TBZF Series Motorized Vertical Stages, 6–30 mm Travel, Wedge Design

Model TBZF Series · waveqvanta.com/products/tbzf-series-motorized-vertical-stages

Wedge-type motorized Z stages for medium-to-large payloads that are raised and lowered at high repetition rates.



The TBZF series are wedge-type motorized vertical-motion stages for medium and large payloads in applications with frequent, repeated moves. The guide surfaces are finish-ground, and the lift is driven by a 1 mm or 2 mm lead screw and a standard two-phase stepping motor; the larger models use ground screws with wear-resistant tin bronze nuts. Three sizes provide 6, 10 and 30 mm of vertical travel on 60 × 60 mm to 200 × 200 mm tables.

Key features

- Wedge-type structure for high rigidity and load capacity, up to 20 kg on the TBZF30-200
- Ground lead screws (φ8 × 1, φ12 × 2) with wear-resistant tin bronze nuts on TBZF10-120 and TBZF30-200; φ6 × 1 ball screw on TBZF6-60
- Linear slider guides on finish-ground surfaces for smooth, accurate vertical motion
- Repeatability ≤ ±2.5 µm and backlash ≤ 5 µm on all models
- Two-phase stepping motors (28, 42 or 57 frame, 1.8°); five-phase 28 stepping motor available via the -ST528 ordering suffix
- Built-in limit (2) and origin (1) sensors with NPN open-collector outputs; DB9 connector

Specifications

Travel Range	6 / 10 / 30 mm (by model)
Table Size	60 × 60 / 120 × 120 / 200 × 200 mm
Drive	φ6 × 1 ball screw (TBZF6-60); ground screw φ8 × 1 or φ12 × 2 (larger models)
Guide	Linear slider guides
Body	Black anodized aluminum alloy
Repeatability	≤ ±2.5 µm
Backlash	≤ 5 µm
Static Parallelism	≤ 0.1 mm
Max Speed	3.64–13 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	0.2 m; high-flex cable on TBZF10-120 and TBZF30-200
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 (TBZF6-60 origin sensor: OFF when blocked)
Max Load (Horizontal Direction)	4 / 10 / 20 kg (by model)

Self-Locking at Power-Off	Not provided on TBZF6-60

Model overview

Model	Travel (mm)	Table (mm)	Drive Screw	Full / Half Step (µm)	20-Microstep Res. (µm)	Max Speed (mm/s)	Motor Frame / Current	Max Load (kg)	Weight (kg)
TBZF6-60	6	60 × 60	Ball screw φ6 × 1	3.5 / 1.75	0.175	7	28 / 1.3 A	4	0.8
TBZF10-120	10	120 × 120	Ground screw φ8 × 1	1.82 / 0.91	0.091	3.64	42 / 1.7 A	10	2.5
TBZF30-200	30	200 × 200	Ground screw φ12 × 2	6.49 / 3.245	0.325	13	57 / 2.8 A	20	11.5

Typical applications

- Vertical positioning of optics, samples and fixtures
- Automation equipment with frequent short-stroke Z moves
- Height adjustment in test and inspection systems
- Focus adjustment in optical setups