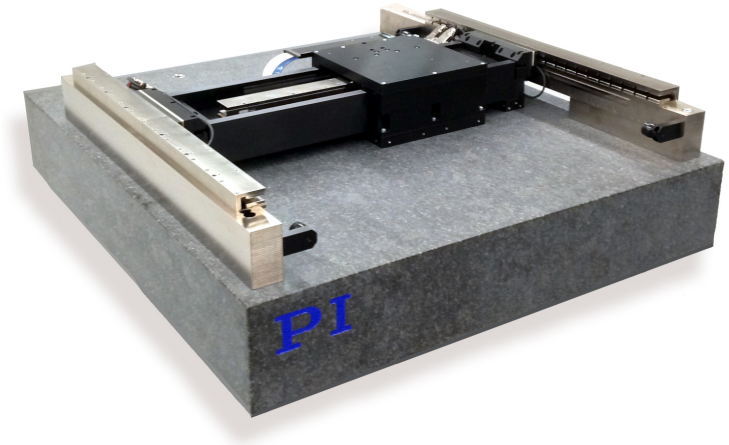
PIglide HS: Planar Air Bearing Stage

ULTRA PERFORMANCE XY NANOPOSITIONING SYSTEM



A-322 Series

- Ideal for scanning and high-resolution positioning
- Clean room compatible design
- Travel lengths to 500 mm x 1000 mm
- Load to 25 kg
- Non-contact fully preloaded air bearings
- Resolution to 1 nm
- Velocity to 2 m/sec
- Acceleration to 2 g
- Active straightness and yaw control algorithms
- Dynamic 2-D mapping achieves near "laser" performance

Overview

The PIglide HS planar air-bearing stage has been designed to maximize throughput while providing the ultimate level of precision. This stage is ideal for wafer inspection and scribing applications, as well as other ultra-precision motion applications such as flat panel inspection.

Flexural coupling of the cross beam to the lower axis provides yaw-compliance without sacrificing system stiffness. The gantry axis incorporates dual linear motors and dual linear encoders, allowing for active control of the yaw motion of both axes of motion. Ironless linear motors provide smooth motion with no cogging or attractive forces. The PIglide HS incorporates three high-accuracy linear encoders, one for the bridge axis and two for the gantry axis.

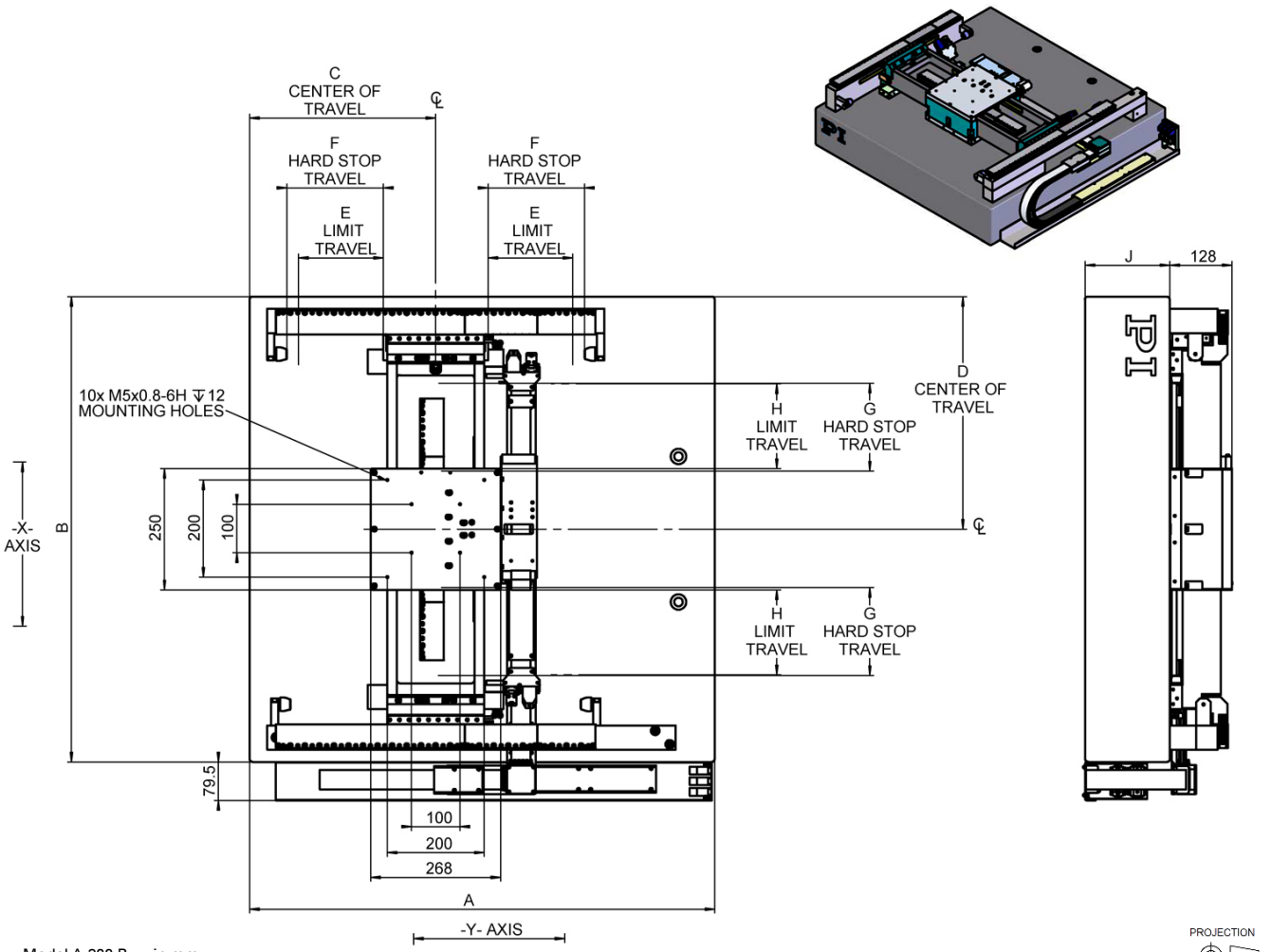
The PIglide HS is coupled with industry-leading digital controls and drives that offer advanced control algorithms to improve dynamic performance and error compensation, and a suite of software development tools.

