

SolarScribe

Photovoltaic Panel Scribing System

Split axis or gantry configurations to accommodate all PV/FPD scribing applications

Choose from mechanical or air-bearing systems

Direct-drive linear motor stages

Travel to 2.5 m

High dynamic system stiffness for best accuracy

Industry-leading control system with real-time position-based laser firing output

Options include single or multiple step-axis carriages, multiple Z-axis options, theta stage with integral brake, passive or active vibration isolation, machine base, control enclosure

Aerotech has a long, successful history of developing innovative motion products specifically designed for the semiconductor and photovoltaic manufacturing industries. From printing and scribing to final inspection, our systems are optimized to be the highest throughput, highest accuracy, and lowest cost of ownership motion platforms on the market. That tradition of innovation and performance has been leveraged in the development of the SolarScribe motion platform.

The SolarScribe automation series is the most comprehensive photovoltaic panel scribing system available today. It includes both mechanical and air-bearing versions of split-axis and gantry-style systems for maximum application flexibility.

Performance Optimized Design

All design elements of the SolarScribe have been optimized to provide maximum throughput while maintaining tight control of geometric characteristics like dynamic straightness. In addition, because each customer and solar technology application has its own set of requirements, Aerotech has designed the SolarScribe system to include a



multitude of options like multi-head scan axes, Z and theta correction axes, and machine base/isolation systems. As always, all configurations put Aerotech's proven core technologies and extensive manufacturing capability to work for you, providing outstanding performance and versatility.

Advanced Control Architecture

The SolarScribe is coupled to Aerotech's advanced Automation 3200 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 dynamic errors while our Position Synchronized Laser Firing Output (PSO) functionality automatically adjusts the laser pulse frequency to match the current scribing speed, providing an additional throughput boost.

Cable Management System

Extensive R&D has resulted in an optimized cable management system (CMS) that has been field-proven to be the industry's most reliable design. Large bend radii and high-flex cables ensure millions of cycles of maintenance-free operation. In the unlikely event of a component failure, robust diagnostics and a modular design minimize mean time to repair (MTTR), ensuring very high machine availability.

