PIglide LC Linear Stage with Air Bearings

High-Performance Nanopositioning System for a Good Price

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)	10	20	30	40	50	µrad	max.
Straightness / flatness (1)	±1	±1	±1.5	±2	±2.5	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/s²	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		

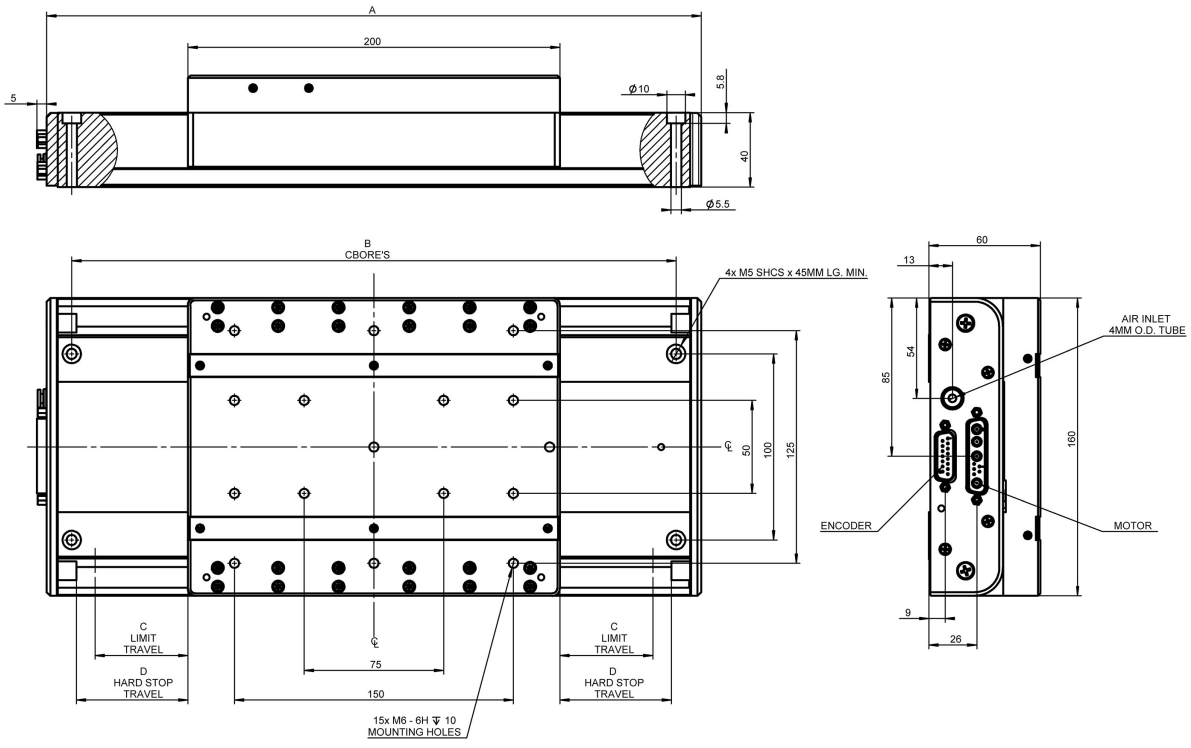
Drive properties	A-110.050xx A-110.100xx	A-110.200xx A-110.300xx A-110.400xx	Unit	Tolerance
Drive type	Linear motor, ironless, 3-phase	Linear motor, ironless, 3-phase		
Intermediate circuit voltage, effective	48, nominal 60, max.	48, nominal 60, max.	V DC	
Peak force	25	85	N	typ.
Nominal force	9.2	39	N	typ.
Force constant, effective	4.2	12.3	N/A	typ.
Resistance phase-phase	8.2	3.6	Ω	typ.
Inductivity 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	A-110.xxxC
Integrated Sensor	Incremental linear encoder	Absolute encoder	Incremental linear encoder
Sensor signal	Sin/cos, 1 V peak-peak, 20 µm signal period	BiSS-C	A/B quadrature, TTL
Sensor resolution	1.2 nm (4)	1 nm	50 nm
Bidirectional repeatability	±0.5 µm (4)	±0.5 µm	±0.5 µm
Accuracy, uncompensated (5)	A-110.050: ± 1 µm A-110.100: ± 1.5 µm A-110.200: ± 2 µm A-110.300: ± 3 µm A-110.400: ± 4 µm	A-110.050: ± 1.5 µm A-110.100: ± 1.5 µm A-110.200: ± 1.5 µm A-110.300: ± 1.5 µm A-110.400: ± 1.5 µm	A-110.050: ± 1 µm A-110.100: ± 1.5 µm A-110.200: ± 2 µm A-110.300: ± 3 µm A-110.400: ± 4 µm
Accuracy, with error compensation (5)	A-110.050: ± 1 µm A-110.100: ± 1 µm A-110.200: ± 1 µm A-110.300: ± 1.5 µm A-110.400: ± 1.5 µm	A-110.050: ± 0.5 µm A-110.100: ± 0.5 µm A-110.200: ± 0.5 µm A-110.300: ± 0.5 µm A-110.400: ± 0.5 µm	A-110.050: ± 1 µm A-110.100: ± 1 µm A-110.200: ± 1 µm A-110.300: ± 1.5 µm A-110.400: ± 1.5 µm

