T-MAX PRECISION DIRECT DRIVE ROTARY SERVO

The Direct Drive Serco Stages from the T-Max series are a perfect rotary positioner for advanced technology applications like optical metrology, high speed assembly operations, micromachining, laser scanning, life sciences, 3D printing and many others. The high torque capabilities, the rugged design and the high resolution encoders all packaged in a low profile make it an attractive positioning module for many applications

DESCRIPTION

- Low Profile Direct-drive Rotary Stage
- Smooth Brushless Servo-drive Positioning Motion
- Integrated High Resolution Rotary Encoder
- High Stability Double pre-loaded Hub Bearing System

T-Max Background

T-Max™ series of precision, direct-drive rotary servo positioning stages are ideal for today's high performance technology environment. Driven by a powerful brushless, torque motor with an integrated high-resolution rotary encoder system. T-Max provides closed position and velocity feedback, enabling outstanding trajectory control. Built for the most demanding high precision applications, the rotating hub is suspended by large diameter precision ball bearings. This preloaded hub design provides for high load capacity and excellent running characteristics in a space efficient package. The absence of any mechanical contact in the drive components increases life expectancy dramatically and extends MTBF and service intervals. In most installations, this stage has an unlimited service lifetime.

T-Max Features & Benefits

T-Max series of rotary stages provide smooth, low friction rotary motions over a large speed range with zero-backlash. These are key advantages in any application where excellent trajectory control is required. T-Max positioning stages operate with low vibration and superior flatness. These are attractive features in any precision application. Closed-loop rotary position control coupled with direct drive technology creates a robust rotating hub with low-hysteresis and remarkable angular resolution. The single piece rotating hub design affords rugged mechanical stability, integrity and increased precision under load. The double preloaded hub with a crossed-roller top bearing and duplex angular ball bearing at the bottom offers

extreme stiffness and outstanding dynamic characteristics with low axial and radial run out even at maximum load. A top ball bearing configuration is available for low drag, damping and compliance as an option.

Applications

T-Max series rotary positioning stages are designed for precise motor driven rotary positioning and indexing. These rotary tables are intended to function independently or in conjunction with other positioning components used in high precision and automation applications. A low-profile design minimizes stacking height and Abbé error in multi-axis configurations and enables T-Max to fit where other motorized devices cannot.

T-Max models are available with 67, 98, 136 and 200 mm hub diameters in several resolution ranges configured to match speed and positioning requirements of your application.

T-Max Accessories

A range of specialized configuration rotary positioning stages, based on the essential components of the T-Max stages are available to meet almost every application. Variants of these rotational stage products can be adapted for use in either clean rooms, vacuum chambers or sealed for operation in harsh environments while preserving all of their desirable high performance characteristics. Our Labyrinth seal protects T-Max from dust and spraying water, providing ingress protection rating IP53. These positioning stages can be factory equipped, tuned and tested with user supplied or custom or custom fabricated brackets gimbals and other tooling including a variety of work-holding collets, 3-jaw chucks and collet closing systems.

T-Max Specifications

Capacities	T Max-2	T Max-3	T Max-5
Payload Axial (kg)	10	18	25
Payload Radial (kg)	10	18	25
Hub Diameter (mm)	67	98	136
Aperture Diameter H-7 tolerance (mm)	9	8	38
Continuous Torque (Nm)	0.17	0.9	2.9
Peak Torque (Nm)	0.53	2.45	19.5

Rotary Stage Resolution

Resolution is defined as the smallest angular value, which can be detected by the evaluating electronics as the hub turns relative to the base. Resolution is developed by

the combined effect of the scale grating pitch, specified in lines per revolution (lpr) and an electronic multiplying factor, determined by the counting electronics.

Three configurations of electronic pulse counting systems are available in the **T-Max** product. All **T-Max** positioning stages share the same native analogue 1 Volt P-P encoder read head. This output is directly compatible with our **MICROMATIC™** series controllers and most other high-performance servo controllers.

Lower cost and performance controllers may require direct TTL encoder input signals. T-MAX system accomplishes this with an in-line analog to TTL pulse for signal conditioning. The In-line TTL conversion is achieved with a defined interpolation factor, 1x, 25x, or 100x. Contact factory for other interpolation factors.

T-Max 2				
Encoder	Grating Disk	Interpolator*	Resolution	Max speed
Output				
Analog 1 V (p-p)	3,600 lpr	In-Controller	0.1 degrees/cycle	
TTL-9.0	3,600 lpr	10x	9.0 arc-sec	889 rpm
TTL-0.9	3,600 lpr	100x	0.9 arc-sec	444 rpm
T-Max 3				
Encoder	Grating Disk	Interpolator*	Resolution	Max speed
Output				
Analog 1 V (p-p)	10,000 lpr	In-Controller	0.036 deg/cycle	
TTL-3.25	10,000 lpr	10x	3.25 arc-sec	320 rpm
TTL-0.32	10,000 lpr	100x	0.32 arc-sec	160 rpm
T-Max 5				
Encoder	Grating Disk	Interpolator*	Resolution	Max speed
Output				
Analog 1 V (p-p)	18,000 lpr	In-Controller	0.02 deg/cycle	
TTL-2.38	18,000 lpr	10x	2.38 arc-sec	222 rpm
TTL-0.24	18,000 lpr	100x	0.24 arc-sec	89 rpm

- Analog Encoder system resolution specified in degrees per cycle
- TTL Encoder system resolution specified in arc-seconds per pulse

* Contact Factory for other available interpolator factors and/or resolutions