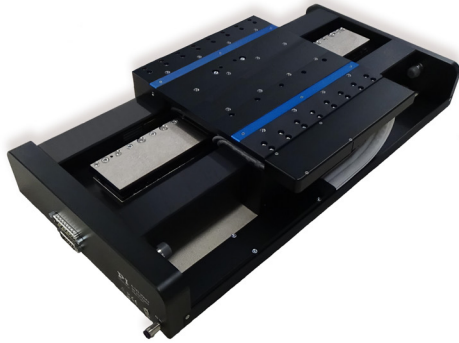


PIglide AT3 Linear Stage with Air Bearings

High Performance Nanopositioning Stage



A-123

- Ideal for scanning applications or high-precision positioning
- Cleanroom compatible
- Size of the motion platform 210 mm × 210 mm
- Travel ranges 50 mm to 750 mm
- Resolution to 1 nm

Product overview

The stages in the PIglide are equipped with a servo drive linear motor with preloaded air bearings and integrated linear encoder. The combination of these noncontact components results in a frictionless motion platform that offers the highest performance, quality, and lifetime.

A high-force linear motor can drive the stage to top speed within a few milliseconds, and the high-capacity bearings can support payloads up to 60 kg. The laterally opposed, actively preloaded air bearing design in this model allows mounting in any orientation.

Accessories and options

- Encoder
- PIglide filter and air preparation kits
- Single and multi-axis motion controller
- XY setups and individual configurations
- Cable track variations
- Options with counterweight for vertical (Z) orientation
- Customizations available
- Base plates made of granite and systems for reducing vibration

Application fields

PIglide positioning systems are ideally suited for many high-precision applications such as metrology, photonics, and precision scanning in semiconductor or flat panel display manufacturing.

Thanks to the friction-free motion, no particles are formed, which makes PIglide stages ideal for cleanroom applications.

Specifications

Motion	A-123.050	A-123.100	A-123.150	A-123.200	A-123.350	A-123.500	A-123.750	Unit	Tolerance
Active axes	X	X	X	X	X	X	X		
Travel range	50	100	150	200	350	500	750	mm	
Pitch / yaw ⁽¹⁾	5	10	15	15	20	25	35	µrad	max.
Straightness / flatness ⁽¹⁾	1	1	1	1.5	2	2.5	3	µm	max.
Straightness / flatness per 25 mm travel range ⁽¹⁾	0.1	0.1	0.1	0.1	0.1	0.1	0.1	µm	max.
Velocity, unloaded ⁽²⁾	1	1	1	1	1	1	1	m/s	max.
Acceleration, unloaded ⁽²⁾	30	30	30	30	30	30	30	m/s ²	max.

Mechanical properties	A-123.050	A-123.100	A-123.150	A-123.200	A-123.350	A-123.500	A-123.750	Unit	Tolerance
Load capacity in z ^(3, 7)	410	410	410	410	410	410	410	N	max.
Load capacity in y ^(3, 7)	295	295	295	295	295	295	295	N	max.
Permissible torque in θ_x ⁽⁷⁾	30	30	30	30	30	30	30	Nm	max.
Permissible torque in θ_y ⁽⁷⁾	12	12	12	12	12	12	12	Nm	max.
Moved mass	5	5	5	5	5	5	5	kg	
Overall mass	14	15.5	16.5	18	21.5	25	32	kg	
Guide type	air bearing	air bearing	air bearing	air bearing	air bearing	air bearing	air bearing		

Drive properties	A-123	Unit	Tolerance
Drive type	Ironless 3-phase linear motor		
Intermediate circuit voltage, RMS	48, nominal 80, max.	V DC	
Peak force	298	N	typ.
Nominal force	87.5	N	typ.
Force constant, RMS	19.9	N/A	typ.
Resistance phase-phase	3.6	Ω	typ.
Inductance phase-phase	1.2	mH	typ.
Back EMF phase-phase	16	V·s/m	max.
Cabling	External, moving cable		

Positioning	A-123.xxxA	A-123.xxxB
Integrated sensor	Incremental linear encoder	Absolute encoder
Sensor signal	Sin/cos, 1 V peak-peak, 20 µm signal period	BiSS-C
Sensor resolution	1.2 nm ⁽⁴⁾	1 nm
Bidirectional repeatability	A-123.050: ± 0.15 µm ⁽⁴⁾ A-123.100: ± 0.15 µm ⁽⁴⁾ A-123.150: ± 0.15 µm ⁽⁴⁾ A-123.200: ± 0.15 µm ⁽⁴⁾	A-123.050: ± 0.15 µm A-123.100: ± 0.15 µm A-123.150: ± 0.15 µm A-123.200: ± 0.15 µm A-123.350: ± 0.2 µm

