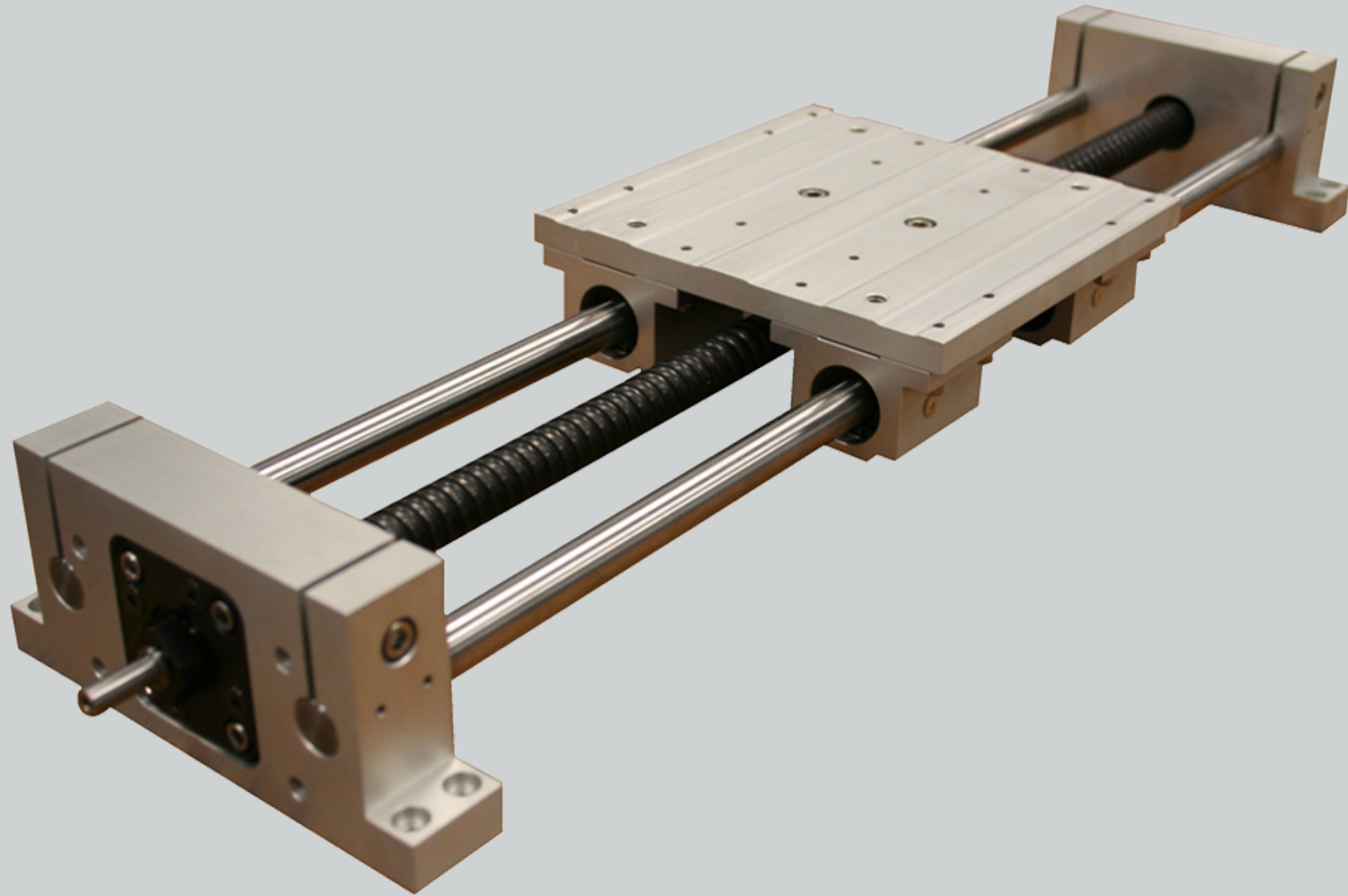




SteadyRailTM Series

***POSITIONING STAGES
AND TABLES***

EXPERTLY DESIGNED, DELIVERED TO PERFORM

Powered by over 70 years of relentless problem-solving and steadfast reliability, Bishop-Wisecarver delivers innovative motion solutions around the world that thrive in harsh and extreme conditions. Our linear and rotary motion solutions, custom complex assemblies, and embedded intelligence systems lead the manufacturing industry, and they are backed by The Signature Experience promise of expert guidance, confidence and customer satisfaction.

PERFECT FOR HARSH AND EXTREME ENVIRONMENTS

When you purchase from Bishop-Wisecarver, you aren't just getting a product that works; you're getting products, systems, and industry-leading expertise you can trust, especially in harsh conditions and critical environments—always exceeding our customers' reliability requirements.

Our Motion Products and Solutions Are Also Perfect For:



**HARSH
ENVIRONMENTS**



LONG LENGTH



LOW NOISE



**HIGH/LOW
TEMPERATURE**



**LOW TOTAL COST
OF OWNERSHIP**



**SMOOTH, LOW
FRICTION MOTION**



**MOIST
ENVIRONMENTS**



FOOD GRADE



CLEAN ROOM



VACUUM

INTRODUCTION

SteadyRail™ is an out-of-the-box solution that can be used manually or as a driven actuator. Designed with an emphasis on simplicity and durability, SteadyRail leverages round rail technology with ball bushings for robust and low friction performance. Featuring a highly rigid construction, SteadyRail is available to support long product life as well as lower maintenance requirements. SteadyRail utilizes high quality aluminum, carbon steel and stainless steel materials and features a number of sizes, pillow blocks and end support options. SteadyRail is capable of load capacities of up to 3,400 lbs. and travel lengths of up to 48 inches.

Design Benefits

- Low maintenance
- Added drive components for standalone functionality
- Ball screw drive mechanisms integrated
- Available as a complete motion system
- Low coefficient of friction at 0.003 typical

Options

- Travel ranges from 6" to 42" stroke length
- Unsupported or continuously supported round shaft linear bearings
- Carbon or stainless steel shafting in several diameters and load capacities
- Undriven or with ball screw drive mechanisms with various diameters and lead pitch
- Motor mount flanges and shaft coupler combinations
- Precision machined and anodized aluminum components

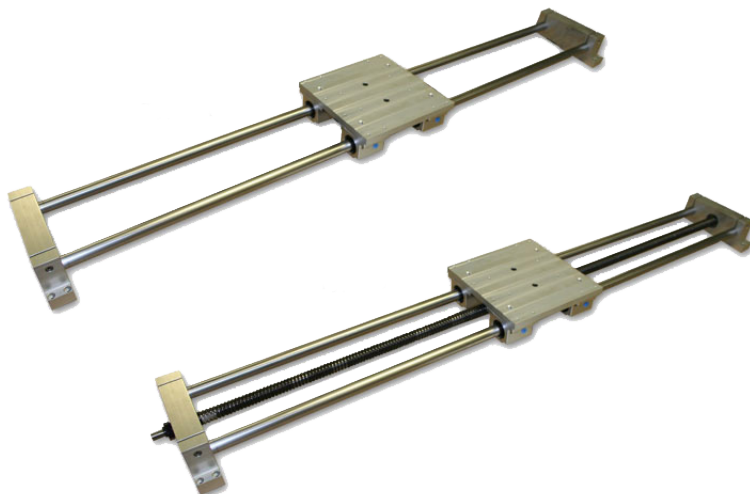


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Need Help

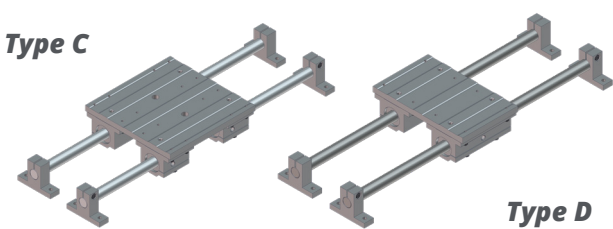
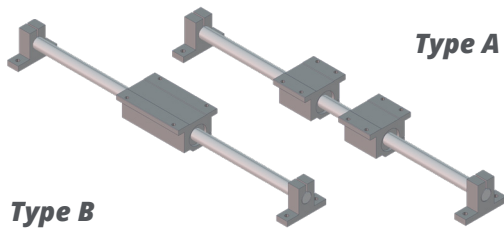
Application + Design Assistance
925.439.8272