Custom Designs

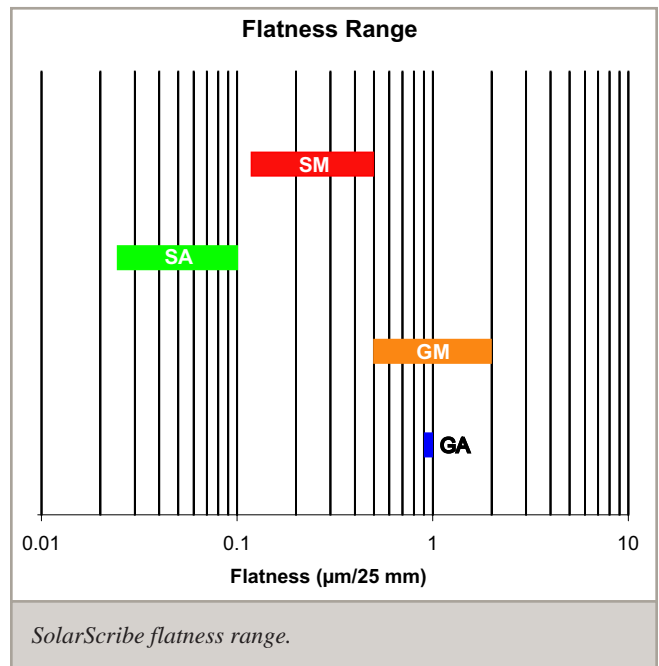
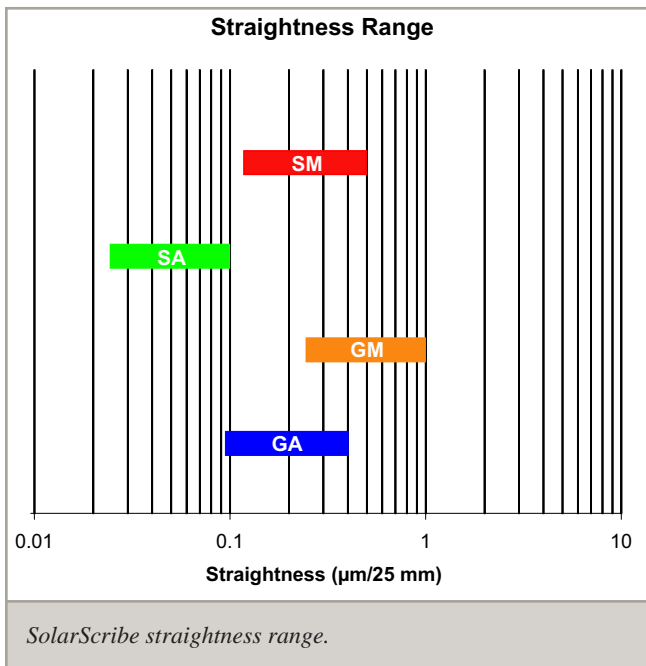
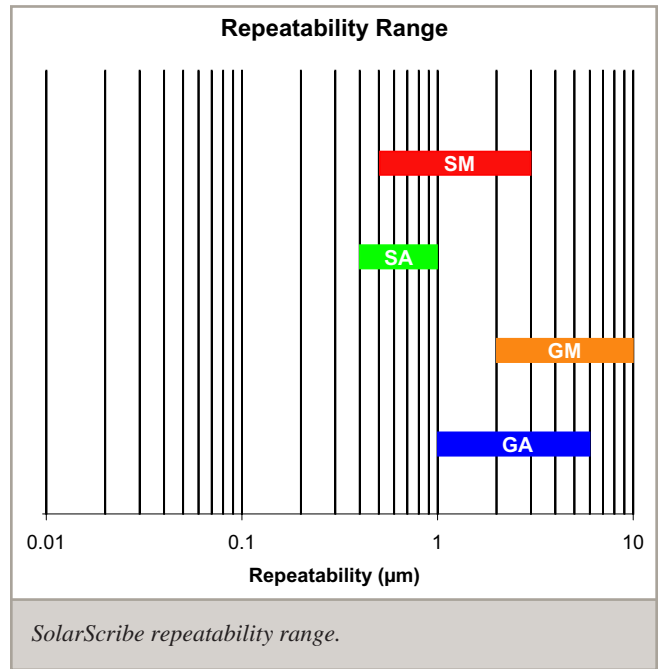
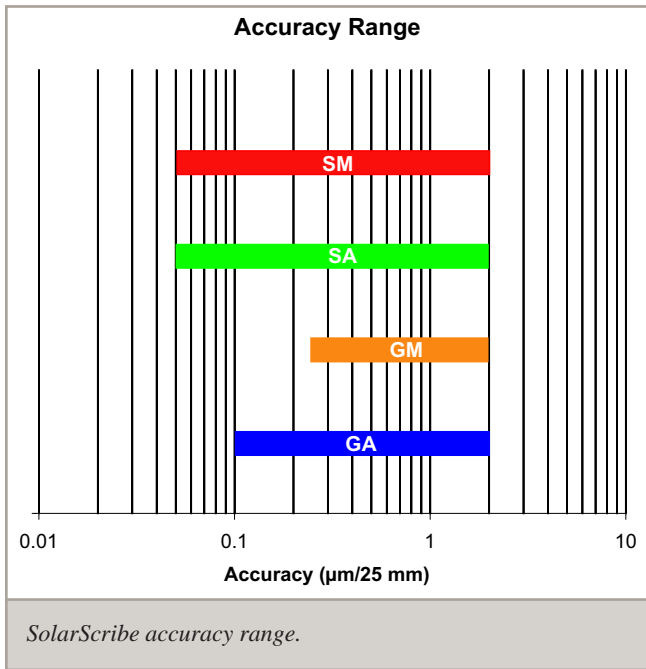
Aerotech has engineered and manufactured custom high performance systems to meet customers' needs and specifications for a variety of applications.

SolarScribe SPECIFICATIONS

| Basic Model | SM Split Axis | SA Split Axis | GM Gantry | GA Gantry |
|---|-----------------------------|---|----------------|----------------|
| Travel Options, Upper Axis ⁽¹⁾ | 500 to 1500 mm | 500 to 1500 mm | 500 to 1500 mm | 500 to 1000 mm |
| Travel Options, Lower Axis ⁽¹⁾ | 500 to 2500 mm | 500 to 2500 mm | 500 to 1700 mm | 500 to 1700 mm |
| Motor Type | Linear Brushless Servomotor | | | |
| Encoder Options | LT | Noncontact Linear Encoder; 20 μ m Fundamental | | |
| | LN | Noncontact Linear Encoder; 4 μ m Fundamental | | |
| Maximum Speed ⁽²⁾ | 3 m/s | 2 m/s | 3 m/s | 1 m/s |
| Maximum Acceleration | 5 g | 1.5 g | 3 g | 0.5 g |
| Orthogonality | 5 arc sec | | | |

Notes:

