Precision Rolled Ball Screws
'R' Series [F2R] and ACME SCREWS [F2ACME]
'O' Series [O2TH] zeroTOOTH motor Mount
Technical Information

fang TOOTH Fast delivery program

Metric Leads & Diameters

www.fangtooth-linear.com

Other Products

Automation Ideas with Teeth

fang TOOTH

Linear Actuators | Ball Screws | Gearboxes | Lifts | Systems

fangOPEN & fangMAX Precision Gear Rack Guided Actuators

And

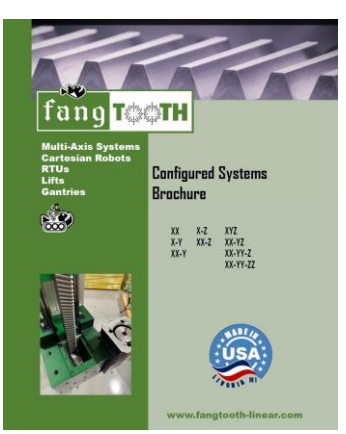
FINGLIDE Guided Ball Screw Actuators

Servo & Industrial Gearboxes

Fangtooth will tackle any solution by making a custom to fit your exact requirement

CALL TODAY

Multi-Axis Systems



www.fangtooth-linear.com

BALLSCREW CATALOG CONTENTS

"R" Series Rolled Screw

Page 4

High Quality Ball Screws with Internal re-circulation
Order the whole assembly with one part number including the support bearings.

"Ø" Series Motor Mount

Page 14

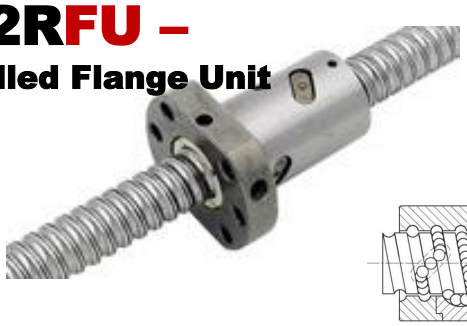
S imple to Drop into Design
L onger Screws at Higher Speeds
I ncreased Ball Screw L10 Life
P erfect Motor Mount

Slip means Float for Float Adapter

fangTOOTH
'R' Series Ball Screws

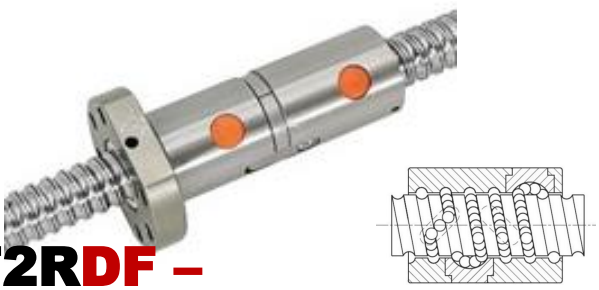
Product Offering

F2RFU –
Rolled Flange Unit



F2RSQ –
Rolled Square Lead Plus High Speed

F2RDF –
Rolled Double (nut) Flange



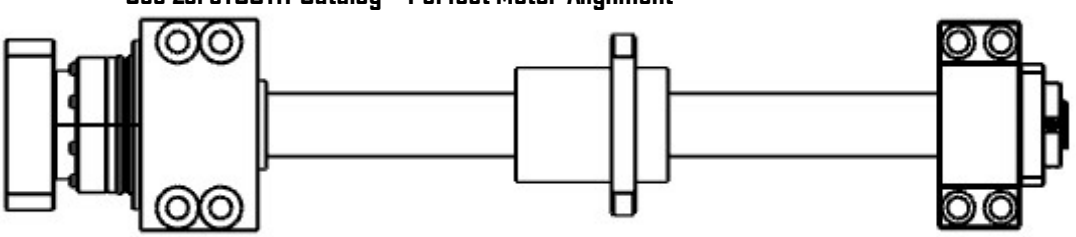
F2RTY –
Rolled Toy Miniature

BK-FIXED **BF-FREE** **FK-FIXED** **FF-FLOAT**

fang 02TH Screw Axis

Zero Tooth – Free/Fixed
Zero Problem Motor Mounting

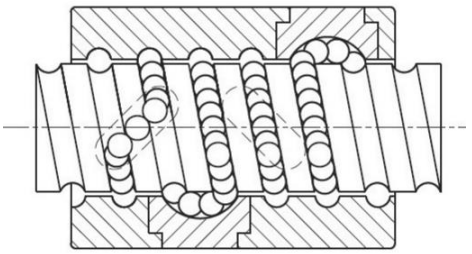
See ZeroTOOTH Catalog – Perfect Motor Alignment



Ball Nut Design & Lead Accuracy

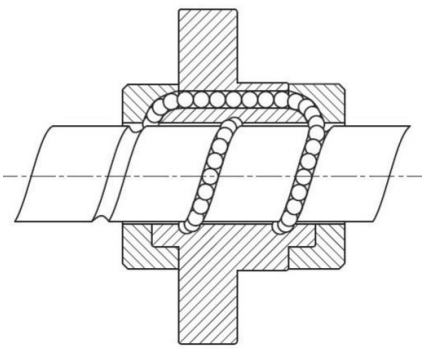
Ball Nut Type: F / D

The type F and D ball nut utilize internal ball returns of cast steel. The ball returns are captured in the ball nut to prevent the returns from coming out of the assembly during ball recirculation. This design allows for high DN (rotation speed) as well as high translational speeds when compared to external or end type ball returns.



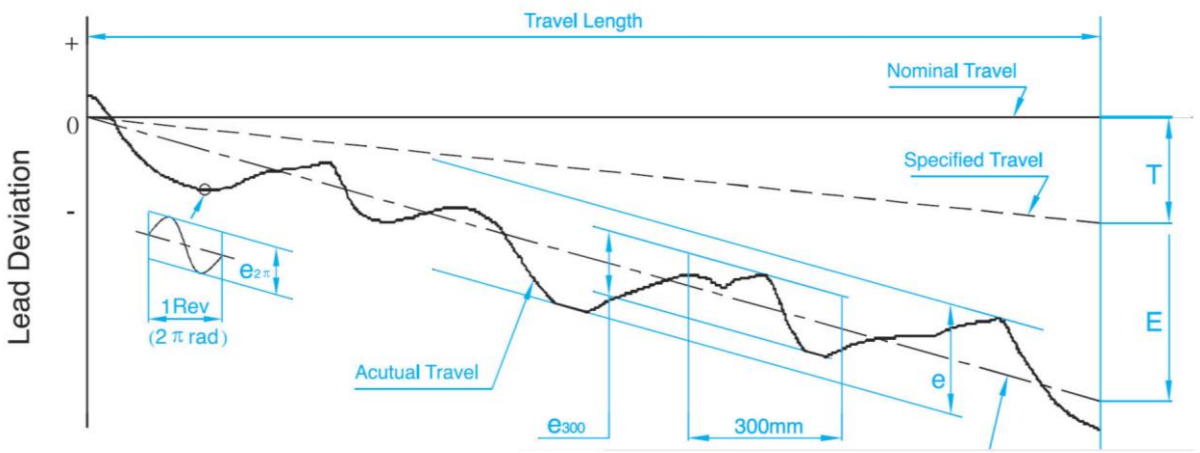
Ball Nut Type: E

The type E ball screw is a high lead ball screw with end style ball returns. The high lead ball screws allow for high translation rates while maintaining lower critical speeds.



Lead Accuracy

- The ball screws offered by Alpha have an accumulated travel deviations of grade C7 and C10. The value allowable per 300mm measured at any portion of the thread is 0.05mm for C7 and 0.21mm for C10.



FAST BALL SCREW DELIVERY PROGRAM

list of model numbers
SHIP NOW BALL SCREWS: 2 day FAST delivery

16mm Dia Ball Screw Assembly with 10mm Lead Constant

00001kf	F2RFU1610-750-BK12BF12ASM	FixedFloatFlangeFacingDriveEnd (750mmOAL)
00001fk	F2RFU1610-750-BF12BK12ASM	FloatFixedFlangeoppositeDriveEnd (750mmOAL)
00006kf	F2RFU1610-1200-BK12BF12ASM	FixedFloatFlangeFacingDriveEnd (1200mmOAL)
00011fk	F2RFU1610-2000-BF12BK12ASM	FloatFixedFlangeoppositeDriveEnd (2m OAL)

20mm Dia Ball Screw Assembly with 10mm Lead Constant

00002kf	F2RFU2010-750-BK15BF15ASM	FixedFloatFlangeFacingDriveEnd (750mmOAL)
00002fk	F2RFU2010-750-BF15BK15ASM	FloatFixedFlangeoppositeDriveEnd (750mmOAL)
00007kf	F2RFU2010-1200-BK15BF15ASM	FixedFloatFlangeFacingDriveEnd (1200mmOAL)
00012fk	F2RFU2010-2000-BF15BK15ASM	FloatFixedFlangeoppositeDriveEnd (2m OAL)

25mm Dia Ball Screw Assembly with 10mm Lead Constant

00003kf	F2RFU2510-750-BK20BF20ASM	FixedFloatFlangeFacingDriveEnd (750mmOAL)
00003fk	F2RFU2510-750-BF20BK20ASM	FloatFixedFlangeoppositeDriveEnd (750mmOAL)
00008kf	F2RFU2510-1200-BK20BF20ASM	FixedFloatFlangeFacingDriveEnd (1200mmOAL)
00013fk	F2RFU2510-2000-BF20BK20ASM	FloatFixedFlangeoppositeDriveEnd (2m OAL)

32mm Dia Ball Screw Assembly with 10mm Lead Constant

00004kf	F2RFU3210-750-BK25BF25ASM	FixedFloatFlangeFacingDriveEnd (750mmOAL)
00004fk	F2RFU3210-750-BF25BK25ASM	FloatFixedFlangeoppositeDriveEnd (750mmOAL)
00009kf	F2RFU3210-1200-BK25BF25ASM	FixedFloatFlangeFacingDriveEnd (1200mmOAL)
00014fk	F2RFU3210-3000-BF25BK25ASM	FloatFixedFlangeoppositeDriveEnd (3m OAL)

40mm Dia Ball Screw Assembly with 10mm Lead Constant

00005kf	F2RFU4010-750-BK30BF30ASM	FixedFloatFlangeFacingDriveEnd (750mmOAL)
00005fk	F2RFU4010-750-BF30BK30ASM	FloatFixedFlangeoppositeDriveEnd (750mmOAL)
00010kf	F2RFU4010-1200-BK30BF30ASM	FixedFloatFlangeFacingDriveEnd (1200mmOAL)
00015fk	F2RFU4010-3000-BF30BK30ASM	FloatFixedFlangeoppositeDriveEnd (3m OAL)

With or Without End Supports:
ASM = with end supports
MIN = without end supports

FAST BALL SCREW DELIVERY PROGRAM

list of model numbers

CUSTOM NOW BALL SCREWS: 2 week FAST delivery

Customize Lenths to 1 mm increments:
Make sure you specify OAL (Overall Length)

EXAMPLE for OAL = 1455 mm 16mm DIA models:
164CL3kf-1455 or F2RFU1610-1455-BK12BF12ASM or
165CL3fk-1455 or F2RFU1610-1455-BF12BK12ASM

16mm Dia Ball Screw Assembly with 10mm Lead Constant

160CL1kf-LENGTH	F2RFU1610-700-BK12BF12ASM	FixedFloatFlangeFacingDriveEnd(to 700mmOAL)
161CL1fk-LENGTH	F2RFU1610-700-BK12BK12ASM	FloatFixedFlangeoppositeDriveEnd(to 700mmOAL)
162CL2kf-LENGTH	F2RFU1610-1150-BK12BF12ASM	FixedFloatFlangeFacingDriveEnd(700-1150mmOAL)
163CL2fk-LENGTH	F2RFU1610-1150-BF12BK12ASM	FloatFixedFlangeoppositeDriveEnd(700-1150mmOAL)
164CL3kf-LENGTH	F2RFU1610-1900-BK12BF12ASM	FixedFloatFlangeFacingDriveEnd(1151-1900mmOAL)
165CL3fk-LENGTH	F2RFU1610-1900-BF12BK12ASM	FloatFixedFlangeoppositeDriveEnd(1151-1900mmOAL)

20mm Dia Ball Screw Assembly with 10mm Lead Constant

200CL1kf-LENGTH	F2RFU2010-700-BK15BF15ASM	FixedFloatFlangeFacingDriveEnd(to 700mmOAL)
201CL1fk-LENGTH	F2RFU2010-700-BK15BK15ASM	FloatFixedFlangeoppositeDriveEnd(to 700mmOAL)
202CL2kf-LENGTH	F2RFU2010-1150-BK15BF15ASM	FixedFloatFlangeFacingDriveEnd(700-1150mmOAL)
203CL2fk-LENGTH	F2RFU2010-1150-BF15BK15ASM	FloatFixedFlangeoppositeDriveEnd(700-1150mmOAL)
204CL3kf-LENGTH	F2RFU2010-1900-BK15BF15ASM	FixedFloatFlangeFacingDriveEnd(1151-1900mmOAL)
205CL3fk-LENGTH	F2RFU2010-1900-BF15BK15ASM	FloatFixedFlangeoppositeDriveEnd(1151-1900mmOAL)

25mm Dia Ball Screw Assembly with 10mm Lead Constant

250CL1kf-LENGTH	F2RFU2510-700-BK20BF20ASM	FixedFloatFlangeFacingDriveEnd(to 700mmOAL)
251CL1fk-LENGTH	F2RFU2510-700-BK20BK20ASM	FloatFixedFlangeoppositeDriveEnd(to 700mmOAL)
252CL2kf-LENGTH	F2RFU2510-1150-BK20BF20ASM	FixedFloatFlangeFacingDriveEnd(700-1150mmOAL)
253CL2fk-LENGTH	F2RFU2510-1150-BF20BK20ASM	FloatFixedFlangeoppositeDriveEnd(700-1150mmOAL)
254CL3kf-LENGTH	F2RFU2510-1900-BK20BF20ASM	FixedFloatFlangeFacingDriveEnd(1151-1900mmOAL)
255CL3fk-LENGTH	F2RFU2510-1900-BF20BK20ASM	FloatFixedFlangeoppositeDriveEnd(1151-1900mmOAL)