3D Modeling + CAD Drawing
BWC.com

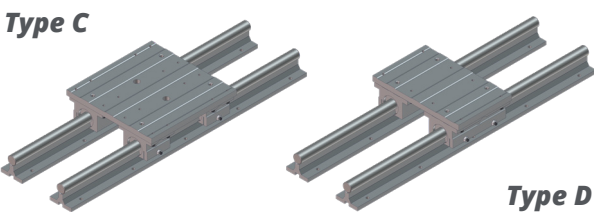
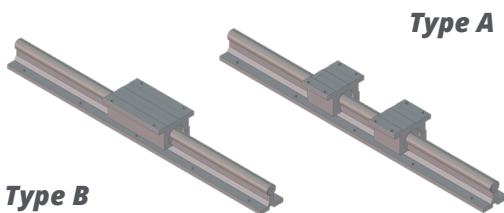
SYSTEM OVERVIEW

SteadyRail Linear Stages are constructed of either carbon steel or stainless steel shafting and high quality aluminum alloy components that are protected with a clear anodized surface finish.

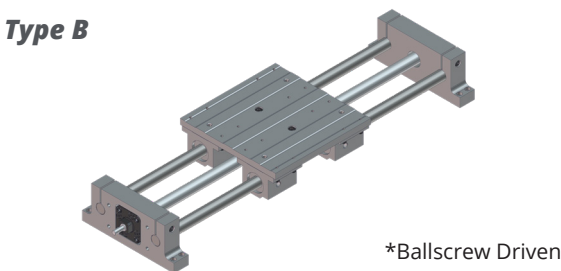
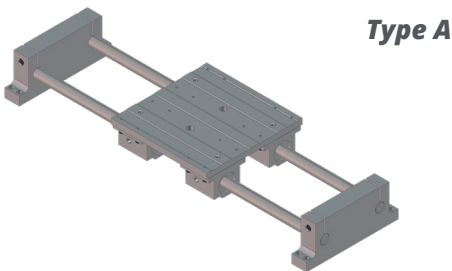
Stage 1 - End Supported Systems



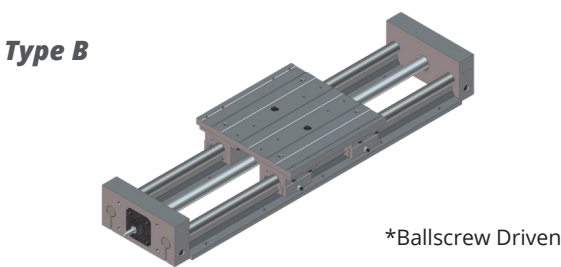
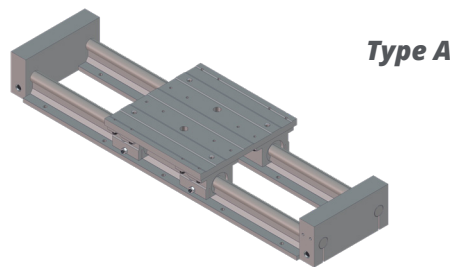
Stage 2 - Continuously Supported Systems



Stage 3 - Double End Supported Systems

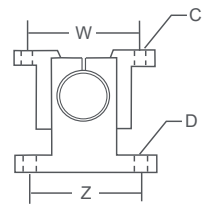
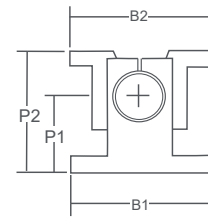
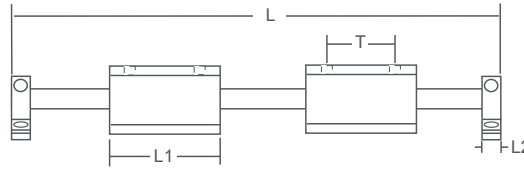
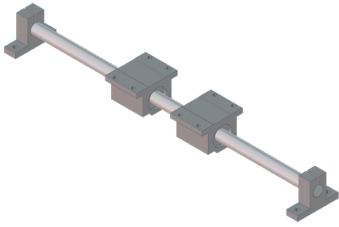


Stage 4 - Double Continuously Supported Systems



END SUPPORTED SYSTEM

Stage 1 Type A / Short Single Bearing Ball Bushing Blocks



Dimensions

STOCK CODE	SHAFT DIA.	MAX. LOAD* (LBS)	L	L1	L2	B1	B2	P1	P2	W	T	Z	C THRU HOLE / BOLT SIZE	D THRU HOLE / BOLT SIZE
1A04	0.250	120	See Below	1.19	0.50	1.50	1.630	0.688	1.125	1.312	0.750	1.12	0.156 / #6	0.156 / #6
1A06	0.375	190		1.31	0.56	1.63	1.750	0.750	1.250	1.437	0.875	1.25	0.156 / #6	0.156 / #6
1A08	0.500	460		1.69	0.63	2.00	2.000	1.000	1.687	1.688	1.000	1.50	0.156 / #6	0.188 / #8
1A10	0.625	800		1.94	0.69	2.50	2.500	1.000	1.875	2.125	1.125	1.88	0.188 / #8	0.218 / #10
1A12	0.750	940		2.06	0.75	2.50	2.750	1.250	2.187	2.375	1.250	2.00	0.188 / #8	0.218 / #10
1A16	1.000	1700		2.81	1.00	3.06	3.250	1.500	2.687	2.875	1.750	2.50	0.219 / #10	0.281 / 1/4

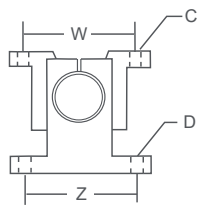
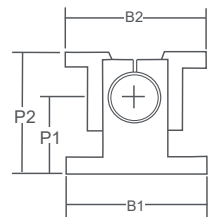
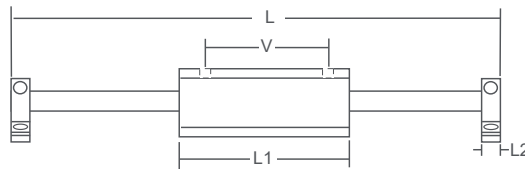
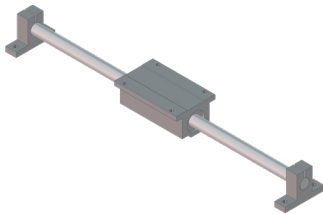
*Based on a travel of 2 million inches.