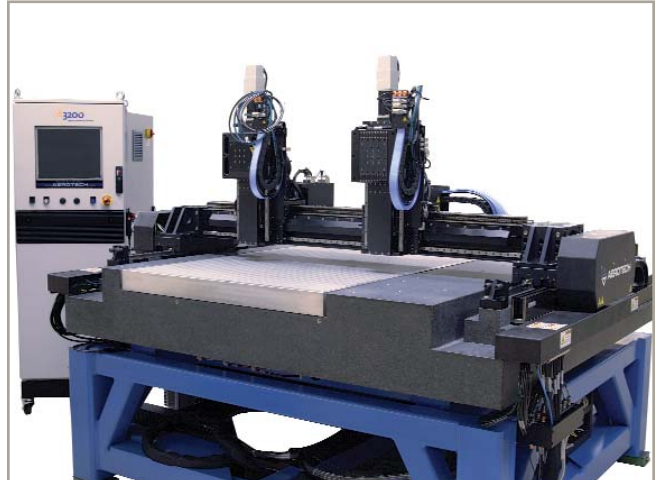
- 1. Custom travels available. Please contact an Aerotech sales representative for details.
- 2. Maximum speed based on stage capability. Maximum application velocity may be limited by system data rate and system resolution.



SolarScribe MODELS



SolarScribe-SA with optional machine base and isolation system.



SolarScribe-GM with optional dual-carriage step axis, control cabinet, machine base, and isolation system.



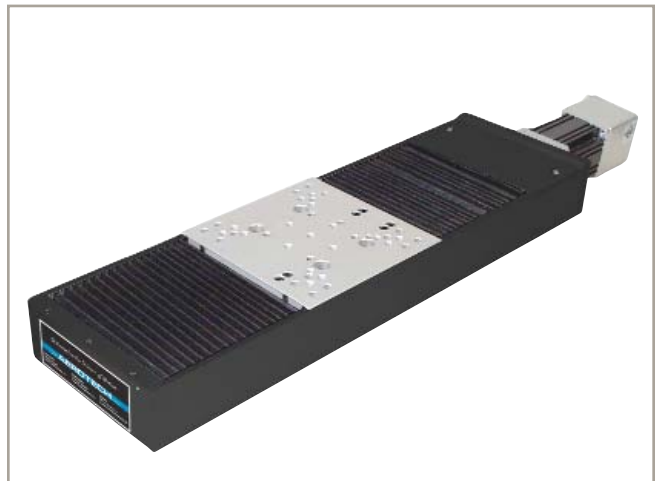
SolarScribe-GA



SolarScribe-SM with optional dual-carriage step axis.



Optional scan axis theta stage (ARA1000).



Optional Z stage (ATS150).

SolarScribe ORDERING INFORMATION

Ordering Example

| SOLARSCRIBE | -SM | -1000 | -1500 | -NC | -LNAS | -100 | -T |
|-------------|----------------------|------------------------|------------------------|------------|-----------------|---------------|---------------------|
| Series | Model | Upper Axis Travel (mm) | Lower Axis Travel (mm) | Limits | Encoder Options | Z Axis Travel | Optional Theta Axis |
| | SM SA GM GA | 500-1500 | 500-2500 | -NC -NO | -LTAS -LNAS | 25-150 | -T |

SolarScribe Photovoltaic Panel Scribing System

| | |
|----|--|
| SM | Split-axis configuration, mechanical-bearing motion platform |
| SA | Split-axis configuration, air-bearing motion platform |
| GM | Gantry configuration, mechanical-bearing motion platform |
| GA | Gantry configuration, air-bearing motion platform |

Upper Axis Travel

| | |
|------------|---|
| 500 - 1500 | Upper axis travel in millimeters; includes linear motor, linear encoder, and normally-closed limits |
|------------|---|

Lower Axis Travel

| | |
|------------|---|
| 500 - 2500 | Lower axis travel in millimeters; includes linear motor, linear encoder, and normally-closed limits |
|------------|---|

Limits

| | |
|-----|---|
| -NC | Normally-closed end of travel limit switches (STANDARD) |
| -NO | Normally-open end of travel limit switches |

Encoder Options

| | |
|-------|---|
| -LTAS | Noncontact linear encoder; 20 µm fundamental; amplified sine output |
| -LNAS | Noncontact linear encoder; 4 µm fundamental; amplified sine output |

Z Axis Travels

| | |
|----------|--|
| 25 - 150 | Z axis travel in millimeters; includes rotary motor, brake, rotary encoder, and normally closed limits |
|----------|--|

Optional Theta Axis

| | |
|----|---------------------------------------|
| -T | System to include optional theta axis |
|----|---------------------------------------|

Note: If GA or GM models are chosen, standard encoder option includes dual encoders on the lower (scan) axis.