PIMag® Precision Linear Stage

HIGH VELOCITY AND PRECISION DUE TO MAGNETIC DIRECT DRIVE

V-551

- Travel ranges to 230 mm
- Velocity up to 0.5 m/ s
- Absolute encoder with 1 nm resolution
- Excellent guiding accuracy
- Compact design with 160 mm width

Reference- class linear stage

Thanks to the smooth- running precision linear guides with crossed roller bearings, the linear positioning stage is particularly suitable for scanning applications with constant velocity. The anti- creep system reliably prevents cage creep. The guides have high load capacity and high precision under all operating conditions.

PIMag® magnetic direct drive

The stage has an ironless magnetic direct drive, which makes high velocities and acceleration possible. Due to the friction- free drive and the sine- commutated control by a motion controller from PI, high position resolution is achieved. The push and pull force is freely adjustable.

Direct- measuring absolute encoder

The absolute encoder supplies explicit position information that enables immediate determination of the position. This means that referencing is not required during switch- on, which increases efficiency and safety during operation. Position measuring takes place directly at the motion platform with the highest accuracy so that nonlinearity, mechanical play or elastic deformation have no influence on position measuring.

Fields of application

Industry and research. Automation, measuring technology, photonics and precision scanning in semiconductor or flat panel display manufacturing

Specifications

	V-551.2B	V-551.4B	V-551.7B	Unit	Tolerance
Motion and Positioning					
Active axes	X	X	X		
Travel range	60	130	230	mm	
Integrated Sensor	Absolute measuring encoder, BiSS	Absolute measuring encoder, BiSS	Absolute measuring encoder, BiSS		
Sensor resolution	1	1	1	nm	
Min. incremental motion	2	2	2	nm	typ.
Unidirectional repeatability	0.02	0.02	0.02	µm	typ.
Bidirectional repeatability	±0.05	±0.05	±0.05	µm	typ.
Pitch	±50	±100	±100	µrad	typ.
Yaw	±50	±50	±50	µrad	typ.
Straightness	±1	±1	±2	µm	typ.
Flatness	±2	±2	±2	µm	typ.
Velocity	0.5	0.5	0.5	m/ s	max.
Mechanical Properties					
Load capacity in z	150	150	150	N	max.
Load capacity in y	50	50	50	N	max.
Moved mass	2.2	2.7	4.9	kg	
Overall mass	4.2	5.5	9.7	kg	
Linear guiding	Anti creep	Anti creep	Anti creep		
Drive Properties					
Drive type	PIMag® linear motor, ironless, 3-phase	PIMag® linear motor, ironless, 3-phase	PIMag® linear motor, ironless, 3- phase		
Intermediate circuit voltage	110 *	110 *	110 *	VDC	max.
Peak force	180	180	180	N	typ.
Nominal force	27	27	27	N	typ.
Peak current, effective	10	10	10	A	typ.
Nominal current, effective	1.5	1.5	1.5	A	typ.
Force constant, effective	18	18	18	N/ A	typ.
Resistance per phase	6.3	6.3	6.3	Ω	typ.
Inductivity per phase	0.9	0.9	0.9	mH	typ.
Back EMF phase-phase	16	16	16	Vs/ m	max.
Travel range limit	Limits are set via software; additional mechanical stop buffers.	Limits are set via software; additional mechanical stop buffers.	Limits are set via software; additional mechanical stop buffers.		
Miscellaneous					
Operating temperature range	10 to 50	10 to 50	10 to 50	°C	
Humidity	20 – 90% rel., not condensing	20 – 90% rel., not condensing	20 – 90% rel., not condensing		
Material	Aluminum (black anodized)	Aluminum (black anodized)	Aluminum (black anodized)		
Motor connection	HD Sub- D 26 (m)	HD Sub- D 26 (m)	HD Sub- D 26 (m)		
Sensor connection	Sub- D 15 (f)	Sub- D 15 (f)	Sub- D 15 (f)		

* 24 VDC with C-891.120200

Order Information

V-551.2B
PIMag® Precision Linear Stage, Magnetic Direct Drive, 60 mm Travel Range, 1 nm Resolution, Absolute Encoder
V-551.4B
PIMag® Precision Linear Stage, Magnetic Direct Drive, 130 mm Travel Range, 1 nm Resolution, Absolute Encoder
V-551.7B
PIMag® Precision Linear Stage, Magnetic Direct Drive, 230 mm Travel Range, 1 nm Resolution, Absolute Encoder
Ask about custom designs!