SYSTEM TYPE

STANDARD SYSTEM LENGTHS (L)

SYSTEM TYPE	12"	18"	24"	30"	36"	42"	48"
Stage 1 - A							

Stage 1 Type B / Long Double Bearing Ball Bushing Blocks



Dimensions

STOCK CODE	SHAFT DIA.	MAX. LOAD* (LBS)	L	L1	L2	B1	B2	P1	P2	W	V	Z	C THRU HOLE / BOLT SIZE	D THRU HOLE / BOLT SIZE
1B04	0.250	96	See Below	2.50	0.50	1.50	1.630	0.688	1.125	1.312	2.000	1.12	0.156 / #6	0.156 / #6
1B06	0.375	150		2.75	0.56	1.63	1.750	0.750	1.250	1.437	2.250	1.25	0.156 / #6	0.156 / #6
1B08	0.500	370		3.50	0.63	2.00	2.000	1.000	1.687	1.688	2.500	1.50	0.156 / #6	0.188 / #8
1B10	0.625	640		4.00	0.69	2.50	2.500	1.000	1.875	2.125	3.000	1.88	0.188 / #8	0.218 / #10
1B12	0.750	750		4.50	0.75	2.50	2.750	1.250	2.187	2.375	3.500	2.00	0.188 / #8	0.218 / #10
1B16	1.000	1360		6.00	1.00	3.06	3.250	1.500	2.687	2.875	4.500	2.50	0.219 / #10	0.281 / 1/4

*Based on a travel of 2 million inches.

SYSTEM TYPE

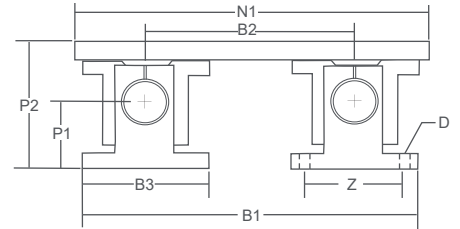
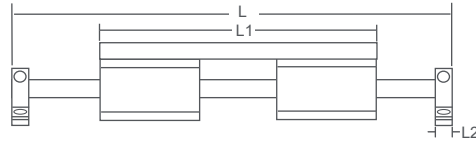
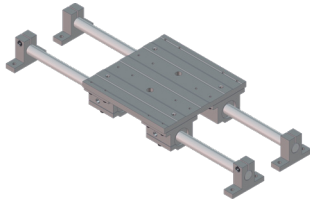
STANDARD SYSTEM LENGTHS (L)

SYSTEM TYPE	12"	18"	24"	30"	36"	42"	48"
Stage 1 - B							

Travel length is calculated by subtracting the pillow block length (L1) and both the end support block length (L2) from the total system length (L).

END SUPPORTED SYSTEM

Stage 1 Type C / Short Single Bearing Ball Bushing Blocks



Dimensions													
STOCK CODE	SHAFT DIA.	MAX. LOAD* (LBS)	L	L1	L2	B1	B2	B3	N1	P1	P2	Z	D THRU HOLE / BOLT SIZE
1C04	0.250	240	See Below	4.00	0.50	3.75	2.25	1.50	4.00	0.688	1.375	1.12	0.156 / #6
1C06	0.375	380		4.50	0.56	4.13	2.50	1.63	4.50	0.750	1.500	1.25	0.156 / #6
1C08	0.500	920		5.50	0.63	5.25	3.25	2.00	5.50	1.000	2.063	1.50	0.188 / #8
1C10	0.625	1600		6.50	0.69	6.25	3.75	2.50	6.50	1.000	2.250	1.88	0.218 / #10
1C12	0.750	1880		7.50	0.75	7.00	4.50	2.50	7.50	1.250	2.688	2.00	0.218 / #10
1C16	1.000	3400		9.00	1.00	8.56	5.50	3.06	9.00	1.500	3.188	2.50	0.281 / 1/4

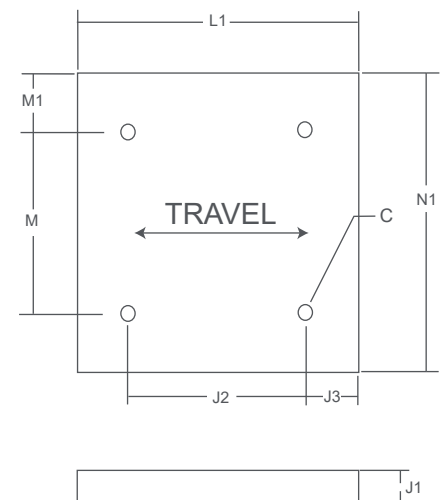
*Based on a travel of 2 million inches.

SYSTEM TYPE	STANDARD SYSTEM LENGTHS (L)						
Stage 1 - C	12"	18"	24"	30"	36"	42"	48"

Travel length is calculated by subtracting the carriage length (L1) and both the end support block length (L2) from the total system length (L).

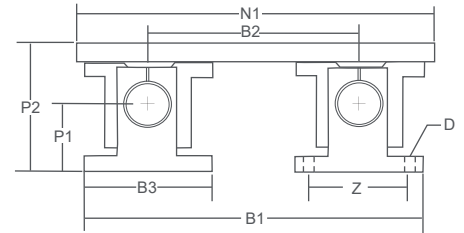
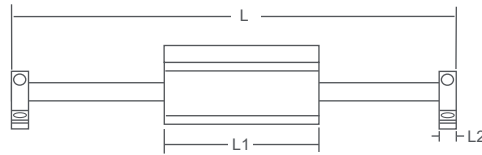
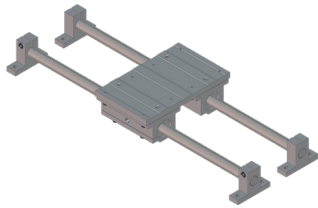
Carriage Dimensions									
STOCK CODE	SHAFT DIA.	M	M1	J1	C	J2	J3	L1	N1
1C04	0.250	2.25	0.88	0.25	#8-32	3.50	0.25	4.00	4.00
1C06	0.375	2.50	1.00	0.25	#10-32	3.75	0.38	4.50	4.50
1C08	0.500	3.25	1.13	0.37	1/4-20	4.50	0.50	5.50	5.50
1C10	0.625	3.75	1.38	0.37	1/4-20	5.25	0.63	6.50	6.50
1C12	0.750	4.50	1.50	0.50	5/16-18	6.00	0.75	7.50	7.50
1C16	1.000	5.50	1.75	0.50	3/8-16	7.00	1.00	9.00	9.00

Unit: inch



END SUPPORTED SYSTEM

Stage 1 Type D / Long Double Bearing Ball Bushing Blocks



Dimensions													
STOCK CODE	SHAFT DIA.	MAX. LOAD* (LBS)	L	L1	L2	B1	B2	B3	N1	P1	P2	Z	D THRU HOLE / BOLT SIZE
1D04	0.250	192	See Below	2.50	0.50	3.75	2.25	1.50	4.00	0.688	1.375	1.12	0.156 / #6
1D06	0.375	300		2.75	0.56	4.13	2.50	1.63	4.50	0.750	1.500	1.25	0.156 / #6
1D08	0.500	740		3.50	0.63	5.25	3.25	2.00	5.50	1.000	2.063	1.50	0.188 / #8
1D10	0.625	1280		4.00	0.69	6.25	3.75	2.50	6.50	1.000	2.250	1.88	0.218 / #8
1D12	0.750	1500		4.50	0.75	7.00	4.50	2.50	7.50	1.250	2.688	2.00	0.218 / #8
1D16	1.000	2720		7.00	1.00	8.56	5.50	3.06	9.00	1.500	3.188	2.50	0.281 / 1/4

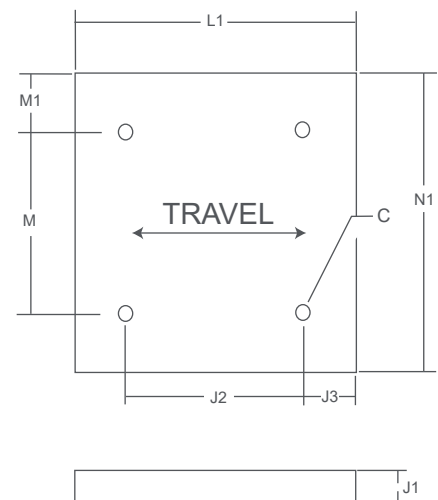
*Based on a travel of 2 million inches.

