

PIglide LC Linear Stage with Air Bearings

Inexpensive High Performance Nanopositioning Stage



A-110

- Ideal for scanning applications or high-precision positioning
- Cleanroom compatible
- Size of the motion platform 160 mm × 200 mm
- Travel ranges to 400 mm
- Load capacity to 100 N

Product overview

PIglide positioning systems have a magnetic linear motor, magnetically preloaded air bearings and an optical linear encoder: Noncontact and friction-free motion for the highest accuracy and reliability

Accessories and options

- Encoder
- PIglide Filter and Air Preparation Kits
- Single and multi-axis motion controller
- XY setups and individual configurations
- 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-110.050xx	A-110.100xx	A-110.200xx	A-110.300xx	A-110.400xx	Unit	Tolerance
Active axes	X	X	X	X	X		
Travel range	50	100	200	300	400	mm	
Pitch / yaw ⁽¹⁾	15	15	20	30	40	μrad	max.
Straightness / flatness ⁽¹⁾	0.5	0.5	1	1	1.5	μm	max.
Straightness / flatness per 10 mm travel range ⁽¹⁾	±10	±10	±10	±10	±10	nm	max.
Velocity, unloaded ⁽²⁾	0.5	0.5	1	1	1	m/s	max.
Acceleration, unloaded ⁽²⁾	10	10	30	30	30	m/s ²	max.

Mechanical properties	A-110.050xx	A-110.100xx	A-110.200xx	A-110.300xx	A-110.400xx	Unit	Tolerance
Load capacity in z ⁽³⁾	100	100	100	100	100	N	max.
Moved mass	2.5	2.5	2.6	2.6	2.6	kg	
Overall mass	6.3	7.5	11	12	14	kg	
Guide type	air bearing	air bearing	air bearing	air bearing	air bearing		

Drive properties	A-110.050xx A-110.100xx	A-110.200xx A-110.300xx A-110.400xx	Unit	Tolerance
Drive type	Ironless 3-phase linear motor	Ironless 3-phase linear motor		
Intermediate circuit voltage, RMS	48, nominal 60, max.	48, nominal 60, max.	V DC	
Peak force	25	85	N	typ.
Nominal force	9.2	39	N	typ.
Force constant, RMS	4.2	12.3	N/A	typ.
Resistance phase-phase	8.2	3.6	Ω	typ.
Inductance phase-phase	2.7	1.24	mH	typ.
Back EMF phase-phase	4.2	10.1	V·s/m	max.
Cabling	Internal, no moving cable	External, moving cable		

Positioning	A-110.xxxA	A-110.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	$\pm 0.1 \mu\text{m}$ ⁽⁴⁾	$\pm 0.1 \mu\text{m}$
Positioning accuracy, uncalibrated ⁽⁵⁾	A-110.050: $\pm 1.5 \mu\text{m}$ A-110.100: $\pm 1.5 \mu\text{m}$ A-110.200: $\pm 2 \mu\text{m}$ A-110.300: $\pm 3 \mu\text{m}$ A-110.400: $\pm 4 \mu\text{m}$	A-110.050: $\pm 1.5 \mu\text{m}$ A-110.100: $\pm 1.5 \mu\text{m}$ A-110.200: $\pm 1.5 \mu\text{m}$ A-110.300: $\pm 1.5 \mu\text{m}$ A-110.400: $\pm 1.5 \mu\text{m}$
Positioning accuracy, calibrated ⁽⁵⁾	A-110.050: $\pm 0.5 \mu\text{m}$ A-110.100: $\pm 0.5 \mu\text{m}$ A-110.200: $\pm 0.5 \mu\text{m}$ A-110.300: $\pm 0.5 \mu\text{m}$ A-110.400: $\pm 0.5 \mu\text{m}$	A-110.050: $\pm 0.5 \mu\text{m}$ A-110.100: $\pm 0.5 \mu\text{m}$ A-110.200: $\pm 0.5 \mu\text{m}$ A-110.300: $\pm 0.5 \mu\text{m}$ A-110.400: $\pm 0.5 \mu\text{m}$

Miscellaneous	A-110
Operating pressure ⁽⁶⁾	60 to 70 psi (415 to 485 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 CG is centered no more than 50 mm above the motion platform. The stage is designed for horizontal operation only.