Positioning	A-123.xxxA	A-123.xxxB
	A-123.350: $\pm 0.2 \mu\text{m}$ ⁽⁴⁾ A-123.500: $\pm 0.2 \mu\text{m}$ ⁽⁴⁾ A-123.750: $\pm 0.5 \mu\text{m}$ ⁽⁴⁾	A-123.500: $\pm 0.2 \mu\text{m}$ A-123.750: $\pm 0.5 \mu\text{m}$
Positioning accuracy, uncalibrated ⁽⁵⁾	A-123.050: $\pm 1 \mu\text{m}$ A-123.100: $\pm 1 \mu\text{m}$ A-123.150: $\pm 1.5 \mu\text{m}$ A-123.200: $\pm 2 \mu\text{m}$ A-123.350: $\pm 3 \mu\text{m}$ A-123.500: $\pm 3.5 \mu\text{m}$ A-123.750: $\pm 5 \mu\text{m}$	A-123.050: $\pm 1.5 \mu\text{m}$ A-123.100: $\pm 1.5 \mu\text{m}$ A-123.150: $\pm 1.5 \mu\text{m}$ A-123.200: $\pm 1.5 \mu\text{m}$ A-123.350: $\pm 1.5 \mu\text{m}$ A-123.500: $\pm 1.5 \mu\text{m}$ A-123.750: $\pm 1.5 \mu\text{m}$
Positioning accuracy, calibrated ⁽⁵⁾	A-123.050: $\pm 0.3 \mu\text{m}$ A-123.100: $\pm 0.3 \mu\text{m}$ A-123.150: $\pm 0.3 \mu\text{m}$ A-123.200: $\pm 0.3 \mu\text{m}$ A-123.350: $\pm 0.3 \mu\text{m}$ A-123.500: $\pm 0.5 \mu\text{m}$ A-123.750: $\pm 0.5 \mu\text{m}$	A-123.050: $\pm 0.3 \mu\text{m}$ A-123.100: $\pm 0.3 \mu\text{m}$ A-123.150: $\pm 0.3 \mu\text{m}$ A-123.200: $\pm 0.3 \mu\text{m}$ A-123.350: $\pm 0.3 \mu\text{m}$ A-123.500: $\pm 0.5 \mu\text{m}$ A-123.750: $\pm 0.5 \mu\text{m}$
Miscellaneous	A-123	
Operating pressure ⁽⁶⁾	75 to 85 psi (515 to 585 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	
Materials	Hardcoat aluminum, stainless steel mounting hardware	

⁽¹⁾ Dependent on the flatness of the surface, on which the stage is mounted.

⁽²⁾ Can be limited by the payload, controller or drive.

⁽³⁾ Assumes payload center of gravity is centered no more than 50 mm above the motion platform.

⁽⁴⁾ Assumes 16384x interpolation. Contact PI for the use of other factors.

⁽⁵⁾ Improved accuracy can be obtained with controller-based error compensation. The stage must be ordered with a controller from PI to reach these values.

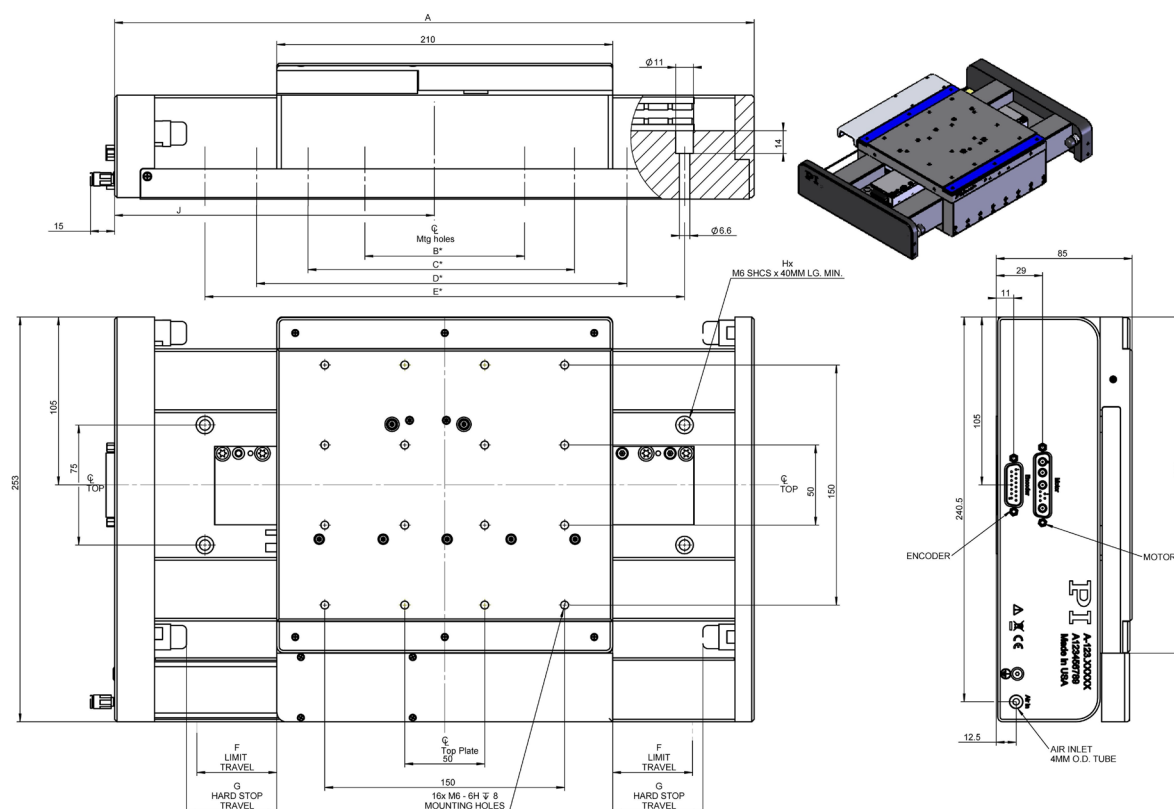
Accuracy values assume short duration and do not consider the long-term effects of thermal drift on the stage.