SYSTEM TYPE	STANDARD SYSTEM LENGTHS (L)						
Stage 1 - D	12"	18"	24"	30"	36"	42"	48"

Travel length is calculated by subtracting the carriage length (L1) and both the end support block length (L2) from the total system length (L).

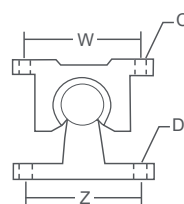
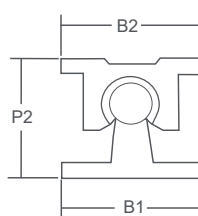
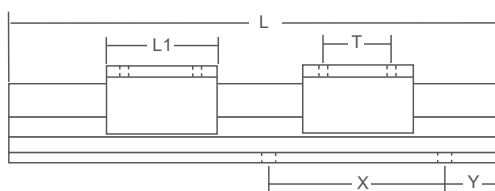
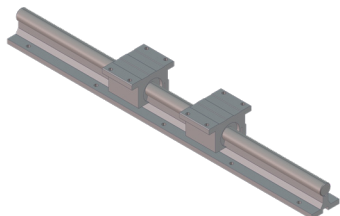
Carriage Dimensions									
STOCK CODE	SHAFT DIA.	M	M1	J1	C	J2	J3	L1	N1
1D04	0.250	2.25	0.88	0.25	#8-32	2.00	0.25	2.50	4.00
1D06	0.375	2.50	1.00	0.25	#10-32	2.00	0.38	2.75	4.50
1D08	0.500	3.25	1.13	0.37	1/4-20	2.50	0.50	3.50	5.50
1D10	0.625	3.75	1.38	0.37	1/4-20	3.00	0.50	4.00	6.50
1D12	0.750	4.50	1.50	0.50	5/16-18	3.50	0.50	4.50	7.50
1D16	1.000	5.50	1.75	0.50	3/8-16	4.50	0.75	6.00	9.00

Unit: inch



CONTINUOUSLY SUPPORTED SYSTEM

Stage 2 Type A / Short Single Bearing Ball Bushing Blocks



Dimensions

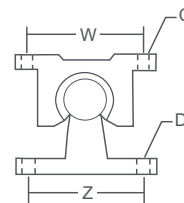
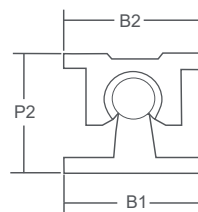
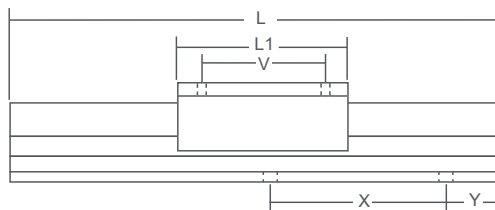
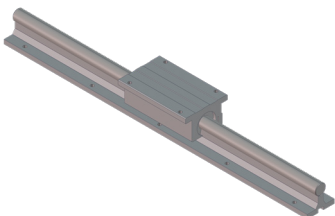
STOCK CODE	SHAFT DIA.	MAX. LOAD* (LBS)	L	L1	B1	B2	P2	W	T	X	Y	Z	C THRU HOLE / BOLT SIZE	D THRU HOLE / BOLT SIZE
2A08	0.500	460	See Below	1.50	1.50	2.00	1.812	1.688	1.00	4.00	2.00	1.000	0.156 / #6	0.169 / #6
2A10	0.625	800		1.75	1.63	2.50	2.000	2.125	1.13	4.00	2.00	1.125	0.188 / #8	0.193 / #8
2A12	0.750	940		1.88	1.75	2.75	2.437	2.375	1.25	6.00	3.00	1.250	0.188 / #8	0.221 / #10
2A16	1.000	1700		2.63	2.13	3.25	2.937	2.875	1.75	6.00	3.00	1.500	0.219 / #10	0.281 / 1/4

*Based on a travel of 2 million inches.

SYSTEM TYPE	STANDARD SYSTEM LENGTHS (L)							
Stage 2 - A	12"	18"	24"	30"	36"	42"	48"	

Travel length is calculated by subtracting the pillow block length (L1) from the total system length (L).

Stage 2 Type B / Long Double Bearing Ball Bushing Blocks



Dimensions

STOCK CODE	SHAFT DIA.	MAX. LOAD* (LBS)	L	L1	B1	B2	P2	W	V	X	Y	Z	C THRU HOLE / BOLT SIZE	D THRU HOLE / BOLT SIZE
2B08	0.500	370	See Below	3.50	1.50	2.00	1.812	1.688	2.50	4.00	2.00	1.000	0.156 / #6	0.169 / #6
2B10	0.625	640		4.00	1.63	2.50	2.000	2.125	3.00	4.00	2.00	1.125	0.188 / #8	0.193 / #8
2B12	0.750	750		4.50	1.75	2.75	2.437	2.375	3.50	6.00	3.00	1.250	0.188 / #8	0.221 / #10
2B16	1.000	1360		6.00	2.13	3.25	2.937	2.875	4.50	6.00	3.00	1.500	0.219 / #10	0.281 / 1/4

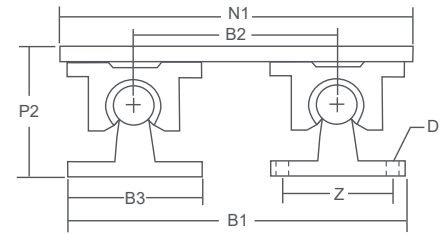
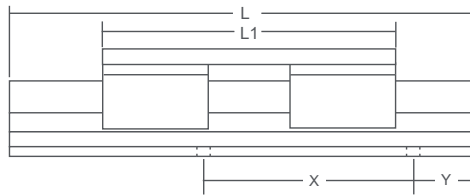
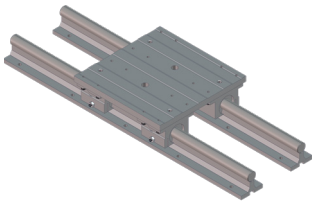
*Based on a travel of 2 million inches.

SYSTEM TYPE	STANDARD SYSTEM LENGTHS (L)							
Stage 2 - B	12"	18"	24"	30"	36"	42"	48"	

Travel length is calculated by subtracting the pillow block length (L1) from the total system length (L).

CONTINUOUSLY SUPPORTED SYSTEM

Stage 2 Type C / Short Single Bearing Ball Bushing Blocks



Dimensions

STOCK CODE	SHAFT DIA.	MAX. LOAD* (LBS)	L	L1	B1	B2	B3	N1	P2	X	Y	Z	D THRU HOLE / BOLT SIZE
2C08	0.500	920	See Below	5.50	4.75	3.25	1.50	5.50	2.187	4.00	2.00**	1.000	0.177 / #6
2C10	0.625	1600		6.50	5.38	3.75	1.63	6.50	2.375	4.00	2.00**	1.125	0.193 / #8
2C12	0.750	1880		7.50	6.25	4.50	1.75	7.50	2.937	6.00	3.00	1.250	0.221 / #10
2C16	1.000	3400		9.00	7.63	5.50	2.13	9.00	3.437	6.00	3.00	1.500	0.281 / 1/4

*Based on a travel of 2 million inches.

