

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

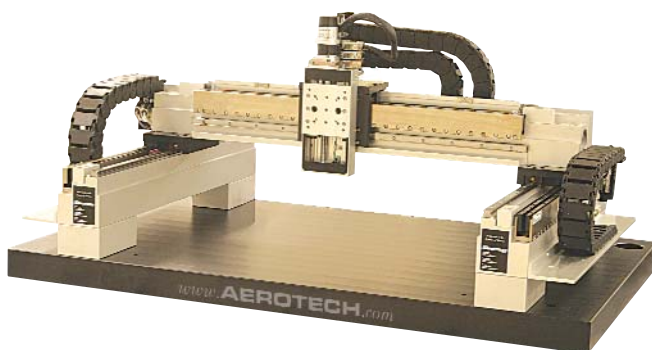
APPLICATION: LASER MICROMACHINING

- 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

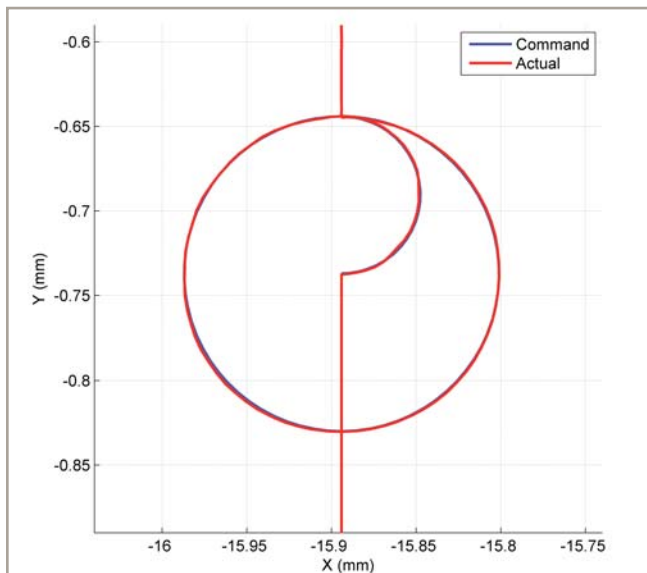


AGS15000 Series SPECIFICATIONS

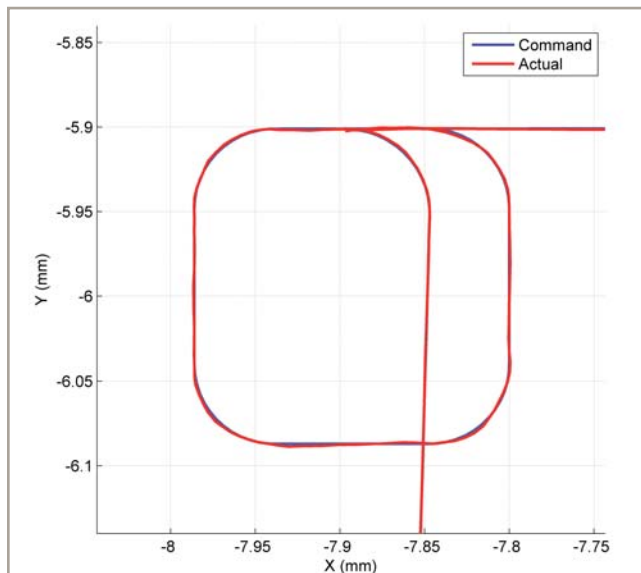
| Basic Model | | AGS15500-500 | AGS15750-750 | AGS151000-1000 | AGS151250-1250 |
|-------------------------------------|------------|--|--|--|--|
| Total Travel | | 500 mm x 500 mm (20 in x 20 in) | 750 mm x 750 mm (30 in x 30 in) | 1000 mm x 1000 mm (40 in x 40 in) | 1250 mm x 1250 mm (50 in x 50 in) |
| Drive System ⁽¹⁾ | Lower Axis | Linear Brushless Servomotor — Dual BLM-386-A or Dual BLMH-382-A | | | |
| | Upper Axis | Linear Brushless Servomotor — BLM-264-A | | | |
| Bus Voltage | | Up to 340 VDC | | | |
| Feedback | | Noncontact Linear Encoder | | | |
| Resolution ⁽²⁾ | | 0.001 μm - 1.0 μm (0.04 μin - 40 μin) | | | |
| Maximum Travel Speed ⁽³⁾ | | 3 m/s (120 in/s) | | | |
| Maximum Linear Acceleration | | 5 g (50 m/s ²) (no-load) | | | |
| Maximum Load ⁽⁴⁾ | | 40.0 kg (88.2 lb) | | | |
| Accuracy ^(5,6) | | $\pm 1.5 \mu\text{m}$ ($\pm 60 \mu\text{in}$) | $\pm 2.0 \mu\text{m}$ ($\pm 80 \mu\text{in}$) | $\pm 2.5 \mu\text{m}$ ($\pm 100 \mu\text{in}$) | $\pm 3.0 \mu\text{m}$ ($\pm 120 \mu\text{in}$) |
| Repeatability | | $\pm 0.5 \mu\text{m}$ ($\pm 20 \mu\text{in}$) | $\pm 0.75 \mu\text{m}$ ($\pm 30 \mu\text{in}$) | $\pm 1.0 \mu\text{m}$ ($\pm 40 \mu\text{in}$) | $\pm 1.25 \mu\text{m}$ ($\pm 50 \mu\text{in}$) |
| Orthogonality | | 5 arc sec | | | |
| Moving Mass | 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. With encoder multiplier.
3. Maximum speed based on stage capability; maximum application velocity may be limited by system data rate and system resolution.
4. Maximum load based on bearing capability; maximum application load may be limited by acceleration and dynamic requirements.
5. Measured at center of travel, single axis under static conditions.
6. Available with Aerotech controllers with HALAR.

