



## ServoBelt Rotary Stages

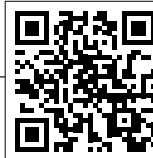
*Precision rotary motion in an easy-to-integrate package.*

- **Room in the Middle.** ServoBelt Rotary stages offer two different through hole configurations. Available with 50-, 100- or 200-mm center openings, our large through hole stages accommodate large bundles of power, signal and pneumatic conductors. They also make it easy to integrate laser and optical systems. Standard-sized models with 16- or 25-mm through holes offer a more economical choice when fewer utilities need to pass through the center of the stage.
- **Direct Drive Performance.** Designed for NEMA 23 and 34 motors, the ServoBelt rotary stages offer speeds up to 1,000 rpm, continuous torque to 6.6 N-m and resolution down to 0.16 arc-sec with Renishaw ring encoders or tape scales for partial rotation.
- **Application Flexibility.** ServoBelt Rotary stages support both continuous rotation and variable indexing applications.
- **Robust, Lubed-for-Life Bearings.** ServoBelt Rotary stages incorporate large full duplex, angular contact bearings, imparting moment and load capacities far in excess of its usual application requirements. This excess load capacity translates into virtually limitless bearing life.
- **Cost Effective.** ServoBelt Rotary stages offer an economical solution for a variety of medium-duty rotary motion jobs such as driving carousel tables on packaging and assembly machines and providing fourth-axis rotary motion for laser cutting and mini CNC machines.

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# DATA SHEET

TECHNICAL SPECIFICATIONS	ServoBelt Rotary Size/Feedback				
	SBR-16-31	SBR-50-31	SBR-25-51	SBR-100-51	SBR-200
Type	NEMA 23 3:1 Belt Drive Rotary		NEMA 23 5:1 Belt Drive Rotary		NEMA 23 or 34 11:1 Belt Drive Rotary
Bearing Type	Preloaded duplex angular contact				
Stage Diameter/Height, mm	100 / 50	100 / 54	165 / 54	165 / 60.6	275 / 69.2
Through Hole	16.0mm (0.63 in.)	50.8mm (2.00 in.)	25.4mm (1.00 in.)	101.6mm (4.00 in.)	203.2mm (8.00 in.)
Accuracy ( $\pm$ arc-sec) Deviation from commanded angle.	16KCPR: 90 Ring: 36		16KCPR: 75 Ring: 48		16KCPR: 60 Ring: 66
Kinematic Wobble ( $\pm$ arc-sec) Tilt of rotary axis irrespective of table flatness or physical runout of table top.	8		16		10
Kinematic Radial Runout ( $\mu$ m TIR) In-plane wander of rotational centerline irrespective of table roundness or physical runout of table top OD.	13		20		30
Table Top Parallelism To Base ( $\mu$ m TIR) Total indicated worst case parallelism top to bottom.	80		80		125
Bi-Directional Repeatability With motor encoder versions only, assumes 0.2 degrees lost motion at pinion, divided by ratio.	16KCPR: $\pm$ 120 arc-sec Ring: Control Dependent, $\pm$ 1 count possible		16KCPR: $\pm$ 40 arc-sec Ring: Control Dependent, $\pm$ 1 count possible		16KCPR: $\pm$ 100 arc-sec Ring: Control Dependent, $\pm$ 1 count possible
Uni-Directional Repeatability Angular conversion of 10 $\mu$ m at bull gear radius.	16KCPR: $\pm$ 30 arc-sec Ring: Control Dependent, $\pm$ 1 count possible		16KCPR: $\pm$ 12 arc-sec Ring: Control Dependent, $\pm$ 1 count possible		16KCPR: $\pm$ 15 arc-sec Ring: Control Dependent, $\pm$ 1 count possible
Resolution Choices	16KCPR: 16k @ motor Ring: 1 $\mu$ m, 0.5 $\mu$ m, 0.2 $\mu$ m, 0.1 $\mu$ m (100mm ring)		16KCPR: 16k @ motor Ring: 1 $\mu$ m, 0.5 $\mu$ m, 0.2 $\mu$ m, 0.1 $\mu$ m (150mm ring)		16KCPR: 16k @ motor Ring: 1 $\mu$ m, 0.5 $\mu$ m, 0.2 $\mu$ m, 0.1 $\mu$ m (255mm ring)
Table Resolution (KCPR) Measured in thousands of pulses per revolution of the table (KCPR).	16KCPR: 48 Ring: 314.9, 629.8, 1574, 3149		16KCPR: 80 Ring: 472, 944, 236, 4720		16KCPR: 176 Ring: 800, 1600, 4000, 8000
Speed Limit (RPM) Note that maximum speed for ring encoder units decreases as resolution increases.	16KCPR: 1300 Ring: 1300-134		16KCPR: 800 Ring: 764-66		16KCPR: 360 Ring: 374-52
Continuous Torque, N-m (motor) RMS torque allowed at table. Assume peak torque to be 3 times RMS torque for no longer than 3 seconds.	1.3(-1), 2.4(-2), 3(-3), 4.0(-4)		2.1(-1), 4.1(-2), 5.4(-3), 6.6(-4)		NEMA 23: 9.0(-2), 11.9(-3), 14.5(-4) NEMA 34: 20(-2), 30(-3), 38(-4)
Load Capacity Axial/Radial (kN) Load capacity are for L10 rating life of 1 million table revolutions. Load capacity is not equivalent to payload. The ability to servo control a given payload is dependent on inertia, motion profile, duty cycle and control architecture.	14.0 / 26.0	7.0 / 4.0	48.0 / 39.0	14.0 / 8.0	21.0 / 12.0
Max. Moment (N-m) Moment loads are for L10 rating life of 1 million table revolutions.	480	120	1150	434	1050
Rotational Inertia (kg-m <sup>2</sup> ) Rotational inertia of table.	16KCPR: 0.00048 Ring: 0.00093	16KCPR: 0.00051 Ring: 0.00096	16KCPR: 0.0033 Ring: 0.0050	16KCPR: 0.0060 Ring: 0.0070	16KCPR: 0.037 Ring: 0.046
Stage Weight (kg, less motor)	1.55	1.32	3.2	2.8	7.5
Recommended Payload Maximum, kg Bearing capacity is far in excess of these numbers for enhanced bearing life. Ability to control recommended payloads entirely dependent on move profile and moment of inertia.	10		25		100



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