**For 18", 30", and 42" system lengths subtract 1" of "Y" dimension.

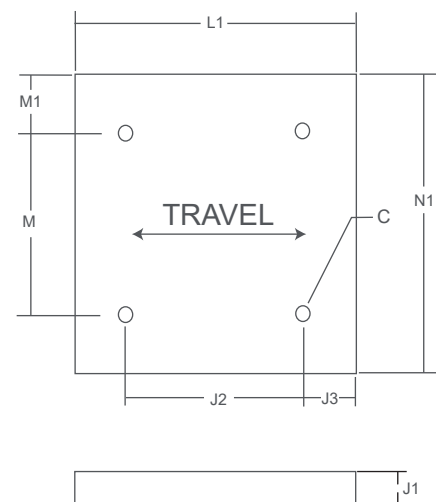
SYSTEM TYPE	STANDARD SYSTEM LENGTHS (L)						
Stage 2 - C	12"	18"	24"	30"	36"	42"	48"

Travel length is calculated by subtracting the carriage length (L1) from the total system length (L).

Carriage Dimensions

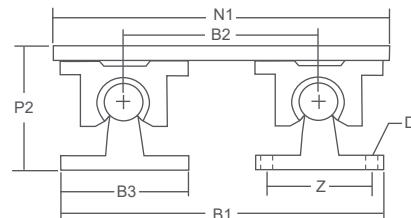
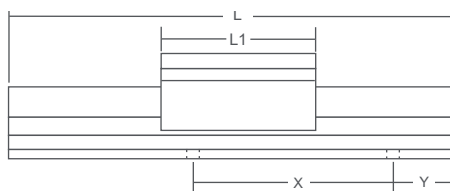
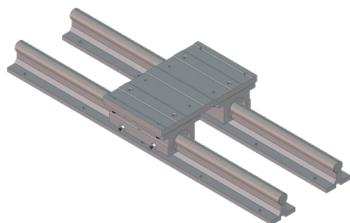
STOCK CODE	SHAFT DIA.	M	M1	J1	C	J2	J3	L1	N1
2C08	0.500	3.25	1.13	0.37	1/4-20	4.50	0.50	5.50	5.50
2C10	0.625	3.75	1.38	0.37	1/4-20	5.25	0.63	6.50	6.50
2C12	0.750	4.50	1.50	0.50	5/16-18	6.00	0.75	7.50	7.50
2C16	1.000	5.50	1.75	0.50	3/8-16	7.00	1.00	9.00	9.00

Unit: inch



CONTINUOUSLY SUPPORTED SYSTEM

Stage 2 Type D / Long Double Bearing Ball Bushing Blocks



Dimensions

STOCK CODE	SHAFT DIA.	MAX. LOAD* (LBS)	L	L1	B1	B2	B3	N1	P2	X	Y	Z	D THRU HOLE / BOLT SIZE
2D08	0.500	740	See Below	3.50	4.75	3.25	1.50	5.50	2.187	4.00	2.00**	1.000	0.177 / #6
2D10	0.625	1280		4.00	5.38	3.75	1.63	6.50	2.375	4.00	2.00**	1.125	0.193 / #8
2D12	0.750	1500		4.50	6.25	4.50	1.75	7.50	2.937	6.00	3.00	1.250	0.221 / #10
2D16	1.000	2720		6.00	7.63	5.50	2.13	9.00	3.437	6.00	3.00	1.500	0.281 / 1/4

*Based on a travel of 2 million inches.

**For 18", 30", and 42" system lengths subtract 1" of "Y" dimension.

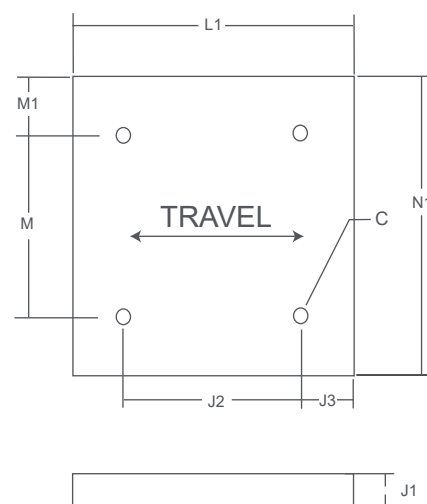
SYSTEM TYPE	STANDARD SYSTEM LENGTHS (L)						
Stage 2 - D	12"	18"	24"	30"	36"	42"	48"

Travel length is calculated by subtracting the pillow block length (L1) from the total system length (L).

Carriage Dimensions

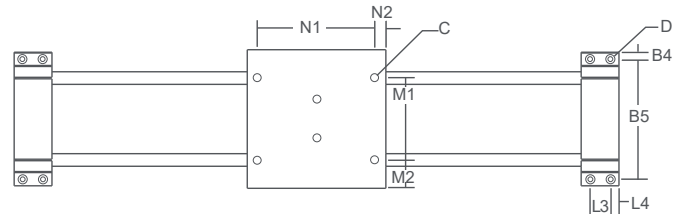
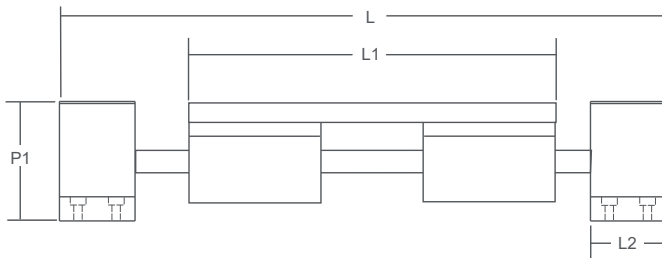
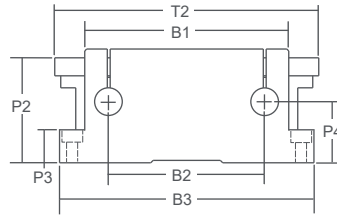
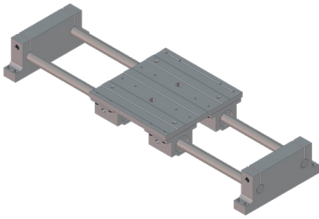
STOCK CODE	SHAFT DIA.	M	M1	J1	C	J2	J3	L1	N1
2D08	0.500	3.25	1.13	0.37	1/4-20	2.50	0.50	3.50	5.50
2D10	0.625	3.75	1.38	0.37	1/4-20	3.00	0.50	4.00	6.50
2D12	0.750	4.50	1.50	0.50	5/16-18	3.50	0.50	4.50	7.50
2D16	1.000	5.50	1.75	0.50	3/8-16	4.50	0.75	6.00	9.00

Unit: inch



DOUBLE END SUPPORTED SYSTEM

Stage 3 Type A / Short Single Bearing Ball Bushing Blocks



Dimensions

STOCK CODE	SHAFT DIA.	MAX. LOAD* (LBS)	L	L1	L2	L3	L4	B1	B2	B3	B4	B5	M1	M2	N1	N2	P1	P2	P3	P4	T2	C	D HOLE/ BOLT
3A08	0.500	920	See Below	5.50	1.00	0.56	0.22	4.25	3.25	5.30	0.25	4.80	3.25	1.125	4.50	0.50	2.38	2.187	0.50	1.125	5.50	1/4-20	0.19 / #8
3A10	0.625	1600		6.50	1.00	0.56	0.22	5.00	3.75	6.25	0.25	5.75	3.75	1.375	5.25	0.63	2.38	2.375	0.60	1.313	6.50	1/4-20	0.19 / #8
3A12	0.750	1880		7.50	1.30	0.80	0.25	6.00	4.50	7.20	0.25	6.70	4.50	1.500	6.00	0.75	2.75	2.937	0.75	1.500	7.50	5/16-18	0.22 / #10
3A16	1.000	3400		9.00	1.30	0.74	0.28	7.25	5.50	8.70	0.35	8.00	5.50	1.750	7.00	1.00	3.37	3.437	0.75	1.750	9.00	3/8-16	0.28 / 1/4

