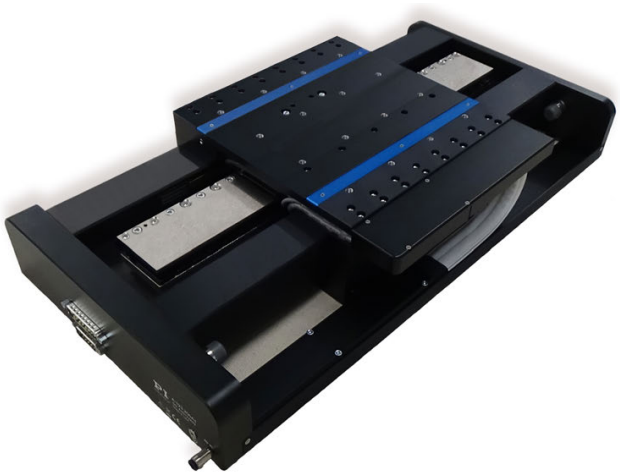
Plglide AT3 Linear Air Bearing Stage

HIGH PERFORMANCE NANOPOSITIONING STAGE



A-123 Series

- Ideal for scanning or ultra-precise positioning
- Cleanroom compatible
- Customizable
- Table size 210 mm x 210 mm
- Travel lengths 50 mm to 750 mm
- 35 kg max payload
- Non-contact fully preloaded air bearings
- Ironless cog-free linear motor
- Integral optical linear encoder
- Resolutions to 1nm
- Velocity to 1 m/sec
- Acceleration to 3 g
- Maintenance-free

Overview

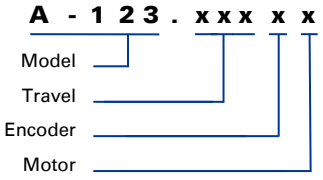
The Plglide AT3 series of stages are linear servo motor driven with fully preloaded air bearings and an integral optical linear encoder. The combination of these non-contact components results in a frictionless motion platform that offers the highest performance, quality, and life. These stages are ideally suited for many high precision applications, such as metrology, photonics alignment, semiconductor inspection, flat panel display, laser machining, and precision scanning applications. The non-contact design also makes these stages ideal for cleanroom applications. A high-force linear motor can drive the stage to top speed within a few milliseconds, and the large capacity bearings can support payloads up to 35 kg. The laterally opposed, actively preloaded air bearing design in this model will support normal, vertical, and side-mounted orientations.

Accessories and Options

- Multiple encoder options
- Air preparation kits
- Single or multi-axis motion controllers and servo drives
- XY stacks and custom configurations with precision alignment
- Cable track variations
- Counterbalance options for vertical (Z) orientations
- Customizations available
- Granite bases and vibration isolation systems

Model	A-123.050	A-123.100	A-123.150	A-123.200	A-123.350	A-123.500	A-123.750
Travel	50 mm	100 mm	150 mm	200 mm	350 mm	500 mm	750 mm
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	19.9 N/A						
Continuous Force	87.5 N						
Peak Force	298 N						
Motor Back EMF	16 V/m/sec						
Motor Resistance (phase-to-phase)	3.6 Ohms						
Motor Inductance (phase-to-phase)	1.2 mH						
Maximum Velocity (1)	1 m/sec						
Maximum Acceleration (1) (Unloaded)	3 g						
Maximum Payload (2)	35 kg normal, 25 kg lateral						
Accuracy (3) (uncompensated)	+/-1.0 µm	+/-1.0 µm	+/-1.5 µm	+/-2.0 µm	+/-3.0 µm	+/-3.5 µm	+/-5.0 µm
Accuracy (3) (with error compensation)	+/-0.5 µm				+/- 1.0 µm		+/- 1.5 µm
Repeatability (4)	+/-0.25 µm				+/-0.5 µm		+/-0.75 µm
Encoder Resolution (4)	up to 1 nm (see encoder options table)						
Straightness & Flatness (5)	< 0.1 µm / 25 mm						
	< 1 µm TIR			< 2 µm TIR	< 3 µm TIR		< 5 µm TIR
Pitch & Yaw TIR (5)	1 arc-sec	2 arc-sec	3 arc-sec	3 arc-sec	4 arc-sec	5 arc-sec	7 arc-sec
Stage Mass	14 kg	15.5 kg	16.5 kg	18 kg	21.5 kg	25 kg	32 kg
Moving Mass	5 kg						
Cabling	External, moving loop						
Operating Pressure (6)	80 (+/-5) psi (550 +/-35 kPa)						
Air Consumption	< 1.0 SCFM (28 SLPM)						
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 / SS Fasteners						

