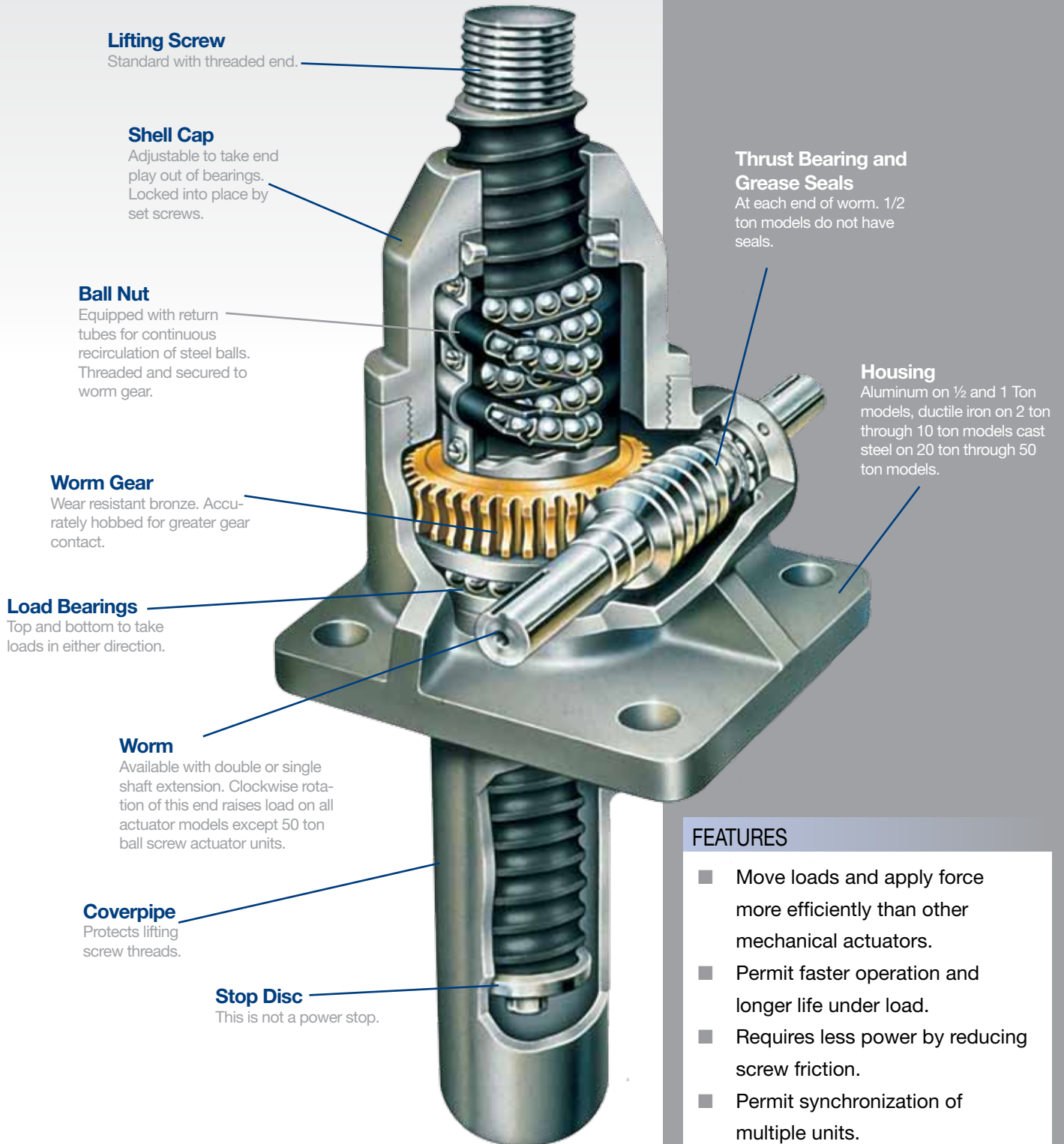


BALL SCREW ACTUATORS

1/2 to 50 TONS



Lifting Screw
Standard with threaded end.

Shell Cap
Adjustable to take end play out of bearings. Locked into place by set screws.

Ball Nut
Equipped with return tubes for continuous recirculation of steel balls. Threaded and secured to worm gear.

Worm Gear
Wear resistant bronze. Accurately hobbled for greater gear contact.

Load Bearings
Top and bottom to take loads in either direction.

Worm
Available with double or single shaft extension. Clockwise rotation of this end raises load on all actuator models except 50 ton ball screw actuator units.

