CZF Series High-Precision Motorized Vertical Stages, 8–40 mm Travel

Model CZF Series · waveqvanta.com/products/czf-series-high-precision-motorized-vertical-stages

Compact high-precision motorized Z stages for instruments, automation equipment and short-stroke, high-repetition positioning.



The CZF series are precision motorized vertical-motion stages for applications that need both tight accuracy and frequent repeated moves. A ball screw drives the lift through a 1:1 timing belt (CZF8-60) or a worm gear reduction (CZF20-120, CZF40-200), guided by crossed-roller or linear slider guides mounted on finish-ground surfaces. The hard black anodized aluminum bodies are compact enough for integration into instruments and automation equipment with strict space and weight limits.

Key features

- Ball screw lift: φ6 × 1 mm with 1:1 timing belt (CZF8-60); φ12 × 5 or φ16 × 10 with 80:1 or 120:1 worm gear reduction
- Tin bronze worm gears and high-frequency-quenched steel worms on CZF20-120 and CZF40-200
- Crossed-roller bearing guide (CZF8-60) or linear slider guides (CZF20-120, CZF40-200) on finish-ground mounting surfaces
- Fine resolution on worm-driven models: ≈0.039 µm and ≈0.052 µm at 8 microsteps
- Repeatability ≤ ±3 µm (CZF8-60) and ≤ ±2 µm (CZF20-120)
- Three built-in sensors (2 limit, 1 origin) with high-flex cable; modular cable units simplify maintenance
- Two-phase stepping motors as standard; five-phase 28 stepping motor available via the -ST528 ordering suffix

Specifications

Travel Range	8 / 20 / 40 mm (by model)
Table Size	60 × 60 / 120 × 120 / 200 × 200 mm
Ball Screw	φ6 × 1, φ12 × 5 or φ16 × 10 mm lead (by model)
Transmission	Timing belt 1:1 (CZF8-60); worm gear 80:1 (CZF20-120) or 120:1 (CZF40-200)
Travel per Motor Revolution	1 / 0.0625 / ≈0.083 mm (by model)
Worm Gear / Worm	Wear-resistant tin bronze gear; high-frequency-quenched steel worm
Guide	Crossed-roller bearing guides (CZF8-60); linear slider guides (others)
Body	Black anodized aluminum alloy
Repeatability	≤ ±3 µm (CZF8-60); ≤ ±2 µm (CZF20-120)
Backlash (Zero Load)	≤ 15 µm (CZF20-120, CZF40-200)
Static Parallelism	≤ 0.1 mm (CZF8-60, CZF20-120); ≤ 0.12 mm (CZF40-200)
Max Speed	0.625–5 mm/s (zero load, motor at 600 rpm)
Motor	Two-phase stepping motor, 1.8° step angle (28, 42 or 57 frame)
Motor Option	Five-phase 28 stepping motor (-ST528 suffix)
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	ON when sensor is blocked
Max Load (Horizontal Direction)	4 / 20 / 30 kg (by model)
Self-Locking at Power-Off	Not provided on CZF8-60

Model overview

Model	Travel (mm)	Table (mm)	Drive	Full / Half Step (µm)	8-Microstep Res. (µm)	Max Speed (mm/s)	Repeatability (µm)	Max Load (kg)	Weight (kg)
CZF8-60	8	60 × 60	Ball screw φ6 × 1, belt 1:1	5 / 2.5	0.625	5	≤±3	4	1
CZF20-120	20	120 × 120	Ball screw φ12 × 5, worm 80:1	≈0.31 / 0.155	≈0.039	0.625	≤±2	20	4.2
CZF40-200	40	200 × 200	Ball screw φ16 × 10, worm 120:1	≈0.42 / 0.21	≈0.052	0.833	—	30	12.5

Typical applications

- Integration into instruments and automation equipment
- Short-stroke, high-repetition positioning on production lines
- Vertical alignment of optics and samples
- Precision focusing and height adjustment