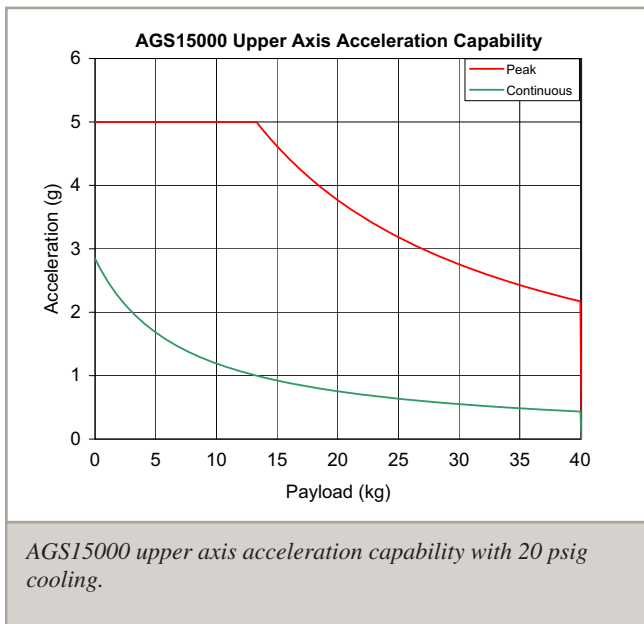
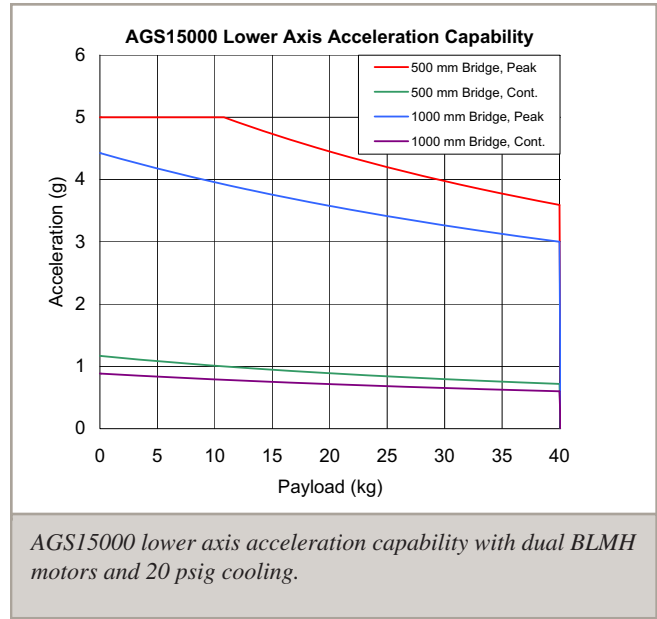
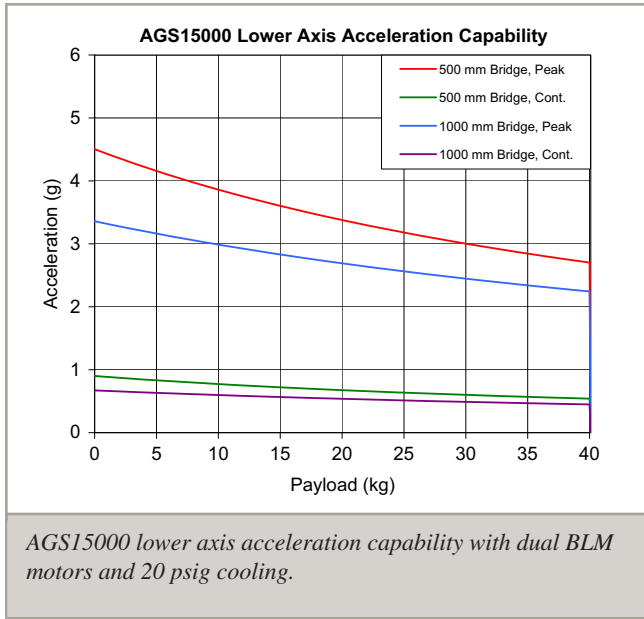


2D plot showing following error of $<1 \mu\text{m}$ at 25 mm/s profile velocity. Feature: 180 micron diameter circle.



