

PIglide VC Voice Coil Linear Stage with Air Bearings

High-Performance Miniature Nanopositioning System



A-131

- Ideal for scanning applications or high-precision positioning
- Cleanroom compatible
- Travel ranges to 25 mm
- Load capacity to 100 N
- Acceleration to 80 m/s²

Product Overview

The PIglide stage with air bearing and voice coil drive offers high velocity and acceleration in a compact package. The contactless components of the motion platform ensure the highest performance, quality, and lifetime.

Voice Coil Drive Technology

Voice coil drives consist of 2 essential components: A permanent magnet and a coil, which is located in the air gap of the magnetic field. When current flows through the coil, it moves in the magnetic field of the permanent magnet. The direction of motion depends on the polarity. Thanks to their low weight and friction-free drive principle, voice coil drives are particularly suitable for applications, which require high dynamics and high velocities at limited travel ranges. High scan frequencies and precision positioning are also possible with these drives, because they are free of the effects of hysteresis.

Accessories and options

- Encoder
- Bellows for additional protection
- PIglide filter and air preparation kits
- Single and multi-axis motion controller

Application fields

High-speed scanning, applications in manufacturing.

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

Specifications

Motion	A-131	Unit	Tolerance
Active axes	X		
Travel range	25	mm	
Pitch ⁽¹⁾	10	μrad	max.
Yaw ⁽¹⁾	10	μrad	max.
Straightness / flatness ⁽¹⁾	±0.125	μm	max.
Velocity, unloaded ⁽²⁾	1	m/s	max.
Acceleration, unloaded ⁽²⁾	80	m/s ²	max.

Mechanical properties	A-131	Unit	Tolerance
Load capacity in z (3)	100	N	max.
Moved mass	0.85	kg	
Overall mass	3.6	kg	
Guide type	Air bearing		

Drive properties	A-131	Unit	Tolerance
Drive type	Brushless voice coil drive, ironless, 1 phase		
Intermediate circuit voltage, effective	48, nominal 80, max.	V DC	
Peak force	70.4	N	typ.
Nominal force	22.3	N	typ.
Force constant, effective	6.9	N/A	typ.
Resistance	2.7	Ω	typ.
Inductivity (at 1000 Hz)	1.4	mH	typ.
Back EMF	6.9	V·s/m	
Nominal power	28	W	max.
Cabling	Internal, no moving cable		

Positioning	A-131.025A1x	A-131.025D1x	A-131.025F1x
Integrated sensor	Incremental linear encoder	Incremental linear encoder	Incremental linear encoder
Sensor signal	Sin/cos, 1 V peak-peak, 20 μm signal period	A/B quadrature, TTL	A/B quadrature, TTL
Sensor resolution	1.2 nm (4)	100 nm (5)	500 nm (5)
Bidirectional repeatability	±0.1 μm (4)	±0.1 μm	±0.1 μm
Accuracy (6)	0.2 μm	0.2 μm	0.2 μm
Reference point switch	Home index	Home index	Home index
Reference point switch repeatability	+/- 1 encoder step	+/- 1 encoder step	+/- 1 encoder step

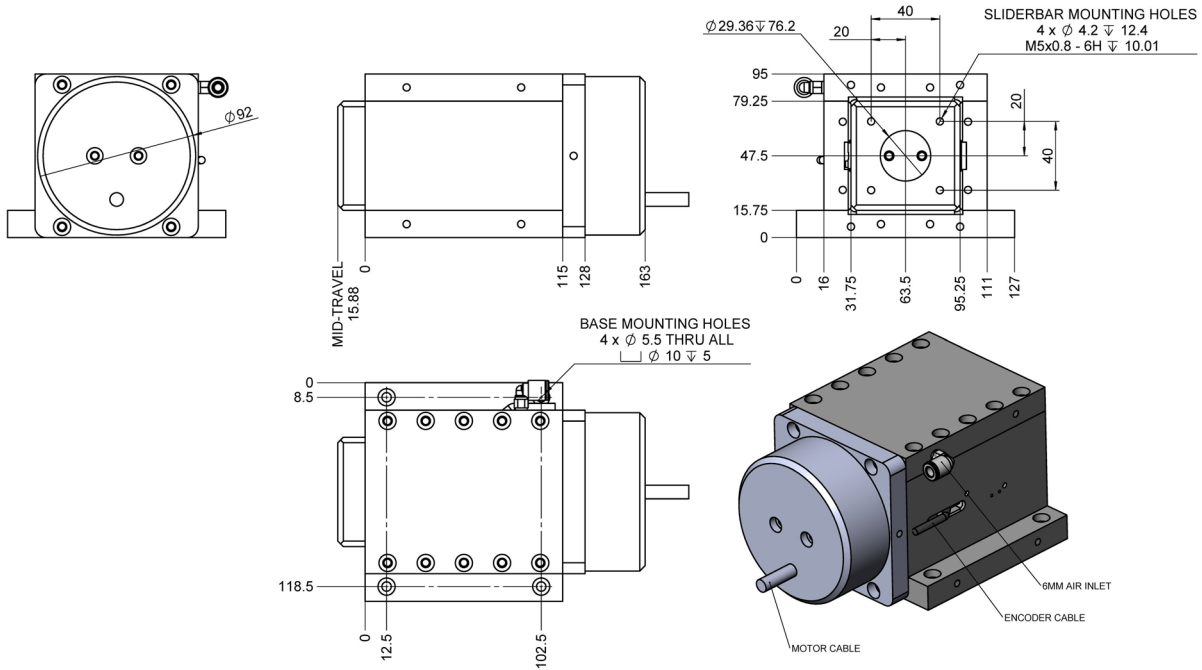
Miscellaneous	A-131
Operating pressure (7)	75 to 85 psi (520 to 585 kPa)
Air consumption	< 1.0 SCFM (28 SLPM)
Air quality	Clean (filtered to 1.0 μm or better) - ISO 8573-1 Class 1 Oil free - ISO 8573-1 Class 1 Dry (-15 °C dew point) - ISO 8573-1 Class 3
Materials	Hardcoat aluminum, stainless steel fasteners

