Plglide IS Planar XY Air Bearing Stage

ULTRA PERFORMANCE, COMPACT XY NANOPositionING SYSTEM

Overview
The Plglide IS planar XY air-bearing stage is a low profile, high precision alternative to stacked XY stages. The fully preloaded air bearing puck floats in both X and Y directions on a common base, providing smooth, frictionless motion. Ideal for inspection, laser marking, microscopy, scanning, and other precision motion applications. The efficient, compact design saves space in tight machine designs. Ironless linear motors provide smooth motion with no cogging or attractive forces. Optical linear encoders provide position feedback information down to 1nm, depending on interpolation.

The Plglide IS can be coupled with a variety of industry-leading digital controls and drives that offer advanced algorithms to improve dynamic performance and error compensation and a wide suite of software development tools.

A-311 Series
- Ideal for scanning or high-resolution positioning
- Clean room compatible
- Customizable
- Travel lengths to 200mm x 200mm
- Load to 15kg max
- Non-contact fully preloaded air bearings
- Low profile design
- Resolution to 1nm
- Velocity to 2m/sec
- Acceleration to 2.75g

Accessories and Options
- Multiple encoder options
- Air preparation kits
- Multi-axis motion controller and servo drives
- Granite surface plates
- Machine bases
- Vibration isolation systems
- Additional accessories and customizations available
## Specifications

### Drive System
- Brushless ironless linear servo motor, 3-phase

### Feedback System
- Non-contact optical linear encoder with travel limits and home index

### Motor Bus Voltage
- 48 VDC nominal, 80 VDC max

### Motor Force Constant
- 12.3 N/A

### Continuous Force
- 39 N

### Peak Force
- 85 N

### Motor Back EMF
- 10.1 V/m/sec

### Motor Inductance
- 3.6 Ω

### Maximum Inductance (phase-to-phase)
- 2.4 mH

### Maximum Velocity (1)
- Upper (X) Axis: 2.75 g
- Lower (Y) Axis: 1.5 g

### Maximum Acceleration (1)
- Upper (X) Axis: 2.75 g
- Lower (Y) Axis: 1.5 g

### Maximum Payload (2)
- 15 kg

### Accuracy (3)(Uncompensated)
- +/-1.0 µm

### Accuracy (3) with error compensation
- +/-0.5 µm

### Repeatability (4)
- +/-0.05 µm

### Encoder Resolution (4)
- Up to 1 nm (see encoder options table)

### Straightness (5)
- < +/-10 nm / 10mm
- < 0.50 µm TIR
- < 1.0 µm TIR

### Flatness (6)
- < +/-10 nm / 10mm
- < 1.0 µm TIR
- < 2.0 µm TIR

### Pitch (5)
- < 4 arc-sec TIR
- < 6 arc-sec TIR
- < 8 arc-sec TIR
- < 10 arc-sec TIR

### Yaw (5)
- < 1 arc-sec TIR
- < 2 arc-sec TIR
- < 3 arc-sec TIR
- < 4 arc-sec TIR

### XY Orthogonality
- < 5 arc-sec

### Stage Mass
- 14.5 kg
- 18.5 kg
- 22.5 kg
- 27.5 kg

### Moving Mass
- Upper (X) Axis: 5.5 kg
- Lower (Y) Axis: 6.5 kg
- 7.5 kg
- 8.5 kg

### Cabling
- External e-chain, moving loops

### Operating Pressure (6)
- 65 (+/-5) psi

### Air Consumption
- < 2.0 SCFM

### Air Quality
- Clean (filtered to 1.0 µm or better) - ISO 8573-1 Class 1
- Oil-free -ISO 8573-1 Class 1
- Dry (-15 °C dew point) - ISO 8573-1 Class 3

### Construction
- Hardcoat Aluminum with SS Fasteners

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1. Maximum velocity and acceleration based on unloaded stage capability, may be limited by payload, controller, or drive performance.
2. Assumes payload CG is centered no more than 50mm above the stage table. Stage is only designed for horizontal operation.
3. Improved accuracy can be obtained with controller-based error compensation. Specs listed are for encoder options A & C. Accuracy values assume short-term time duration and do not consider the long-term effects of thermal drift on the stage.
4. Encoder resolution depends on encoder option chosen and interpolation used if sine encoders are chosen. Resolution will impact repeatability specification.
5. Dependent on the flatness of the surface to which the stage is mounted.
6. To protect stage from damage, an under-pressure air sensor tied to the controller E-stop input is recommended.
7. All specifications are per axis unless noted otherwise.
### Ordering Example

Part# A-311.BB1 is a

**Model:** A-311 (PIglide IS planar motorized air bearing stage)

**Travel:** B (150 mm x 150 mm)

**Encoder:** B (1nm absolute, high-accuracy, BiSS-C output)

**Motor Wiring:** 1 (48 VDC)

### Model A-311.xxx

<table>
<thead>
<tr>
<th>Model</th>
<th>Travel (X-Axis x Y-Axis)</th>
<th>Encoder (1)</th>
<th>Motor Wiring</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-311</td>
<td>D = 50 mm x 50 mm</td>
<td>A = 20µm grating pitch incremental, sine (1 Vp-p) output</td>
<td>1 = Standard motor option, 48 VDC buss</td>
</tr>
<tr>
<td></td>
<td>A = 100 mm x 100 mm</td>
<td>B = 1nm resolution absolute, high accuracy, BiSS-C serial output</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B = 150 mm x 150 mm</td>
<td>C = 50nm resolution incremental, A-quad-B (TTL) output</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C = 200 mm x 200 mm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Alternate TTL encoder resolutions are available on request.

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Model A-311.Bxx, in mm

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-311.Dxx</td>
<td>300</td>
<td>232</td>
<td>100</td>
<td>275</td>
<td>25</td>
<td>30</td>
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<tr>
<td>A-311.Axx</td>
<td>350</td>
<td>282</td>
<td>150</td>
<td>325</td>
<td>50</td>
<td>55</td>
</tr>
<tr>
<td>A-311.Bxx</td>
<td>400</td>
<td>332</td>
<td>200</td>
<td>375</td>
<td>75</td>
<td>80</td>
</tr>
<tr>
<td>A-311.Cxx</td>
<td>450</td>
<td>382</td>
<td>250</td>
<td>425</td>
<td>100</td>
<td>105</td>
</tr>
</tbody>
</table>