM (-FT1)



FRONT TOOLING PLATFORM WITH GRIPPER (-FT2)



FRONT TOOLING PLATFORM WITH ALIGNMENT GRIPPER (-FT3 & -FT4)



LaserTurn1 ORDERING INFORMATION

Cutting Configuration (Required)

-DCUT	Dry cutting configuration
-WCUT	Wet cutting configuration with fluid rotary union

Front Tooling (Required)

-FT1	Front tooling platform
-FT2	Front tooling platform with gripper
-FT3	Front tooling platform with right-hand alignment gripper
-FT4	Front tooling platform with left-hand alignment gripper

Gripper Jaws (Optional)

-J1	Gripper jaws for 0-8 mm tube diameters
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Metrology - Linear (Required)

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

Metrology option applies to linear axis only.

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.

Accessories (ordered as separate items)

Collet-D-CLTxx	Levin type D collet, 0.1 mm to 8 mm part diameter sizes available
RingSeal-D-RSxx	Ring seal for wet cutting - consult with Aerotech for available sizes
CGF	Collet and Gripper Filtration Kit