2D plot showing following error of $<1 \mu\text{m}$ at 25 mm/s average profile velocity. Feature: 180 micron square with 50 micron corner radii.

AGS15000 Series SPECIFICATIONS



AGS15000 Series ORDERING INFORMATION

Ordering Information

| AGS15 | -500 | -500 | -HL | -10X2 | -10 | -LT50X50 | -LT50X50 | -GR |
|--------|-------------------------------|-------------------------------|----------------|-------------------------|-------------------------|---------------------------|---------------------------|---------------|
| Series | X-Travel (mm) (Lower Axis) | Y-Travel (mm) (Upper Axis) | Gantry Type | X-Motor (Lower Axis) | Y-Motor (Upper Axis) | X-Encoder (Lower Axis) | Y-Encoder (Upper Axis) | Base Plate |
| | -500-500 | -500-500 | -HL | -10X2 | -10 | -LTxxAS | -LTxxAS | -GR |
| | -750-750 | -750-750 | | -10HX2 | | -LTxxX50 | -LTxxX50 | -GRR |
| | -1000-1000 | -1000-1000 | | | | | | |
| | -1250-1250 | -1250-1250 | | | | | | |

AGS15000 Series Linear Motor Gantry

| | |
|----------------|--|
| AGS15500-500 | 500 mm x 500 mm (20 in x 20 in) cartesian gantry with linear motor, linear encoder, and limits |
| AGS15750-750 | 750 mm x 750 mm (30 in x 30 in) cartesian gantry with linear motor, linear encoder, and limits |
| AGS151000-1000 | 1000 mm x 1000 mm (40 in x 40 in) cartesian gantry with linear motor, linear encoder, and limits |
| AGS151250-1250 | 1250 mm x 1250 mm (50 in x 50 in) cartesian gantry with linear motor, linear encoder, and limits |
| AGSxxxx-yyyy | Other travels available; please consult factory |

Gantry Type

| | |
|-----|------------------|
| -HL | High load design |
|-----|------------------|

Motor

| | |
|--------|---|
| -10X2 | Dual brushless linear motor – dual BLM-386-A (lower X-axis only) |
| -10HX2 | Dual brushless linear motor – dual BLMH-382-A (lower X-axis only) |
| -10 | Brushless linear motor — BLM-264-A (upper Y-axis only) |

Standard Linear Encoders

| | |
|-----------|--|
| -LT50AS | Dual linear encoder for lower axis; linear encoder for upper axis; amplified sine output; for AGS15500-500 |
| -LT50X50 | Dual linear encoder for lower axis; linear encoder for upper axis; 0.1 micron line driver output; for AGS15500-500 |
| -LT75AS | Dual linear encoder for lower axis; linear encoder for upper axis; amplified sine output; for AGS15750-750 |
| -LT75X50 | Dual linear encoder for lower axis; linear encoder for upper axis; 0.1 micron line driver output; for AGS15750-750 |
| -LT100AS | Dual linear encoder for lower axis; linear encoder for upper axis; amplified sine output; for AGS151000-1000 |
| -LT100X50 | Dual linear encoder for lower axis; linear encoder for upper axis; 0.1 micron line driver output; for AGS151000-1000 |
| -LT125AS | Dual linear encoder for lower axis; linear encoder for upper axis; amplified sine output; for AGS151250-1250 |
| -LT125X50 | Dual linear encoder for lower axis; linear encoder for upper axis; 0.1 micron line driver output; for AGS151250-1250 |

Base Plate

| | |
|---------------|--|
| -GR500-500 | Granite baseplate for AGS15500-500 |
| -GR750-750 | Granite baseplate for AGS15750-750 |
| -GR1000-1000 | Granite baseplate for AGS151000-1000 |
| -GR1250-1250 | Granite baseplate for AGS151250-1250 |
| -GRR500-500 | Granite baseplate for AGS15500-500 with 150 mm (6 in) risers |
| -GRR750-750 | Granite baseplate for AGS15750-750 with 150 mm (6 in) risers |
| -GRR1000-1000 | Granite baseplate for AGS151000-1000 with 150 mm (6 in) risers |
| -GRR1250-1250 | Granite baseplate for AGS151250-1250 with 150 mm (6 in) risers |

Accessories (to be ordered as separate line item)

| | |
|-------------|---|
| Z100 | 100 mm (4 in) travel z-stage |
| Z100LM | Pneumatic-counterbalanced 100 mm (4 in) travel linear motor z-stage |
| Z150 | 150 mm (6 in) travel z-stage |
| Z150LM | Pneumatic-counterbalanced 150 mm (6 in) travel linear motor z-stage |
| THETA | 360° travel theta axis |
| MB500-500 | Steel weldment machine base for AGS15500-500 |
| MB750-750 | Steel weldment machine base for AGS15750-750 |
| MB1000-1000 | Steel weldment machine base for AGS151000-1000 |
| MB1250-1250 | Steel weldment machine base for AGS151250-1250 |