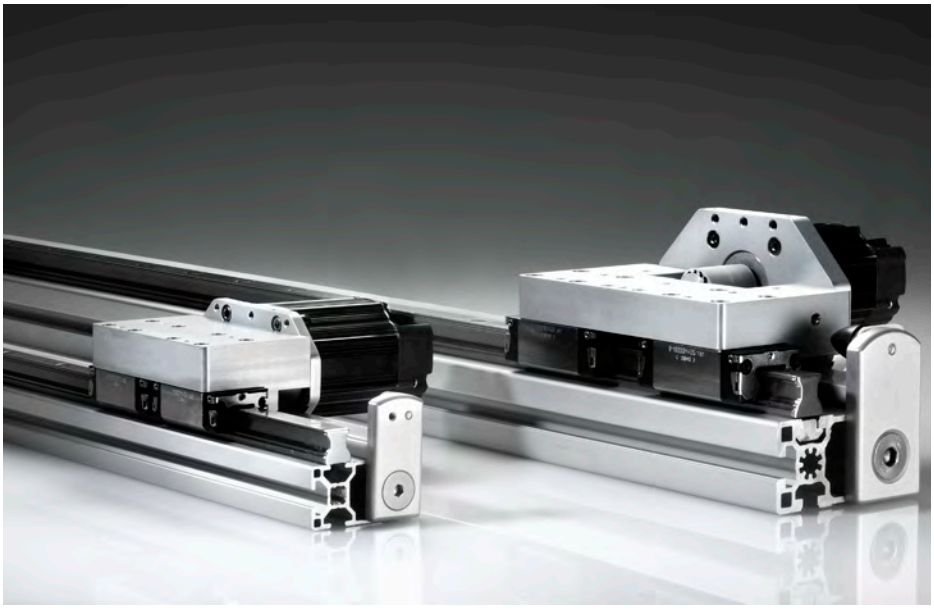
Bell Everman

Solutions For A World Of Motion

SERVOBELT LINEAR DRIVE

Forget everything you thought you knew about belt drives



- **High Performance, Low Cost.** With speeds up to 4 m/s, accuracy to ± 4 µm per meter and bi-directional repeatability of ± 1 encoder count, ServoBelt Linear compares favorably to high-end linear motor drives costing thousands more.
- **Limitless Scalability.** With a chassis based on standard Bosch-Rexroth T-slot extrusions, ServoBelt Linear can be engineered for travel distances up to 50 meters to create large-format motion systems.
- **Multiple Carriages and Axes.** A single ServoBelt Linear axis will support multiple carriages with independent motion. Multi-axis configurations include Cartesian motion systems and gantry robots.

PART NUMBERING — SBL – XX – XX – XX – XX – XX – XX – XX – XX – XX – XX – XX

Series
ServoBelt Linear (SBL)

Model
L (Light Duty), M (Medium Duty) or H (Heavy Duty)

Motor

Available on Light & Medium Duty models only:
231P, 231S (NEMA 23, 1 stack, parallel or series wound)
232P, 232S (NEMA 23, 2 stack, parallel or series wound)
233P, 233S (NEMA 23, 3 stack, parallel or series wound)
234P, 234S (NEMA 23, 4 stack, parallel or series wound)
Customer supplied motor

Available on Medium & Heavy Duty models only:
342P, 342S (NEMA 34, 2 stack, parallel or series wound)
343P, 343S (NEMA 34, 3 stack, parallel or series wound)
344P, 344S (NEMA 34, 4 stack, parallel or series wound)
Customer supplied motor

Chassis & Carriage
30x60 (30 x 60 Series, without wrap) – Light Duty
45x45W (45 x 45 Series, wrap only) – Medium Duty
45x90, 45x90W (45 x 90 Series, with or without wrap) – Medium Duty
45x180, 45x180W (45 x 180 Series, with or without wrap) – Medium & Heavy Duty
45x270, 45x270W (45 x 270 Series, with or without wrap) – Medium & Heavy Duty
90x90S (90 x 90S Series, no wrap available) – Medium & Heavy Duty

Extra Carriages
0, 1 or 2

Length (Travel Length = Overall Length - 240mm)
Available in 20 mm increments between 340 mm and 5,500 mm (Light Duty)
Available in 20 mm increments between 340 mm and 17,600 mm (Medium Duty)