32mm Dia Ball Screw Assembly with 10mm Lead Constant

320CL1kf-LENGTH	F2RFU3210-700-BK25BF25ASM	FixedFloatFlangeFacingDriveEnd(to 700mmOAL)
321CL1fk-LENGTH	F2RFU3210-700-BK25BK25ASM	FloatFixedFlangeoppositeDriveEnd(to 700mmOAL)
322CL2kf-LENGTH	F2RFU3210-1150-BK25BF25ASM	FixedFloatFlangeFacingDriveEnd(700-1150mmOAL)
323CL2fk-LENGTH	F2RFU3210-1150-BF25BK25ASM	FloatFixedFlangeoppositeDriveEnd(700-1150mmOAL)
324CL4kf-LENGTH	F2RFU3210-2150-BK25BF25ASM	FixedFloatFlangeFacingDriveEnd(1151-2150mmOAL)
325CL4fk-LENGTH	F2RFU3210-2150-BF25BK25ASM	FloatFixedFlangeoppositeDriveEnd(1151-2150mmOAL)
326CL5kf-LENGTH	F2RFU3210-2875-BK25BF25ASM	FixedFloatFlangeFacingDriveEnd(2151-2875mmOAL)
327CL5fk-LENGTH	F2RFU3210-2875-BF25BK25ASM	FloatFixedFlangeoppositeDriveEnd(2151-2875mmOAL)

40mm Dia Ball Screw Assembly with 10mm Lead Constant

400CL1kf-LENGTH	F2RFU4010-700-BK30BF30ASM	FixedFloatFlangeFacingDriveEnd(to 700mmOAL)
401CL1fk-LENGTH	F2RFU4010-700-BK30BK30ASM	FloatFixedFlangeoppositeDriveEnd(to 700mmOAL)
402CL2kf-LENGTH	F2RFU4010-1150-BK30BF30ASM	FixedFloatFlangeFacingDriveEnd(700-1150mmOAL)
403CL2fk-LENGTH	F2RFU4010-1150-BF30BK30ASM	FloatFixedFlangeoppositeDriveEnd(700-1150mmOAL)
404CL4kf-LENGTH	F2RFU4010-2150-BK30BF30ASM	FixedFloatFlangeFacingDriveEnd(1151-2150mmOAL)
405CL4fk-LENGTH	F2RFU4010-2150-BF30BK30ASM	FloatFixedFlangeoppositeDriveEnd(1151-2150mmOAL)
406CL5kf-LENGTH	F2RFU4010-2875-BK30BF30ASM	FixedFloatFlangeFacingDriveEnd(2151-2875mmOAL)
407CL5fk-LENGTH	F2RFU4010-2875-BF30BK30ASM	FloatFixedFlangeoppositeDriveEnd(2151-2875mmOAL)

Model Number Code:
F2R Fangtooth 'R' Rolled

F2RFU - 16 05 - 0400 - BK12 / BF12

ASM: Support Bearings Included
MIN: Minus Support Bearings

Base Model	
FU	Flange Unit
DF	Double Flange
SQ	Square Lead
TY	Toy Miniature

Screw Diameter	
4	Size: 4 mm
6	Size: 6 mm
8	Size: 8 mm
10	Size: 10 mm
12	Size: 12 mm
14	Size: 14 mm
16	Size: 16 mm
20	Size: 20 mm
25	Size: 25 mm
32	Size: 32 mm
40	Size: 40 mm
50	Size: 50 mm
63	Size: 63 mm
80	Size: 80 mm
100	Size: 100 mm

Lead	
1	1 mm
2	2mm
2.5	2.5 mm
3	3 mm
5	5 mm
10	10 mm
16	16 mm
20	20 mm
25	25 mm
32	32 mm
40	40 mm
50	50 mm
64	63 mm

Overall Length
100 – 6000 mm

- Left-hand thread available for some combinations of screw size, lead, and nut type.

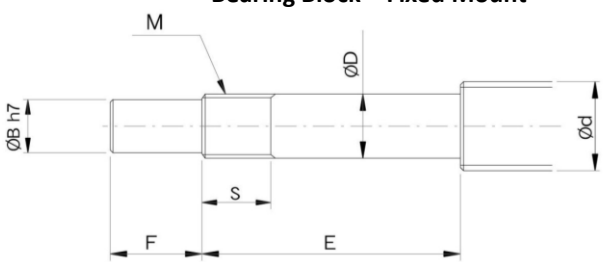
End Machining	
BK10	BF10
BK12	BF12
BK15	BF15
BK17	BF17
BK20	BF20
BK25	BF25
BK30	BF30
BK35	BF35
BK40	BF40

- Type FK or FF machining available as well.
- May also include two fixed mounted bearings.
- Unsupported ends XX also available.
- Custom ends must be defined on drawing.

IMPORTANT NOTES
BKBF – Flange Faces Drive End
BFBK – Flange Faces Float End
FKFF – Flange Faces Drive End
FFFK – Flange Faces Float End

Shaft End Machining

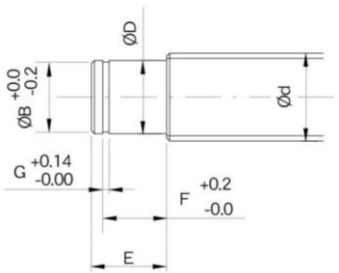
Bearing Block – Fixed Mount



Unit : mm

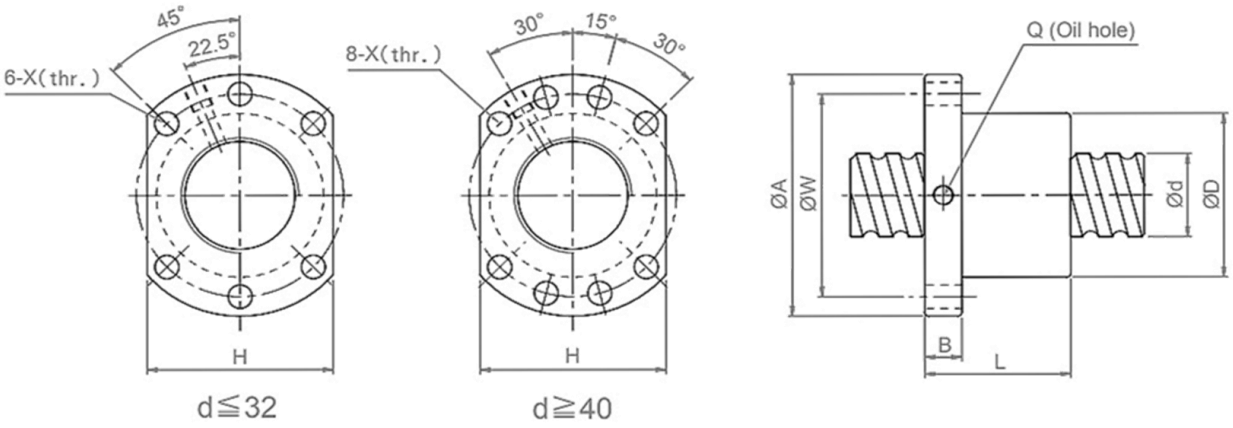
Support Unit	Ball Screw Diameter Ød	Drive Shaft Diameter ØB	Bearing Shaft Diameter ØD	Bearing Shaft Length E	Drive Shaft Length F	Lock Nut Thread M	Thread Length S
BK12	16	10	12	36	15	M12 x 1	14
BK15	20	12	15	40	20	M15 x 1	12
BK20	25	17	20	53	25	M20 x 1	15
BK25	32	20	25	65	30	M25 x 1.5	18
BK30	40	25	30	72	38	M30 x 1.5	25
BK40	50	35	40	93	50	M40 x 1.5	35

Bearing Block – Float Mount



Support Unit	Ball Screw Diameter Ød	Snap Ring Diameter ØB	Shaft Diameter ØD	Shaft Length E	Bearing & C-Ring Length F	C-Ring Width G
BF12	16	9.6	10	11	9.15	1.15
BF15	20	14.3	15	13	10.15	1.15
BF20	25	19	20	19	15.35	1.35
BF25	32	23.9	25	20	16.35	1.35
BF30	40	28.6	30	21	17.75	1.75
BF40	50	38	40	23	19.75	1.75

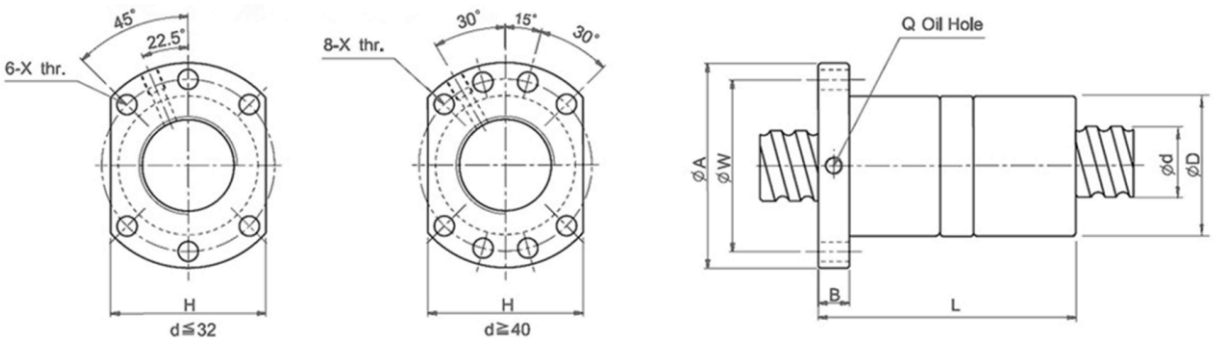
F2RFU Ball Screw
Fangtooth Rolled Flange Unit



Units: mm

Basic Model	Ball Circle Dia (d)	Lead	(D)	(A)	(B)	(L)	(W)	(X)	(H)	(Q)	(C_{dyn})	(C_0)
F2RFU1605-4	16 mm	5 mm	28	48	10	50	38	5.5	40	M6	1720 lbs	3946 lbs
F2RFU1610-3	16 mm	10 mm	28	48	10	47	38	5.5	40	M6	1590 lbs	2754 lbs
F2RFU2005-4	20 mm	5 mm	36	58	10	51	47	6.6	44	M6	2492 lbs	5248 lbs
F2RFU2010-3	20 mm	10 mm	36	58	10	57	47	6.6	40	M6	1841 lbs	3704 lbs
F2RFU2505-4	25 mm	5 mm	40	62	10	51	51	6.6	48	M6	2822 lbs	6858 lbs
F2RFU2510-4	25 mm	10 mm	40	62	10	85	51	9.0	48	M6	4287 lbs	8549 lbs
F2RFU3205-4	32 mm	5 mm	50	80	12	52	65	9.0	62	M6	3197 lbs	9151 lbs
F2RFU3210-4	32 mm	10 mm	50	80	12	85	65	9.0	62	M8	7475 lbs	15810 lbs
F2RFU4005-4	40 mm	5 mm	63	93	12	55	78	9.0	70	M8	3550 lbs	11753 lbs
F2RFU4010-4	40 mm	10 mm	63	93	14	93	78	9.0	70	M8	8622 lbs	20992 lbs
F2RFU5005-4	50 mm	5 mm	75	110	14	55	93	11.0	85	M8	3815 lbs	14912 lbs
F2RFU5010-4	50 mm	10 mm	75	110	15	93	93	11.0	85	M8	9812 lbs	27563 lbs
F2RFU5020-4	50 mm	20 mm	75	110	16	138	93	11.0	85	M8	10240 lbs	31591 lbs
F2RFU6310-4	63 mm	10 mm	90	125	18	98	108	11.0	95	M8	11179 lbs	35280 lbs
F2RFU6320-4	63 mm	20 mm	95	135	20	149	115	13.5	100	M8	16698 lbs	52589 lbs
F2RFU8010-4	80 mm	10 mm	105	145	20	98	125	13.5	110	M8	12392 lbs	46967 lbs
F2RFU8020-4	80 mm	20 mm	125	165	25	154	145	13.5	130	M8	18709 lbs	68123 lbs
F2RFU10020-4	100 mm	20 mm	150	202	30	180	170	17.5	155	M8	20771 lbs	86399 lbs

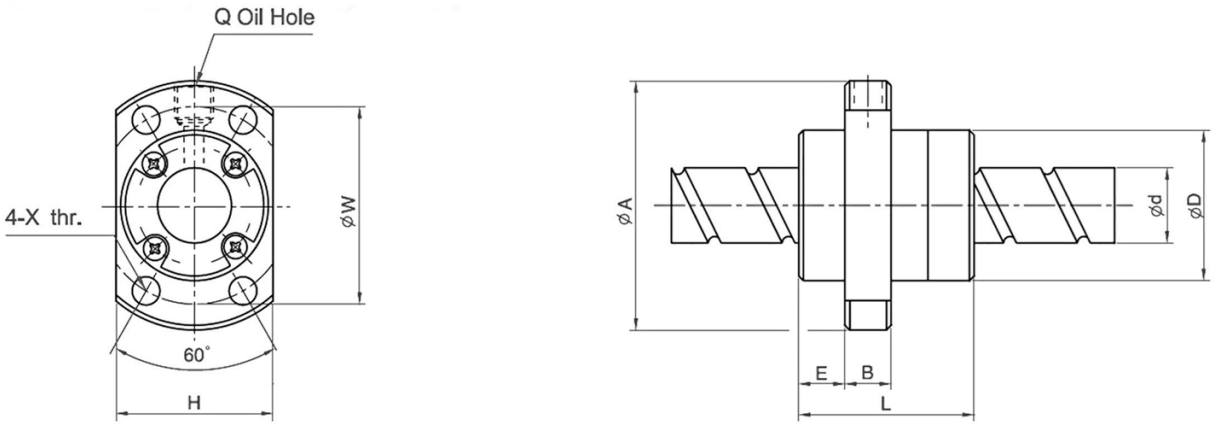
F2RDF Ball Screw
Fangtooth Rolled Double (nut) Flange



Units: mm

Basic Model	Ball Circle Dia (d)	Lead	(D)	(A)	(B)	(L)	(W)	(X)	(H)	(Q)	(C_{dyn})	(C_0)
F2RDF1605-4	16 mm	5 mm	28	48	10	100	38	5.5	40	M6	1720 lbs	2754 lbs
F2RDF2005-4	20 mm	5 mm	36	58	10	101	47	6.6	44	M6	2492 lbs	5248 lbs
F2RDF2505-4	25 mm	5 mm	40	62	10	101	51	6.6	48	M6	2822 lbs	6858 lbs
F2RDF3205-4	32 mm	5 mm	50	80	12	102	65	9.0	48	M6	3197 lbs	9151 lbs
F2RDF3210-4	32 mm	10 mm	50	80	12	162	65	9.0	62	M8	7475 lbs	15810 lbs
F2RDF4005-4	40 mm	5 mm	63	93	14	105	78	9.0	62	M8	3550 lbs	11753 lbs
F2RDF4010-4	40 mm	10 mm	63	93	14	165	78	9.0	70	M8	8622 lbs	20992 lbs
F2RDF5010-4	50 mm	10 mm	75	110	16	171	93	11.0	70	M8	9812 lbs	27563 lbs
F2RDF6310-4	63 mm	10 mm	90	125	18	182	108	11.0	95	M8	11179 lbs	35280 lbs
F2RDF8010-4	80 mm	10 mm	105	145	20	182	125	13.5	110	M8	12392 lbs	46967 lbs
F2RDF8020-4	80 mm	20 mm	125	165	25	295	145	13.5	130	M8	20771 lbs	68123 lbs