⁽⁶⁾ To protect the stage against damage, it is recommended to connect an air pressure sensor to the Motion-Stop input of the controller.

⁽⁷⁾ Assumes an air bearing operating pressure of 80 psi (550 kPa).

Ask about customized versions.

Drawings / Images



MODEL	A	B*	C*	D*	E*	F	G	Hx	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	256.5
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

A-123, dimensions in mm. * The mounting holes are symmetric around the center line located at "J".

Ordering Information

A-123.050A1

Piglide AT3 linear stage, air bearing, 50 mm travel range, incremental linear encoder with sin/cos signal transmission, 20 μ m sensor signal period, ironless 3-phase linear motor, 48 V

A-123.050B1

Piglide AT3 linear stage, air bearing, 50 mm travel range, absolute linear encoder with BiSS-C signal transmission, 1 nm sensor resolution, ironless 3-phase linear motor, 48 V

A-123.100A1

Piglide AT3 linear stage, air bearing, 100 mm travel range, incremental linear encoder with sin/cos signal transmission, 20 μ m sensor signal period, ironless 3-phase linear motor, 48 V

A-123.100B1

Piglide AT3 linear stage, air bearing, 100 mm travel range, absolute linear encoder with BiSS-C signal transmission, 1 nm sensor resolution, ironless 3-phase linear motor, 48 V

A-123.150A1

Piglide AT3 linear stage, air bearing, 150 mm travel range, incremental linear encoder with sin/cos signal transmission, 20 μ m sensor signal period, ironless 3-phase linear motor, 48 V

A-123.150B1

PIglide AT3 linear stage, air bearing, 150 mm travel range, absolute linear encoder with BiSS-C signal transmission, 1 nm sensor resolution, ironless 3-phase linear motor, 48 V

A-123.200A1

PIglide AT3 linear stage, air bearing, 200 mm travel range, incremental linear encoder with sin/cos signal transmission, 20 µm sensor signal period, ironless 3-phase linear motor, 48 V

A-123.200B1

PIglide AT3 linear stage, air bearing, 200 mm travel range, absolute linear encoder with BiSS-C signal transmission, 1 nm sensor resolution, ironless 3-phase linear motor, 48 V

A-123.350A1

PIglide AT3 linear stage, air bearing, 350 mm travel range, incremental linear encoder with sin/cos signal transmission, 20 µm sensor signal period, ironless 3-phase linear motor, 48 V

A-123.350B1

PIglide AT3 linear stage, air bearing, 350 mm travel range, absolute linear encoder with BiSS-C signal transmission, 1 nm sensor resolution, ironless 3-phase linear motor, 48 V

A-123.500A1

PIglide AT3 linear stage, air bearing, 500 mm travel range, incremental linear encoder with sin/cos signal transmission, 20 µm sensor signal period, ironless 3-phase linear motor, 48 V

A-123.500B1

PIglide AT3 linear stage, air bearing, 500 mm travel range, absolute linear encoder with BiSS-C signal transmission, 1 nm sensor resolution, ironless 3-phase linear motor, 48 V

A-123.750A1

PIglide AT3 linear stage, air bearing, 750 mm travel range, incremental linear encoder with sin/cos signal transmission, 20 µm sensor signal period, ironless 3-phase linear motor, 48 V

A-123.750B1

PIglide AT3 linear stage, air bearing, 750 mm travel range, absolute linear encoder with BiSS-C signal transmission, 1 nm sensor resolution, ironless 3-phase linear motor, 48 V