Controllers / Drivers / Amplifiers

C-891 PIMag® Motion Controller

Related Products

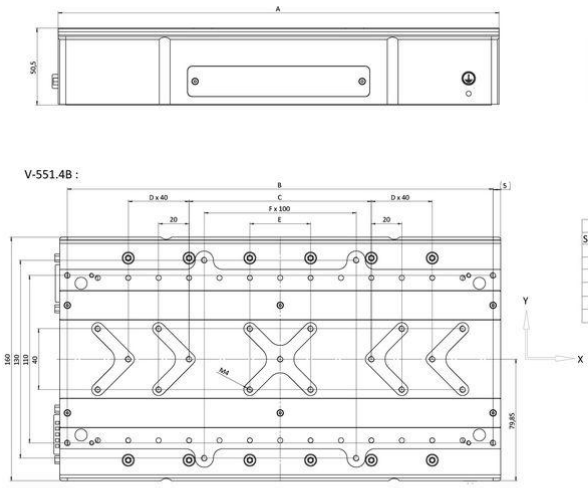
M-511 • M-521 • M-531 High- Precision Linear Translation Stage
LMS-180 Linear Motor Stage
UPS-150 Ultra Precision Stage
A-110 PIglide LC Linear Air Bearing Stage

Technology

PIMag® Magnetic Direct Drives | In particular in terms of wear and dynamics, voice- coil actuators and magnetic linear drives offer advantages compared to common spindle- based technologies. Learn more ...

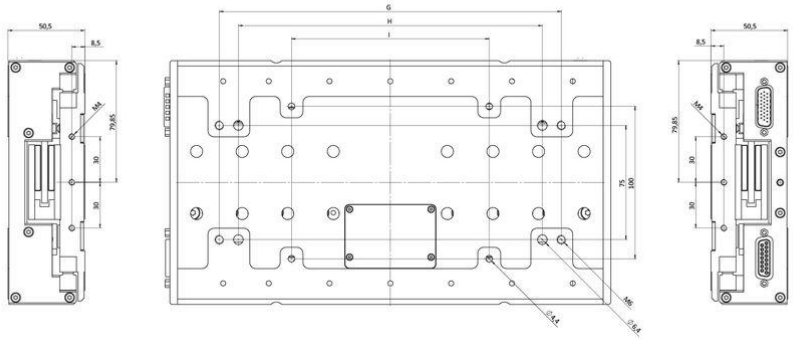
Drawings / Images

V-551, dimensions in mm

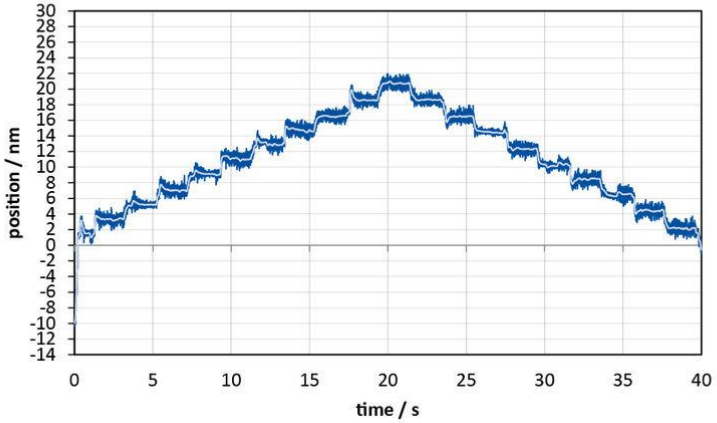


	V-551.2B	V-551.4B	V-551.7B
Stroke	60	130	230
A	220	290	450
B	210	280	440
C	60	120	120
D	1	1	3
E	-	40	40
F	1	1	3

V-551, dimensions in mm



	V-551.2B	V-551.4B	V-551.7B
G	125	225	225
H	175	200	250
I	130	130	190



Reliable and repeatable 2 nm steps performed by a V-551.

V-551.2B, V-551.4B and V-551.7B PIMag® Precision Linear Stages