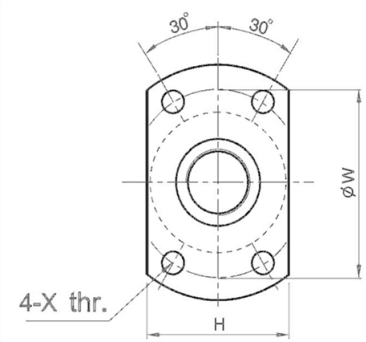
F2RSQ Ball Screw
Fangtooth Rolled Square Lead Plus (High Speed)

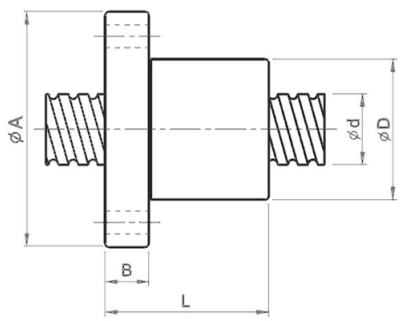


Units: mm

Basic Model	Ball Circle Dia (d)	Lead	(D)	(A)	(E)	(B)	(L)	(W)	(X)	(H)	(Q)	(C_{dyn})	(C_0)
F2RSQ1616-6	16 mm	16 mm	32	53	10.1	10	38	42	4.5	34	M6	2601 lbs	5622 lbs
F2RSQ1632-3	16 mm	32 mm	24	53	10.5	10	34	45	5.5	36	M6	1808 lbs	2998 lbs
F2RSQ2020-6	20 mm	20 mm	39	62	11.5	10	55	50	5.5	41	M6	3924 lbs	9436 lbs
F2RSQ2040-3	20 mm	40 mm	39	58	11	10	41	48	5.5	40	M6	2006 lbs	3880 lbs
F2RSQ2525-6	25 mm	25 mm	47	74	13	12	57	60	6.6	49	M6	5864 lbs	14749 lbs
F2RSQ2550-3	25 mm	50 mm	47	70	13	12	50	58	6.6	48	M6	3020 lbs	6085 lbs
F2RSQ3232-6	32 mm	32 mm	58	92	16	12	82	74	9.0	60	M6	8576 lbs	23148 lbs
F2RSQ3264-3	32 mm	64 mm	58	92	15.5	12	62	74	9.0	60	M6	4409 lbs	9392 lbs
F2RSQ4040-6	40 mm	40 mm	73	114	19	19	100	93	11.0	75	M6	13669 lbs	38801 lbs
F2RSQ5050-6	50 mm	50 mm	90	135	21.5	20	125	112	11.0	92	M6	16005 lbs	60847 lbs

F2RTY Ball Screw
Toy Miniature





Units: mm

Basic Model	Ball Circle Dia (d)	Lead	(D)	(A)	(B)	(L)	(W)	(X)	(H)	(Q)	(C_{dyn})	(C_0)
F2RTY0401-2	4 mm	1 mm	10	20	10	12	15	2.9	34	-	141 lbs	214 lbs
F2RTY0601-3	6 mm	1 mm	12	24	10	15	18	3.4	36	-	245 lbs	494 lbs
F2RTY0801-4	8 mm	1 mm	14	27	10	16	21	3.4	41	-	355 lbs	888 lbs
F2RTY0802-3	8 mm	2 mm	14	27	10	16	21	3.4	40	-	489 lbs	1010 lbs
F2RTY082.5-3	8 mm	2.5 mm	16	29	10	26	23	3.4	49	-	487 lbs	1008 lbs
F2RTY1002-3	10mm	2 mm	18	35	12	28	27	4.5	48	M6	536 lbs	1254 lbs
F2RTY1004-3	10 mm	4 mm	26	46	12	34	36	4.5	60	-	1032 lbs	1995 lbs
F2RTY1202-4	12 mm	2 mm	20	37	12	28	29	4.5	60	-	736 lbs	1997 lbs
F2RTY1402-4	14 mm	2 mm	21	40	14	23	31	5.5	75	-	780 lbs	2321 lbs
F2RTY1602-4	16 mm	2 mm	25	43	14	40	35	5.5	92	-	822 lbs	2646 lbs

Fangtooth Ball Screw Mounting Screw and Nut

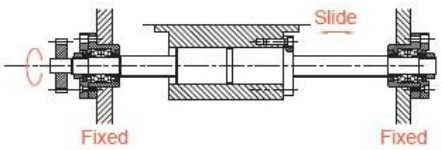


Fig 1.4.1

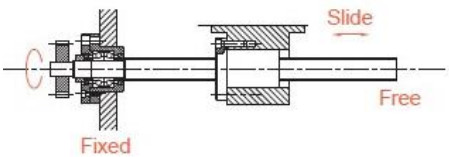


Fig 1.4.2

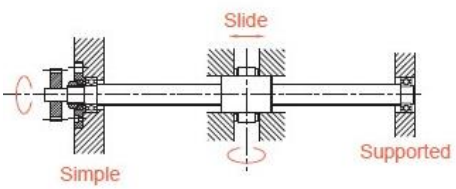


Fig 1.4.3

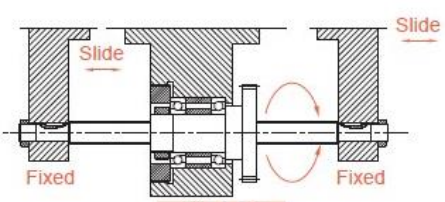


Fig 1.4.4

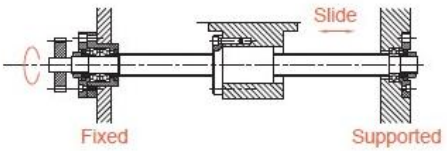


Fig 1.4.5

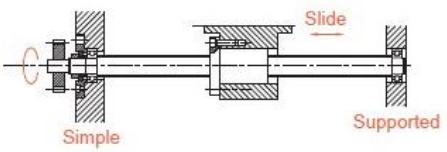


Fig 1.4.6

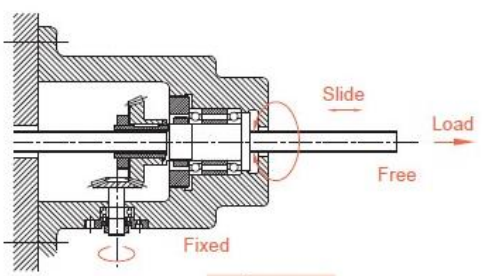


Fig 1.4.7

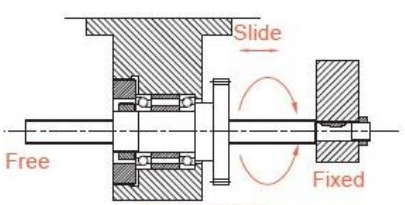
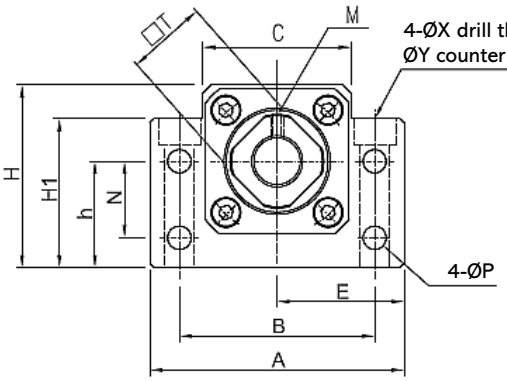
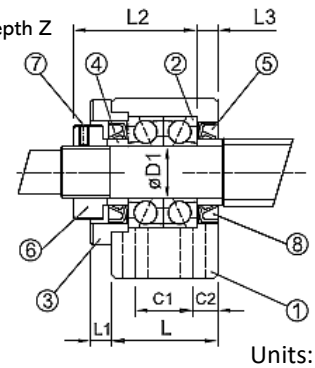


Fig 1.4.8

Pillow Block
Fixed-Free End Supports

BK FIX
Fixed End Supports

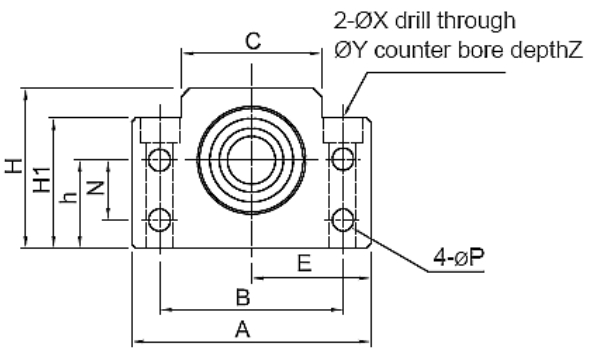


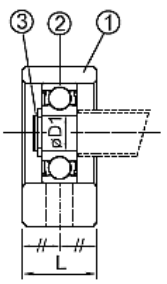


Units: mm

Basic Model	Ball Screw (Dia)	(A)	(B)	(C)	(C1)	(C2)	(E)	(H)	(H1)	(h)	(L)	(L1)	(L2)	(L3)	(T)	(P)	(N)	(M)	(X)	(Y)	(Z)
	(D1 DIM)																				
BK12FIX	16	60	46	34	13	6	30	43	32.5	25	25	5	29	5	19	5.5	18	M3	6.6	11	1.5
BK15FIX	20	70	54	40	15	6	35	48	38	28	27	6	32	6	22	5.5	18	M3	6.6	11	6.5
BK20FIX	25	88	70	52	19	8	44	60	50	34	35	8	43	8	30	6.6	22	M4	9	14	8.5
BK25FIX	32	106	85	64	22	10	53	80	70	48	42	12	54	9	35	9	33	M5	11	17.5	11
BK30FIX	40	128	102	76	23	11	64	89	78	51	45	14	61	9	40	11	33	M6	14	20	13
BK40FIX	50	160	130	100	33	14	80	110	90	60	61	18	76	15	50	14	37	M8	18	26	17.5

BF FREE
Float End Supports



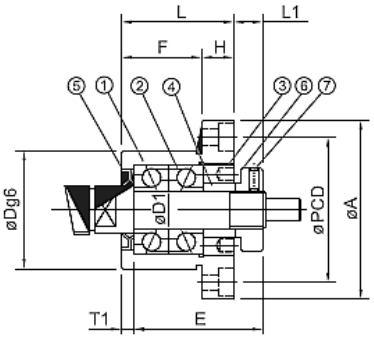


Units: mm

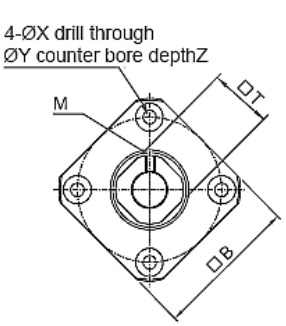
Basic Model	Ball Screw (Dia)	(D1)	(A)	(B)	(C)	(E)	(H1)	(h)	(H)	(L)	(N)	(P)	(X)	(Y)	(Z)	(c-ring)
BF12FREE	16	10	60	46	35	30	32.5	25	43	20	18	5.5	6.6	11	1.5	C10
BF15FREE	20	15	70	54	40	35	38	28	48	20	18	5.5	6.6	11	6.5	C15
BF20FREE	25	20	88	70	52	44	50	34	60	26	22	6.6	9	14	8.5	C20
BF25FREE	32	25	106	85	64	53	70	48	80	30	33	9	11	17.5	11	C25
BF30FREE	40	30	128	102	76	64	78	51	89	32	33	11	14	20	13	C30
BF40FREE	50	40	160	130	100	80	90	60	110	37	37	14	18	26	17.5	C40

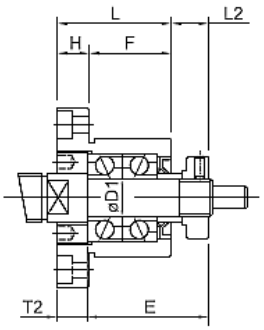
Flanged Fixed-Free End Supports

FK FIX
Fixed End Supports



Mount A



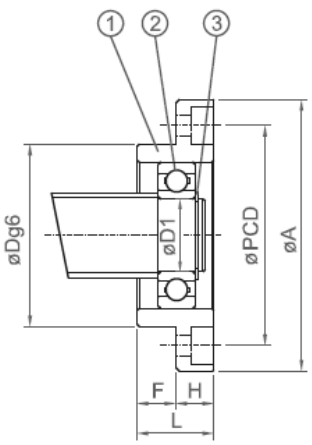


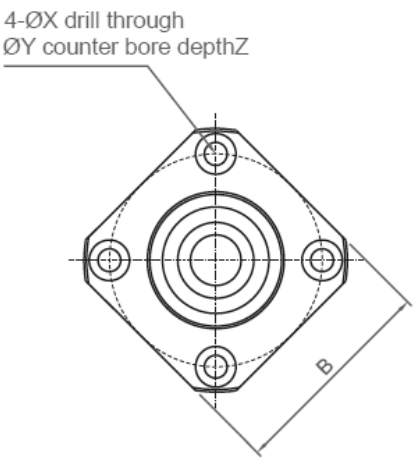
Mount B

Units: mm

Basic Model	(D1 DIM) Ball Screw (Dia)	(A)	(F)	(L)	(E)	(Dg6)	(H)	(PCD)	(M)	(B)	(L1)	(T1)	(L2)	(T2)	(X)	(Y)	(Z)	(T)
FK10FIX	12/14/15	52	17	27	29.5	634	10	42	M3	42	7.5	5	8.5	6	4.5	8	4	16
FK12FIX	14/15/16	54	17	27	29.5	36	10	44	M3	44	7.5	5	8.5	6	4.5	8	4	19
FK15FIX	20/25	63	17	32	36	40	15	50	M3	52	10	6	12	8	5.5	9.5	6	22
FK20FIX	25	85	30	52	50	57	22	70	M4	68	8	10	12	14	6.6	11	10	10
FK25FIX	32	96	30	57	60	63	27	80	M5	79	13	10	20	17	9	15	13	35
FK30FIX	40	117	32	62	61	75	30	95	M6	93	14	12	17	18	11	18	15	40

FF FREE
Float End Supports





Units: mm

Basic Model	Ball Screw (Dia)	(D1)	(L)	(H)	(F)	(Dg6)	(A)	(PCD)	(B)	(X)	(Y)	(Z)	(c-ring)
FF10FREE	12/14/15	8	12	7	5	28	43	35	35	3.4	6.5	64	C8
FF12FREE	14/15/16	10	15	7	8	34	52	42	42	4.5	8	4	C10
FF15FREE	20/25	15	17	9	8	40	63	50	52	5.5	9.5	5.5	C15
FF20FREE	25	20	20	11	9	57	85	70	68	6.6	11	6.5	C20
FF25FREE	32	25	24	14	10	63	98	80	79	8.5	14	8.5	C25
FF30FREE	40	30	27	18	9	75	75	95	93	11	17.5	11	C30

Model Number Code: Fangtooth 'ACME' Rolled

F2ACME - 16 05 - 0400 - BK12 / BF12

ASM: Support Bearings Included
MIN: Minus Support Bearings

Screw Diameter	
16	Size: 16 mm
20	Size: 20 mm
30	Size: 30 mm
40	Size: 40 mm
55	Size: 55 mm

Lead	
3	3 mm
5	5 mm
6	6 mm
9	3 mm
10	5 mm
12	10 mm
18	16 mm
24	20 mm

Overall Length
100 – 6000 mm

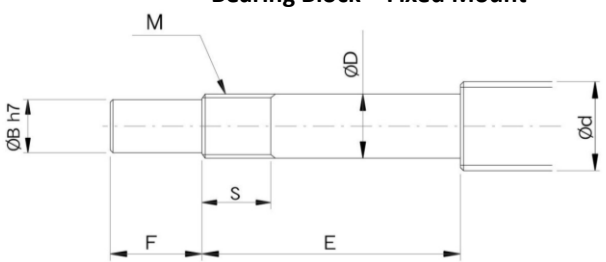
End Machining	
BK12	BF12
BK15	BF15
BK20	BF20
BK25	BF25
BK30	BF30
BK40	BF40

- May also include two fixed mounted bearings.
- Unsupported ends XX also available.
- Custom ends must be defined on drawing.