Coverpipe
Protects lifting screw threads.

Stop Disc
This is not a power stop.

Thrust Bearing and Grease Seals
At each end of worm. 1/2 ton models do not have seals.

Housing
Aluminum on 1/2 and 1 Ton models, ductile iron on 2 ton through 10 ton models cast steel on 20 ton through 50 ton models.

FEATURES

- Move loads and apply force more efficiently than other mechanical actuators.
- Permit faster operation and longer life under load.
- Requires less power by reducing screw friction.
- Permit synchronization of multiple units.
- Capacity from 1/2 to 50 Tons.
- Handles full load in tension or compression.
- 40 models available.

BALL SCREW ACTUATORS

MODEL NUMBERING SYSTEM

FL - TKM - 9802 - 6 - 1R

Model Prefix

R - Reducer
F - C-face Adapter
L - Limit Switch
E - Encoder
J - Rotary Counter

Screw End & Configuration

T - Threaded End
C - Clevis End
M - Top Plate
P - Plain End
K - Anti-rotation Screw
CC - Double Clevis
D - Inverted Rotating
U - Upright Rotating

Series & Capacity No.

Series:

Ball Screw (98xx, 28xx, 78xx)
Special BS (108xx, 38xx, 88xx)

(2800 series base configurations are available only on 1/2, 1, 2, 3 and 50 Ton models)

Capacities:

Upright model suffixes end with the capacity number.
Inverted model suffixes lower the capacity number by one digit. Rotating model suffixes raise the capacity number by one digit.

1/2 & 1 Ton models use ball screw lead measurement in place of capacity information. These numbers change as described above based on actuator configuration.

M - Base Model

Travel

1" increment travels are always represented using the exact travel amount.

Travels with fractional lengths are quoted using that length, but are serialized when the order is processed.

Serialized digits in this position may also be used for other models containing special features

Model Suffix

B - Boot
L - Single End Worm Ext. Left
R - Single End Worm Ext. Right
1 - Optional Ratio #1
2 - Optional Ratio #2
X - Supplied without cover pipe

B9863A TV - 10.50 - LX2 - BFL

Capacity

B9863 - 1000 Lbs

Screw End

C - Clevis End Screw
CC - Double Clevis Ends
M - Top Plate Screw
P - Plain End Screw
T - Threaded End Screw

Travel

1" Incremental travels are always represented using the exact travel amount. Fractional lengths are represented and processed to the nearest 100ths.

Base Model

None - Upright Translating
D - Inverted Rotating
K - Keyed, anti-rotation
U - Upright Rotating
V - Inverted Translating

Key Accessories

B - Boot
E - Encoder
F - C-face Adapter
H - Hand Wheel
J - Rotary Counter
L - Limit Switch
R - Reducer

Model Suffix

L - Single End Worm Extension Left
N - Numeric Gear Ratio - 100 turns/inch
R - Single End Worm Extension Right
X - Supplied without Cover Pipe
1 - Alternate Gear Ratio #1
2 - Alternate Gear Ratio #2

Alphabet characters representing features and suffixes should always be used in alphabetic order to avoid questions of hierarchy.

Models for actuators with specialized features will have a serialized suffix such as B9225T-0001.

