AGS15000 Series

Linear Motor Gantries

- Optimized design for precise contouring
- Velocity to 3 m/s and acceleration to 5 g
- High power brushless linear servomotors for smooth motion
- Travels up to 1.3 m X 1.3 m available
- Customizable Z and θ axes for flexible configurations
- Noncontact linear encoders
- Configurable cable management system allows for integration of fiber lasers, cameras, air lines, etc. for multiple applications

24/7 Operation Around the World

The AGS15000 series of Cartesian gantry systems is designed for ultra-precision, high-dynamic contouring, providing outstanding performance and versatility in a wide range of automation platforms. The planar design minimizes dynamic pitch errors at the workpoint.

AGS15000 systems can be found in production plants around the world, in applications including precision micromachining, stencil cutting, fuel cell manufacturing, printed electronics, flat sheet processing, high-speed pick-and-place, automated assembly, vision inspection, dispensing stations, and high-accuracy inspection.

High Speed/High Acceleration

Aerotech's high-performance BLM and BLMH series brushless linear servomotors drive the AGS15000 to speeds of 3 m/s and accelerations of 5 g. Dual linear motors and encoders are included on the lower axis for the highest level of performance and precision. The rugged noncontact optical linear encoders offer resolutions to 1 nm when coupled with Aerotech's encoder multiplier. Optimized to account for thermal expansion, the design ensures high accuracy under varying operating conditions.

Rugged Design

The linear motor is a noncontact device, resulting in no backlash, wear, or maintenance. The bearings are preloaded linear motion guides with wiper seals and grease fittings, and are mounted to provide optimized dynamic stiffness and load distribution.

The AGS15000 design keeps the linear motors and linear encoders to the outside of the work area. This design makes the gantry less susceptible to debris-induced damage.

Long-Lasting Cable Management System

The cable management system (CMS) is optimized and field-proven as the industry's most reliable design. Large bend radii and high-flex cables ensure that the AGS15000 provides millions of cycles of maintenance-free operation. In the unlikely event of a component failure, a modular design ensures that part replacement is fast and easy.

All customer cabling and pneumatics can be routed through the system e-chain. Connectors are provided at the workpiece and at the opposite end of the e-chain, greatly simplifying final machine integration.

Turnkey Operation

Aerotech's years of experience manufacturing precision positioning and control systems can be leveraged by acquiring a turnkey system. Typical options include Z-theta mechanisms, risers to accommodate automated parts handling equipment, brackets for flying optics components, isolation systems, and machine bases that are designed to accommodate the entire controls and electronics subsystems.

System Controllers

Aerotech manufactures a wide range of amplifiers and advanced motion controllers that are optimized for high-performance automation applications.

AGS15000 Series EXAMPLES

Aerotech Gantries: Flexible, High-Throughput Solutions for Your Application

Aerotech designs and manufactures gantries for many of the largest manufacturers in the world. These systems are carefully engineered to provide superior performance in applications as varied as pick-and-place, automated assembly, vision inspection, dispensing stations, and packaging applications. With our extensive experience and broad line of products, Aerotech can deliver the ideal gantry for your application.

APPLICATION: Stencil Cutting

- Planar design greatly increases the servo bandwidth of the system, improving geometric tolerances of the stencil apertures at high speeds
- Custom cable management system supports Z axes, autofocus height sensing heads, and fiber laser beam delivery
- Extremely smooth velocity regulation for high cut quality

APPLICATION: Laser Micromachining

- Sealed design protects linear motors and encoders, allowing use in harsh environments
- Planar design coupled with dual linear motors/ encoders and stiff mounting interfaces permit micron-level dynamic accuracies on high-speed cutting applications
- Large bend radius cable management system is sized for integration of laser's fiber delivery system for simple and seamless integration of lasers
- Mounting surfaces on bridge structure enable attachment of optics for free space laser delivery systems or galvo scanners

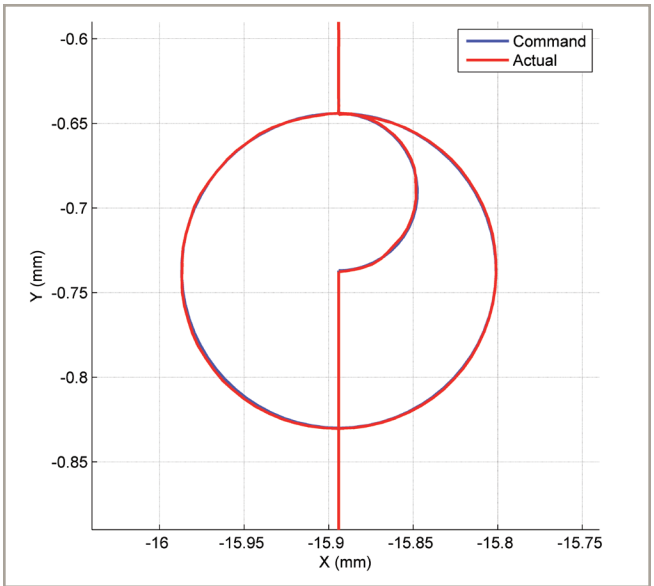
APPLICATION: Dispensing

- High speed (up to 1 m/s) to achieve economical production throughput
- High resolution, direct-drive axes allow micron-level dynamic tolerances for dispensing over complex contours
- Powerful, noncontact linear motors enable high accelerations for rapid direction reversals of complex contours, increasing throughput