IMPORTANT NOTES
BKXX – Fixed Free Arrangement
BKBF – Flange Faces Drive End
BFBK – Flange Faces Float End

Shaft End Machining

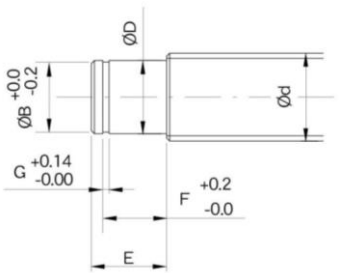
Bearing Block – Fixed Mount



Unit : mm

Support Unit	Ball Screw Diameter Ød	Drive Shaft Diameter ØB	Bearing Shaft Diameter ØD	Bearing Shaft Length E	Drive Shaft Length F	Lock Nut Thread M	Thread Length S
BK12	16	10	12	36	15	M12 x 1	14
BK15	20	12	15	40	20	M15 x 1	12
BK20	25	17	20	53	25	M20 x 1	15
BK25	32	20	25	65	30	M25 x 1.5	18
BK30	40	25	30	72	38	M30 x 1.5	25
BK40	50	35	40	93	50	M40 x 1.5	35

Bearing Block – Float Mount

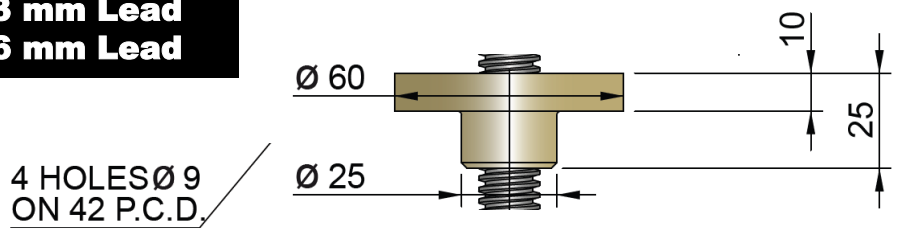


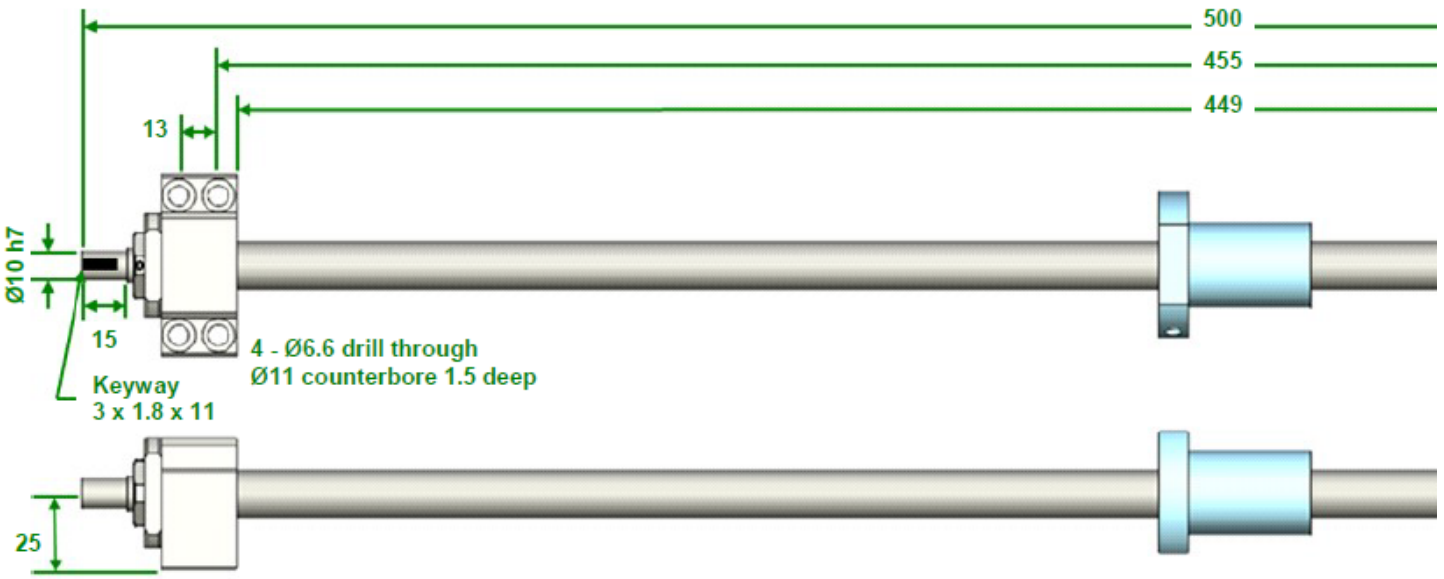
Support Unit	Ball Screw Diameter Ød	Snap Ring Diameter ØB	Shaft Diameter ØD	Shaft Length E	Bearing & C-Ring Length F	C-Ring Width G
BF12	16	9.6	10	11	9.15	1.15
BF15	20	14.3	15	13	10.15	1.15
BF20	25	19	20	19	15.35	1.35
BF25	32	23.9	25	20	16.35	1.35
BF30	40	28.6	30	21	17.75	1.75
BF40	50	38	40	23	19.75	1.75

TECHNICAL DATA

½ Ton

16 mm DIA x 03 mm Lead
16 mm DIA x 06 mm Lead





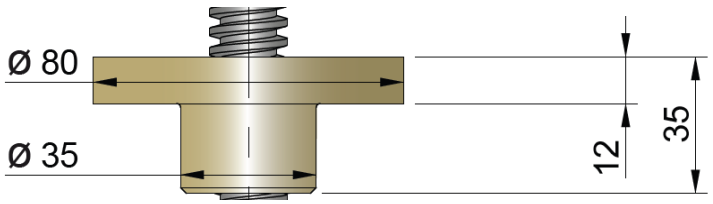
BK12 FIXED BEARING

Example shown (500MM OVERALL LENGTH)
F2ACME-1603-0500-BK12XXASM 3 MM LEAD
F2ACME-1603-0500-BK12XXASM 6 MM LEAD

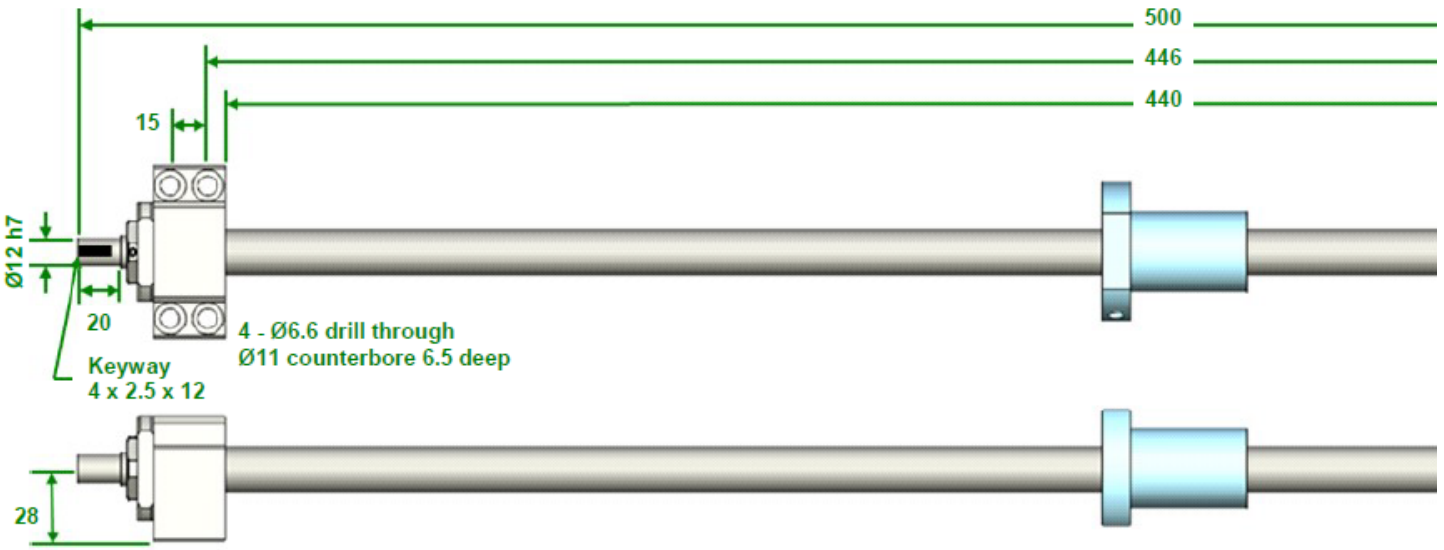
TECHNICAL DATA

1 Ton

20 mm DIA x 05 mm Lead
20 mm DIA x 010 mm Lead



4 HOLES Ø 11
ON 57 P.C.D.



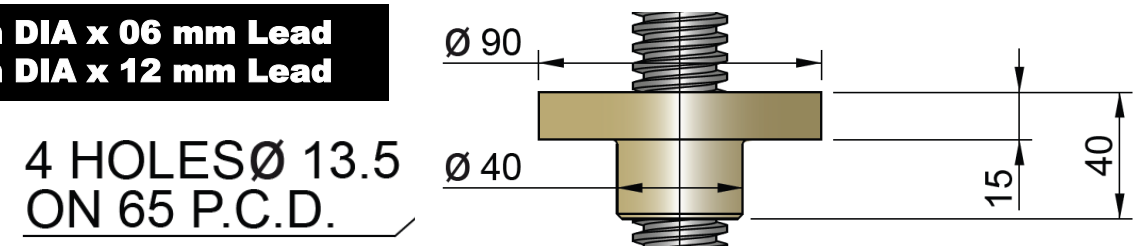
BK15 FIXED BEARING

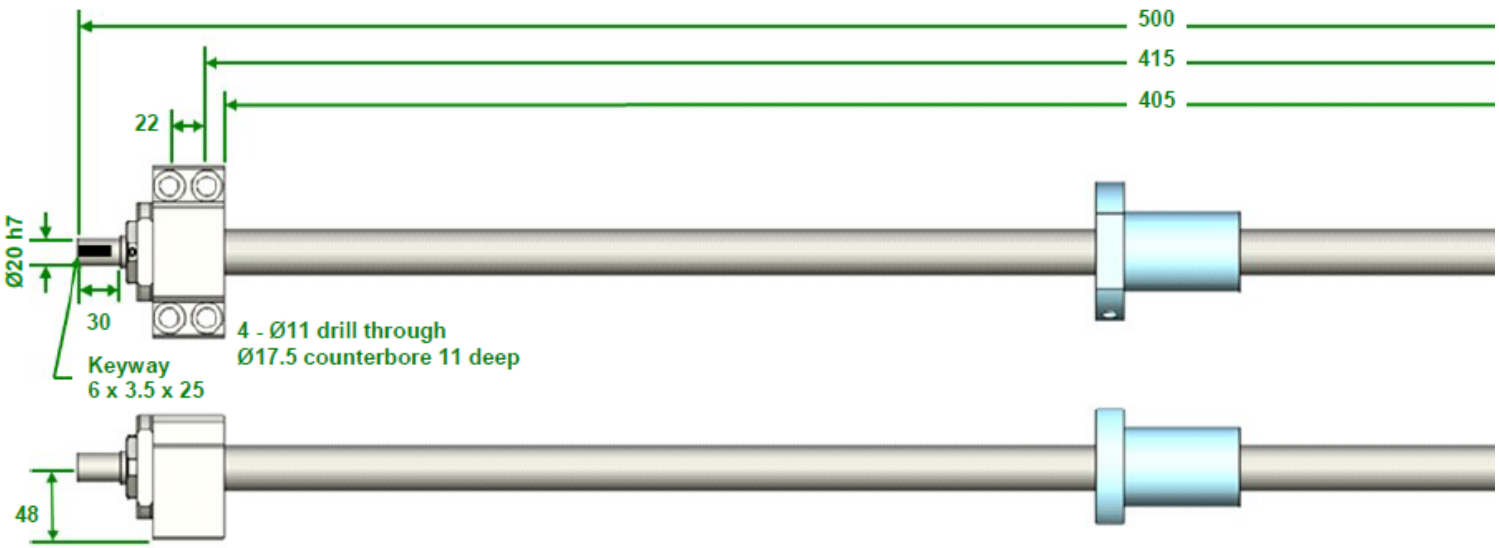
Example shown (500MM OVERALL LENGTH)
F2ACME-2005-0500-BK15XXASM 5 MM LEAD
F2ACME-2010-0500-BK15XXASM 10 MM LEAD