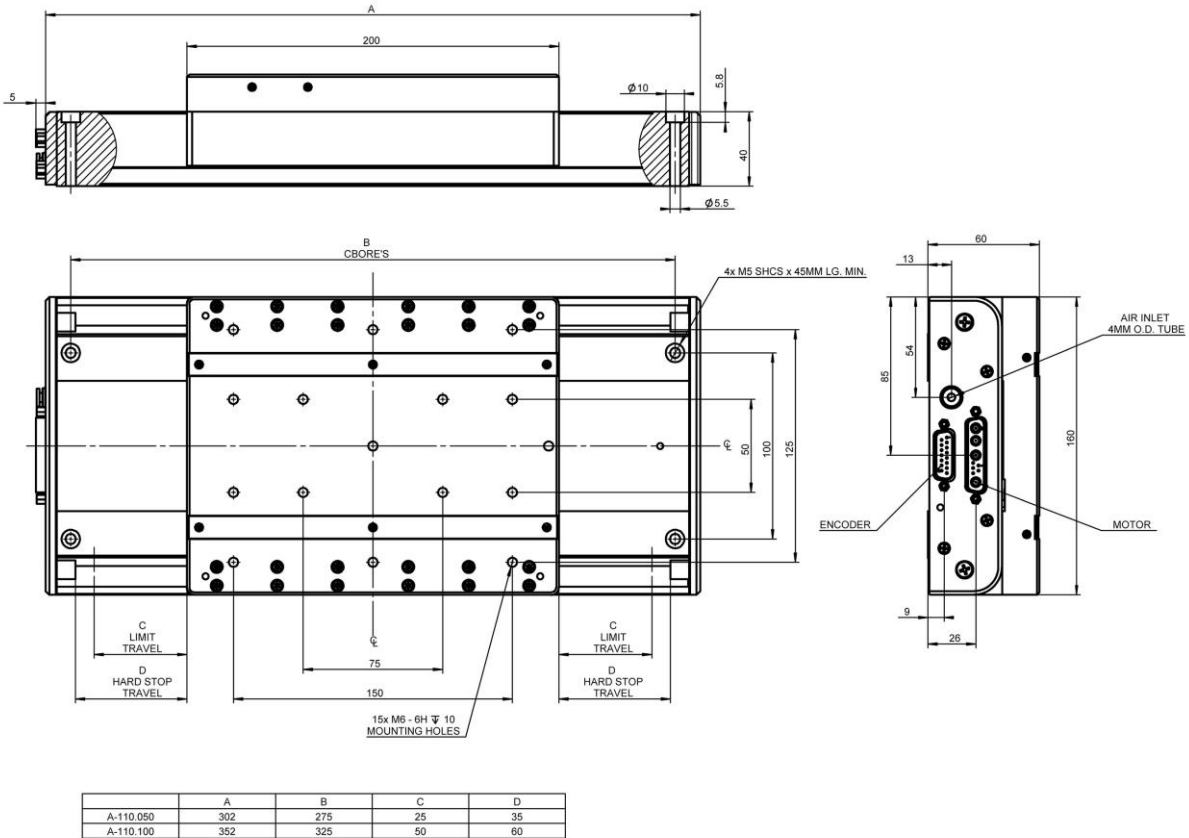
⁽⁴⁾ Assumes 16384x interpolation. Contact PI for the use of other factors.

⁽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-term duration and do not consider the long-term effects of thermal drift on the stage.

