PIMag® Linear Stage

Inexpensive, with Linear Motor

V-408

- Iron core 3-phase linear motor
- Crossed roller bearings for high load capacity
- Minimum incremental motion 20 nm
- Bidirectional repeatability ±0.1 µm
- Compact design
- Low price

PIMag® magnetic direct drive

3-phase magnetic direct drives do not use mechanical components in the drivetrain, they transmit the drive force to the motion platform directly and without friction. The drives reach high velocities and accelerations. Iron core motors are used when forces and accelerations need to be achieved in a limited installation space. The design with iron cores maximizes the magnetic forces and ensures high thermal stability of the drive.

Crossed roller bearings

With crossed roller bearings, the point contact of the balls in ball bearings is replaced by a line contact of the hardened rollers. Consequently, they are considerably stiffer and need less preload, which reduces friction and allows smoother running. Crossed roller bearings are also distinguished by high guiding accuracy and load capacity. Force-guided rolling element cages prevent linear guide creeping.

Direct position measurement

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.

Application fields

Industry and research. Automation technology with high demands on dynamics and precision.

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Preliminary data

Motion and positioning	V-408	Unit	Tolerance
Active axes	X		
Travel range	V-408.132020: 25 mm V-408.232020: 50 mm	mm	
Integrated Sensor	Incremental linear encoder		
Sensor signal periods	80	µm	
Sensor resolution	10*	nm	typ.
Min. incremental motion	20	nm	typ.
Bidirectional repeatability	±0.1	µm	typ.
Pitch / Yaw	±150	µrad	typ.
Straightness / flatness	±4	µm	typ.
Velocity	25 mm: 1.1 50 mm: 1.5	m/s	max.

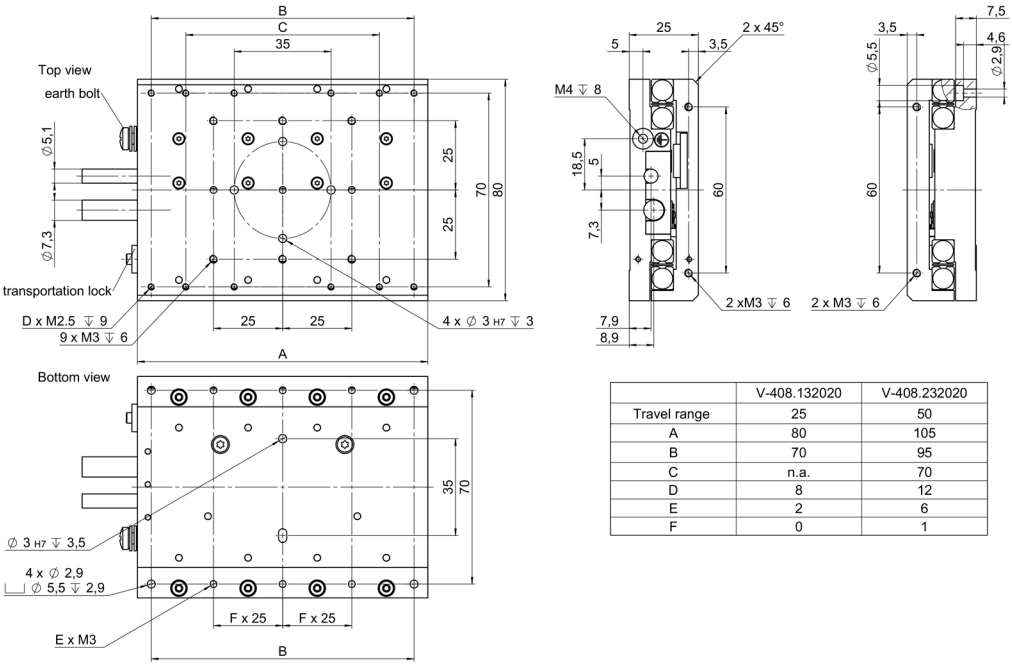
Mechanical properties	V-408	Unit	Tolerance
Load capacity in Z	80	N	max.
Moved mass	V-408.132020: 0.23 V-408.232020: 0.3	kg	
Mass without cable	V-408.132020: 0.5 V-408.232020: 0.65	kg	
Overall mass	V-408.132020: 0.79 V-408.232020: 0.94	kg	
Guide type	Crossed roller bearing with anti-creep system		

Drive properties	V-408	Unit	Tolerance
Drive type	PIMag® Linear motor, iron core, 3-phase		
Intermediate circuit voltage	48	V DC	max.
Peak force	14	N	typ.
Nominal force	4	N	typ.
Peak current, effective	3.2	A	typ.
Nominal current, effective	0.7	A	typ.
Force constant, effective	4.81	N/A	typ.
Resistance phase-phase	1.23	Ω	typ.
Inductivity phase-phase	0.97	mH	typ.
Back EMF phase-phase	3.02	V·s/m	max.

Miscellaneous	V-408	Unit	Tolerance
Operating temperature range	10 to 50	°C	
Humidity	20 – 90% rel., not condensing		
Material	Aluminum, black anodized		
Motor connector	HD Sub-D 26 (m)		
Sensor connection	Sub-D 15 (f)		
Cable length	2	m	

* interpolated

Drawings and Images



	V-408.132020	V-408.232020
Travel range	25	50
A	80	105
B	70	95
C	n.a.	70
D	8	12
E	2	6
F	0	1

V-408, dimensions in mm

Ordering Information

V-408.132020
PIMag® Linear Stage, 80 mm × 25 mm Cross section, 25 mm Travel Range, 80 N Load Capacity, Linear Encoder with Sin/Cos Signal Transmission, 80 µm Sensor signal period, Iron core 3-phase linear motor, 48 V

V-408.232020
PIMag® Linear Stage, 80 mm × 25 mm Cross section, 50 mm Travel Range, 80 N Load Capacity, Linear Encoder with Sin/Cos Signal Transmission, 80 µm Sensor signal period, Iron core 3-phase linear motor, 48 V