KAxx-Z Series Closed-Loop Motorized Vertical Stages, 50–1000 mm Travel

Model KAxx-Z Series · waveqvanta.com/products/kaxx-z-series-closed-loop-motorized-vertical-stages

Linear-encoder closed-loop Z stages for fine vertical adjustment over 50–1000 mm of travel.



The KAxx-Z series are vertical versions of the KA series motorized linear stages, fitted with a right-angle mounting block and a power-failure protection unit so the carriage can be driven in the Z direction. Apart from motion direction and load rating, the specifications follow the standard KA stages. A linear optical encoder closes the position loop at 1 µm resolution (KA050-Z to KA400-Z) or 0.5 µm (KA600-Z to KA1000-Z).

Key features

- Closed-loop control with a linear optical encoder: 1 µm or 0.5 µm resolution depending on model
- Precision ball screws (φ12 × 4, φ16 × 5 or φ25 × 5) with linear slider guides
- Right-angle mounting block and power-failure protection unit for vertical operation
- Open-loop repeatability ≤ ±3 µm up to 400 mm travel and ≤ ±5 µm for 600–1000 mm
- Centered vertical load of 15 kg (KA050-Z to KA400-Z) or 30 kg (KA600-Z to KA1000-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 (50–400 mm models), AC servo motors, right-side encoder mounting 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
Position Feedback	Linear optical encoder (grating scale)
Closed-Loop Resolution	1 µm (KA050-Z to KA400-Z); 0.5 µm (KA600-Z to KA1000-Z)
Open-Loop 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 (50–400 mm); ≤ 70 µm (600–1000 mm)
Repeatability (Open Loop)	≤ ±3 µm (50–400 mm); ≤ ±5 µm (600–1000 mm)
Static Clearance (Open Loop)	≤ 3 µm
Backlash (Open Loop)	≤ 5 µm
Static Parallelism	≤ 0.1 mm; ≤ 0.12 mm (KA600-Z, KA800-Z)
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	Closed-Loop Res. (µm)	Repeatability (µm)	Straightness / Parallelism (µm)	Yaw / Pitch (″)	Max Load (kg)	Weight (kg)
KA050-Z	50	120 × 120	φ12 × 4	1	≤±3	≤10 / ≤15	≤30 / ≤35	15	8.4
KA100-Z	100	120 × 120	φ12 × 4	1	≤±3	≤10 / ≤15	≤30 / ≤35	15	8.8
KA150-Z	150	120 × 120	φ12 × 4	1	≤±3	≤10 / ≤15	≤30 / ≤35	15	9.6
KA200-Z	200	120 × 120	φ12 × 4	1	≤±3	≤10 / ≤15	≤30 / ≤35	15	10.3
KA300-Z	300	150 × 150	φ16 × 5	1	≤±3	≤15 / ≤20	≤40 / ≤55	15	13.3
KA400-Z	400	150 × 150	φ16 × 5	1	≤±3	≤15 / ≤20	≤40 / ≤55	15	14.9
KA600-Z	600	200 × 200	φ25 × 5	0.5	≤±5	≤15 per 100 mm (both)	—	30	30.3
KA800-Z	800	200 × 200	φ25 × 5	0.5	≤±5	≤15 per 100 mm (both)	—	30	36
KA1000-Z	1000	200 × 200	φ25 × 5	0.5	≤±5	≤15 per 100 mm (both)	—	30	41

Typical applications

- Fine Z-axis adjustment
- Vertical positioning in automated inspection and assembly
- Long-travel lifting of optics, cameras or samples
- Metrology and alignment setups