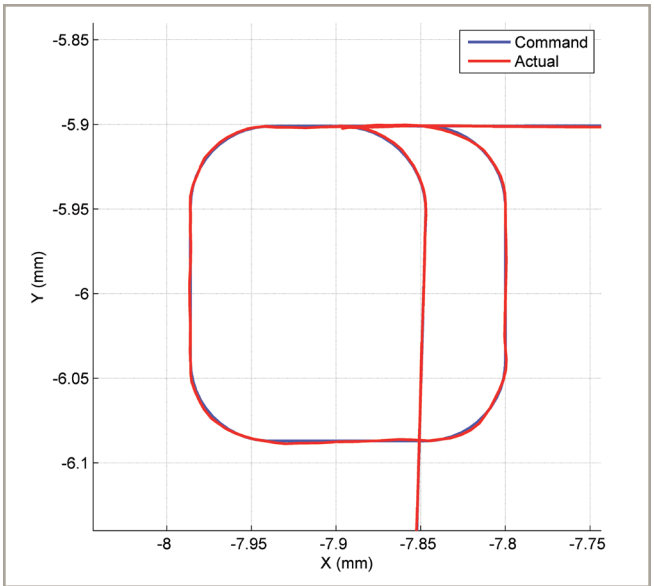
AGS15000 Series SPECIFICATIONS

Basic Model		AGS15000-500-500	AGS15000-750-750	AGS15000-1000-1000	AGS15000-1250-1250
Total Travel		500 mm x 500 mm	750 mm x 750 mm	1000 mm x 1000 mm	1250 mm x 1250 mm
Bus Voltage		Up to 340 VDC			
Maximum Travel Speed[2]		3 m/s			
Maximum Linear Acceleration		5 g (no load)			
Maximum Load[3]		40.0 kg			
Accuracy[4]		±1.5 µm	±2.0 µm	±2.5 µm	±3.0 µm
Repeatability		±0.5 µm	±0.75 µm	±1.0 µm	±1.25 µm
Orthogonality		5 arc sec			
Nominal System Weight (Gantry Only)[5]		275 kg	325 kg	375 kg	425 kg
Moving Mass[5]	Lower Axis	62.0 kg	72.3 kg	82.5 kg	92.7 kg
	Upper Axis	7.2 kg			
Material		Aluminum			
Finish	Stage	Black Anodize, ESD Optional			
	Carriage	Hard Coating, ESD Optional			

Notes:
1. Air cooling options available.
2. Maximum speed based on stage capability; maximum application velocity may be limited by system data rate and system resolution.
3. Maximum load based on bearing capability; maximum application load may be limited by acceleration and dynamic requirements.
4. Measured at center of travel, single axis under static conditions.
5. Values shown are approximations only and will vary based on customer requirements including, but not limited to, nominal gantry travel, maximum system velocity, quantity and size of customer cables and hoses, and customer payload mass and size.

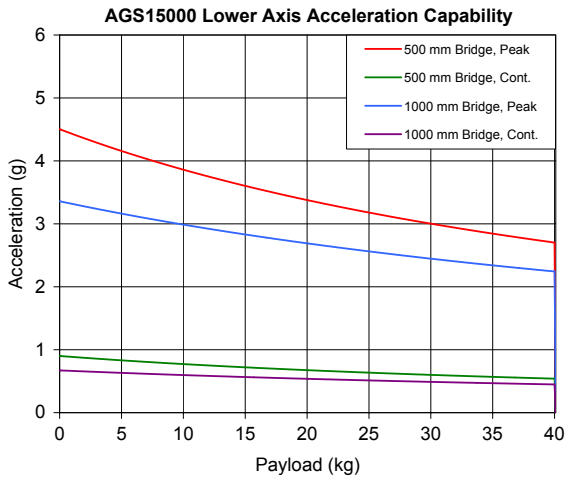


2D plot showing following error of <1 µm at 25 mm/s profile velocity. Feature: 180 micron diameter circle.