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

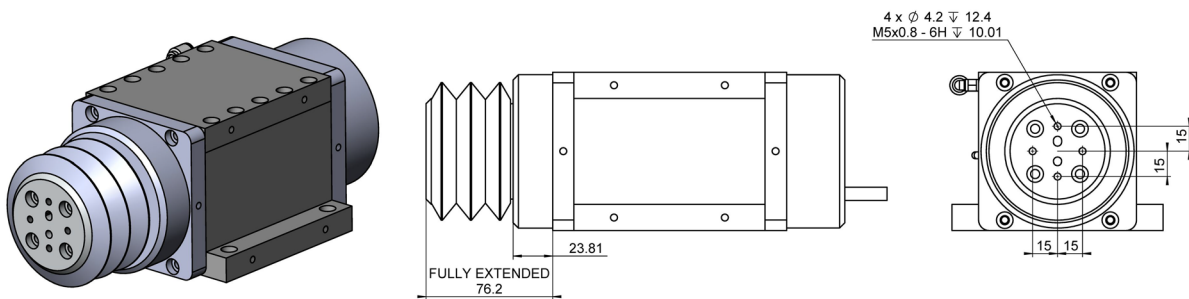
⁽²⁾ Can be limited by the payload, controller or drive.

- (3) Assumes that the center of gravity is centered no more than 50 mm from the motion platform.
- (4) Assumes 16384x interpolation. Contact PI for the use of other factors.
- (5) Alternative resolutions on request. Higher resolutions can limit the velocity.
- (6) Improved accuracy can be obtained with controller-based error compensation. The stage must be ordered with a controller from PI to reach these values.
- (7) 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-131.025xx, dimensions in mm



A-131.025xxB, dimensions in mm

Ordering Information

A-131.025A1

PIglide VC Linear Stage, Air Bearing, 25 mm Travel Range, Voice Coil, 48 V, Linear Encoder with Sin/Cos Signal Transmission, 20 µm Signal Period

A-131.025D1

PIglide VC Linear Stage, Air Bearing, 25 mm Travel Range, Voice Coil, 48 V, Linear Encoder with A/B Quadrature Signal Transmission, 100 nm Sensor Resolution

A-131.025F1

PIglide VC Linear Stage, Air Bearing, 25 mm Travel Range, Voice Coil, 48 V, Linear Encoder with A/B Quadrature Signal Transmission, 500 nm Sensor Resolution

With protective bellows

A-131.025A1B

PIglide VC Linear Stage, Air Bearing, 25 mm Travel Range, Voice Coil, 48 V, Linear Encoder with Sin/Cos Signal Transmission, 20 µm Signal Period, Bellows

A-131.025D1B

PIglide VC Linear Stage, Air Bearing, 25 mm Travel Range, Voice Coil, 48 V, Linear Encoder with A/B Quadrature Signal Transmission, 100 nm Sensor Resolution, Bellows

A-131.025F1B

PIglide VC Linear Stage, Air Bearing, 25 mm Travel Range, Voice Coil, 48 V, Linear Encoder with A/B Quadrature Signal Transmission, 500 nm Sensor Resolution, Bellows