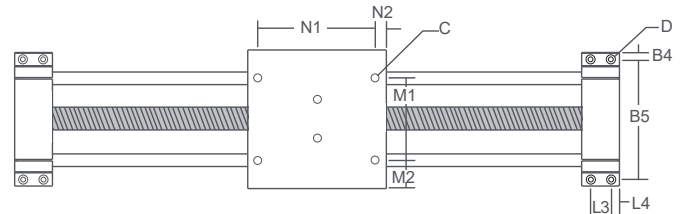
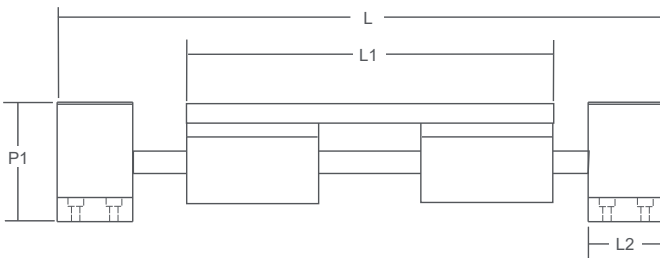
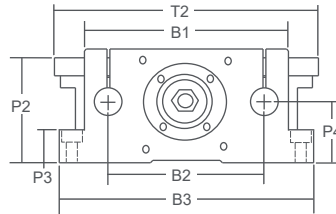
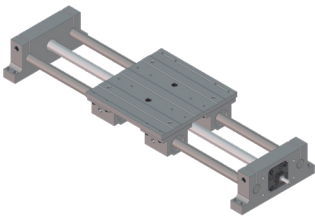
*Based on a travel of 2 million inches.

TRAVEL	OVERALL SYSTEM LENGTH (L)			
	3A08	3A10	3A12	3A16
6	13.5	14.5	16.1	17.6
12	19.5	20.5	22.1	23.6
18	25.5	26.5	28.1	29.6
24	31.5	32.5	34.1	35.6
30	37.5	38.5	40.1	41.6
36	43.5	44.5	46.1	47.6
42	49.5	50.5	52.1	53.6

Unit: inch

DOUBLE END SUPPORTED SYSTEM WITH BALL SCREW

Stage 3 Type B / Short Single Bearing Ball Bushing Blocks, Ball Screw Drive



Dimensions

STOCK CODE	SHAFT DIA.	MAX. LOAD* (LBS)	L	L1	L2	L3	L4	B1	B2	B3	B4	B5	M1	M2	N1	N2	P1	P2	P3	P4	T2	C	D HOLE/ BOLT
3B08	0.500	920	See Below	5.50	1.00	0.56	0.22	4.25	3.25	5.30	0.25	4.80	3.25	1.125	4.50	0.50	2.38	2.187	0.50	1.125	5.50	1/4-20	0.19 / #8
3B10	0.625	1600		6.50	1.00	0.56	0.22	5.00	3.75	6.25	0.25	5.75	3.75	1.375	5.25	0.63	2.38	2.375	0.60	1.313	6.50	1/4-20	0.19 / #8
3B12	0.750	1880		7.50	1.30	0.80	0.25	6.00	4.50	7.20	0.25	6.70	4.50	1.500	6.00	0.75	2.75	2.937	0.75	1.500	7.50	5/16-18	0.22 / #10
3B16	1.000	3400		9.00	1.30	0.74	0.28	7.25	5.50	8.70	0.35	8.00	5.50	1.750	7.00	1.00	3.37	3.437	0.75	1.750	9.00	3/8-16	0.28 / 1/4

*Based on a travel of 2 million inches.

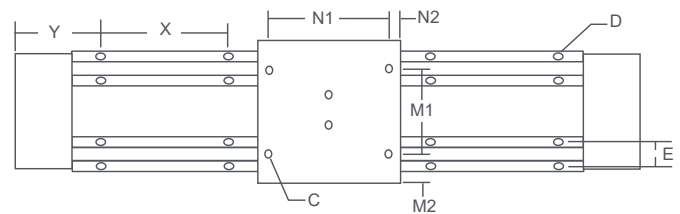
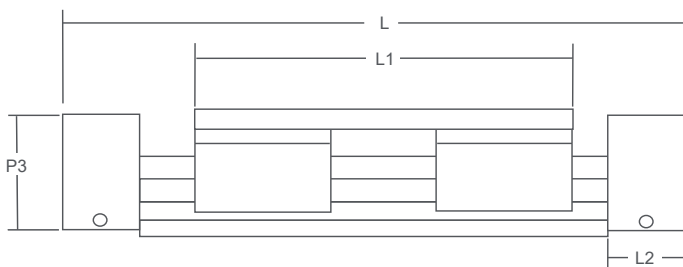
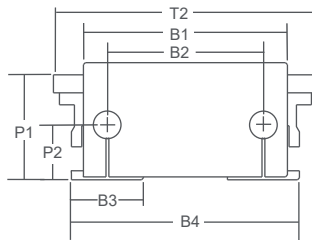
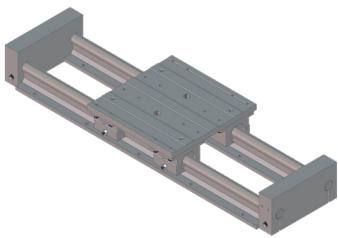
TRAVEL	OVERALL SYSTEM LENGTH (L)			
	3B08	3B10	3B12	3B16
6	13.5	14.5	16.1	17.6
12	19.5	20.5	22.1	23.6
18	25.5	26.5	28.1	29.6
24	31.5	32.5	34.1	35.6
30	37.5	38.5	40.1	41.6
36	43.5	44.5	46.1	47.6
42	49.5	50.5	52.1	53.6

Unit: inch

Various ball screw and lead screw options are available. See page 15 for standard options. Please specify screw lead when ordering or call Bishop-Wisecarver for available options.

DOUBLE CONTINUOUSLY SUPPORTED SYSTEM

Stage 4 Type A / Short Single Bearing Ball Bushing Blocks



Dimensions

STOCK CODE	SHAFT DIA.	MAX. LOAD* (LBS)	L	L1	L2	B1	B2	B3	B4	M1	M2	N1	N2	P1	P2	P3	T2	C	D HOLE / BOLT	E	X	Y
4A08	0.500	920	See Below	5.50	1.00	4.25	3.25	1.50	4.75	3.25	1.125	4.50	0.50	2.187	1.125	2.38	5.50	1/4-20	0.17 / #6	1	4.00	2.75**
4A10	0.625	1600		6.50	1.00	5.00	3.75	1.63	5.38	3.75	1.375	5.25	0.63	2.375	1.125	2.38	6.50	1/4-20	0.19 / #8	1-1/8	4.00	3.25**
4A12	0.750	1880		7.50	1.30	6.00	4.50	1.75	6.25	4.50	1.500	6.00	0.75	2.937	1.500	2.75	7.50	5/16-18	0.22 / #10	1-1/4	6.00	2.05
4A16	1.000	3400		9.00	1.30	7.25	5.50	2.13	7.63	5.50	1.750	7.00	1.00	3.437	1.750	3.37	9.00	3/8-16	0.28 / 1/4	1-1/2	6.00	2.80

*Based on a travel of 2 million inches.