Energy Chain
STD (Standard), R (Remove) or HD (Heavy Duty)

Motor Feedback
16K or 20K—*NEMA 34 Motor only*

Linear Feedback
LE1 (Renishaw Tonic linear encoder, 1µ resolution), LE.2 (Renishaw Tonic linear encoder, 0.2µ resolution), LE.1 (Renishaw Tonic linear encoder, 0.1µ resolution)

Sensor Type
NPN (Sinking Sensors, Normally Closed), PNP (Sourcing Sensors, Normally Closed), REED (Normally Open)

Environment (Bearing Coatings)
STD (Standard rail and block), TDC (Thin Dense Chrome Plating on standard rail), SS (Stainless Steel Bearing Rail), CR (Corrosion Resistant, stainless steel bearing blocks)

EXAMPLE — SBL – M – 342S – 45X90 – 1 – 600 – R – 20K – LE1 – NPN – CR

TECHNICAL SPECIFICATIONS	ServoBelt Linear		
	SBL-L **ServoBelt Linear, Light Duty**	**SBL-M** **ServoBelt Linear, Medium Duty**	**SBL-H** **ServoBelt Linear, Heavy Duty**
Type	Rotary Drive Linear, NEMA 23 or user motor	Rotary Drive Linear, NEMA 23, 34 or user motor	Rotary Drive Linear, NEMA 34 or user motor
Payload, lb Payload x Acceleration = Linear Force	50	100	300
Linear travel per motor revolution (mm)	75		200
Bearing type	Preloaded 4-row ricirculating ball, std or corrosion resistant		
Length max	5m single piece chassis, with bearing splices 95m with chassis and bearing splices		
Motor type	3-phase brushless servo or user supplied of any type		
Accuracy (µm) Linear accuracy at stage centerline, after two-point temperature scale correction.	Linear optical encoder: ±4/meter Rotary encoder: ±135/full travel		
Raw belt accuracy (mm)	+0.0/-0.5		
Uni-directional repeatability (µm) Achievable under ideal conditions	±10		±15
Bi-directional repeatability (µm)	±25 to ±125 depending on deceleration profile		±76 to ±127 depending on deceleration profile
Angular deviation (±arc-sec) Yaw angle maximum in the plane of the base. Most chassis are flexible enough that this is generally the achievable number when the unit is straightened on user surface.	±20		
Encoder type and resolution(s): rotary (CPR), linear (µm)	16KCPR (NEMA 23) rotary motor encoder; 1µm magnetic linear; 1µm, 0.5µm, 0.1µm optical linear	16KCPR (NEMA 23), 16KCPR (NEMA 34) rotary motor encoder; 1µm magnetic linear; 1µm, 0.5µm, 0.1µm optical linear	16KCPR (NEMA 34) rotary motor encoder; 1µm magnetic linear; 1µm, 0.5µm, 0.1µm optical linear
Speed (m/sec)	4		
Max continuous linear force (lbf)	38 single carriage 30 dual carriage	75 single carriage 60 dual carriage	300 single carriage 240 dual carriage
Max shear for 10Mm @ 2m/sec (N)	840	2028 (single rail) 4057 (double rail)	4057 (double rail)
Max pitch and yaw moment for 10Mm @ 2m/sec (N-m)	5.6	110 (single rail) 220 (double rail)	220 (double rail)
Max roll moment for 10Mm @ 2m/sec (N-m)	5.6	25 (single rail) 183, 365, 232 (-180, -270, -90S)	183, 365 (-180, -270)
Moving mass	Refer to configurator, depends on carriage style and motor selections		
Chassis mass	Refer to configurator, depends on carriage style and motor selections		
Ultimate dynamic belt life Belt life cycles (out and back to same spot), load in Newtons, cycles to belt failure	30M cycles @ 56N 20M cycles @ 112N 15M cycles @ 168N 2M cycles @ 225N	30M cycles @ 112N 20M cycles @ 225N 15M cycles @ 337N 2M cycles @ 450N	5M Cycles @ 1334N
Maximum length, mm	5500	unlimited length can be expanded indefinitely with the use of rail splice kits	
Minimum chassis size, mm	30 x 60	45 x 45	45 x 180
Bearings style-size, mm	single-15	dual-20 or single-20	dual-20