TECHNICAL DATA

2.5 Ton

30 mm DIA x 06 mm Lead
30 mm DIA x 12 mm Lead





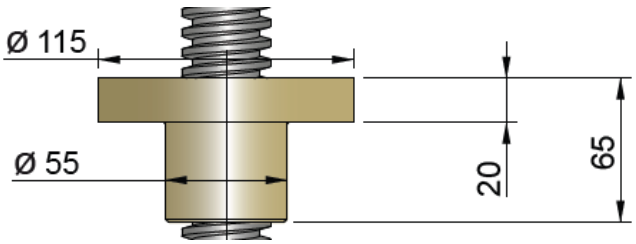
BK25 FIXED BEARING

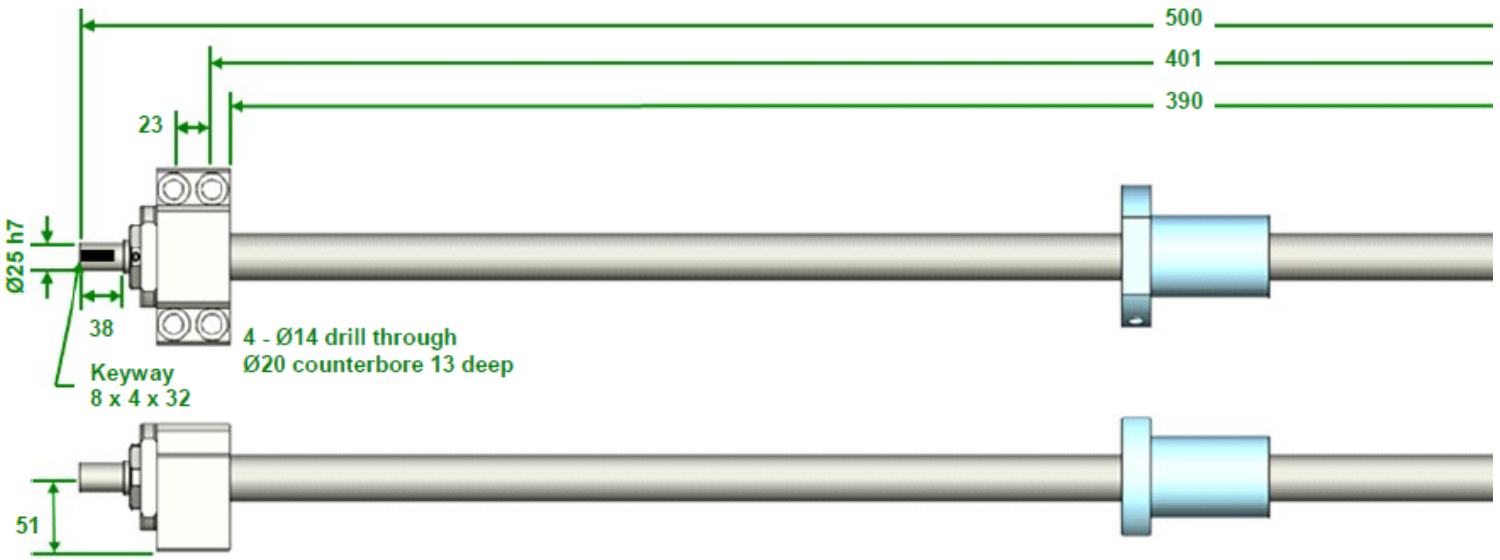
Example shown (500MM OVERALL LENGTH)
F2ACME-3006-0500-BK25XXASM 6 MM LEAD
F2ACME-3012-0500-BK25XXASM 12 MM LEAD

TECHNICAL DATA

5.0 Ton

40 mm DIA x 09 mm Lead
40 mm DIA x 18 mm Lead





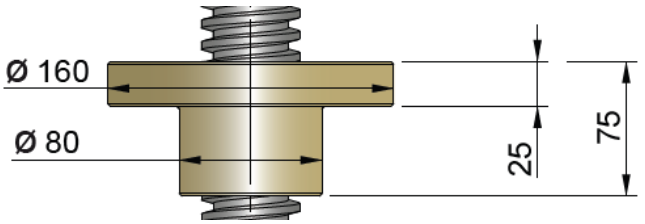
BK30 FIXED BEARING

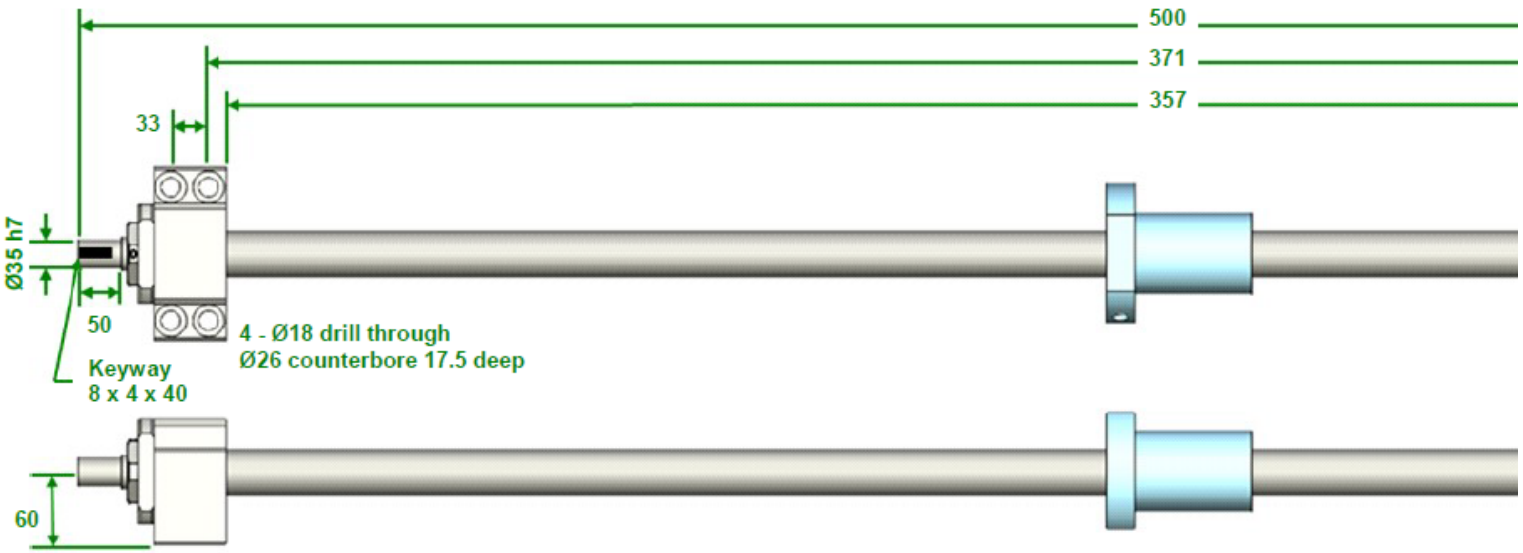
Example shown (500MM OVERALL LENGTH)
F2ACME-4009-0500-BK30XXASM 09 MM LEAD
F2ACME-4018-0500-BK30XXASM 18 MM LEAD

TECHNICAL DATA

10.0 Ton

55 mm DIA x 12 mm Lead
55 mm DIA x 24 mm Lead





BK40 FIXED BEARING

Example shown (500MM OVERALL LENGTH)
F2ACME-5512-0500-BK40XXASM 12 MM LEAD
F2ACME-5524-0500-BK40XXASM 24 MM LEAD

MADE IN USA
LIVONIA MI

fang 02TH

Screw Axis

25X25, 32X32, 40X40

Perfect Motor Mount Ball Screws Assemblies

FIXED/FLOAT BALL SCREW ASSEMBLIES

- **S**imple to Drop into Design
- **L**onger Screws at Higher Speeds
- **I**ncreased Ball Screw L10 Life
- **P**erfect Motor Mount

Slip means Float for Float Adapter

www.fang2th.com

fang TOOTH

Ball Screw Assemblies

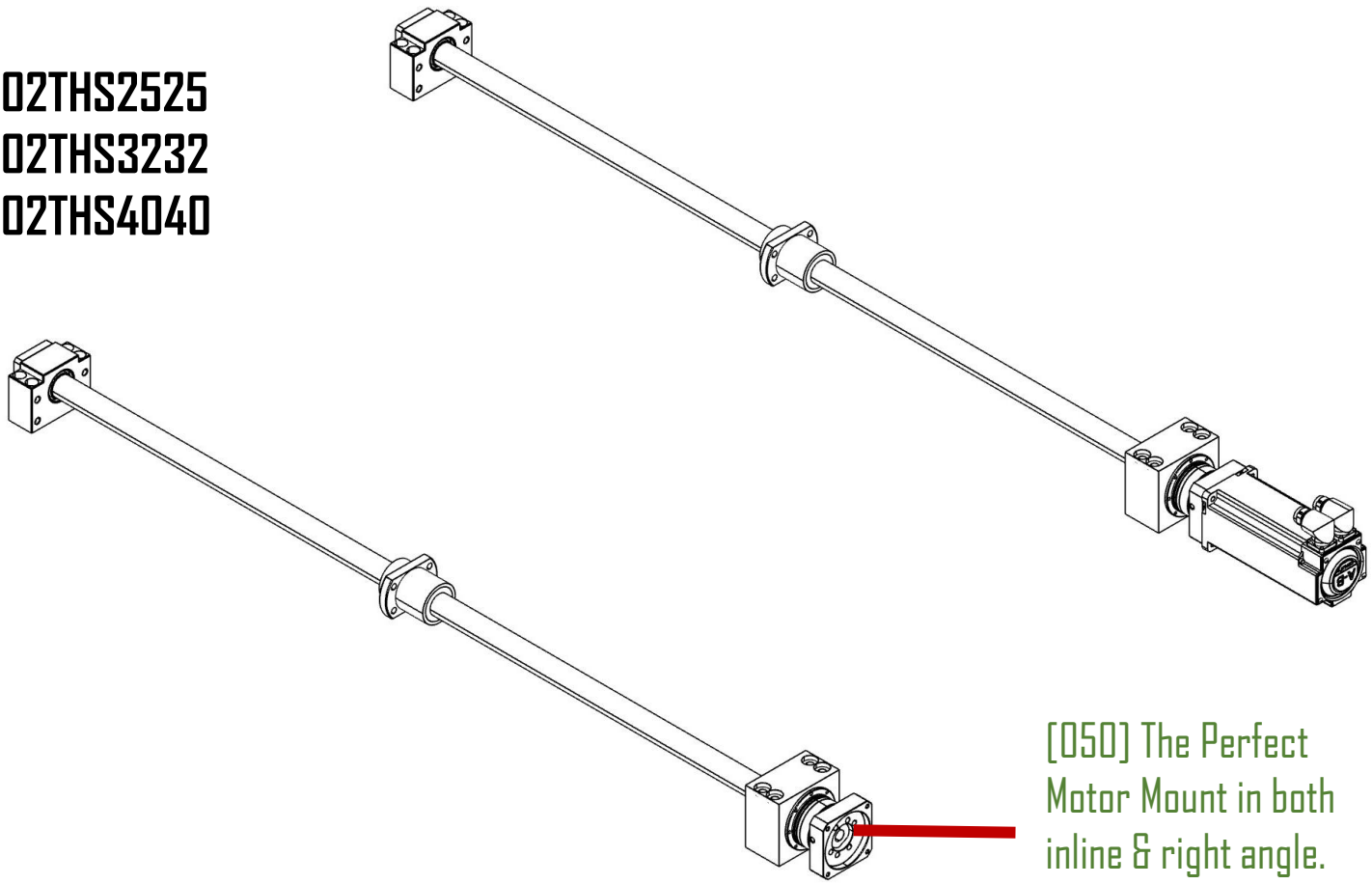
NOTE 1: (S.L.I.P) Simple to Drop Into Your Design
Engineers spend hours trying to get ball screw assemblies correct. By the time a design engineer has to create their own ball screw assembly, they need to (1) correctly specify the direction of the nut, (2) select the correct end bearings, (3) select the correct ball screw end machining & (4) figure out how to build a motor mount and (5) add a coupling. For many engineers, this can take days and there still are errors made. The Fangtooth Perfect Ball Screw Assembly is all in one.

NOTE 2: (S.L.I.P) Longer Ball Screws at Higher Speeds. Critical whip is always a ball screw issue. The longer the screw, the slower you need to spin it. But the standard aggressive leads on the Fangtooth ZeroTOOTH (02TH) allows high linear speeds. A 10mm lead needs to spin 4 times faster than a 40mm lead. The trick is the precision gearing in the ZeroTOOTH perfect motor mount.

NOTE 3: (S.L.I.P) Increased Ball Screw L10 Life
Slowing down the speed of the screw can quadruple its bearing life. For example, a 40X10 (40mm Diameter & 10mm lead) screw must spin at 3000 rpm to move at 500 mm/s. But using a 40X40 screw, it must only spin at 750 rpm. Adding a 10:1 gearbox adjusts the 40X40, in effect to a 40X10. Every revolution of the ball screw the bearings move in and out of the load zone much slower, which significantly reduces the bearing metal fatigue, thus extending the life of the ball nut.

NOTE 4: (S.L.I.P) Perfect Motor Mount on the Fangtooth Ball Screw Assembly.
Often ball screw integrations fail the motor coupling due to ball screw misalignment, but also the fixed thrust bearing is in the way of the motor mount. This assembly uses a clever float input and gearbox combination to solve both issues. The gearbox pilots on center for perfect alignment, acts as the float bearing and eliminates a coupling.

02THS2525
02THS3232
02THS4040



[050] The Perfect Motor Mount in both inline & right angle.

Internally circulating balls
Fixed / Float end bearings
No Couplings!

CAPABILITIES

Up to 1.3 m/s

Rolled Screws at C7 tolerances

Ground Screws to P3 tolerances

[100] Pre-Engineered fixed float end bearing assembly. Rolled or Ground ball screws. Ask about Planetary Roller Screws.