BALL SCREW ACTUATORS

PERFORMANCE TABLE

Specifications - Ball Screw Actuator														
Capacity (Tons)	1/2	1	2 (HL)	2	3	5 (HL)	5	10 (HL)	10	20 (HL)	20	25	50 [†]	
Max. Speed Cface Driven (in/min)** Pg. 118	—	—	287.5	72.0	118.5	287.5	136.5	215.5	102.0	215.5	108.0	81.0	—	
Max. Speed Red. Driven (in/min)** Pg. 110	—	—	57.51	14.4	23.7	57.4	27.2	43	20.4	43.1	21.6	20.1	33.4	
Dimensional Information Pg. 115	52	53	54-59	54-59	60-61	62	63	64	65	66	66	67	68-69	
Lifting Screw	Diameter (in)	5/8	3/4	1	1	1-11/64	1-1/2	1-1/2	1-1/2	1-1/2	2-1/4	2-1/4	3	4
	Lead (in)	0.200	0.200	1.000	0.250	0.413	1.000	0.474	1.000	0.474	1.000	0.5000	0.660	1.000
Worm Gear Ratios	Standard	5:1	5:1	6:1	6:1	6:1	6:1	6:1	8:1	8:1	8:1	8:1	10-2/3:1	10-2/3:1
	Optional No. 1	20:1	20:1	24:1	24:1	24:1	24:1	24:1	24:1	24:1	24:1	24:1	32:1	32:1
	Optional No. 2	—	—	12:1	12:1	12:1	12:1	12:1	—	—	—	—	—	—
Turns of Worm for 1 inch Stroke	Standard	25	25	6	24	14.526	6	12.667	8	16.889	8	16	16.16	10.67
	Optional No. 1	100	100	24	96	58.106	24	50.667	24	50.667	24	48	48.48	32
	Optional No. 2	—	—	12	48	29.053	12	25.334	—	—	—	—	—	—
Worm Torque at No Load (in-lb)	Standard	0.5	2	10	3	5	20	10	20	15	50	40	40	40
	Optional No. 1	0.5	2	10	3	5	20	10	20	15	50	40	40	40
	Optional No. 2	—	—	10	3	5	20	10	—	—	—	—	—	—
Maximum Horsepower per Actuator	Standard	1/3	1/2	2	2	2	4	4	5	5	5	5	8	15
	Optional No. 1	1/6	1/4	1/2	1/2	1/2	3/4	3/4	1-1/2	1-1/2	1-1/2	1-1/2	2-1/2	6
	Optional No. 2	—	—	3/4	3/4	3/4	2	2	—	—	—	—	—	—
Starting Worm Torque at Full Load (in-lb)	Standard	10.5	22	180	50	110	500	220	800	350	1375	700	925	2700
	Optional No. 1	5.0	11	80	25	50	206	90	400	175	625	325	475	1500
	Optional No. 2	—	—	110	30	68	300	145	—	—	—	—	—	—
Running Worm Torque at Full Load (in-lb)	Standard	9.5	21	160	45	100	410	180	700	300	1270	650	825	2200
	Optional No. 1	4.0	10	70	20	45	183	80	290	150	570	300	425	1200
	Optional No. 2	—	—	100	25	60	270	125	—	—	—	—	—	—
Efficiency Rating (%)	Standard	67.0	60.6	66.3	58.9	65.7	64.7	69.8	56.8	62.8	62.7	61.2	59.7	67.8
	Optional No. 1	39.8	31.8	37.9	33.2	36.5	36.2	39.3	45.7	41.9	46.5	44.2	38.6	41.4
	Optional No. 2	—	—	53.0	53.1	54.8	49.1	50.3	—	—	—	—	—	—
Weight with 6 inch Stroke (Raise) (lb)	2.8	5	20	20	21	40	40	50	50	115	115	235	520	
Weight per Additional 1 inch Stroke (Raise) (lb)	0.1	0.3	0.3	0.3	0.4	0.9	0.9	0.9	0.9	1.5	1.5	2.9	5.0	
Hold Back Torque at Rated Load (ft-lb)	Standard	1	1	2	2	7	8	8	24	11	24	24	24	92
	Optional No. 1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	2	2	33
	Optional No. 2	—	—	1	1	2	2	2	—	—	—	—	—	—
Key Torque (in-lb)	35	70	100	175	440	1800	850	3500	1700	7000	3500	6000	17700	
Max Worm Speed at Full Load (rpm)	Standard	2001	1432	700	2521	1146	504	1146	394	900	229	450	545	350
	Optional No. 1	2101	1432	394	1261	630	229	252	236	540	151	291	332	252
	Optional No. 2	—	—	430	5875	695	420	869	—	—	—	—	—	—
Maximum Load at Full Horsepower and 170 rpm (lb)	Standard	1150	1601	1459	5875	3830	2585	6384	4104	9855	3927	8489	14018	17250
	Optional No. 1	1223	1556	458	2729	1734	377	2126	1791	4878	280	1968	5751	8942
	Optional No. 2	—	—	680	3557	2096	1858	4595	—	—	—	—	—	—

Notes:

- Hold Back Torque is restraining torque at the worm shaft to keep load from running down.
- Lifting torques are proportional to load, down to 25% of rated load.
- See page 107 for Ball Screw and Nut Life Expectancy.
- All actuator units can be supplied with standard raises up to 24 inches. Special raises up to 20 feet are available upon request. Closed height dimensions may increase for actuators supplied with bellows boots. See page 148-149.

[†] Does your ball screw application require more than 50 tons? Please contact our Customer Service group to explore our specialty options for higher load ratings up to 100 tons.