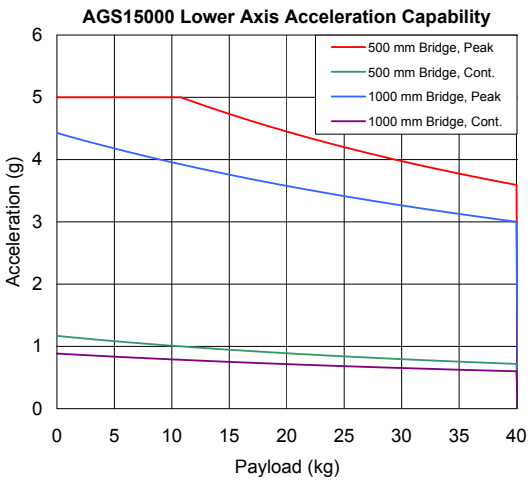


2D plot showing following error of <1 µm at 25 mm/s average profile velocity. Feature: 180 micron square with 50 micron corner radii.

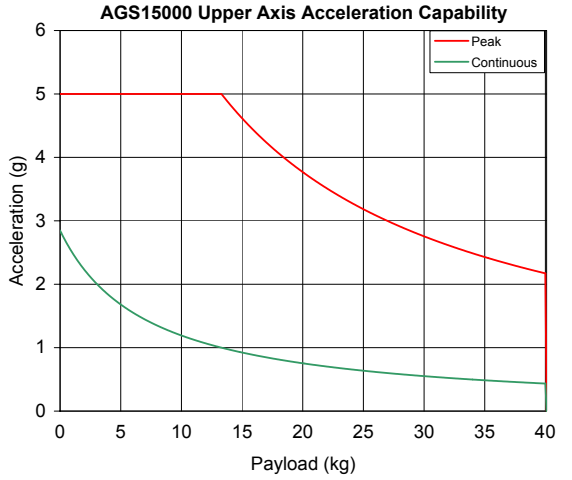
AGS15000 Series SPECIFICATIONS



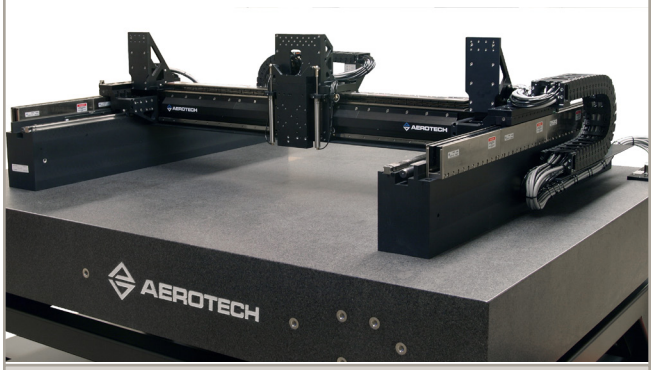
AGS15000 lower axis acceleration capability with dual BLM motors and 20 psig cooling.



AGS15000 lower axis acceleration capability with dual BLMH motors and 20 psig cooling.

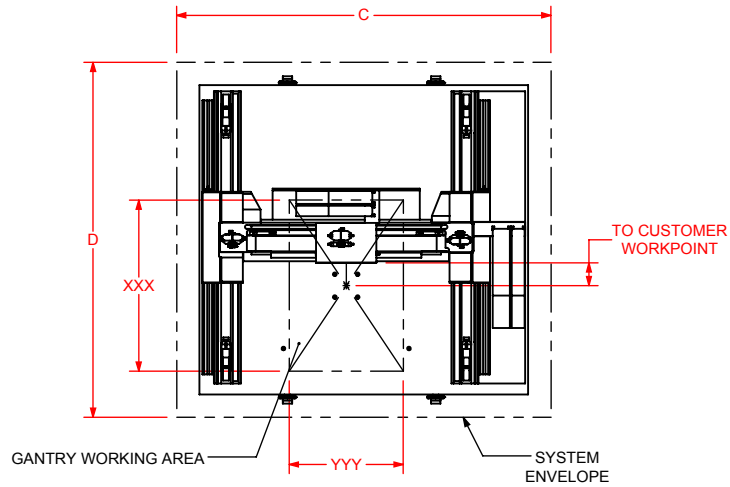


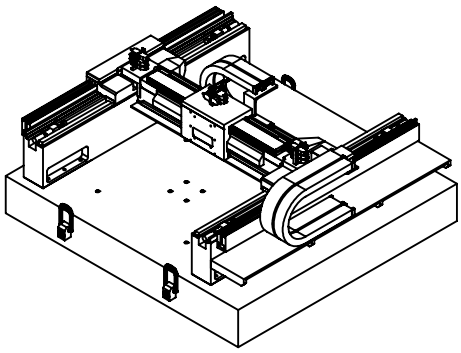
AGS15000 upper axis acceleration capability with 20 psig cooling.