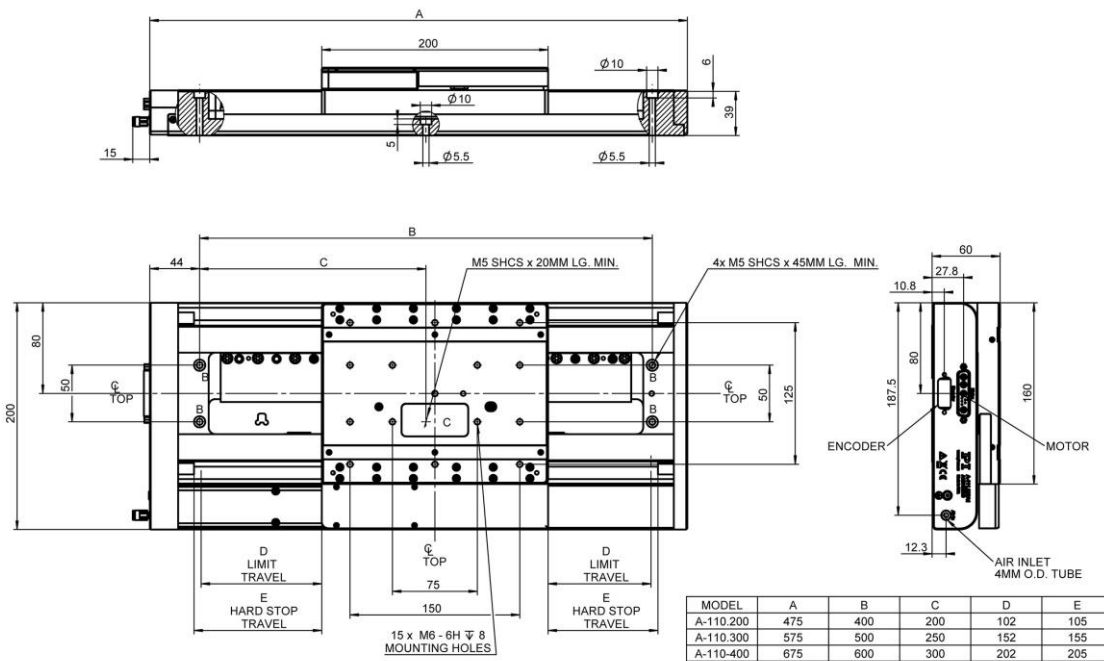
⁽⁶⁾ To protect the stage against damage, it is recommended to connect an air pressure sensor to the Motion-Stop input of the controller.

Ask about customized versions.

Drawings / Images



A-110.050 and A-110.100, dimensions in mm



A-110.200, A-110.300, and A-110.400, dimensions in mm

Ordering Information

A-110.050A1

PIglide LC linear stage, air bearing, 50 mm travel range, incremental linear encoder with sin/cos signal transmission, 20 µm sensor signal period, ironless 3-phase linear motor, 48 V

A-110.050B1

PIglide LC 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-110.100A1

PIglide LC linear stage, air bearing, 100 mm travel range, incremental linear encoder with sin/cos signal transmission, 20 µm sensor signal period, ironless 3-phase linear motor, 48 V

A-110.100B1

PIglide LC 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-110.200A1

PIglide LC 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-110.200B1

PIglide LC 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-110.300A1

PIglide LC linear stage, air bearing, 300 mm travel range, incremental linear encoder with sin/cos signal transmission, 20 µm sensor signal period, ironless 3-phase linear motor, 48 V

A-110.300B1

PIglide LC linear stage, air bearing, 300 mm travel range, absolute linear encoder with BiSS-C signal transmission, 1 nm sensor resolution, ironless 3-phase linear motor, 48 V

A-110.400A1

PIglide LC linear stage, air bearing, 400 mm travel range, incremental linear encoder with sin/cos signal transmission, 20 µm sensor signal period, ironless 3-phase linear motor, 48 V

A-110.400B1

PIglide LC linear stage, air bearing, 400 mm travel range, absolute linear encoder with BiSS-C signal transmission, 1 nm sensor resolution, ironless 3-phase linear motor, 48 V