Recommended Lead Constants

25x25

10:1 Motor Mount – 2.5 mm / rev

7:1 Motor Mount – 3.571 mm / rev

5:1 Motor Mount – 5.0 mm / rev

4:1 Motor Mount – 6.25 mm / rev

32x32

10:1 Motor Mount – 3.2 mm / rev

7:1 Motor Mount – 4.571 mm / rev

5:1 Motor Mount – 6.4 mm / rev

4:1 Motor Mount – 8.0 mm / rev

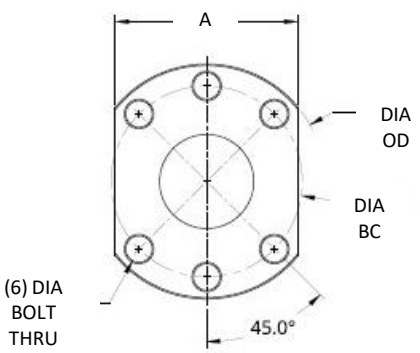
40x40

10:1 Motor Mount – 4.0 mm / rev

7:1 Motor Mount – 5.714 mm / rev

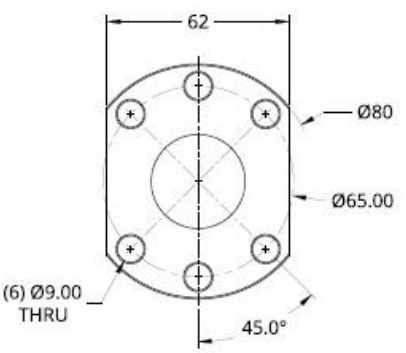
5:1 Motor Mount – 8.0 mm / rev

4:1 Motor Mount – 10.0 mm / rev



Rolled

	25 X 25	32 X 32	40 X 40
Dynamic Capacity	12082 N (2716 lb)	18024 N (4052 lb)	37069 N (8333 lb)
Static Capacity	33548 N (7542 lb)	5329 kgf (11748 lb)	102293 N (23000 lb)
Backlash	0.000/0.005	0.000/0.005	0.000/0.005
Grade	C7	C7	C7
DIM A	48.0mm	62.0mm	70.0mm
DIM OD	62.0mm	80.0mm	93.0mm
DIM BC	51.0mm	65.0mm	78.0mm
DIM BOLT	6.6m	9.0mm	9.0mm
NUT LENGTH	89.0mm	112.0mm	138.0mm
NUT PILOT DIA	40.0mm	50.0mm	63.0mm



Ground

	25 X 25	32 X 32	40 X 40
Dynamic Capacity	46000 N (10341 lb)	52500 N (11800 lb)	84500 N (19000 lb)
Static Capacity	35000 N (7870 lb)	45500 N (10230 lb)	76440 N (17850 lb)
Backlash	0.000/0.005	0.000/0.005	0.000/0.005
Grade	P5	P5	P5
DIM A	48.0mm	62.0mm	70.0mm
DIM OD	62.0mm	80.0mm	93.0mm
DIM BC	51.0mm	65.0mm	78.0mm
DIM BOLT	6.6m	9.0mm	9.0mm
NUT LENGTH	89.0mm	112.0mm	138.0mm
NUT PILOT DIA	40.0mm	50.0mm	63.0mm

HOW TO ORDER zeroTOOTH STANDARD AXIS
02THS2525 and 02THS3232 and 02THS4040

SCREW

Distance Between End Bearings (mm)

zeroTOOTH: 02THSC73232FX-06PL010-1000/MS2N04

Servo Motor PN

C7 – Rolled Screw Tolerance
P5 – Ground Screw Tolerance

BALL SCREW DIAMETER
25 mm
32 mm
40 mm

BALL SCREW LEAD
25 mm
32 mm
40 mm

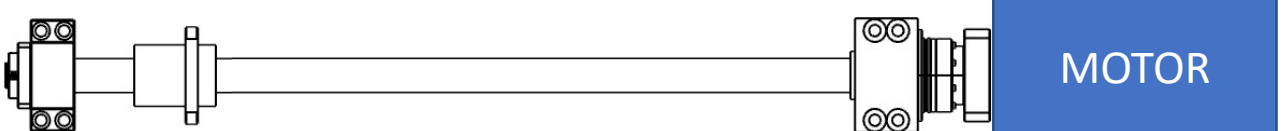
Gearbox:

06PL – Size 6 Inline Planetary
06PR – Size 6 Right Angle Planetary
09PL – Size 9 Inline Planetary
09PR – Size 9 Right Angle Planetary

Ratio:

004 – 4:1	030 – 30:1
005 – 5:1	031 – 31:1
007 – 7:1	035 – 35:1
009 – 9:1	040 – 40:1
010 – 10:1	050 – 50:1
012 – 12:1	060 – 60:1
014 – 14:1	061 – 61:1
016 – 16:1	070 – 70:1
020 – 20:1	080 – 80:1
021 – 21:1	090 – 90:1
025 – 25:1	091 – 91:1

FX – NUT FLANGE TOWARD MOTOR



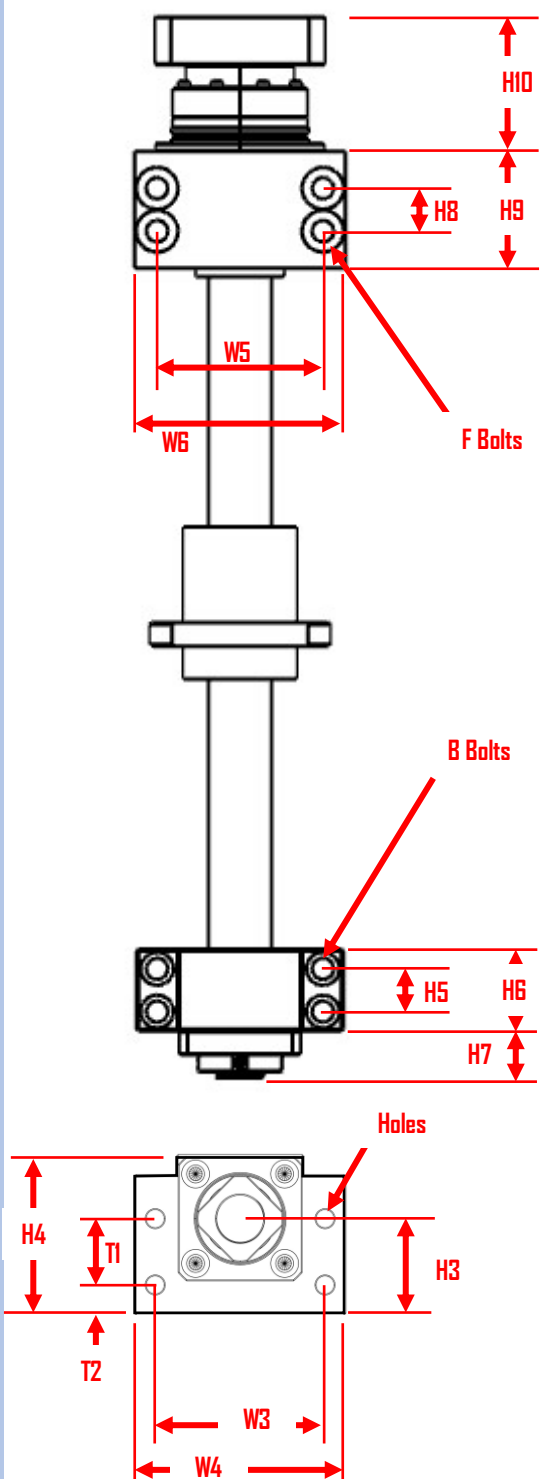
XF – NUT FLANGE OPPOSITE MOTOR

25X25: TRAVEL + 179 mm Rolled
32X32: TRAVEL + 216 mm Rolled
40X40: TRAVEL + 258 mm Rolled

BETWEEN BEARING LENGTHS / TRAVEL

EXAMPLES

25X25 BBL	25X25 Travel	32X32 BBL	32X32 Travel	40X40 BBL	40X40 Travel
679	500	716	500	758	500
979	800	1016	800	1058	800
1179	1000	1216	1000	1258	1000
1679	1500	1716	1500	1758	1500
2379	2200	2416	2200	2458	2200
2779	2600	2816	2600	2858	2600
3179	3000	3216	3000	3258	3000
3679	3500	3716	3500	3758	3500



	25 X 25	32 X 32	40 X 40
DIM H3	48.0mm	48.0mm	60.0mm
DIM H4	72.0mm	80.0mm	89.0mm
DIM H5	19.0mm	22.0mm	23.0mm
DIM H6	35.0mm	42.0mm	45.0mm
DIM H7	15.0mm	20.0mm	25.0mm
DIM H8	22.0mm	22.0mm	26.0mm
DIM H9	60.0mm	60.0mm	60.0mm
DIM H10	63.0mm	63.0mm	69.5mm
DIM W3	85.0mm	85.0mm	114.0mm
DIM W4	88.0mm	106.0mm	128.0mm
DIM W5	85.0mm	85.0mm	114.0mm
DIM W6	108.0mm	108.0mm	130.0mm
DIM T1	22.0mm	33.0mm	33.0mm
DIM T2	24.0mm	15.0mm	18.0mm
F BOLTS	M10	M10	M12
B BOLTS	M8	M10	M12
HOLES	6.6	9	11

GEARBOX TECHNICAL DATA

* FANG2504 Max Input Torque = XX Nm (XX lb-in)
* FANG2508 Max Input Torque = XX Nm (XX lb-in)

* 06PL Planetary Values Based on 5000 rpm input
* 09PL Planetary Values Based on 4000 rpm input

Type		Inline / Right		Inline / Right	
Series	RATIO	06PL	06PR	09PL	09PR
Nom Output Torque (T2n)	4:1	48 (425)	48 (425)	130 (1150)	130 (1150)
	5:1	60 (531)	60 (531)	160 (1416)	160 (1416)
	7:1	50 (442)	50 (442)	140 (1239)	140 (1239)
	10:1	40 (354)	60 (531)	100 (885)	160 (1416)
	14:1	NA	42 (372)	NA	140 (1239)
	16:1	48 (425)	NA	130 (1150)	NA
	20:1	48 (425)	40 (354)	130 (1150)	140 (1239)
	21:1	60 (531)	NA	160 (1416)	NA
Nm (lb-in)	25:1	60 (531)	60 (531)	160 (1416)	160 (1416)
	31:1	50 (442)	NA	140 (1239)	NA
	35:1	50 (442)	50 (442)	140 (1239)	140 (1239)
	40:1	48 (425)	48 (425)	130 (1150)	130 (1150)
	50:1	60 (531)	60 (531)	160 (1416)	160 (1416)
	61:1	50 (442)	NA	140 (1239)	NA
	70:1	50 (442)	50 (442)	140 (1239)	140 (1239)
	91:1	40 (354)	NA	100 (885)	NA
	100:1	40 (354)	40 (354)	100 (885)	100 (885)
	140:1	NA	NA	NA	140 (1239)
	200:1	NA	NA	NA	10 (885)

Max Output Torque (T2n)	4:1	72 (638)	72 (638)	195 (1725)	195 (1725)
	5:1	90 (796)	90 (796)	240 (2124)	240 (2124)
	7:1	75 (663)	75 (663)	210 (1859)	210 (1859)
	10:1	60 (531)	90 (796)	150 (1327)	240 (2124)
	14:1	NA	63 (558)	NA	210 (1859)
	16:1	72 (638)	NA	195 (1725)	NA
	20:1	72 (638)	90 (796)	195 (1725)	210 (1859)
	21:1	90 (796)	NA	240 (2124)	NA
Nm (lb-in)	25:1	90 (796)	90 (796)	240 (2124)	240 (2124)
	31:1	75 (663)	NA	210 (1859)	NA
	35:1	75 (663)	75 (663)	210 (1859)	210 (1859)
	40:1	72 (638)	72 (638)	195 (1725)	195 (1725)
	50:1	90 (796)	90 (796)	240 (2124)	240 (2124)
	61:1	75 (663)	NA	210 (1859)	NA
	70:1	75 (663)	75 (663)	210 (1859)	210 (1859)
	91:1	60 (531)	NA	150 (1327)	NA
	100:1	60 (531)	60 (531)	150 (1327)	150 (1327)
	140:1	NA	NA	NA	210 (1859)
	200:1	NA	NA	NA	150 (1327)

Type		Inline / Right		Inline / Right	
Series	RATIO	06PL	06PR	09PL	09PR
Efficiency %	4:1	97	95	97	95
	5:1	97	95	97	95
	7:1	97	95	97	95
	10:1	97	95	97	95
	14.1	NA	95	NA	95
	16:1	97	NA	97	NA
	20:1	97	95	97	95
	21:1	94	92	94	NA
	25:1	94	NA	94	92
	31:1	94	92	94	NA
	35:1	94	92	94	92
	40:1	94	92	94	92
	50:1	94	NA	94	92
	61:1	94	92	94	NA
	70:1	94	NA	94	92
	91:1	94	92	94	NA
	100:1	94	NA	NA	92
	140:1	NA	NA	NA	92
	200:1	NA	NA	NA	92
Mass Moment of Inertia(In)	4:1	0.14	0.35	0.51	2.25
	5:1	0.13	0.35	0.47	2.25
	7:1	0.13	0.35	0.45	2.25
	10:1	0.13	0.35	0.44	2.25
	14:1	NA	0.31	NA	1.87
	16:1	0.03	NA	0.13	NA
	20:1	0.03	0.31	0.13	1.87
Kg cm²	21:1	0.03	NA	0.13	NA
	25:1	0.03	0.09	0.13	0.35
	31:1	0.03	NA	0.13	NA
	35:1	0.03	0.09	0.13	0.35
	40:1	0.03	0.09	0.13	0.35
	50:1	0.03	0.09	0.13	0.35
	61:1	0.03	NA	0.13	NA
	70:1	0.03	0.09	0.13	0.35
	91:1	0.03	NA	0.13	NA
	100:1	0.03	0.09	0.13	0.35
	140:1	NA	NA	NA	0.31
	200:1	NA	NA	NA	0.31

Type	Inline / Right		Inline / Right	
Series	06PL	06PR	09PL	09PR
Nom Input Speed (n1n)	5000	5000	4000	4000
Max Input Speed (1max)	10000	10000	8000	8000
1 STAGE arc-min	<5	<6	<5	<6
2 STAGE arc-min	<7	<9	<7	<9
Weight (m) kg (lb) 1 STAGE	1.2 (2.65)	2.1 (4.63)	3.0 (6.61)	5.9 (13)
kg (lb) 2 STAGE	1.6 (3.53)	1.9 (4.19)	3.7 (8.16)	4.5 (9.9)
Average Service Life	> 25,000 hours			
Lubrication	Sealed Synthetic Grease			
Protection Rating	IP67			
Operating Temperature	-10 to 90 C			

FANGTOOTH REFERENCE MOTION PROFILES TO USED WITH FANG02th BALL SCREW SELECTION TABLES

500 mm MOVES

SECTION A - 25X25 [500mm of Travel – 16.68 inches]

Profile #	Total Time	Accel Time	Decel Time	Speed	Acceleration	Max Motor Speed	Gearbox Ratio
100.1a	4.00 sec	0.20 sec	0.20 sec	0.125 m/s	0.625 m/s2	3000.00 rpm	10:1
100.3a	2.20 sec	0.10 sec	0.10 sec	0.250 m/s	2.5 m/s2	2400.00 rpm	4:1
100.5a	1.20 sec	0.20 sec	0.20 sec	0.500 m/s	2.5 m/s2	4800.00 rpm	4:1

500 mm MOVES

SECTION B - 32X32 [500mm of Travel – 16.68 inches]

Profile #	Total Time	Accel Time	Decel Time	Speed	Acceleration	Max Motor Speed	Gearbox Ratio
100.1a	4.00 sec	0.20 sec	0.20 sec	0.125 m/s	0.625 m/s2	2350.00 rpm	10:1
100.3b	2.20 sec	0.10 sec	0.10 sec	0.250 m/s	2.5 m/s2	3280.00 rpm	7:1
100.5b	1.20 sec	0.20 sec	0.20 sec	0.500 m/s	2.5 m/s2	4688.00 rpm	5:1

500 mm MOVES

SECTION C - 40X40 [500mm of Travel – 16.68 inches]

Profile #	Total Time	Accel Time	Decel Time	Speed	Acceleration	Size 2508 Max Motor Speed	Gearbox Ratio
100.1a	4.00 sec	0.20 sec	0.20 sec	0.125 m/s	0.625 m/s2	1875.00 rpm	10:1
100.3c	2.20 sec	0.10 sec	0.10 sec	0.250 m/s	2.5 m/s2	1875.00 rpm	5:1
100.5c	1.20 sec	0.20 sec	0.20 sec	0.500 m/s	2.5 m/s2	3750.00 rpm	5:1
100.5d	1.20 sec	0.20 sec	0.20 sec	0.500 m/s	2.5 m/s2	5250.00 rpm	7:1

SIZING/SELECTION PRECAUTIONS:

Fangtooth Inc. is not responsible for and does not warrant (a) equipment, components and/or material furnished by the Buyer; (b) the sufficiency of functionality of any design specifications furnished by the Buyer; nor shall Company be liable for defects or damages arising from the foregoing. Notwithstanding any other provision in Fangtooth inc. Terms and Conditions, none of the warranties given by the Company shall apply to products manufactured by others and sold by the Company. Buyer will at its own expense arrange for any dismantling and reassembly of any goods and equipment and the provision of all equipment (including without limitation lifting equipment and crane-age) to the extent that this is necessary to remedy the defect or facilitate re-performance of service.