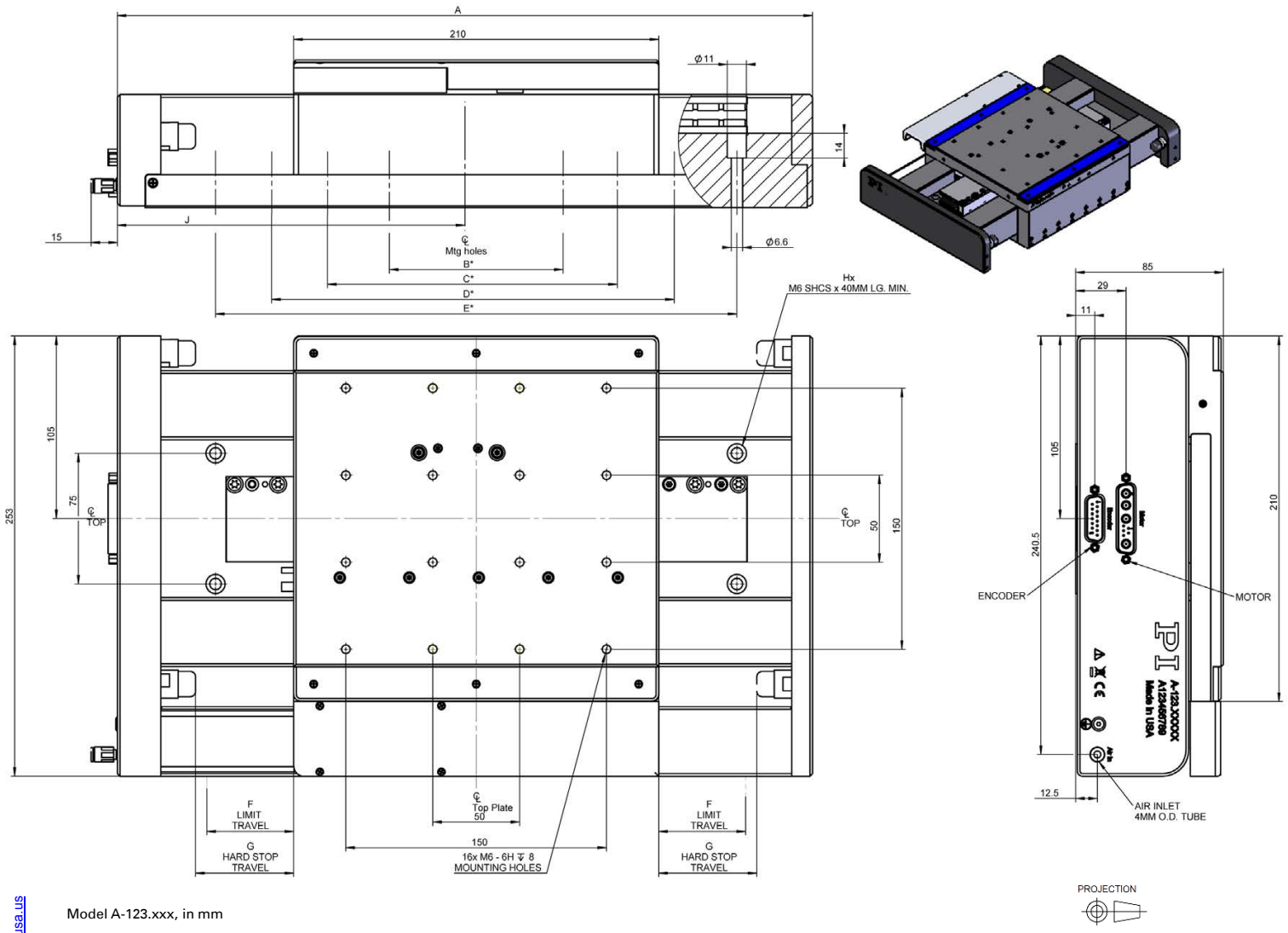
1. Maximum velocity and acceleration based on unloaded stage capability, may be limited by payload, controller, or drive performance.
2. Assumes payload CG is centered no more than 50mm above the stage table.
3. Improved accuracy can be obtained with controller-based error compensation. Specs listed 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.



Model	Travel	Encoder (1)	Motor Wiring
A-123	050 = 50mm	A = 20µm grating pitch incremental, sine (1 Vp-p) output	1 = Standard motor, 48 VDC buss
	100 = 100mm	B = 1nm resolution absolute, BiSS-C serial output	
	150 = 150mm	C = 50nm resolution incremental, A-quad-B (TTL) output	
	200 = 200mm		
	350 = 350mm		
	500 = 500mm		
	750 = 750mm		

1. Alternate TTL encoder resolutions are available on request.

Ordering Example
Part# A-123.200C1 is a
Model: A-123 (Plglide AT3 linear motorized air bearing stage)
Travel: 200 mm
Encoder: C (50 nm resolution incremental A-quad-B(TTL) output)
Motor Wiring: 1 (48 VDC)



Model A-123.xxx, in mm

Model	A	B*	C*	D*	E*	F	G	H	J
A-123.050	350	–	–	–	250	25	31.5	4	181.5
A-123.100	400	100	–	–	300	50	56.5	8	206.5
A-123.150	450	100	–	–	350	75	81.5	8	231.5
A-123.200	500	100	–	–	400	100	106.5	8	265.5
A-123.350	650	100	325	–	550	175	181.5	12	331.5
A-123.500	800	100	300	500	700	250	256.5	16	406.5
A-123.750	1050	100	400	700	1000	375	381.5	16	531.5

*Mounting holes symmetric about ℄ located at "J"