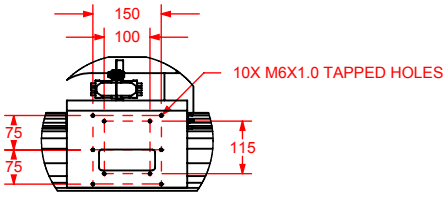


AGS15000 with pneumatically counterbalanced z axis, brackets for flying optics, and machine base.

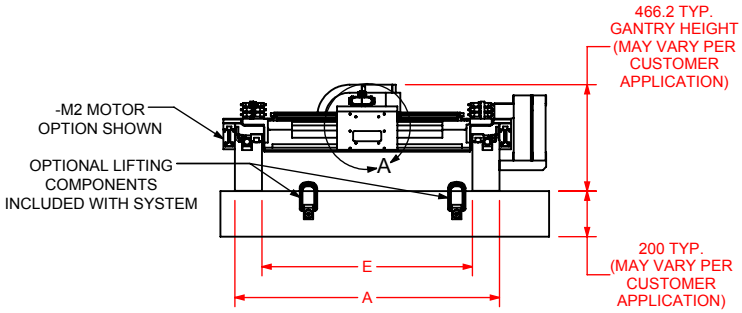
AGS15000 Series DIMENSIONS

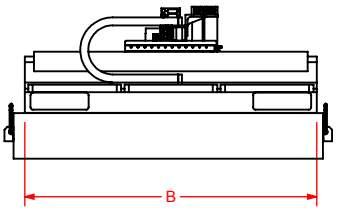






DETAIL A





"XXX" LOWER-AXIS NOMINAL TRAVEL	"YYY" UPPER-AXIS NOMINAL TRAVEL	"A" GANTRY WIDTH	"B" GANTRY DEPTH	"C" SYSTEM WIDTH	"D" SYSTEM DEPTH	"E" GANTRY SPAR SPACING
500	500	1122.5 - 1197.5	992.5 - 1067.5	1602.5 - 1677.5	1268 - 1343	885 - 960
750	750	1372.5 - 1447.5	1242.5 - 1317.5	1852.5 - 1927.5	1518 - 1593	1135 - 1210
1000	1000	1622.5 - 1697.5	1492.5 - 1567.5	2102.5 - 2177.5	1768 - 1843	1385 - 1460

NOTES:

1. IN THE TABLE ABOVE, COMMON NOMINAL TRAVEL LENGTHS ARE SHOWN FOR REFERENCE. OTHER NOMINAL TRAVEL LENGTHS AND NOMINAL TRAVEL COMBINATIONS ARE AVAILABLE.
2. "A", "B", "C", AND "D" DIMENSIONAL RANGES ARE SHOWN FOR REFERENCE ONLY AND MAY VARY BASED ON THE CUSTOMER'S APPLICATION.
3. SYSTEM DIMENSIONS WILL VARY BASED ON CUSTOMER REQUIREMENTS INCLUDING, BUT NOT LIMITED TO:
   - NOMINAL GANTRY TRAVEL
   - MAXIMUM SYSTEM VELOCITY
   - REQUIRED CLEARANCE FROM WORK SURFACE
   - QUANTITY AND SIZE OF CUSTOMER CABLES AND HOSES
   - CUSTOMER PAYLOAD MASS AND SIZE
4. GANTRY SYSTEM IS EQUIPPED WITH ELECTRICAL AND MECHANICAL TRAVEL LIMITS BEYOND NOMINAL TRAVEL DISTANCE.
5. CONTACT AEROTECH FOR APPLICATION SPECIFIC DIMENSIONS.

DIMENSIONS: MILLIMETERS

AGS15000 Series ORDERING INFORMATION

AGS15000 Series Linear Motor Gantry

AGS15000-XXXX-YYYY	AGS15000 Linear Motor Gantry system, XXX mm lower-axis travel, YYY mm upper-axis travel

Motor (Required)

-M1	Lower axis: dual BLM-386-A brushless linear motor Upper axis: single BLM-264-A brushless linear motor
-M2	Lower axis: dual BLMH-382-A brushless linear motor Upper axis: single BLM-264-A brushless linear motor

Feedback (Required)

-E1	Lower axis: dual incremental linear encoders, 1 Vpp output Upper axis: single incremental linear encoder, 1 Vpp output
-E2	Lower axis: dual incremental linear encoders, 0.1 µm digital TTL output Upper axis: single incremental linear encoder, 0.1 µm digital TTL output

Lifting (Optional)

-LF	Lifting hardware provided with system assembly

Performance Grade (Required)

-PL6	Standard performance - plots for accuracy-only included

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