Fangtooth Inc. shall not be responsible for any claims which the Company determines are due to improper installation, operation above rated capacity, exceeds L10 life cycles, operation at extreme conditions, normal wear and tear, accident, or because the Product has been used, adjusted, altered, handled, maintained, repaired or stored other than as directed by the Company.

Tables published herein are intended as an estimated guide to help begin the design process. All applications require full evaluation against the actual intended use. Buyers select products at their own risk. Consider factors such as cycle duty and motor sizing due to torque, speed and heat requirements.

Warning: As this is only a general guide, to ensure acceptable system life please call Fangtooth Application Engineering with full duty cycle to verify.

Based on weight & Motion Profile from page

MAXIMUM INPUT TORQUE REQUIREMENTS

FANG02th BALL SCREW AXIS HORIZONTAL MOVES

SECTION 25 [500mm of Travel – 16.68 inches] HORIZONTAL ← 25X25 mm →

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	600 lbs	1200 lbs	2400 lbs
4.00 sec	0.125 m/s	100.1a	0.03 Nm	0.07 Nm	0.12 Nm	0.22 Nm	0.41 Nm	0.79 Nm
2.20 sec	0.250 m/s	100.3a	0.19 Nm	0.32 Nm	0.58 Nm	1.10 Nm	2.15 Nm	4.24 Nm
1.20 sec	0.500 m/s	100.5a	0.19 Nm	0.32 Nm	0.58 Nm	1.10 Nm	2.15 Nm	4.24 Nm

SECTION 32 [500mm of Travel – 16.68 inches] HORIZONTAL ← 32X32 mm →

Total Time	Speed	Profile #	3600 lbs	4800 lbs	6000 lbs	7500 lbs	8400 lbs	9600 lbs
4.00 sec	0.125 m/s	100.1a	NA	1.99 Nm	2.48 Nm	2.98 Nm	3.47 Nm	3.96 Nm
2.20 sec	0.250 m/s	100.3b	4.64 Nm	6.17 Nm	NA	NA	NA	NA
1.20 sec	0.500 m/s	100.5b	5.07 Nm	NA	NA	NA	NA	NA

SECTION 40 [500mm of Travel – 16.68 inches] HORIZONTAL ← 40X40 mm →

Total Time	Speed	Profile #	4000 lbs	6000 lbs	7500 lbs	10000 lbs	15000 lbs	18000 lbs
4.00 sec	0.125 m/s	100.1a	NA	NA	NA	5.18 Nm	7.75 Nm	9.29 Nm
2.20 sec	0.250 m/s	100.3c	NA	NA	NA	22.38 Nm	NA	NA
1.20 sec	0.500 m/s	100.5c	9.02 Nm	13.47 Nm	16.81 Nm	NA	NA	NA
1.20 sec	0.500 m/s	100.5d	NA	NA	NA	16.04 Nm	NA	NA

Motion Profile #	Maximum End Bearing Centers	Based on Profile Move & Speed	Maximum Speed at 3.75m End Brg Centers	Maximum Speed at 4m End Brg Centers	Maximum Speed at 4.5m End Brg Centers	Maximum Speed at 5m End Brg Centers
100.1a 100.3a 100.5a	3200 mm 2300 mm 1600 mm	← 25X25 mm →	95 mm/s	80 mm/s	65 mm/s	50 mm/s

Motion Profile #	Maximum End Bearing Centers	Based on Profile Move & Speed	Maximum Speed at 3.75m End Brg Centers	Maximum Speed at 4m End Brg Centers	Maximum Speed at 4.5m End Brg Centers	Maximum Speed at 5m End Brg Centers
100.1a 100.3a 100.5a	4200 mm 2950 mm 2100 mm	← 32X32 mm →	159 mm/s	140 mm/s	110 mm/s	85 mm/s

Motion Profile #	Maximum End Bearing Centers	Based on Profile Move & Speed	Maximum Speed at 3.75m End Brg Centers	Maximum Speed at 4m End Brg Centers	Maximum Speed at 4.5m End Brg Centers	Maximum Speed at 5m End Brg Centers
100.1a 100.3a 100.5a	5200 mm 3700 mm 2600 mm	← 40X40 mm →	247 mm/s	210 mm/s	165 mm/s	135 mm/s

Warning: As this is only a general guide, to ensure acceptable system life please call Fangtooth Application Engineering with full duty cycle to verify.

Based on weight & Motion Profile from page

MAXIMUM INPUT TORQUE REQUIREMENTS

FANG02th BALL SCREW AXIS VERTICAL MOVES

25x25 mm

SECTION 25 [500mm of Travel – 16.68 inches] VERTICAL

Total Time	Speed	Profile #	75 lbs	150 lbs	300 lbs	400 lbs	500 lbs	600 lbs
4.00 sec	0.125 m/s	100.1a	0.18 Nm	0.34 Nm	0.95 Nm	0.86 Nm	1.07 Nm	1.28 Nm
2.20 sec	0.250 m/s	100.3a	0.52 Nm	0.98 Nm	1.91 Nm	2.52 Nm	3.14 Nm	3.75 Nm
1.20 sec	0.500 m/s	100.5a	0.52 Nm	0.98 Nm	1.91 Nm	2.52 Nm	3.14 Nm	3.75 Nm

32X32 mm

SECTION 32 [500mm of Travel – 16.68 inches] VERTICAL

Total Time	Speed	Profile #	400 lbs	500 lbs	600 lbs	750 lbs	900 lbs	1250 lbs
4.00 sec	0.125 m/s	100.1a	1.09 Nm	1.35 Nm	1.62 Nm	2.02 Nm	2.42 Nm	2.42 Nm
2.20 sec	0.250 m/s	100.3b	1.86 Nm	2.31 Nm	2.76 Nm	3.43 Nm	-	-
1.20 sec	0.500 m/s	100.5b	2.03 Nm	2.52 Nm	3.02 Nm	-	-	-

40X40 mm

SECTION 40 [500mm of Travel – 16.68 inches] VERTICAL

Total Time	Speed	Profile #	1500 lbs	1750 lbs	2000 lbs	2250 lbs	2500 lbs	2750 lbs
4.00 sec	0.125 m/s	100.1a	5.05 Nm	5.89 Nm	6.73 Nm	7.56 Nm	8.39 Nm	9.23 Nm
2.20 sec	0.250 m/s	100.3c	11.92 Nm	13.89 Nm	-	-	-	-

Motion Profile #	Maximum End Bearing Centers	Based on Profile Move & Speed	Maximum Speed at 3.75m End Brg Centers	Maximum Speed at 4m End Brg Centers	Maximum Speed at 4.5m End Brg Centers	Maximum Speed at 5m End Brg Centers
100.1a	3200 mm	25X25 mm	95 mm/s	80 mm/s	65 mm/s	50 mm/s
100.3a	2300 mm					
100.5a	1600 mm					

Motion Profile #	Maximum End Bearing Centers	Based on Profile Move & Speed	Maximum Speed at 3.75m End Brg Centers	Maximum Speed at 4m End Brg Centers	Maximum Speed at 4.5m End Brg Centers	Maximum Speed at 5m End Brg Centers
100.1a	4200 mm	32X32 mm	159 mm/s	140 mm/s	110 mm/s	85 mm/s
100.3a	2950 mm					
100.5a	2100 mm					

Motion Profile #	Maximum End Bearing Centers	Based on Profile Move & Speed	Maximum Speed at 3.75m End Brg Centers	Maximum Speed at 4m End Brg Centers	Maximum Speed at 4.5m End Brg Centers	Maximum Speed at 5m End Brg Centers
100.1a	5200 mm	40X40 mm	247 mm/s	210 mm/s	165 mm/s	135 mm/s
100.3a	3700 mm					
100.5a	2600 mm					

Fangtooth Inc. Terms & Conditions for Sale
11970 Mayfield St. Livonia, MI 48150

SECTION 1: APPLICABILITY

1.1 These terms & conditions (the "Terms and Conditions") of sale are applicable to all quotations for the sale or orders for the purchase of all equipment or goods (the "Products") made by or for Fangtooth Inc 11970 Mayfield St. Livonia MI 48150 ("Company".)

1.2 Unless otherwise agreed, written quotations are valid for 30 days from the date of quotation. All price lists and discounts are subject to change without notice.

1.3 All orders placed by the Buyer are subject to written acceptance by the Company. No contract between Buyer and Company shall exist prior to the time of such acceptance by the Company.

1.4 These Terms & Conditions supersede all prior written terms, understandings, purchase orders, assurances and offers. Company shall not be deemed to have waived these Terms & Conditions if it fails to object to the conditions appearing in or attached to a purchase order issued by Buyer. Buyer's acceptance of the Products or services furnished by the Company shall constitute its acceptance of these Terms & Conditions.

SECTION 2: PRICE & SHIPPING DATES

2.1 All orders must be bona fide commitments showing a complete description of equipment, quantity, price & shipping dates required by the Buyer.

2.2 Timely performance by Company is contingent upon Buyer supplying to Company, when applicable, all required technical information and data, including drawing approvals, and all required commercial documentation. Shipping dates are subject to final confirmation or change by Company and are based on prompt receipt of all necessary information regarding the order. Unless otherwise indicated, all delivery dates specified by the Company are estimated time frames and time is not of the essence in Company's performance of the sale of the Products.

2.3 If shipment is delayed for thirty (30) days or more from the delivery date accepted by the Company for reasons attributable to the Buyer and provided that the Buyer shall have no other liability to the Company in respect of such delay, the reasonable direct costs of putting the Products into storage at a facility off-site of Company's premises until such times as they are shipped (or delivered) shall be the to the Buyer's account and at Buyer's sole risk.

SECITON 3: PAYMENT

Terms of payment are net 30 days from the date of invoice unless otherwise agreed in writing. Late payments may be subject to interest on the unpaid balance at the greater of 2% per month or the maximum rate permitted by law. No deductions or set-offs are to be made by Buyer from amounts due unless specifically authorized by the Company in writing. If in the judgment of the Company, the financial condition of Buyer at any time does not justify continuance of production or shipment on the terms of payment specified, the Company may require full or partial payment in advance.

SECTION 4: TAXES

The Company's prices do not include sales, use, excise taxes, tariffs, duties or value added or similar taxes or fees. The Company will add such taxes or fees to the invoice unless the Buyer provides Company with tax-exempt certificate acceptable to the applicable taxing authorities or arranges payment of such taxes or fees directly by the Buyer.

SECTION 5: WARRANTY

5.1 NEW PRODUCT – Company warrants the Products shall be free of defects in material and workmanship and meet the Product specifications for a period from the date of shipment as specified below.

5.1.a FANGTOOTH MAX straddle mounted pinion systems – 3 years.

5.1.b FANGTOOTH OPEN cantilevered pinion systems – 2 years.

5.1.c FANGTOOTH Any products not specified as standard including any units with non-standard coatings for corrosion claims – 1 year.

5.1.d FANGBOT integrated systems – FANGTOOTH MAX integrated into larger systems will carry the full 3 year warranty. FANGTOOTH OPEN integrated into larger systems will carry the full 2 year warranty. Custom (non-standard) engineered products within the larger systems or any other non-standard FANGTOOTH products will be warranties for 18 months.

5.2 Notwithstanding the warranty periods listed above, the warranty on normal wear items such as oil seals is limited to one year. The warranties of gearboxes, motors, brakes, couplings, linear rail, linear bearings, gear rack and pinion and all other add on items shall be the warranties provided by, and shall be the responsibility of, the original equipment manufacturer. The Company is not responsible for and does not warrant (a) equipment, components and/or material furnished by the Buyer; (b) the sufficiency of functionality of any design specifications furnished by the Buyer; nor shall Company be liable for defects or damages arising from the foregoing. Notwithstanding any other provision in these Terms and Conditions, none of the warranties given by the Company shall apply to products manufactured by others and sold by the Company. Buyer will at its own expense arrange for any dismantling and reassembly of any goods and equipment and the provision of all equipment (including without limitation lifting equipment and crane-age) to the extent that this is necessary to remedy the defect or facilitate re-performance of service.

Unless otherwise agreed, necessary transport of the Products and/or parts therefo to and from Company in connection with the remedying of defects will be at the risk and expense of the Buyer. Buyer will follow Company's instructions regarding such transport.

Unless otherwise agreed, Buyer will bear any additional costs which Company incurs as a result of the Products being located in a place other than the place of delivery.

Defective parts which have been replaced will be made available to Company and will be its property.