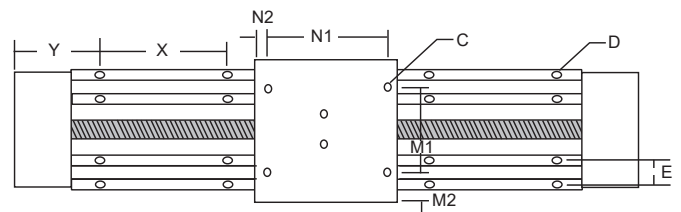
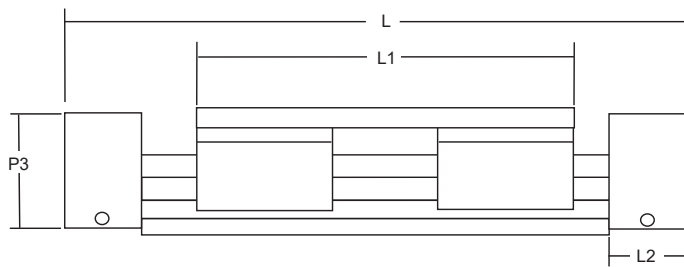
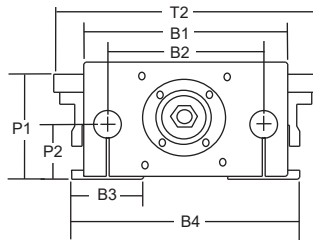
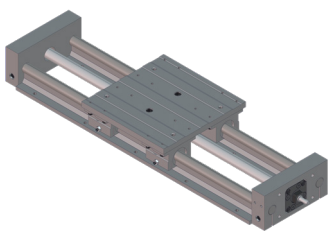
**For 12", 24", and 36" travel lengths subtract 1" of "Y" dimension.

TRAVEL	OVERALL SYSTEM LENGTH (L)			
	4A08	4A10	4A12	4A16
6	13.5	14.5	16.1	17.6
12	19.5	20.5	22.1	23.6
18	25.5	26.5	28.1	29.6
24	31.5	32.5	34.1	35.6
30	37.5	38.5	40.1	41.6
36	43.5	44.5	46.1	47.6
42	49.5	50.5	52.1	53.6

Unit: inch

DOUBLE CONTINUOUSLY SUPPORTED SYSTEM

Stage 4 Type B / Short Single Bearing Ball Bushing Blocks, Ball Screw Drive



Dimensions

STOCK CODE	SHAFT DIA.	MAX. LOAD* (LBS)	L	L1	L2	B1	B2	B3	B4	M1	M2	N1	N2	P1	P2	P3	T2	C	D HOLE / BOLT	E	X	Y
4B08	0.500	920	See Below	5.50	1.00	4.25	3.25	1.50	4.75	3.25	1.125	4.50	0.50	2.187	1.125	2.38	5.50	1/4-20	0.17 / #6	1	4.00	2.75**
4B10	0.625	1600		6.50	1.00	5.00	3.75	1.63	5.38	3.75	1.375	5.25	0.63	2.375	1.125	2.38	6.50	1/4-20	0.19 / #8	1-1/8	4.00	3.25**
4B12	0.750	1880		7.50	1.30	6.00	4.50	1.75	6.25	4.50	1.500	6.00	0.75	2.937	1.500	2.75	7.50	5/16-18	0.22 / #10	1-1/4	6.00	2.05
4B16	1.000	3400		9.00	1.30	7.25	5.50	2.13	7.63	5.50	1.750	7.00	1.00	3.437	1.750	3.37	9.00	3/8-16	0.28 / 1/4	1-1/2	6.00	2.80

*Based on a travel of 2 million inches.

**For 12", 24", and 36" travel lengths subtract 1" of "Y" dimension.

TRAVEL	OVERALL SYSTEM LENGTH (L)			
	4B08	4B10	4B12	4B16
6	13.5	14.5	16.1	17.6
12	19.5	20.5	22.1	23.6
18	25.5	26.5	28.1	29.6
24	31.5	32.5	34.1	35.6
30	37.5	38.5	40.1	41.6
36	43.5	44.5	46.1	47.6
42	49.5	50.5	52.1	53.6

Unit: inch

Various ball screw and lead screw options are available. See page 15 for standard options. Please specify screw lead when ordering or call Bishop-Wisecarver for available options.

STOCK CODE BUILDER

1 A 04 A J CS Txx S P HL Mxxx

Stage

1: Stage 1
2: Stage 2
3: Stage 3
4: Stage 4

Type Designations

A: Short, Single Bearing Block
B: Long, Double Bearing Block
C: Short, Single Bearing Block
D: Long, Double Bearing Block

Shaft Diameter⁴

(in 1/16")

04: 0.250"
06: 0.375"
08: 0.500"
10: 0.625"
12: 0.750"
16: 1.00"

Version

A

Pillow Block Type

Blank: Standard Pillow Blocks
J: Adjustable (for stages 2 & 4 only)

Shafting Material

CS: Carbon Steel
SS: Stainless Steel

Motor Option

Blank (Types 1, 2, 3A, 4A only)
Number or letter designation (contact BW for detailed options)

Home & Limit Switches

Blank: (Types 1, 2, 3A, 4A only)
NN: None
HL: Home & Limit

Ball Screw Lead

Blank: (Types 1, 2, 3A, 4A only)
P: 0.200"
U: 0.500"⁵

Ball Screw Diameter

Blank: (Types 1, 2, 3A, 4A only)
S: Ball Screw (0.631" for size 08 & 10, 0.750" for size 12 & 16)

Travel or System Length (inches)

Specify length in inches
Lxx for Type 1 & 2
Txx for Type 3 & 4

Notes:

- Standard Travel Lengths: 06, 12, 18, 24, 30, 36, 42, 48
- Type 1 and 2 use System Length (Lxx), Type 3 and 4 use Travel Length (Txx)
- Type A systems use travel length based on the two pillow blocks butted together.
- Available shaft sizes dependent on system size.
- 0.500" lead ball screw is available only on size 3B12, 3B16, 4B12, 4B16.

TECHNICAL GUIDE

Basic Dynamic Load (C)

This term is arrived at based upon evaluation of a number of identical linear systems individually run in the same conditions. 90% of them can run with the load (with a constant value in the constant direction) for a distance of 2,000,000 inches without damage caused by rolling fatigue. This is the basis of this rating.

Basic Static Load Rating (CO)

This term defines a static load such that at the contracting position where the maximum stress is exercised, the sum of the permanent deformation of the rolling elements and that of the rolling plane is 0.0001 times the diameter of the rolling element.

Ambient Working Temperature

The ambient working temperature range for each linear system depends on the model. Consult Bishop-Wisecarver on use outside the recommended temperature range.

Notice that the ambient working temperature range for sealed linear systems made of stainless steel is from -20° C to 120° C. Temperature conversion equation:

$$C = \frac{5}{9} (F - 32) \quad F = 32 + \frac{9}{5} C$$

LINEAR SYSTEM TYPE	AMBIENT WORKING TEMPERATURE
Linear Motion Bushing	-20 to 70° C
Pillow Blocks	-20 to 70° C

Frictional Resistance

The frictional resistance is expressed by the following equation:

$$F = \mu \times W + f$$

F: Frictional resistance μ : Coefficient of friction

W: Load weight f: Sealing resistance

The frictional resistance of each linear system depends upon the model, load weight, speed, and lubricant. The sealing resistance depends on the lip of interference and lubricant, regardless of the load weight. The sealing resistance of one linear system is about 200 to 500gf. The coefficient of friction depends on the load weight, moment load, and preload. The chart below shows the coefficient of kinetic friction of each type of linear system which has been installed and lubricated properly and applied with normal load is: ($P/C = 0.2$). P = Applied Load, C = Rated Load.