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 fasteners

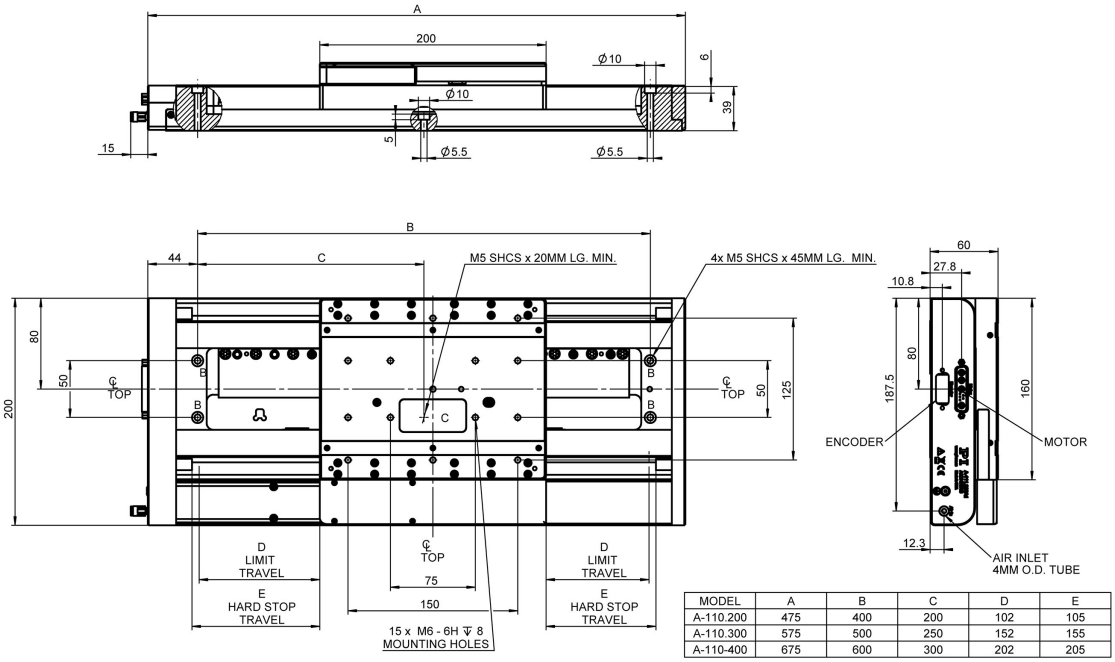
[1] Dependent on the flatness of the surface, on which the stage is mounted.
[2] Can be limited by the payload, controller or drive.
[3] Assumes payload CG is centered no more than 50 mm above the motion platform. The stage is designed for horizontal operation only.
[4] Assumes 16384x interpolation. 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.

