

# 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 30 N
- Acceleration to 40 m/s<sup>2</sup>

#### 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 motors are direct drives. In direct drives, the force of the drive element is transmitted directly to the load to be moved without the use of mechanical transmission elements such as coupling, drive screw, or gearhead. Voice coil drives consist of a permanent magnet and a winding body that are located in the air gap of the magnetic field. When current flows through the winding body, it moves in the magnetic field of the permanent magnet. Thanks to their low weight and friction-free drive principle, voice coil drives are particularly suitable for applications that 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

- 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.

Motion	Unit	Tolerance	A-131.025A1
Active axes			X
Travel range in X	mm		25
Acceleration in X, unloaded	m/s <sup>2</sup>	Max.	40
Maximum velocity in X, unloaded	mm/s		1000
Straightness (Linear crosstalk in Y with motion in X)	µm	Max.	± 0.5
Flatness (Linear crosstalk in Z with motion in X)	µm	Max.	± 0.5
Pitch (Rotational crosstalk in θY with motion in X)	µrad	Max.	± 10
Yaw (Rotational crosstalk in θZ with motion in X)	µrad	Max.	± 10

Positioning	Unit	Tolerance	A-131.025A1
Integrated sensor			Incremental linear encoder
Bidirectional repeatability in X	μm	Typ.	± 0.1
Positioning accuracy in X, calibrated	μm	Typ.	± 0.25
Positioning accuracy in X, uncalibrated	μm	Typ.	± 2
Sensor signal			Sin/cos, 1 V peak-peak
Sensor resolution	nm		1.2
Sensor signal period	μm		20
Reference switch			Encoder index
Limit switches			Hall effect

Drive Properties	Unit	Tolerance	A-131.025A1
Drive type			Voice coil
Nominal voltage	V		48
Peak voltage	V		28
Nominal current, RMS	A	Typ.	3
Peak current, RMS	A	Typ.	10
Drive force in negative direction of motion in X	N	Typ.	22.3
Drive force in positive direction of motion in X	N	Typ.	22.3
Peak force in negative direction of motion in X	N		70.4
Peak force in positive direction of motion in X	N		70.4
Force constant	N/A		6.9
Resistance phase-phase	Ω	Typ.	2.7
Inductance phase-phase	mH		1.4
Back EMF	V-s/m	Max.	6.9

Mechanical Properties	Unit	Tolerance	A-131.025A1
Guide			Air bearing guide with air preload
Moved mass in X, unloaded	g		1630
Permissible push force in Z	N	Max.	30
Overall mass	g		3600
Material			Hardcoat aluminum, stainless steel mounting hardware

Miscellaneous	Unit	Tolerance	A-131.025A1
Connector			D-sub 9W4 (m)
Sensor connector			D-sub 15-pole (m)
Operating pressure	kPa		520 to 585
Air consumption	L/min	Max.	28
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
Recommended controllers / drivers			A-81x (1, 2, or 4 axes) A-82x (4, 6, or 8 axes)
Cable length	m		0.45
Operating temperature range	°C		15 to 25

Note on pitch, yaw, straightness, and flatness: Dependent on the flatness of the surface, on which the stage is mounted.

Note on velocity and acceleration: Can be limited by the payload, controller or drive.

Note on permissible push force in Z: Assumes that the load's center of gravity is centered no more than 50 mm from the motion platform.

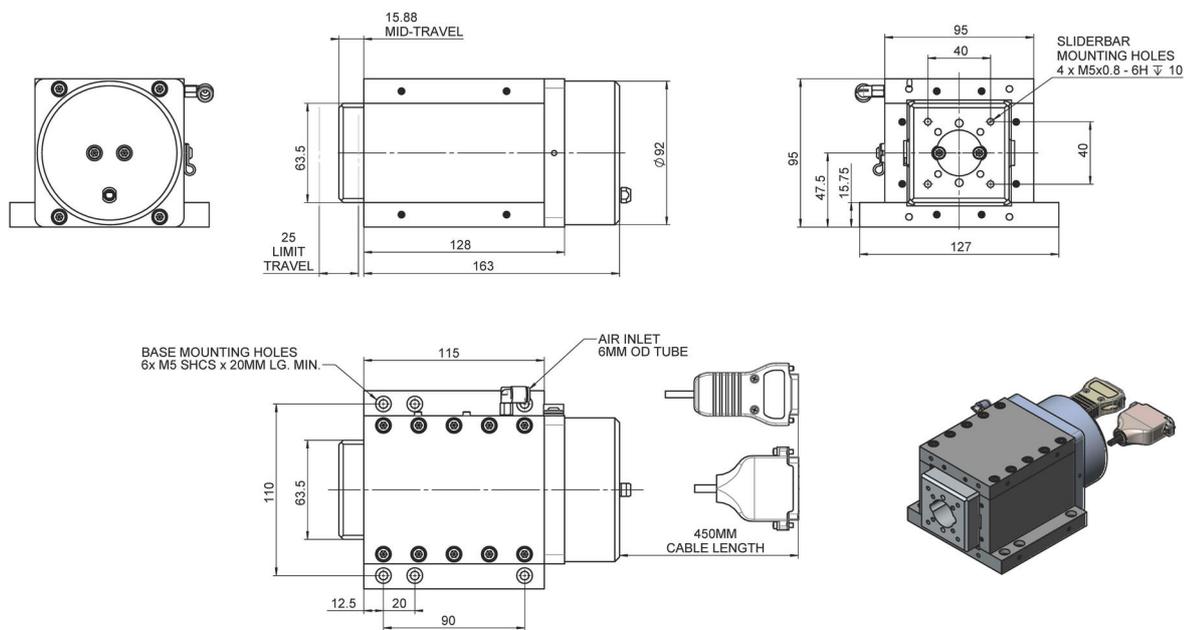
Note on sensor resolution and bidirectional repeatability: Assumes 16384x interpolation. Contact PI for the use of other factors.

Note on positioning accuracy, calibrated: Improved accuracy can be obtained with controller-based error compensation. The stage must be ordered with a controller from PI to reach these values.

Note on operating pressure: 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-131.025A1, dimensions in mm

## Order Information

### A-131.025A1

Pliglide VC linear stage, air bearing, 25 mm travel range, voice coil, 48 V, linear encoder with sin/cos signal transmission, 20  $\mu$ m signal period