Coefficient of Friction (μ)

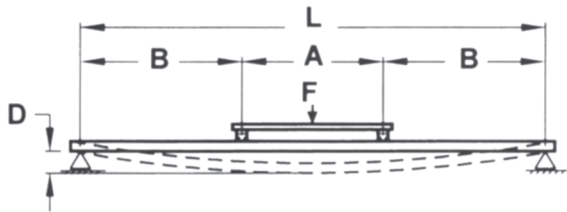
LINEAR SYSTEM TYPE	COEFFICIENT OF FRICTION
Recirculating Bushing	0.002 to 0.003
Linear Motion Bushing	0.002 to 0.003

TECHNICAL GUIDE

Shaft Deflection

The function and the service life of a system can be greatly reduced and even cause premature failures if shaft deflection is not observed. We have provided an equation to help calculate the maximum shaft deflection for your selected condition.

$$D = \frac{F \times B \times [3L^2 - 4B^2]}{48EI} + \frac{5SL^4}{384EI}$$



Equation Terms

- D = Deflection (in)
- L = Distance between shaft and support (in)
- E = Modulus of elasticity (lbf / in²)
- I = Shafts moment of inertia (in⁴)
- S = Shaft unit weight (lbf / in)
- F = Load (including carriage weight) (lbf)
- A = Distance between carriage bearings (in)
- B = (L - A) / 2 (in)

Specifications

SOLID SHAFT		
SHAFT DIA. (INCH)	EI (LBF X IN ²)	S (LBF X IN)
0.250	5.75 x 10 ³	0.014
0.375	2.97 x 10 ⁴	0.031
0.500	9.20 x 10 ⁴	0.055
0.625	2.25 x 10 ⁵	0.086
0.750	4.66 x 10 ⁵	0.125
0.875	8.63 x 10 ⁵	0.170
1.000	1.47 x 10 ⁶	0.222
1.125	2.36 x 10 ⁶	0.281
1.250	3.60 x 10 ⁶	0.348

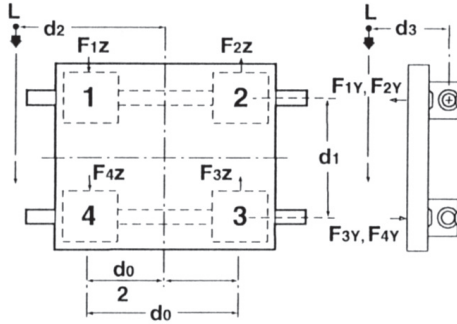
Load Considerations

The loads acting upon a bearing of a linear motion system are important for the proper system selection. When designing a linear motion system it is necessary to consider these loads and the variables of operation and what affect they will have on performance. The following equations demonstrate how the position of the load and center of gravity can influence the system selection. When evaluating your application, review each of the forces acting on your system and determine the system best for your needs.

TECHNICAL GUIDE

Vertical Load

At the time of movement with uniform velocity or at the time of stop. At the time of acceleration, the load varies because of inertia.



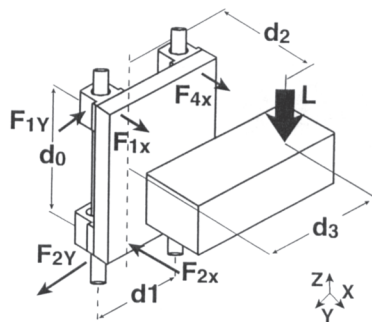
$$F_{1Y} \sim F_{4Y} = \frac{L}{2} \times \frac{d_3}{d_1}$$

$$F_{1Z} \sim F_{4Z} = \frac{L}{4} + \frac{L}{2} \times \frac{d_2}{d_0}$$

$$F_{2Z} \sim F_{3Z} = \frac{L}{4} - \frac{L}{2} \times \frac{d_2}{d_0}$$

Side Mounted Load

At the time of movement with uniform velocity or at the time of stop.



$$F_{1X} \sim F_{4X} = \frac{L}{2} \times \frac{d_2}{d_0}$$

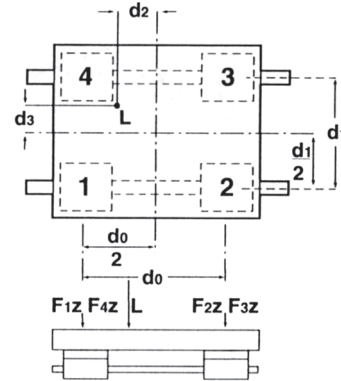
$$F_{1Y} \sim F_{4Y} = \frac{L}{2} \times \frac{d_3}{d_0}$$

$$F_{1X} + F_{4X} \sim F_{2X} + F_{3X}$$

$$F_{1Y} + F_{4Y} \sim F_{2Y} + F_{3Y}$$

Horizontal Load

At the time of movement with uniform velocity or at the time of stop.



$$F_{1Z} = \frac{L}{4} + \left(\frac{L}{2} \times \frac{d_2}{d_0} \right) - \left(\frac{L}{2} \times \frac{d_3}{d_1} \right)$$

$$F_{2Z} = \frac{L}{4} + \left(\frac{L}{2} \times \frac{d_2}{d_0} \right) - \frac{L}{2} \times \frac{d_3}{d_1}$$

$$F_{3Z} = \frac{L}{4} + \left(\frac{L}{2} \times \frac{d_2}{d_0} \right) - \frac{L}{2} \times \frac{d_3}{d_1}$$

$$F_{4Z} = \frac{L}{4} + \left(\frac{L}{2} \times \frac{d_2}{d_0} \right) - \frac{L}{2} \times \frac{d_3}{d_1}$$

Equation Terms

d_0 = Distance between centerlines of pillowblocks (in)

L = Distance between shaft and support (in)

d_2 = Distance from centerline of carriage to load action point (in)

d_3 = Distance from centerline of carriage to load action point (in)

F_{NX} = Force in the X-axis direction (lbf)

F_{NY} = Force in the Y-axis direction (lbf)

F_{NZ} = Force in the Z-axis direction (lbf)

Components & Accessories

DualVee®
MadeWell®
GV3
SL2
PRT2
HDS2
HDRT
MCS
Motor Mounts
Gantry Brackets
Wrenches

Manual Linear Guide Systems

DualVee®
UtiliTrak®
MinVee®
GV3
Simple Select®
SL2
HDS2
MHD
HTS

Actuated Linear Guide Systems

LoPro®
XLA™
ECO60™
SlickStick™
SteadyRail™
HDLS
HDCS
PDU2
DAPDU2
SBD
PSD
SDM
DLS

Rotary Guide Systems

PRT2
DTS2
DTS
DTS+
ALR
HDRT
1-Trak
GFX

Robot Transfer Units

DualVee® RTU
LoPro® RTU

Custom Solutions

Extruded Profile Guides
Custom Bearings
Custom Subassemblies
Engineering Services
Large Diameter Ring Guides and Track

BWC.COM

Women's Business Enterprise



• Certified WOSB

Contact

Web: **BWC.com**
Phone: **(925) 439-8272**
Email: **Sales@bwc.com**

Corporate Office

Bishop-Wisecarver
2104 Martin Way
Pittsburg, CA 94565

Quality Certifications



- Certified Bay Area Green Business
- Certified Evergreen



Certifications & Compliance

- EN 9100:2018
- JISQ 9100:2016
- ISO 13485 & GMP Compliance
- Responsible Minerals Initiative
- RoHS
- International Traffic in Arms Regulations Compliant