Drawings and images



	A	B	C	D
A-110.050	302	275	25	35
A-110.100	352	325	50	60

A-110.050 and A-110.100, dimensions in mm



MODEL	A	B	C	D	E
A-110.200	475	400	200	102	105
A-110.300	575	500	250	152	155
A-110-400	675	600	300	202	205

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

Ordering Information

50 mm travel range

A-110.050A1
PIglide LC Linear Stage, Air Bearing, 50 mm Travel Range, Linear Encoder with Sin/Cos Signal Transmission, 20 µm Signal Period, 3-Phase Linear Motor, 48 V

A-110.050B1
PIglide LC Linear Stage, Air Bearing, 50 mm Travel Range, Absolute Encoder, 1 nm Sensor Resolution, 3-Phase Linear Motor, 48 V

A-110.050C1
PIglide LC Linear Stage, Air Bearing, 50 mm Travel Range, Linear Encoder with A/B Quadrature Signal Transmission, 50 nm Sensor Resolution, 3-Phase Linear Motor, 48 V

100 mm travel range

A-110.100A1
PIglide LC Linear Stage, Air Bearing, 100 mm Travel Range, Linear Encoder with Sin/Cos Signal Transmission, 20 µm Signal Period, 3-Phase Linear Motor, 48 V

A-110.100B1
PIglide LC Linear Stage, Air Bearing, 100 mm Travel Range, Absolute Encoder, 1 nm Sensor Resolution, 3-Phase Linear Motor, 48 V

A-110.100C1
PIglide LC Linear Stage, Air Bearing, 100 mm Travel Range, Linear Encoder with A/B Quadrature Signal Transmission, 50 nm Sensor Resolution, 3-Phase Linear Motor, 48 V

200 mm travel range

A-110.200A1
PIglide LC Linear Stage, Air Bearing, 200 mm Travel Range, Linear Encoder with Sin/Cos Signal Transmission, 20 µm Signal Period, 3-Phase Linear Motor, 48 V

A-110.200B1
PIglide LC Linear Stage, Air Bearing, 200 mm Travel Range, Absolute Encoder, 1 nm Sensor Resolution, 3-Phase Linear Motor, 48 V

A-110.200C1
PIglide LC Linear Stage, Air Bearing, 200 mm Travel Range, Linear Encoder with A/B Quadrature Signal Transmission, 50 nm Sensor Resolution, 3-Phase Linear Motor, 48 V

300 mm travel range

A-110.300A1
PIglide LC Linear Stage, Air Bearing, 300 mm Travel Range, Linear Encoder with Sin/Cos Signal Transmission, 20 µm Signal Period, 3-Phase Linear Motor, 48 V

A-110.300B1
PIglide LC Linear Stage, Air Bearing, 300 mm Travel Range, Absolute Encoder, 1 nm Sensor Resolution, 3-Phase Linear Motor, 48 V

A-110.300C1
PIglide LC Linear Stage, Air Bearing, 300 mm Travel Range, Linear Encoder with A/B Quadrature Signal Transmission, 50 nm Sensor Resolution, 3-Phase Linear Motor, 48 V

400 mm travel range

A-110.400A1
PIglide LC Linear Stage, Air Bearing, 400 mm Travel Range, Linear Encoder with Sin/Cos Signal Transmission, 20 µm Signal Period, 3-Phase Linear Motor, 48 V

A-110.400B1
PIglide LC Linear Stage, Air Bearing, 400 mm Travel Range, Absolute Encoder, 1 nm Sensor Resolution, 3-Phase Linear Motor, 48 V

A-110.400C1
PIglide LC Linear Stage, Air Bearing, 400 mm Travel Range, Linear Encoder with A/B Quadrature Signal Transmission, 50 nm Sensor Resolution, 3-Phase Linear Motor, 48 V

Ask about custom designs!