

## PIMag<sup>®</sup> 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  $\pm 0.1 \mu\text{m}$
- Compact design
- Low price

#### PIMag<sup>®</sup> 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 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

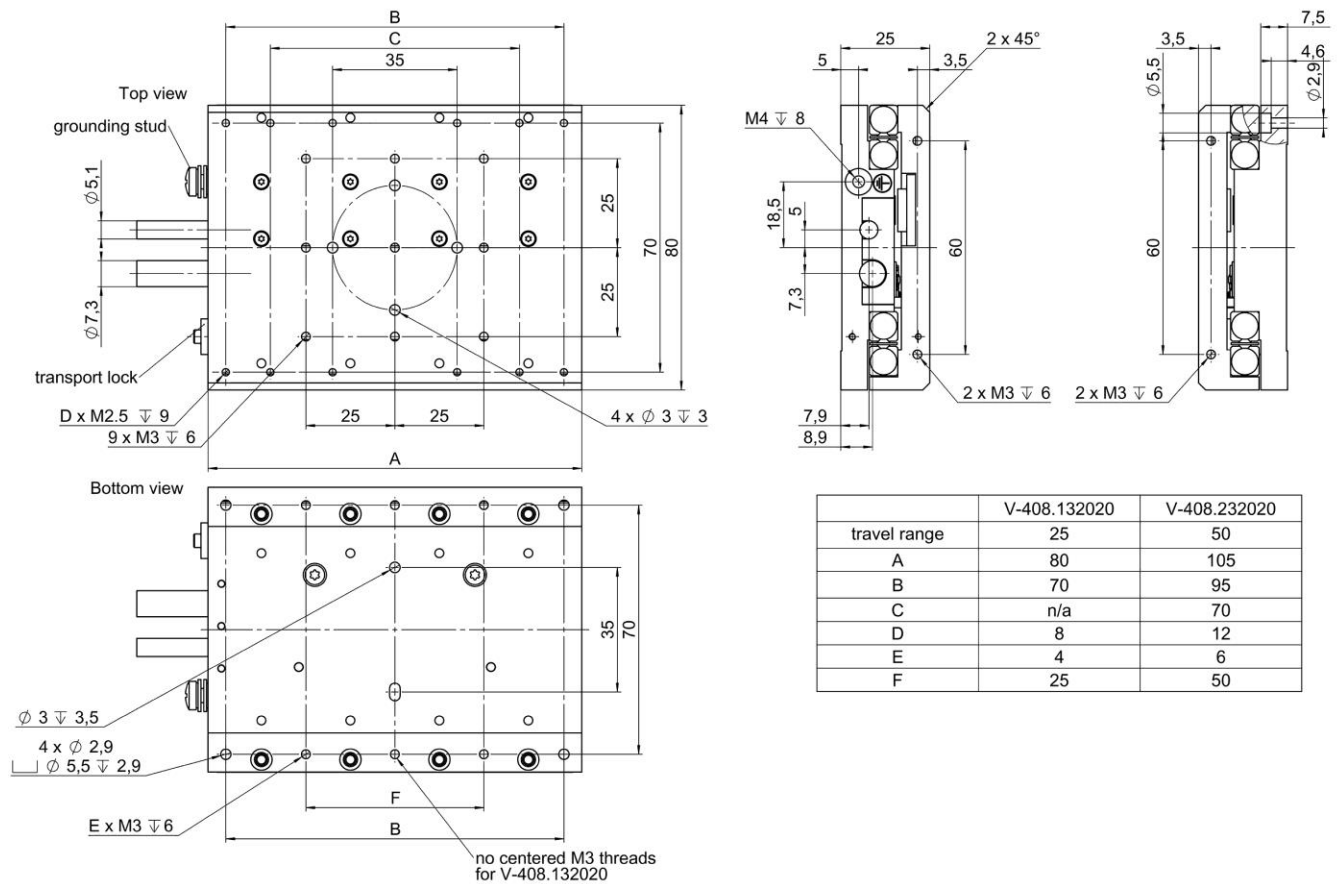
Industry and research. Automation technology with high demands on dynamics and precision.

## Specifications

	V-408	Unit	Tolerance
<b>Motion and positioning</b>			
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 <sup>(1)</sup>	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: 1.2 V-408.232020: 1.5	m/s	max.
<b>Mechanical properties</b>			
Load capacity in Z	80	N	max.
Permissible lateral force	80	N	max.
Permissible torque in $\theta_x$	2.3	N·m	max.
Permissible torque in $\theta_y, \theta_z$	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		
<b>Drive properties</b>			
Drive type	PIMag® Linear motor, iron core, 3-phase		
Intermediate circuit voltage	48	V DC	max.
Peak force	14	N	typ.
Nominal force	5	N	typ.
Peak current, effective	3.2	A	typ.
Nominal current, effective	1.1	A	typ.
Force constant, effective	4.60	N/A	typ.
Resistance phase-phase	1.23	Ω	typ.
Inductance phase-phase	0.97	mH	typ.
Back EMF phase-phase	2.81	V·s/m	max.
Pole pitch N-N	18	mm	
<b>Miscellaneous</b>			
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	

(1) interpolated

## Drawings and Images



V-408, dimensions in mm

## Ordering Information

### V-408.132020

PIMag® linear stage, 80 mm × 80 mm × 25 mm (L × W × H), 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, 105 mm × 80 mm × 25 mm (L × W × H), 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