

PIMag[®] Linear Stage

Inexpensive, with Linear Motor



V-408

- Iron core 3-phase linear motor
- Crossed roller guides for high load capacity
- Minimum incremental motion 20 nm
- Bidirectional repeatability $\pm 0.1 \mu\text{m}$
- 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 guide

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

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.

Specifications

Motion and positioning	V-408	Unit	Tolerance
Active axes	X		
Travel range	V-408.132020: 25 V-408.232020: 50	mm	
Integrated sensor	Incremental linear encoder		
Sensor signal periods	80	µm	
Sensor resolution	10 ⁽¹⁾	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	V-408.132020: 0.5 V-408.232020: 0.7	m/s	max.

Mechanical properties	V-408	Unit	Tolerance
Load capacity in Z	80	N	max.
Permissible lateral force	80	N	max.
Permissible torque in θ_x	2.3	N m	max.
Permissible torque in θ_y, θ_z	1.3	N m	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 guide with anti-creep system		

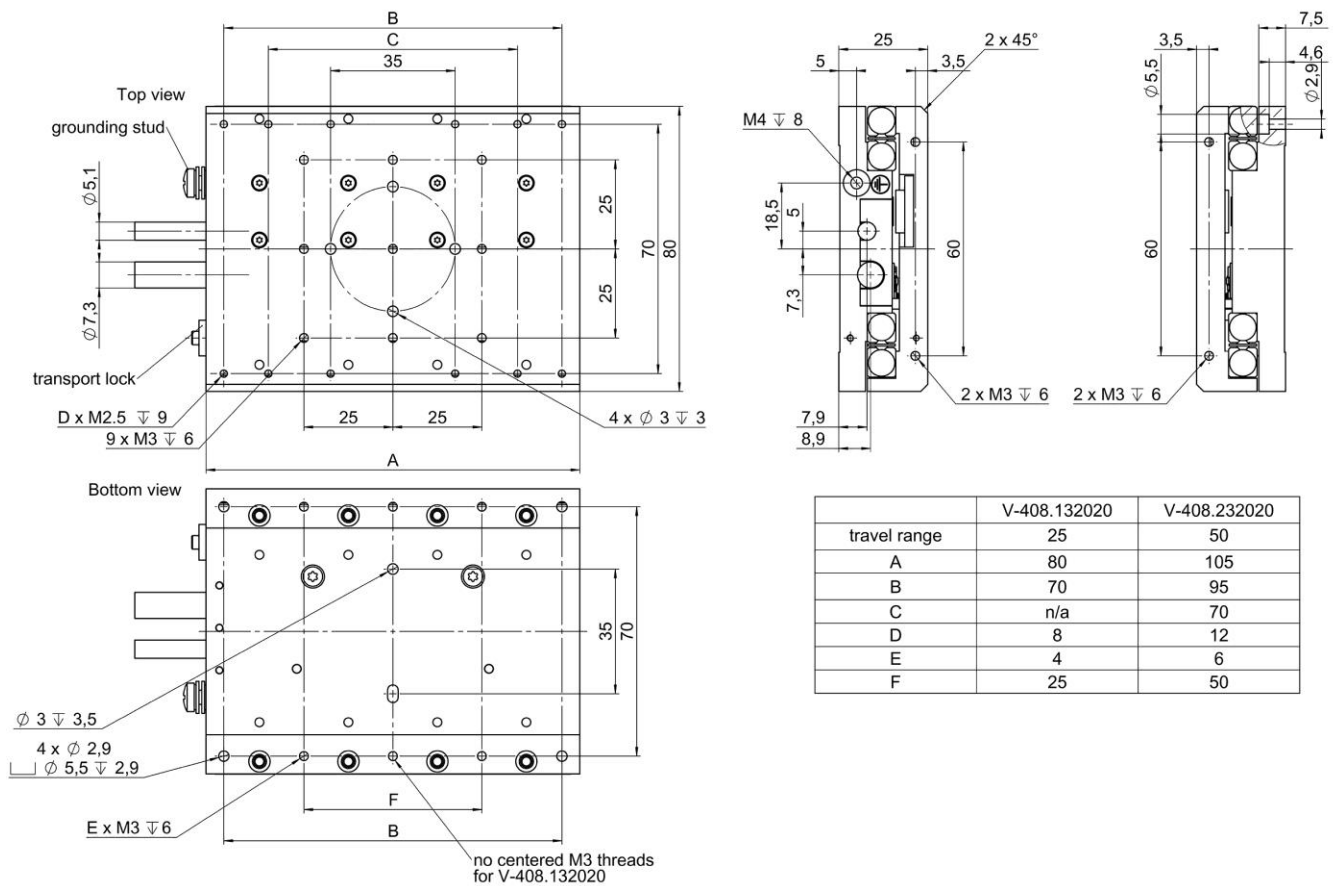
Drive properties	V-408	Unit	Tolerance
Drive type	PIMag® linear motor, iron core, 3-phase		
Intermediate circuit voltage	48	VDC	max.
Peak force	14	N	typ.
Nominal force	5	N	typ.
Peak current, RMS	3.2	A	typ.
Nominal current, RMS	1.1	A	typ.
Force constant, RMS	4.60	N/A	typ.
Resistance phase-phase	2.46	Ω	typ.
Inductance phase-phase	1.94	mH	typ.
Back EMF phase-phase	2.81	V s/m	max.
Pole pitch N-N	18	mm	
Permissible temperature for positioner components	80	°C	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 D-sub 26 (m)		
Sensor connector	D-sub 15 (f)		
Cable length	2	m	

(1) interpolated

The specifications apply to room temperature (22 °C ±3 °C), specifications may deviate outside of this range.

Drawings / Images



V-408, dimensions in mm

Ordering Information

V-408.132020

PIMag® Linear stage, 80 mm width, 25 mm travel range, 80 N load capacity, incremental 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 width, 50 mm travel range, 80 N load capacity, incremental linear encoder with sin/cos signal transmission, 80 µm sensor signal period, iron core 3-phase linear motor, 48 V