5.3 Any claims under this warranty must be made in writing to the Company at the address set forth above (or by email) within thirty (30) days of the discovery thereof. The Company's obligation under this warranty shall be limited to the repair or replacement, at the Company's option, of the Product, or any part thereof, when the Company has determined the Product is not warranted; any Product or parts repaired or replaced pursuant to the warranty will by warranted for the remainder of the original warranty period. The Company shall not be responsible for any claims which the Company determines are due to improper installation, operation above rated capacity, exceeds L10 life cycles, operation at extreme conditions, normal wear and tear, accident, or because the Product has been used, adjusted, altered, handled, maintained, repaired or stored other than as directed by the Company.

5.4 This warranty shall not apply in the event of defects caused by: (i) physical abuse of the Products or any component, or acts of vandalism by any persons other than Company; (ii) alterations, modifications, additions, or repairs made during the applicable warranty period by anyone other than Company, and its authorized employees, agents or subcontractors; (iii) accidents or damage resulting from fire, water, wind, hail, lightning, electrical surge or failure, earthquake, theft or similar causes not caused by the sole negligence of Company; (iv) damage as a result of corrosion or other damage caused by Buyer's failure to protect and maintain the Products in accordance with Company's written instructions and warnings; or (v) design specifications furnished by Buyer.

5.5 Buyer shall not rely upon Company's skill or judgement or furnish Products for any particular purpose beyond the specific express warranties provided herein. Buyer has the responsibility to determine whether the Products and specifications are fit for buyer's intended purpose. Company does not warrant the Products will comply with the requirements or any safety code or regulations, or with any environmental or other law or regulation. Buyer is responsible for the safe and lawful operation and use of the Products.

5.9 THE FOREGOING WARRANTIES ARE THE SOLE WARRANTIES PROVIDED BY COMPANY FOR THE PRODUCTS AND ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ALL OF WHICH ARE HEREBY DISCLAIMED AND EXCLUDED BY MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE. BUYER AGREES THAT ITS SOLE AND EXCLUSIVE REMEDY AGAINST COMPANY WILL BE LIMITED TO THE REPAIR AND REPLACEMENT OF NONCONFORMING OR DEFECTIVE PRODUCTS PROVIDED COMPANY IS PROMPTLY NOTIFIED IN WRITING OF ANY DEFECT. THIS EXLUSIVE REMEDY WILL NOT BE DEEMED TO HAVE FAILED OF ITS ESSENTAIL PURPOSE SO LONG AS COMPANY IS WILLING TO REPAIR OR REPLACE THE NONCONFORMING OR DEFECTIVE PRODUCTS.

SECTION 6: OWNERSHIP OF INTELLECTUAL PROPERTY

Company retains ownership and all rights to its intellectual property. Buyer shall have no rights to Company's intellectual property. Any intellectual property developed by Company and arising in connection with the supply of Products hereunder shall be deemed property of Company, and Company shall have exclusive rights to the use and ownership of such intellectual property.

SECTION 7: THIRD PARTY INTELLECTUAL PROPERTY CLAIMS

Company shall pay costs and damages finally awarded in any suit against Buyer by a third party to the extent based upon a finding that the design or construction of the Products as furnished infringes a patent or other third party intellectual property rights (except infringement occurring as a result of incorporating a design or modification at Buyer's request), provided that Buyer promptly notifies Company of any charge of infringement, and Company is given the right at its expense to settle such charge and to defend or control the defense of any suit based upon such charge. Company shall have no obligation hereunder with respect to claims, suits or proceedings, resulting from or related to, in whole or in part, (i) the use of software or software documentation, (ii) compliance with Buyer's specifications, (iii) the combination with other products, or modification of, the Products after delivery by Company, or (iv) the use of the Products, or any part thereof, in the practice of a process. THIS SECTION SETS FORTH COMPANY'S ENTIRE LIABILITY WITH RESPECT TO PATENTS OR OTHER INFRIGEMENTS OF INTELLECTUAL PROPERTY.

SECTION 8: RETURN OF PRODUCTS

In the event that the Buyer does not accept the Products, the Buyer must apply for authorization from the Company before returning the Products to the Company for credit. The Company will advise the Buyer of the credit to be allowed and necessary restocking charges on the unused material, subject to the Company's inspection and acceptance when received. No material should be returned to the Company except upon receipt of written authorization. In addition to the usual restocking charges, the Buyer must pay the actual transportation expense of the Company, plus all return transportation costs. Motors and specially designed parts will not be accepted for return or credit.

SECTION 9: DELIVERY, TITLE AND RISK OF LOSS

The Products will be delivered Ex Works – Fangtooth Inc's facility (in accordance with Incoterms 2010) unless otherwise agreed in writing by Company. The Buyer will be responsible for making all shipping arrangements, and Buyer will provide sufficient notice and details of such arrangements to allow Company to prepare the Products for delivery. Title and risk of loss will remain with Company and not pass to Buyer until delivery to the Incoterm delivery point.

SECTION 10: FORCE MAJEURE

Company will not be deemed to be in default or otherwise responsible for delays or failures in performance resulting from acts of God: acts or war, or civil disturbance, terrorism, epidemics, governmental action or inaction, fires, floods, earthquakes, tornadoes, or other events beyond Company's reasonable control (a "Force majeure Event"). A Force Majeure Event affecting Company's vendors shall also be deemed as a Force Majeure Event for the Company, provided that the Company shall use commercially reasonable efforts to mitigate any delays caused by its vendor's Force Majeure situation. Company shall in such instances give notice of the non-performance (including its anticipated duration) to the Customer promptly after becoming aware that it has occurred or will occur. In no event shall lack of finances or ability to pay as a result of the financial condition of either party be considered a Force Majeure Event.

SECTION 11: CANCELLATION

Upon written acceptance of an order by the Company, Buyer may not cancel or terminate for convenience, or direct suspension of manufacture, except with Company's written consent and then only upon terms that will compensate Company for its engineering, fabrication and purchasing charges and any other costs relating to such cancellation, termination, or suspension, plus a reasonable amount for profit and overhead.

SECTION 12: ETHICAL BUSINESS PRACTICES

Company requires manufacturing and business practices that are compliant with all applicable laws and regulations, including, the need to conduct all transactions in compliance with ethical business practices. Both the Company and the Buyer agree that neither of them nor their employees, agents, representatives, or other intermediaries will engage in any activity that may be construed to be in violation of their respective codes of ethical business practices or applicable law. Buyer acknowledges and agrees that it shall not, in regards to the sale or resale of the Company's products, make any payment or transfer of value to any third party (including through any or multiple intermediaries) that would cause either the Buyer, Company or any of Company's affiliates to violate either the U.S. Foreign Corrupt Practices Act or any other applicable anti-corruption laws. Buyer shall indemnify and hold Company and Company's affiliates harmless in the even of any breach of this paragraph by buyer or any of its intermediaries.

SECTION 13: LIMITATION OF LIABILITY

NEITHER COMPANY AND ITS AFFILIATES AND THEIR RESPECTIVE OFFICERS, DIRECTORS, EMPLOYEES, AGENTS, INSURERS AND ATTORNEYS SHALL BE LIABLE, WHETHER IN CONTRACT, WARRANTY, FAILURE OF A REMEDY TO ACHIEVE ITS INTENDED OR ESSENTIAL PURPOSES, TORT (INCLUDING LOSS OF USE, REVENUE OR PROFIT, OR FOR COSTS OF CAPITAL OR OF SUBSTITURE USE OR PERFORMANCE, OR FOR INDIRECT, SPECIAL, LIQUIDATED, INCIDENTAL OR CONSEQUENTIAL DAMAGES, OR FOR ANY OTHER LOSS OR COST OF SIMILAR TYPE, OR FOR OTHER CLAIMS BY BUYER FOR ANY DAMAGES OR LOSSES. COMPANY'S MAXIMUM LIABILITY FOR ALL CLAIMS AND LOSSES ARISING OUT OF THE MANUFACTURE OR SALE OF THE PRODUCTS SHALL BE THE PRICE CONFIRMED BY THE COMPANY RELATING TO THE INDIVIDUAL SALE TRANSACTION WITH THE BUYER. BUYER AND COMPANY AGREE THAT THE EXCLUSIONS AND LIMITATIONS SET FORTH IN THIS SECTION ARE SEPARATE AND INDEPENDENT FROM ANY REMEDIES WHICH BUYER MAY HAVE HEREUNDER AND SHALL BE GIVEN FULL FORCE AND EFFECT WHETHER OR NOT ANY OR ALL SUCH REMEDIES SHALL BE DEEMED TO HAVE FAILED OF THEIR ESSENTIAL PURPOSE.

SECTION 14: GOVERNING LAW

The terms of the sales of the Products shall be governed and controlled in all respects by the laws of the State of Michigan and all disputes, including interpretation, enforceability, validity, and construction, shall be determined under the law of the State of Michigan without regard to any conflict of law provisions. Any dispute arising between the parties will be finally resolved in the state or federal courts of Michigan. Each party consents to personal jurisdiction in the state and federal courts of the State of Michigan for any all matters related to or arising out of the sale, attempted sale, delivery, warranty, maintenance or use of the Products, and agrees that personal jurisdiction in any such court will be deemed proper. Buyer shall be liable to Company for any attorney fees and costs incurred by Company in enforcing any of its rights hereunder.

SECTION 15: STATUTE OF LIMITATIONS

To the extent permitted by applicable law, any lawsuit for breach of contract, including breach of warranty, arising out of the transactions covered by this Purchase Order, must be commenced not later than twelve (12) months from the date the cause of action accrued.

SECTION 16: CHANGES IN LAWS AND REGULATIONS

Company's prices and timely performance are based on all applicable laws, rules, regulations, orders, codes, standards or requirements of governmental authorities effective on the date of Company's proposal. Any applicable change to the forgoing shall entitle Company to an equitable adjustment in the prices and time of performance.

SECTION 17: COMPLIANCE WITH EXPORT LAWS AND REGULATIONS

Certain Products manufactured by Company, as well as technical data related thereto, may be subject to export licensing controls under the U.S. Export Administration Regulations and/or the U.S. International Traffic in Arms Regulations, which require licensing for and/or prohibit the export or diversion of the Company's products to certain countries. If Buyer is responsible for obtaining export approvals. Buyer warrants that it will no assist or participate in any export of the Company's products or related technical data without first obtaining the required export license and will not knowingly assist or participate in any such diversion or other violation of applicable U.S. laws and regulations. If Company is responsible for obtaining export approvals, Buyer shall assist the Company, as necessary, in obtaining such approvals. Buyer shall indemnify and hold the Company and its affiliates harmless from any losses or claims arising out of or related to Buyer's failure to comply with applicable export control laws and regulations.

SECTION 18: COMPLIANCE WITH LAWS

Buyer agrees to comply with all applicable local, state, Federal and Foreign laws, orders, directives, and regulations at any time in effect, including, but not limited to, those found in 41 CFR 60 requiring equal opportunity and affirmative action without regard to race, color, religion, sex, national origin, presence of disability or status as a special disabled veteran or Vietnam era veteran, which specifically incorporated herein by reference. If Buyer fails to comply with the provisions of this paragraph, Company may, by written notice to Buyer, terminate any Order for Buyer's default in addition to exercising any other rights or remedies provided by law.

SECTION 19: RELATIONSHIP OF THE PARTIES

Buyer and Company are independent contractors, and nothing in the contract makes either party the agent or legal representative of the other party for any purpose. Neither party has authority to assume or to create any obligation on behalf of the other party.

SECTION 20: WAIVER

The failure of Company to enforce any right or remedy provided in contract or by law on a particular occasion will not be deemed a waiver of that right or remedy on a subsequent occasion or a waiver of any other right or remedy.

SECTION 21: SEVERABILITY

A finding that any provision in these Terms & Conditions or an accepted purchase order is invalid or unenforceable in any jurisdiction will not affect the validity or enforceability of any other provision of these Terms & Conditions or an accepted purchase order or the validity or enforceability of that provision in any other jurisdiction.

SECTION 22: ASSIGNMENT and DELEGATION

No right or interest in the sale of Products hereunder shall be assigned by the Buyer without written permission of the Company. No delegation of any obligation owed, or the performance of any obligation by the Buyer, shall be made without the written permission of the Company. Any attempted assignment of delegation shall be wholly void and totally ineffective for all purposes unless made in conformity with this section. Company shall have the right to assign its obligations to any affiliate of the Company or any successor to substantially all the business or assets of the Company.

SECTION 23: THIRD PARTY RIGHTS

Notwithstanding any provision of law, no third party (including Buyer's customer) shall have the right to enforce these Terms & Conditions or any other contractual rights against Company or its affiliates.

SECTION 24: HEADINGS

The headings of the various paragraphs of these Terms & Conditions have been inserted for convenient reference only and shall not to any extent have the effect of modifying, amending, or changing the expressed terms and provisions hereof.

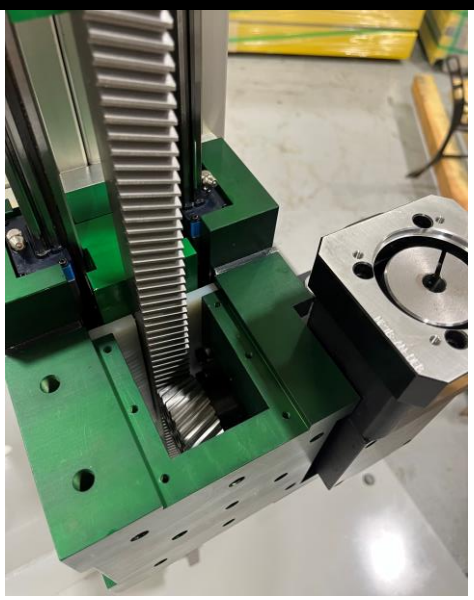
SECTION 25: ENTIRE AGREEMENT

These Terms & Conditions, including any attachments hereto, constitutes the entire understanding and agreement between the parties and supersedes any prior oral or written agreements with respect to the subject matter hereof. No course of prior dealings between the and the Buyer, and no usage of the trade shall be relevant to supplement or explain and term used herein. Acceptance or acquiescence in a course of performance rendered hereunder shall not be relevant to determine the meaning of these Terms & Conditions even though the accepting or acquiescing party has knowledge of the performance and opportunity for objection. Whenever a term defined by the Uniform Commercial Code is used herein, the definition contained in the Uniform Commercial Code shall control

Planetary Lift
Ball Screw Lift

NEPTUNE
TRITON

Standard Rack Axis
Heavy Rack Axis



fangOPEN
fangMAX

MADE IN USA
LIVONIA MI

Fangtooth Inc.
11790 Mayfield St
Livonia, MI 48150
Ph 248-798-4877

fang TOOTH

AUTOMATION IDEAS WITH TEETH

ACTUATORS
GEAR BOXES
ROLLED BALLSCREWS
HIGH FORCE LIFTING JACKS & GUIDED RACK
MULTI AXIS SYSTEMS
CUSTOM ENGINEERED PRODUCTS