PAxx-Z Series Motorized Vertical Stages, 50–1000 mm Travel, Ball Screw Drive

Model PAxx-Z Series · waveqvanta.com/products/paxx-z-series-motorized-vertical-stages

Ball screw motorized Z stages for fine vertical adjustment over 50–1000 mm of travel.



PAxx-Z stages are vertical versions of the PA series motorized linear stages, adding a right-angle mounting block and a power-failure protection unit for Z-direction use. Except for motion direction and load rating, the specifications match the standard PA stages. Nine models cover 50 to 1000 mm of travel using precision ball screws, linear slider guides and two-phase 57 stepping motors.

Key features

- Precision ball screws (φ12 × 4, φ16 × 5 or φ25 × 5) with linear slider guides
- 1 µm (50–200 mm models) or 1.25 µm (300–1000 mm models) resolution at 20 microsteps
- Repeatability ≤ ±3 µm up to 400 mm travel and ≤ ±5 µm for 600–1000 mm
- Right-angle mounting block and power-failure protection unit for vertical operation
- Centered vertical load of 15 kg (PA050-Z to PA400-Z) or 30 kg (PA600-Z to PA1000-Z)
- Built-in limit (2) and origin (1) sensors; DB9 connector with 0.2 m high-flex cable
- Ordering options include a 42-frame stepping motor, AC servo motors with mounting plates, and external sensors

Specifications

Travel Range	50–1000 mm (nine models)
Table Size	120 × 120 mm (50–200 mm); 150 × 150 mm (300–400 mm); 200 × 200 mm (600–1000 mm)
Drive	Precision ball screw φ12 × 4, φ16 × 5 or φ25 × 5
Guide	Linear slider guides
Body	Black anodized aluminum alloy
Resolution (Full Step)	20 µm (50–200 mm); 25 µm (300–1000 mm)
Resolution (20 Microsteps)	1 µm (50–200 mm); 1.25 µm (300–1000 mm)
Max Speed	40 mm/s (50–200 mm); 50 mm/s (300–1000 mm); zero load, motor at 600 rpm
Unidirectional Positioning Accuracy	≤ 30 µm (PA050-Z to PA400-Z)
Repeatability	≤ ±3 µm (50–400 mm); ≤ ±5 µm (600–1000 mm)
Static Clearance	≤ 3 µm
Backlash	≤ 5 µm
Static Parallelism	≤ 0.1 mm (50–400 mm); ≤ 0.12 mm (600–1000 mm)
Motor	Two-phase 57 stepping motor, 1.8° step angle
Motor Current / Holding Torque	2.0 A / 1.3 N·m (50–400 mm); 3.0 A / 1.57 N·m (600–1000 mm)
Stepping Driver	Optional
Connector	DB9 (pin)

Connection Cable	High-flex cable, 0.2 m
Limit Sensors	2 × built-in
Origin Sensor	1 × built-in
Sensor Supply	DC 5–24 V ±10%
Sensor Output	NPN open collector, DC 5–24 V, ≤ 8 mA; residual voltage ≤ 0.3 V at 2 mA
Output Logic	Limit: ON when blocked; origin: OFF when blocked
Max Load (Vertical, Centered)	15 kg (50–400 mm); 30 kg (600–1000 mm)

Model overview

Model	Travel (mm)	Table (mm)	Ball Screw	Full Step / 20-Microstep (µm)	Max Speed (mm/s)	Straightness / Parallelism (µm)	Yaw / Pitch (″)	Max Load (kg)	Weight (kg)
PA050-Z	50	120 × 120	φ12 × 4	20 / 1	40	≤20 / ≤25	≤50 / ≤55	15	7.6
PA100-Z	100	120 × 120	φ12 × 4	20 / 1	40	≤20 / ≤25	≤50 / ≤55	15	8.2
PA150-Z	150	120 × 120	φ12 × 4	20 / 1	40	≤20 / ≤25	≤50 / ≤55	15	9
PA200-Z	200	120 × 120	φ12 × 4	20 / 1	40	≤20 / ≤25	≤50 / ≤55	15	9.7
PA300-Z	300	150 × 150	φ16 × 5	25 / 1.25	50	≤25 / ≤30	≤50 / ≤60	15	12.3
PA400-Z	400	150 × 150	φ16 × 5	25 / 1.25	50	≤25 / ≤30	≤50 / ≤60	15	14
PA600-Z	600	200 × 200	φ25 × 5	25 / 1.25	50	≤15 per 100 mm (both)	—	30	29.5
PA800-Z	800	200 × 200	φ25 × 5	25 / 1.25	50	≤15 per 100 mm (both)	—	30	35
PA1000-Z	1000	200 × 200	φ25 × 5	25 / 1.25	50	≤15 per 100 mm (both)	—	30	40

Typical applications

- Fine Z-axis adjustment
- Vertical positioning in automation and test equipment
- Long-travel lifting of optics, cameras or samples
- Height adjustment in optical setups