

PIMag® Precision Linear Stage

HIGH VELOCITY DUE TO MAGNETIC DIRECT DRIVE, NANOMETER RESOLUTION



V-551

- + Travel ranges to 230 mm
- + Velocity up to 0.5 m/ s
- + Incremental encoder with <2 nm resolution, absolute- measuring
- + 200 N peak force
- + Compact design with 160 mm width

Reference class linear stage

High travel accuracy due to precision linear guiding rails with crossed rollers. No cage creep due to forced guidance (anti creep). Smooth- running precision linear guiding, especially suitable for scanning applications with constant velocity. No moving cables. Travel range can be adjusted mechanically due to adjustable hard stops

PIMag® magnetic direct drive

Ironless magnetic direct drive for high velocity and acceleration. High position resolution by sine- commuted control with PI motion controller. Modularly configurable push/ pull force

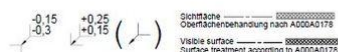
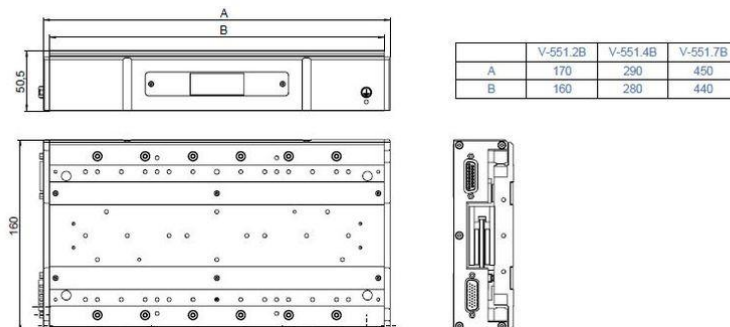
Absolute- measuring encoder

Position measurement with integrated absolute encoder (BiSS Interface). Absolute position measurement, no referencing during switch- on required, therefore increased efficiency and additional safety during operation. BiSS interface, analog signal transmission (sin/ cos, 1 V_{pp}). Up to <2 nm position resolution when operating with PI motion controller

Fields of application

Industry and research. Metrology, photonics, medical and precision scanning in semiconductor or flat panel display manufacturing

V-551.4B, dimensions in mm



Specifications

	V-551.2B	V-551.4B	V-551.7B	Unit	Tolerance
Motion and positioning					
Travel	50	130	230	mm	
Integrated sensor	Incremental encoder, absolute-measuring, BiSS	Incremental encoder, absolute-measuring, BiSS	Incremental encoder, absolute-measuring, BiSS		
Sensor resolution*	<2	<2	<2	nm	
Min. incremental motion	0.01	0.01	0.01	µm	typ.
Unidirectional repeatability	0.02	0.02	0.02	µm	typ.
Bidirectional repeatability	±0.05	±0.05	±0.05	µm	typ.
Pitch / yaw	±50	±50	±25	µrad	typ.
Straightness / flatness per 100 mm	±1	±1	±1	µm	typ.
Velocity	0.5	0.5	0.5	m/ s	max.
Mechanical Properties					
Max. load, horizontal	15	15	15	kg	max.
Max. load, lateral	12	12	12	kg	max.
Moved mass	2.2	2.7	4.9	kg	
Overall mass	4.2	5.5	9.7	kg	
Linear guiding	Crossed roller guide, anti creep	Crossed roller guide, anti creep	Crossed roller guide, anti creep		
Drive Properties					
Motor Type	Ironless PIMag® linear motor	Ironless PIMag® linear motor	Ironless PIMag® linear motor		
Intermediate circuit voltage	300	300	300	VDC	DC, max.
Peak force	200	200	200	B	typ.
Nominal force	58	58	58	N	typ.
Peak current, effective	10	10	10	A	Effective
Nominal current, effective	2.9	2.9	2.9	A	typ.
Force constant, effective	19.9	19.9	19.9	N/ A	typ.
Resistance per phase	2.8	2.8	2.8		typ.
Inductivity per phase	0.9	0.9	0.9	mH	typ.
Back EMF phase-phase	16	16	16	Vs/ m	max.
Reference point and limit switches	Hall effect	Hall effect	Hall effect		
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	Al (black anodized)	Al (black anodized)	Al (black anodized)		
Recommended controller	C-891	C-891	C-891		

* With C-891 controller. Optional down to 0.03 nm with incremental encoder.