Accessories and Options

- Machine bases
- Vibration isolation systems
- Overhead bridges with additional motion axes
- Additional accessories and customizations available on request

Model		A-322.Axx	A-322.Bxx	A-322.Cxx	A-322.Dxx
Travel (Bridge x Gantry)		350 mm x 350 mm	350 mm x 500 mm	500 mm x 500 mm	500 mm x 1000 mm
Drive System		Brushless ironless linear servo motor, 3-phase 1x on Bridge Axis, 2x on Gantry Axis			
Feedback System		Non-contact optical linear encoder 1x on Bridge Axis, 2x on Gantry Axis			
Motor Bus Voltage		48 VDC nominal, 80 VDC max			
Motor Force Constant [1]		19.9 N/A			
Continuous Force [1]		87 N			
Peak Force [1]		298 N			
Motor Back EMF [1]		16 V/m/sec			
Motor Resistance [1] (phase-to-phase)		3.6 Ω			
Motor Inductance [1] (phase-to-phase)		1.2 mH			
Maximum Velocity [2] (Unloaded)		2 m/sec			
Maximum Acceleration [2] (Unloaded)	Bridge Axis	2 g			
	Gantry Axis	1.5 g		1.2 g	
Maximum Payload [3]		25 kg			
Accuracy [4]		< +/- 0.5 µm			
Repeatability		< +/- 0.08 µm			
Encoder Resolution		1 nm			
Straightness [4]		< +/- 10 nm / 10mm			
		< +/- 0.5 µm		< +/- 1.0 µm	
Flatness		< +/- 10 nm / 10mm			
		< +/- 0.5 µm	< +/- 1.0 µm	< +/- 1.5 µm	< +/- 2.5 µm
Pitch		< 3 arc-sec	< 4 arc-sec	< 6 arc-sec	< 8 arc-sec
Yaw [4]		< 1 arc-sec		< 1.5 arc-sec	
XY Orthogonality		< 5 arc-sec			
Stage Mass		610 kg	700 kg	1075 kg	1525 kg
Moving Mass	Bridge Axis	14 kg			
	Gantry Axis	40 kg		43 kg	
Cabling		Flat flex moving loops, cleanroom-grade			
Operating Pressure [5]		552 kPa (80 psi)			
Air Consumption		< 56 liters/min (2 SCFM) if used with external vacuum supply < 100 liters/min (3.2 SCFM) if used with self-generated vacuum supply			
Vacuum		560mm (22 inches) of mercury, < 14 liters/min (0.5 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 and Nickel-plated Steel with SS Fasteners Granite Base			

1. Motor specs are per coil. Note there are 2x coils on the gantry axis.
2. Maximum velocity and acceleration based on stage capability, may be limited by payload, isolation system, or controller/drive performance.
3. Assumes payload CG is centered no more than 50mm above the stage moving table.
4. Values shown obtained using controller-based error compensation. Stage must be purchased with controller. Accuracy values assume short-term time duration and do not consider the long-term effects of thermal drift on the stage.
5. To protect stage from damage, an under-pressure air sensor tied to the controller E-stop input is recommended.
6. All specifications are per axis unless noted otherwise.



Model A-322.Bxx, in mm

Model	A	B	C	D	E	F	G	H	J
A-322.Axx	960	960	384	480	175	200	182	175	175
A-322.Bxx	1110	960	459	480	250	275	182	175	175
A-322.Cxx	1110	1110	459	555	250	275	257	250	250
A-322.Dxx	1610	1110	709	555	500	525	257	250	250

Model	Travel (X-Axis x Y-Axis)	Encoder	Motor Wiring
A-322	A = 350 mm x 350 mm	B = 1nm resolution absolute, high accuracy, BiSS-C serial output	1 = Standard motor option, 48 VDC buss
	B = 350 mm x 500 mm		
	C = 500 mm x 500 mm		
	D = 500 mm x 1000 mm		

A - 322 . x x x

- Model
- Travel
- Encoder
- Motor

Ordering Example

Part# A-322.BB1 is a

Model: A-322 (Plglide HS planar motorized XY air bearing stage)
Travel: B (350 mm x 500 mm
Encoder: B (1 nm absolute BiSS-C)
Motor Wiring: 1 (48 VDC)